CONTRA COSTA COUNTY CCCERA
Employees' Retirement Association

AGENDA

RETIREMENT BOARD MEETING

SECOND MONTHLY MEETING
September 26, 2018
9:00 a.m.

Retirement Board Conference Room
The Willows Office Park
1355 Willow Way, Suite 221
Concord, California

THE RETIREMENT BOARD MAY DISCUSS AND TAKE ACTION ON THE FOLLOWING:

1. Pledge of Allegiance.

2. Accept comments from the public.

CLOSED SESSION

3. The Board will go into closed session pursuant to Govt. Code Section 54957 to consider the disability application for Rebecca Halvorson.

4. CONFERENCE WITH LABOR NEGOTIATORS
(Government Code Section 54957.6)

   Agency designated representatives:
   Gail Strohl, Chief Executive Officer
   Anne Sommers, Admin/HR Manager
   Joe Wiley, CCCERA's Chief Negotiator

   Employee Organization: AFSCME, Local 2700

OPEN SESSION

5. Consider and take possible action to accept the GASB 68 report from Segal Consulting.

6. Review of Report on Growth Sub-portfolio.

7. Update from StepStone Group on Private Credit implementation.

8. Presentation from Verus on Risk Parity manager search process and recommendations.

9. Presentation from AQR regarding a potential commitment to Risk Parity strategy.

10. Consider and take possible action regarding a commitment to AQR Risk Parity strategy.

11. Presentation from PanAgora regarding a potential commitment to Risk Parity strategy.

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The Retirement Board will provide reasonable accommodations for persons with disabilities planning to attend Board meetings who contact the Retirement Office at least 24 hours before a meeting.

12. Consider and take possible action regarding a commitment to PanAgora Risk Parity strategy.

13. Educational session on fiduciary duties presented by fiduciary counsel.

14. Educational presentation on Ralph M. Brown Act open meetings laws.

15. Educational presentation on the California Public Records Act.

16. Consider and take possible action to amend CCCERA's Accessibility of Investment Records Policy.

17. Consider and take possible action to issue a Request for Proposal for Actuarial Consulting and Actuarial Auditing Services.

18. Consider and take possible action on SACRS Voting Proxy Form.

19. Report from Audit Committee.

20. Consider authorizing the attendance of Board:
    a. Nossaman's 2018 Fiduciaries' Forum, Nossaman LLP, October 18-19, 2018, San Francisco, CA.

21. Miscellaneous
    a. Staff Report
    b. Outside Professionals' Report
    c. Trustees' comments

Meeting Date
9/26/18
Agenda Item
#5

CONTRA COSTA COUNTY CCCERA
Employees' Retirement Association

MEMORANDUM

Date: September 26, 2018

To: CCCERA Board of Retirement

From: Gail Strohl, Chief Executive Officer

Subject: Consider and take possible action to accept the GASB 68 report from Segal Consulting.

Background

The Governmental Accounting Standards Board (GASB) issued Statement No. 68 in June 2012 to be effective for fiscal years beginning after June 15, 2014. This Statement's objective is to improve accounting and financial reporting. CCCERA's participating employers can utilize the information contained in the GASB 68 report in their own reporting. Employers are currently assessed a pro-rata share of the report preparation cost. The Segal Consulting report is based on a December 31, 2017 measurement date for employer reporting as of June 30, 2018.

Recommendation

Consider and take possible action to accept the GASB 68 report from Segal Consulting.

Meeting Date
9/26/18
Agenda Item
#5

CONTRA COSTA COUNTY EMPLOYEES' RETIREMENT ASSOCIATION

SCHEDULE OF EMPLOYER ALLOCATIONS AND SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR EMPLOYER REPORTING UNDER
GOVERNMENTAL ACCOUNTING STANDARDS
BOARD (GASB) STATEMENT NO. 68
AS OF JUNE 30, 2018
USING A MEASUREMENT DATE OF DECEMBER 31, 2017

BROWN ARMSTRONG

CERTIFIED PUBLIC ACCOUNTANTS

CONTRA COSTA COUNTY EMPLOYEES' RETIREMENT ASSOCIATION

SCHEDULE OF EMPLOYER ALLOCATIONS AND SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR EMPLOYER REPORTING UNDER GOVERNMENTAL ACCOUNTING STANDARDS BOARD (GASB) STATEMENT NO. 68 AS OF JUNE 30, 2018 USING A MEASUREMENT DATE OF DECEMBER 31, 2017

CONTRA COSTA COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
SCHEDULE OF EMPLOYER ALLOCATIONS AND
SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR EMPLOYER REPORTING UNDER
GOVERNMENTAL ACCOUNTING STANDARDS
BOARD (GASB) STATEMENT NO. 68
AS OF JUNE 30, 2018
USING A MEASUREMENT DATE OF DECEMBER 31, 2017

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Certified Public Accountants

INDEPENDENT AUDITOR'S REPORT

To the Board of Retirement and Audit Committee of
Contra Costa County Employees' Retirement Association
Concord, California

Report on the Schedules

We have audited the accompanying Schedule of Employer Allocations of Contra Costa County Employees' Retirement Association (CCCERA) for the years ended December 31, 2017 and 2016, and the related notes. We have also audited the total for all entities of the columns titled net pension liability, total deferred outflows of resources, total deferred inflows of resources, and total pension expense (specified column totals) included in the accompanying Schedule of Pension Amounts by Employer as of and for the year ended December 31, 2017, and the related notes.

Management's Responsibility for these Schedules

Management is responsible for the preparation and fair presentation of these schedules in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of schedules that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express opinions on the Schedule of Employer Allocations and the specified column totals included in the Schedule of Pension Amounts by Employer based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the Schedule of Employer Allocations and specified column totals included in the Schedule of Pension Amounts by Employer are free from material misstatement.

Our audit involved performing procedures to obtain audit evidence about the amounts and disclosures in the Schedule of Employer Allocations and specified column totals included in the Schedule of Pension Amounts by Employer. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the Schedule of Employer Allocations and specified column totals included in the Schedule of Pension Amounts by Employer, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to CCCERA's preparation and fair presentation of the Schedule of Employer Allocations and the specified column totals included in the Schedule of Pension Amounts by Employer in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of CCCERA's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the Schedule of Employer Allocations and specified column totals included in the Schedule of Pension Amounts by Employer.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinions.

Opinion

In our opinion, the schedules referred to above present fairly, in all material respects, the employer allocations for the years ended December 31, 2017 and 2016, and net pension liability, total deferred outflows of resources, total deferred inflows of resources, and total pension expense (specified column totals) for the total of all participating entities for CCCERA as of December 31, 2017, in accordance with accounting principles generally accepted in the United States of America.

Other Matters

We have audited, in accordance with auditing standards generally accepted in the United States of America, the financial statements of CCCERA as of and for the year ended December 31, 2017, and our report thereon, dated June 22, 2018, expressed an unmodified opinion on those financial statements.

Restriction on Use

Our report is intended solely for the information and use of CCCERA's management, the Board of Retirement, and the Audit Committee of CCCERA, and CCCERA participating employers and their auditors and is not intended to be, and should not be, used by anyone other than these specified parties.

BROWN ARMSTRONG
ACCOUNTANCY CORPORATION

Brown Armstrong
Accountancy Corporation

Bakersfield, California
September 14, 2018

CONTRA COSTA COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
SCHEDULE OF EMPLOYER ALLOCATIONS
FOR THE YEAR ENDED DECEMBER 31, 2017

Employer Name	Net Pension Liability (NPL) (1)	Allocation Percentage (2)
Bethel Island Municipal District	$ 157,443	0.019%
Byron Brentwood Cemetery	29,395	0.004%
Contra Costa Mosquito and Vector Control District	3,017,908	0.372%
Contra Costa County Fire Protection District	110,215,347	13.583%
Central Contra Costa Sanitary District	63,806,000	7.863%
First 5 - Children and Families Commission	1,289,083	0.159%
Contra Costa County	503,558,908	62.058%
Contra Costa County Employees' Retirement Association	4,287,094	0.528%
East Contra Costa Fire Protection District	16,350,262	2.015%
Contra Costa Housing Authority	6,267,604	0.772%
In-Home Supportive Services Authority	794,473	0.098%
Local Agency Formation Commission	181,268	0.022%
Moraga-Orinda Fire District	23,498,575	2.896%
Rodeo Sanitary District	111,965	0.014%
Rodeo-Hercules Fire Protection District	11,693,174	1.441%
San Ramon Valley Fire District	47,110,096	5.806%
Superior Court	12,606,159	1.554%
Delta Diablo Sanitation District (Terminated Employer) (3)	1,435,257	0.177%
Diablo Water District (Terminated Employer) (3)	827,520	0.102%
City of Pittsburg (Terminated Employer) (3)	4,199,080	0.517%
Total for All Employers	**$ 811,436,611**	100.000%

(1) The NPL is including pension obligation bonds and Unfunded Actuarial Accrued Liability prepayments for certain employers.

(2) The unrounded percentages excluding terminated employers are actually used in the allocation of NPL for active employers.

(3) Beginning with the December 31, 2016 funding valuation, the assets and liabilities associated with three terminated employers have been moved to their own cost group. As such, each pension expense and NPL of these three terminated employers have been directly allocated starting with the June 30, 2017 reporting date.

CONTRA COSTA COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
SCHEDULE OF EMPLOYER ALLOCATIONS
FOR THE YEAR ENDED DECEMBER 31, 2016

Employer Name	Net Pension Liability (NPL) (1)	Allocation Percentage (2)
Bethel Island Municipal District	$ 137,084	0.010%
Byron Brentwood Cemetery	75,800	0.005%
Contra Costa Mosquito and Vector Control District	5,140,418	0.367%
Contra Costa County Fire Protection District	167,124,048	11.934%
Central Contra Costa Sanitary District	87,847,116	6.273%
First 5 - Children and Families Commission	2,423,899	0.173%
Contra Costa County	939,305,464	67.071%
Contra Costa County Employees' Retirement Association	6,475,713	0.462%
East Contra Costa Fire Protection District	23,362,447	1.668%
Contra Costa Housing Authority	10,162,604	0.726%
In-Home Supportive Services Authority	1,294,522	0.092%
Local Agency Formation Commission	359,329	0.026%
Moraga-Orinda Fire District	32,569,913	2.326%
Rodeo Sanitary District	203,750	0.015%
Rodeo-Hercules Fire Protection District	14,693,106	1.049%
San Ramon Valley Fire District	72,491,195	5.176%
Superior Court	27,158,829	1.939%
Delta Diablo Sanitation District (Terminated Employer) (3)	1,918,215	0.137%
Diablo Water District (Terminated Employer) (3)	823,144	0.059%
City of Pittsburg (Terminated Employer) (3)	6,888,327	0.492%
Total for All Employers	**$ 1,400,454,923**	100.000%

(1) The NPL is including pension obligation bonds and Unfunded Actuarial Accrued Liability prepayments for certain employers.

(2) The unrounded percentages excluding terminated employers are actually used in the allocation of NPL for active employers.

(3) Beginning with the December 31, 2016 funding valuation, the assets and liabilities associated with three terminated employers have been moved to their own cost group. As such, each pension expense and NPL of these three terminated employers have been directly allocated starting with the June 30, 2017 reporting date.

CONTRA COSTA COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
NOTES TO SCHEDULE OF EMPLOYER ALLOCATIONS
DECEMBER 31, 2017 AND 2016

NOTE 1 – PLAN DESCRIPTION

The Contra Costa County Employees' Retirement Association (CCCERA) is governed by the Board of Retirement (Board) under the County Employees Retirement Law of 1937 (CERL); the California Public Employees' Pension Reform Act of 2013 (PEPRA); and the California State Constitution. Members should refer to CERL and PEPRA for more complete information.

CCCERA is a contributory defined benefit pension plan (the Plan) initially organized under the provisions of the CERL on July 1, 1945. It provides benefits upon retirement, death or disability of members. Prior to 2010, CCCERA operated as a cost-sharing, multiple employer defined benefit pension plan that covered substantially all of the employees of the County of Contra Costa (the County) and 16 other member agencies, and three terminated employers.

In October 2009, the Board depooled CCCERA's assets, actuarial accrued liability (AAL), and normal cost both by tier and employer for determining employer contribution rates. This Board's action yielded 12 separate cost groups by employer, with the exception of smaller employers (those with less than 50 active members at that time) who continue to be pooled with the applicable County tier. The December 31, 2009 valuation was the first to incorporate the new "depooled" employer contribution rates, and those rates were effective July 1, 2011.

CCCERA, with its own governing board, is an independent governmental entity, separate and distinct from the County. CCCERA is presented in the County's basic financial statements as a pension trust fund. Costs of administering the Plan are financed through contributions and investment earnings. Effective January 1, 2015, California Senate Bill 673 (SB 673) makes the CCCERA retirement system an independent "district" and the employer for its entire staff, subject to terms and conditions of employment established by the Board.

NOTE 2 – SUMMARY OF SIGNIFICANT ACCOUNTING AND REPORTING POLICIES

Basis of Presentation and Basis of Accounting

Employers participating in CCCERA are required to report pension information in their financial statements for fiscal periods beginning on or after June 15, 2014, in accordance with Governmental Accounting Standards Board (GASB) Statement No. 68, *Accounting and Financial Reporting for Pensions – an Amendment of GASB Statement No. 27*. The Schedule of Employer Allocations, along with CCCERA's audited financial statements, the GASB Statement No. 67 Actuarial Valuation as of December 31, 2017, and the GASB Statement No. 68 Actuarial Valuation based on a December 31, 2017 Measurement Date for Employer Reporting as of June 30, 2018, prepared by CCCERA's independent actuary, provide the required information for financial reporting related to CCCERA that employers may use in their financial statements.

The accompanying schedule was prepared by CCCERA's independent actuary and was derived from information provided by CCCERA in accordance with accounting principles generally accepted in the United States of America as applicable to governmental organizations.

Use of Estimates in the Preparation of the Schedules

The preparation of this schedule in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect certain amounts and disclosures. Actual results could differ from those estimates.

NOTE 3 – ACTUARIAL METHODS AND ASSUMPTIONS

Net Pension Liability

The collective Plan's Fiduciary Net Position (FNP) as of December 31, 2017, was audited as part of CCCERA's financial statements for the fiscal year ended December 31, 2017. The net pension liability (NPL) for each cost group is the Total Pension Liability (TPL) minus the Plan's FNP (plan assets). The TPL for each cost group is obtained from internal valuation results based on the actual participants in each cost group. The Plan FNP for each cost group was determined by adjusting the Valuation Value of Assets (VVA) for each cost group (which is used to determine employer contribution rates) by the ratio of the total CCCERA Plan FNP to total CCCERA VVA. Based on this methodology, any non-valuation reserves (such as the Post Retirement Death Benefit) are allocated amongst the cost groups based on each cost group's VVA.

For this report, the reporting dates for the employer are June 30, 2018 and 2017. The FNP and NPL were measured as of December 31, 2017 and 2016, respectively, and determined based upon rolling forward the TPL from actuarial valuations as of December 31, 2016 and 2015, respectively. In addition, any significant changes in actuarial assumptions or Plan provisions that occurred between the valuation date and the measurement date have been reflected. The TPL as of December 31, 2017, was measured by (1) valuing the TPL as of December 31, 2016, (before the rollforward) to include the following actuarial assumptions that the Board has adopted for use in the pension funding valuation as of December 31, 2017, and (2) using this TPL in rolling forward the results from December 31, 2016, to December 31, 2017. All assumptions are the same as those used in the December 31, 2017 funding valuation and were based on the results of an actuarial experience study for the period January 1, 2012, through December 31, 2014. Consistent with the provisions of GASB Statement No. 68, the assets and liabilities measured as of December 31, 2017 and 2016, are not adjusted or rolled forward to June 30, 2018 and 2017 reporting dates, respectively.

Allocation of Net Pension Liability to Individual Employers

The allocation method used to derive each employer's proportionate share of the NPL is consistent with GASB Statement No. 68, paragraph 49. The Determination of Proportionate Share is based on the actual January 1, 2017 through December 31, 2017 compensation information provided by CCCERA. In determining the employer's proportionate share, a ratio is calculated using the employees' compensation by employer and cost group.

Paragraph 49 of GASB Statement No. 68 indicates that, to the extent different contribution rates are assessed based on separate relationships that constitute the collective NPL, the determination of the employer's proportionate share of the collective NPL should be made in a manner that reflects those relationships. The allocation method utilized by CCCERA (as described earlier) to determine the employer's proportionate share reflects these relationships through the cost groups. For cost groups that have one employer, all of the NPL for the cost group is allocated to the corresponding employer. For cost groups with multiple employers, NPL is allocated based upon a ratio calculated by using the employer's compensation to the total cost group allocation. If an employer is in multiple cost groups, the employer's total allocated NPL is the sum of its allocated NPL from each cost group. Terminated employers have been directly allocated NPL based on results for the specific employer. The corresponding employer allocation percentage or proportionate share shown on the Schedule of Employer Allocations is on the total Plan basis.

NOTE 4 – RELATIONSHIP TO THE BASIC FINANCIAL STATEMENTS

The components of the schedule have been determined based on the FNP for the CCCERA as shown in the CCCERA Statement of Changes in Fiduciary Net Position and in accordance with requirements promulgated by GASB Statements No. 67 and No. 68. The NPL at December 31, 2017 and 2016, is reported in CCCERA's Required Supplementary Information following the Notes.

CONTRA COSTA COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
SCHEDULE OF PENSION AMOUNTS BY EMPLOYER
AS OF AND FOR THE YEAR ENDED DECEMBER 31, 2017

		Deferred Outflows of Resources				Deferred Inflows of Resources					Pension Expense (1)		
Employer	Net Pension Liability	Differences Between Expected and Actual Experience	Changes of Assumptions or Other Inputs	Changes in Proportion and Differences Between Employer's Contributions and Proportionate Share of Contributions (3)	Total Deferred Outflows of Resources	Differences Between Expected and Actual Experience In Total Pension Liability	Changes of Assumptions or Other Inputs	Net Excess of Actual Over Projected Earnings on Pension Plan Investments	Changes in Proportion and Differences Between Employer's Contributions and Proportionate Share of Contributions (3)	Total Deferred Inflows of Resources	Proportionate Share of Allocable Plan Pension Expense (1)	Net Amortization of Deferred Amounts from Changes in Proportion and Differences Between Employer's Contributions and Proportionate Share of Contributions	Total Pension Expense (1)
Bethel Island Municipal District	$ 157,443	$ -	$ 4,748	$ 114,216	$ 118,964	$ 15,522	$ 2	$ 40,592	$ 8,336	$ 64,452	$ 31,750	$ 28,862	$ 60,583
Byron Brentwood Cemetery	29,395	-	886	46,391	47,277	2,898	-	7,579	5,810	16,287	5,928	32,353	38,275
Contra Costa Mosquito and Vector Control District	3,017,908	-	91,009	140,600	231,609	297,532	37	778,082	174,797	1,250,448	608,598	(65,674)	542,375
Contra Costa County Fire Protection District	110,215,347	-	3,323,684	5,669,284	8,992,968	10,866,006	1,350	28,415,919	5,163,668	44,446,943	22,226,281	(850,237)	21,355,936
Central Contra Costa Sanitary District	63,806,000	-	1,924,151	11,045,200	12,969,351	6,290,561	782	16,450,578	5,334,713	28,076,634	12,867,265	112,144	12,967,767
First 5 - Children and Families Commission	1,289,083	-	38,874	253,585	292,459	127,089	16	332,354	15,187	474,646	259,959	147,618	407,343
Contra Costa County	503,558,908	-	15,185,462	15,776,802	30,962,264	49,645,301	6,168	129,828,465	23,031,988	202,511,922	101,548,852	4,708,294	106,165,258
Contra Costa County Employees' Retirement Association	4,287,094	-	129,283	727,934	857,217	422,660	53	1,105,306	27,096	1,555,115	865,545	188,712	1,052,475
East Contra Costa Fire Protection District	16,350,262	-	493,063	1,550,714	2,043,777	1,611,954	200	4,215,454	3,197,693	9,025,301	3,297,232	(1,984,180)	1,310,069
Contra Costa Housing Authority	6,267,604	-	189,008	294,415	483,423	617,916	77	1,615,925	35,713	2,269,631	1,263,939	61,661	1,324,457
In-Home Supportive Services Authority	794,473	-	23,958	122,132	146,090	78,326	10	204,832	1,456	284,624	160,215	38,594	198,664
Local Agency Formation Commission	181,268	-	5,466	8,177	13,643	17,871	2	46,735	12,043	76,651	36,555	(4,016)	32,504
Moraga-Orinda Fire District	23,498,575	-	708,630	2,432,720	3,141,350	2,316,698	288	6,058,445	3,959,470	12,334,901	4,738,777	(1,456,307)	3,278,183
Rodeo Sanitary District	111,965	-	3,376	190,893	194,269	11,039	1	28,867	14,003	53,910	22,579	106,808	129,368
Rodeo-Hercules Fire Protection District	11,693,174	-	352,623	1,863,733	2,216,356	1,152,817	143	3,014,755	1,558,600	5,726,315	2,358,072	(718,698)	1,637,240
San Ramon Valley Fire District	47,110,096	-	1,420,665	6,183,329	7,603,994	4,644,531	577	12,146,010	3,512,617	20,303,735	9,500,331	(1,012,848)	8,478,887
Superior Court	12,606,159	-	380,155	1,545,115	1,925,270	1,242,827	154	3,250,143	1,912,050	6,405,174	2,542,190	666,914	3,206,804
Delta Diablo Sanitation District (Terminated Employer) (2)	1,435,257	239,142	-	-	239,142	-	-	578,481	-	578,481	-	-	77,870
Diablo Water District (Terminated Employer) (2)	827,520	117,680	-	-	117,680	-	-	95,732	-	95,732	-	-	77,096
City of Pittsburg (Terminated Employer) (2)	4,199,080	125,051	-	-	125,051	-	-	2,032,689	-	2,032,689	-	-	(8,086)
Total for All Employers	$ 811,436,611	$ 481,873	$ 24,275,041	$ 47,965,240	$ 72,722,154	$ 79,361,548	$ 9,860	$ 210,246,943	$ 47,965,240	$ 337,583,591	$ 162,334,068	$ -	$ 162,333,068

(1) Starting with the June 30, 2017 reporting date, the employer contributions now exclude any employer subventions of member contributions and include any member subventions of employer contributions. This change has not been applied on a retroactive basis prior to the June 30, 2017 reporting date.

(2) Beginning with the December 31, 2016 funding valuation, the assets and liabilities associated with three terminated employers have been moved to their own cost group. As such, these three terminated employers have been direct allocated to each their pension expense and NPL starting with the June 30, 2017 reporting date.

(3) Calculated in accordance with Paragraphs 54 and 55 of GAS 68.

NOTE 1 – SUMMARY OF SIGNIFICANT ACCOUNTING AND REPORTING POLICIES

Basis of Presentation and Basis of Accounting

Employers participating in Contra Costa County Employees' Retirement Association (CCCERA) are required to report pension information in their financial statements for fiscal periods beginning on or after June 15, 2014, in accordance with Governmental Accounting Standards Board (GASB) Statement No. 68, *Accounting and Financial Reporting for Pensions – an Amendment of GASB Statement No. 27*. The Schedule of Pension Amounts by Employer, along with CCCERA's audited financial statements, the GASB Statement No. 67 Actuarial Valuation as of December 31, 2017, and the GASB Statement No. 68 Actuarial Valuation Based on a December 31, 2017 Measurement Date for Employer Reporting as of June 30, 2018, prepared by CCCERA's independent actuary, provide the required information for financial reporting related to CCCERA that employers may use in their financial statements.

The accompanying schedule was allocated by employer based on the Employer Allocation Schedule and was prepared by CCCERA's independent actuary. The information was derived from information provided by CCCERA and the County of Contra Costa in accordance with accounting principles generally accepted in the United States of America as applicable to governmental organizations.

Use of Estimates in the Preparation of the Schedule

The preparation of this schedule in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect the reported amounts and disclosures during the reporting period. Actual results could differ from those estimates.

NOTE 2 – ACTUARIAL ASSUMPTIONS

Actuarial Methods and Assumptions Used to Determine Total Pension Liability

The Net Pension Liability (NPL) was measured as of December 31, 2017 and 2016. CCCERA's defined contribution benefit pension plan's (Plan) Fiduciary Net Position (FNP) was valued as of the measurement date while the Total Pension Liability (TPL) was determined based upon rolling forward the TPL from actuarial valuations as of December 31, 2015 and 2014, respectively.

The components of the NPL of CCCERA at December 31, 2017 and 2016, were as follows:

Measurement Date for Employer under GASB Statement No. 68	December 31, 2017	December 31, 2016
Total Pension Liability	$ 9,202,017,660	$ 8,838,974,427
Plan Fiduciary Net Position	(8,390,581,049)	(7,438,519,504)
Net Pension Liability	$ 811,436,611	$ 1,400,454,923
Plan Fiduciary Net Position as a Percentage of the Total Pension Liability	91.18%	84.16%

NOTE 2 – ACTUARIAL ASSUMPTIONS (Continued)

Actuarial Methods and Assumptions Used to Determine Total Pension Liability (Continued)

TPL as of December 31, 2017, was measured by (1) valuing the TPL as of December 31, 2016, (before the rollforward) to include the following actuarial assumptions that the Board of Retirement has adopted for use in the pension funding valuation as of December 31, 2017 and (2) using this TPL in rolling forward the results from December 31, 2016 to December 31, 2017. Other assumptions are the same as those used in the December 31, 2017 funding valuation were based on the results of an actuarial experience study for the period January 1, 2012 through December 31, 2014.

In particular, the following actuarial assumptions were applied to all periods included in the December 31, 2017 measurements:

ACTUARIAL VALUATION ASSUMPTIONS

Valuation Date	December 31, 2017
Investment Rate of Return	7.00%, net of pension plan investment expense, including inflation.
Administrative Expenses	1.13% of payroll allocated to both the employer and member based on the components of the Normal Cost rates for the employer and member.
Projected Salary Increases	General: 4.00% - 13.25% and Safety: 4.00% - 13.75%, varying by service, including inflation.
Attributed to Inflation	2.75%
Cost-of-Living Adjustments (COLA)	2.75% per year except for Safety Tier C, California Public Employees' Pension Reform Act of 2013 (PEPRA) Tier E benefits and PEPRA Tier 4 (2% COLA) and Tier 5 (2% COLA) benefits for members covered under certain memoranda of understanding are assumed to increase at 2% per year. All increases are contingent upon actual increases in the Consumer Price Index.

Post-retirement mortality rates for healthy retirement were based on Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table set back three years for a safety member and no set back for a general member, projected generationally with the two-dimensional MP-2015 projection scale.

Post-retirement mortality rates for a disabled retirement were based on Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table set forward three years for a safety member and set forward eight years for a general member, projected generationally with the two-dimensional MP-2015 projection scale.

Pre-retirement mortality rates were based on Headcount-Weighted RP-2014 Employee Mortality Tables times 75%, projected generationally with the two-dimensional MP-2015 projection scale. Withdrawal rates, disability rates and service retirement rates vary by age, service, gender, and classification.

NOTE 2 – ACTUARIAL ASSUMPTIONS (Continued)

Discount

The discount rate used to measure the TPL was 7.00% as of December 31, 2017 and 2016. The projection of cash flows used to determine the discount rate assumed that employee and employer contributions will be made at rates equal to the actuarially determined contribution rates. For this purpose, only employee and employer contributions that are intended to fund benefits for current plan members and their beneficiaries are included. Projected employer contributions that are intended to fund the service costs for future Plan members and their beneficiaries, as well as projected contributions from future Plan members, are not included. Based on those assumptions, the pension Plan's fiduciary net position was projected to be available to make all projected future benefit payments of current Plan members. Therefore, the long-term expected rate of return on pension Plan investments was applied to all periods of projected benefit payments to determine the TPL as of both December 31, 2017 and 2016.

Long-Term Expected Rate of Return by Asset Class

The long-term expected rate of return on pension Plan investments was determined using a building-block method in which expected future real rates of return (expected returns, net of inflation) are developed for each major asset class. These returns are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation and subtracting expected investment expenses and a risk margin. The target allocation and projected arithmetic real rates of return for each major asset class, after deducting inflation, but before deducting investment expenses, used in the derivation of the long-term expected investment rate of return assumption are summarized in the following table below.

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return
Large Cap U.S. Equity	6%	5.75%
Developed International Equity	10%	6.99%
Emerging Markets Equity	14%	8.95%
Short-Term Govt/Credit	24%	0.20%
U.S. Treasury	2%	0.30%
Real Estate	7%	4.45%
Cash and Equivalents	1%	-0.46%
Risk Diversifying Strategies	2%	4.30%
Private Credit	17%	6.30%
Private Equity	17%	8.10%
Total	100%	

Amortization of Deferred Outflows and Deferred Inflows of Resources

The difference between projected and actual investment earnings on pension Plan investments is amortized over 5 years on a straight-line basis. One-fifth was recognized in pension expense during the measurement period, and the remaining difference between projected and actual investment earnings on pension plan investments at December 31, 2017, is to be amortized over the remaining periods.

The changes in assumptions and differences between expected and actual experience are recognized over the average of the expected remaining service lives of all employees that are provided with pensions through CCCERA (active and inactive employees) determined as of December 31, 2016, (the beginning of the measurement period ending December 31, 2017) and is 4.58 years. Prior period changes of assumptions and differences between expected and actual experience are continued to be recognized based on the expected remaining service lives of all employees calculated as of those prior measurement dates.

NOTE 2 – ACTUARIAL ASSUMPTIONS (Continued)

Amortization of Deferred Outflows and Deferred Inflows of Resources (Continued)

In addition, the net effect of the change in the employer's proportionate share of the collective NPL and collective deferred outflows of resources and deferred inflows of resources is also recognized over the average expected remaining service lives of all employees noted above. The difference between the actual employer contributions and the proportionate share of the employer contributions during the measurement period ending on December 31, 2017, is recognized over the same period as noted above. The Schedule of Pension Amounts by Employer does not reflect contributions made to CCCERA subsequent to the measurement date as defined in GASB Statement No. 68 Paragraphs 54, 55, and 57. Appropriate treatment of such amounts is the responsibility of the employers.

NOTE 3 – RELATIONSHIP TO THE BASIC FINANCIAL STATEMENTS

The components of the schedule associated with pension expense and deferred outflows and inflows of resources have been determined based on the net increase in FNP for CCCERA as shown in the CCCERA Statement of Changes in Fiduciary Net Position and in accordance with requirements promulgated by the GASB Statements No. 67 and No. 68. The NPL at December 31, 2017, is reported in the Notes to CCCERA's Basic Financial Statements and Required Supplementary Information following the Notes.

NOTE 4 – ADDITIONAL FINANCIAL AND ACTUARIAL INFORMATION

Additional financial and actuarial information required for GASB Statement No. 68 disclosures is located in CCCERA's Comprehensive Annual Financial Report for the fiscal year ended December 31, 2017, which can be found on CCCERA's website, and the GASB Statement No. 68 Actuarial Valuation Based on December 31, 2017 Measurement Date for Employer Reporting as of June 30, 2018, which is available upon request from CCCERA.

Contra Costa County Employees' Retirement Association

Governmental Accounting Standards (GAS) 68 Actuarial Valuation Based on December 31, 2017 Measurement Date for Employer Reporting as of June 30, 2018

Segal Consulting

This report has been prepared at the request of the Board of Retirement to assist the sponsors of the Fund in preparing their financial report for their liabilities associated with the CCCERA pension plan. This valuation report may not otherwise be copied or reproduced in any form without the consent of the Board of Retirement and may only be provided to other parties in its entirety, unless expressly authorized by Segal. The measurements shown in this actuarial valuation may not be applicable for other purposes.

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T 415.263.8200 www.segalco.com

September 13, 2018

Board of Retirement
Contra Costa County Employees' Retirement Association
1335 Willow Way, Suite 221
Concord, CA 94520

Dear Board Members:

We are pleased to submit this Governmental Accounting Standards (GAS) 68 Actuarial Valuation based on a December 31, 2017 measurement date for employer reporting as of June 30, 2018. It contains various information that will need to be disclosed in order for Contra Costa County Employees' Retirement Association (CCCERA) employers to comply with GAS 68.

This report was prepared in accordance with generally accepted actuarial principles and practices at the request of the Board to assist the sponsors in preparing their financial report for their liabilities associated with the CCCERA pension plan. The census and financial information on which our calculations were based was provided by CCCERA. That assistance is gratefully acknowledged.

The measurements shown in this actuarial valuation may not be applicable for other purposes. Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; and changes in plan provisions or applicable law.

The actuarial calculations were completed under the supervision of John Monroe, ASA, MAAA, Enrolled Actuary. We are members of the American Academy of Actuaries and we meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. To the best of our knowledge, the information supplied in the actuarial valuation is complete and accurate. Further, in our opinion, the assumptions as approved by the Board are reasonably related to the experience of and expectations for CCCERA.

Sincerely,

Segal Consulting, a Member of The Segal Group, Inc.

By:

Paul Angelo, FSA, MAAA, FCA, EA
Senior Vice President and Actuary

John Monroe, ASA, MAAA, EA
Vice President and Actuary

AW/gxk

SECTION 1

VALUATION SUMMARY

SECTION 2

GAS 68 INFORMATION

SECTION 2 (CONTINUED)

SECTION 3

ACTUARIAL ASSUMPTIONS AND METHODS AND APPENDICES

Purpose

This report has been prepared by Segal Consulting to present certain disclosure information required by Governmental Accounting Standards (GAS) 68 for employer reporting as of June 30, 2018. The results used in preparing this GAS 68 report are comparable to those used in preparing the Governmental Accounting Standards (GAS) 67 report for the plan based on a reporting date and a measurement date as of December 31, 2017. This valuation is based on:

- The benefit provisions of CCCERA, as administered by the Board of Retirement;
- The characteristics of covered active members, inactive vested members, and retired members and beneficiaries as of December 31, 2016, provided by CCCERA;
- The assets of the Plan as of December 31, 2017, provided by CCCERA;
- Economic assumptions regarding future salary increases and investment earnings adopted by the Board for the December 31, 2017 valuation; and
- Other actuarial assumptions, regarding employee terminations, retirement, death, etc. adopted by the Board for the December 31, 2017 valuation.

General Observations on GAS 68 Actuarial Valuation

The following points should be considered when reviewing this GAS 68 report:

- The Governmental Accounting Standards Board (GASB) rules only define pension liability and expense for financial reporting purposes, and do not apply to contribution amounts for pension funding purposes. Employers and plans still develop and adopt funding policies under current practices.
- When measuring pension liability GASB uses the same actuarial cost method (Entry Age method) and the same type of discount rate (expected return on assets) as CCCERA uses for funding. This means that the Total Pension Liability (TPL) measure for financial reporting shown in this report is determined on generally the same basis as CCCERA's Actuarial Accrued Liability (AAL) measure for funding. We note that the same is generally true for the Normal Cost component of the annual plan cost for funding and financial reporting.
- The TPL and the Plan's Fiduciary Net Position include liabilities and assets held for the Post Retirement Death Benefit Reserve. The TPL only includes a liability up to the amount in the Post Retirement Death Benefit Reserve. This is because we understand that the post retirement death benefit is a nonvested benefit and once the reserve is depleted no further benefits would need to be paid.

- The Net Pension Liability (NPL) is equal to the difference between the TPL and the Plan's Fiduciary Net Position. The Plan's Fiduciary Net Position is equal to the market value of assets and therefore, the NPL measure is very similar to an Unfunded Actuarial Accrued Liability (UAAL) on a market value basis.
- For this report, the reporting dates for the employer are June 30, 2018 and 2017. The NPL was measured as of December 31, 2017 and 2016, respectively. The Plan's Fiduciary Net Position (plan assets) was valued as of the measurement dates while the TPL was determined based upon rolling forward the results of the actuarial valuations as of December 31, 2016 and 2015, respectively. In addition, any changes in actuarial assumptions or plan provisions that occurred between the valuation date and the measurement date have been reflected. Consistent with the provisions of GAS 68, the assets and liabilities measured as of December 31, 2017 and 2016 are not adjusted or rolled forward to the June 30, 2018 and 2017 reporting dates, respectively.

Significant Issues in Valuation Year

The following key findings were the result of this actuarial valuation:

- The NPL decreased from $1.40 billion as of December 31, 2016 to $0.81 billion as of December 31, 2017 primarily due to the 13.3% return on the market value of assets during 2017 (that was higher than the assumed return of 7.00%) and other differences between expected and actual experience. Changes in these values during the last two plan years ending December 31, 2017 and December 31, 2016 can be found in Exhibit 5.
- The discount rate used to determine the TPL and NPL as of December 31, 2017 and 2016 was 7.00% following the same assumptions used by CCCERA in the pension funding valuations as of the same dates. The detailed derivation of the discount rate of 7.00% used in the calculation of the TPL and NPL as of December 31, 2017 can be found in Exhibit 5 of Section 2. Various other information that is required to be disclosed can be found throughout Exhibits 1 through 13 in Section 2.
- Based on discussions with CCCERA and their auditors, starting with the June 30, 2017 reporting date for the employers, the employer contributions now exclude any employer subvention of member contributions and include any member subvention of employer contributions in the amounts shown through Exhibits 1 through 13 in Section 2. This change has not been applied on a retroactive basis prior to the June 30, 2017 reporting date.
- Prior to the June 30, 2017 reporting date, the pension expense, NPL and other results attributed to these three terminated employers: (1) Delta Diablo Sanitation District, (2) Diablo Water District and (3) City of Pittsburg were allocated to other employers within the applicable Cost Groups. Starting with the December 31, 2016 funding valuation, the assets and liabilities associated with the three terminated employers have been moved to their own Cost

Group. Therefore, we have directly allocated to each of these terminated employers their pension expense and NPL starting with the June 30, 2017 reporting date. In particular, the TPL for each terminated employers is obtained directly from internal valuation results for that specific employer. Furthermore, the Plan's Fiduciary Net Position for each terminated employer has been set equal to the amount in their respective bookkeeping account.

- Results shown in this report exclude any employer contributions made after the measurement date of December 31, 2017. For employers that participate in the prepayment program, it is our understanding that the portion of the prepayment made in July 2017 that was for the period from January 1, 2018 through June 30, 2018 has also been excluded. Employers should consult with their auditors to determine the deferred outflow that should be created for these contributions.

- All Cost Groups except Cost Groups #1, #2, #6 and #8 only have one active employer, so all of the NPL for those Cost Groups are allocated to that employer. The NPL has already been reduced by any proceeds from Pension Obligation Bonds and any UAAL prepayments.

  For Cost Groups #1, #2, #6 and #8, the NPL is allocated based on the actual compensation by employer within the Cost Group. The steps we used are as follows:

  - Calculate ratio of employer's compensation to the total compensation for the Cost Group.
  - Multiply this ratio by an "adjusted" NPL. This adjusted NPL is larger than the actual NPL as it excludes proceeds from Pension Obligation Bonds and any UAAL prepayments from the Cost Group's assets when determining the employer's proportionate share of the NPL for the Cost Group. It also excludes the NPLs for the three terminated employers.
  - Subtract from the adjusted NPL the outstanding balance of the proceeds from any Pension Obligation Bonds and any UAAL prepayments for those employers in each Cost Group that are subject to these adjustments.
  - If the employer is in several Cost Groups, the employer's total allocated NPL is the sum of its allocated NPL from each Cost Group.

  Proportionate share of total plan NPL is then the ratio of the employer's total allocated NPL to the total NPL of all employers. The NPL allocation can be found in Exhibit 7 in Section 2.

- Page iv contains a summary with the names for all active participating employers in CCCERA. Also shown are the employer name abbreviations and employer numbers that are used throughout the rest of this report.

Summary of Active Participating Employers within CCCERA

#	**Employer Name**	**Abbreviation**
1	Bethel Island Municipal Improvement District	1 - BIMID
2	Byron-Brentwood-Knightsen Union Cemetery District	2 - Union Cemetery
3	Contra Costa Mosquito & Vector Control District	3 - CC Mosquito
4	Contra Costa County Fire Protection District	4 - CCCFPD
5	Central Contra Costa Sanitary District	5 - CCCSD
6	First 5 CC Children & Families Commission	6 - First 5
7	Contra Costa County	7 - County
8	Contra Costa County Employees' Retirement Association	8 - CCCERA (the employer)
9	East Contra Costa Fire Protection District	9 - ECCFPD
10	Contra Costa Housing Authority	10 - Housing Authority
11	In-Home Supportive Services Authority	11 - IHSS
12	Contra Costa Local Agency Formation Commission	12 - LAFCO
13	Moraga-Orinda Fire Protection District	13 - MOFD
14	Rodeo Sanitary District	14 - Rodeo SD
15	Rodeo-Hercules Fire Protection District	15 - RHFD
16	San Ramon Valley Fire Protection District	16 - SRVFPD
17	Contra Costa Superior Court	17 - Court
18	Delta Diablo Sanitation District (Terminated Employer)	18 - DDSD (Term)
19	Diablo Water District (Terminated Employer)	19 - DWD (Term)
20	City of Pittsburg (Terminated Employer)	20 - Pittsburg (Term)

Summary of Key Valuation Results

Reporting Date for Employer under GAS 68	6/30/2018[1]	6/30/2017[1]
Measurement Date for Employer under GAS 68	**12/31/2017**	**12/31/2016**
Disclosure elements for fiscal year ending December 31:		
1. Service Cost[2]	$212,257,626	$202,697,041
2. Total Pension Liability	9,202,017,660	8,838,974,427
3. Plan's Fiduciary Net Position	8,390,581,049	7,438,519,504
4. Net Pension Liability	811,436,611	1,400,454,923
5. Pension Expense	162,333,068	267,159,589
Schedule of contributions for fiscal year ending December 31:		
6. Actuarially determined contributions[3]	$314,512,561	$307,909,509
7. Actual employer contributions[3]	314,512,561	307,909,509
8. Contribution deficiency (excess) (6) – (7)	0	0
Demographic data for plan year ending December 31:[4]		
9. Number of retired members and beneficiaries	9,267	9,100
10. Number of vested terminated members[5]	3,327	3,089
11. Number of active members	10,038	9,848
Key assumptions as of December 31:		
12. Investment rate of return	7.00%	7.00%
13. Inflation rate	2.75%	2.75%
14. Projected salary increases [6]	General: 4.00% to 13.25% and Safety: 4.00% to 13.75%	General: 4.00% to 13.25% and Safety: 4.00% to 13.75%

(1) *The reporting dates and measurement dates for the plan are December 31, 2017 and 2016, respectively.*

(2) *Excludes administrative expense load. The service cost is based on the previous year's valuation, meaning the December 31, 2017 and December 31, 2016 values are based on the valuations as of December 31, 2016 and December 31, 2015, respectively. Furthermore, the actuarial assumptions used to determine the service cost in the December 31, 2015 valuation were the same as those used in the December 31, 2016 valuation.*

(3) *See footnote (1) under Exhibit 6 on page 11.*

(4) *Data as of December 31, 2016 is used in the measurement of the TPL as of December 31, 2017. Note that the demographic counts shown as of December 31, 2017 have been revised based on more recent information. They are slightly different than those shown in the December 31, 2017 GAS 67 report.*

(5) *Includes terminated members with member contributions on deposit.*

(6) *Includes inflation at 2.75% plus real across-the-board salary increases of 0.50% plus promotional and merit increases that vary by service as of December 31, 2017 and 2016.*

Important Information about Actuarial Valuations

An actuarial valuation is a budgeting tool with respect to the financing of future projected obligations of a pension plan. It is an estimated forecast – the actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan.

In order to prepare an actuarial valuation, Segal Consulting ("Segal") relies on a number of input items. These include:

- **Plan of benefits** Plan provisions define the rules that will be used to determine benefit payments, and those rules, or the interpretation of them, may change over time. It is important to keep Segal informed with respect to plan provisions and administrative procedures, and to review the plan description in this report (as well as the plan summary included in our funding valuation report) to confirm that Segal has correctly interpreted the plan of benefits.
- **Participant data** An actuarial valuation for a plan is based on data provided to the actuary by CCCERA. Segal does not audit such data for completeness or accuracy, other than reviewing it for obvious inconsistencies compared to prior data and other information that appears unreasonable. It is important for Segal to receive the best possible data and to be informed about any known incomplete or inaccurate data.
- **Assets** This valuation is based on the market value of assets as of the valuation date, as provided by CCCERA.
- **Actuarial assumptions** In preparing an actuarial valuation, Segal projects the benefits to be paid to existing plan participants for the rest of their lives and the lives of their beneficiaries. This projection requires actuarial assumptions as to the probability of death, disability, withdrawal, and retirement of each participant for each year. In addition, the benefits projected to be paid for each of those events in each future year reflect actuarial assumptions as to salary increases and cost-of-living adjustments. The projected benefits are then discounted to a present value, based on the assumed rate of return that is expected to be achieved on the plan's assets. There is a reasonable range for each assumption used in the projection and the results may vary materially based on which assumptions are selected. It is important for any user of an actuarial valuation to understand this concept. Actuarial assumptions are periodically reviewed to ensure that future valuations reflect emerging plan experience. While future changes in actuarial assumptions may have a significant impact on the reported results, that does not mean that the previous assumptions were unreasonable.

The user of Segal's actuarial valuation (or other actuarial calculations) should keep the following in mind:

- The valuation is prepared at the request of the Board to assist the sponsors of the Fund in preparing items related to the pension plan in their financial reports. Segal is not responsible for the use or misuse of its report, particularly by any other party.
- An actuarial valuation is a measurement of the plan's assets and liabilities at a specific date. Accordingly, except where otherwise noted, Segal did not perform an analysis of the potential range of future financial measures. The actual long-term

cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan.

- If CCCERA is aware of any event or trend that was not considered in this valuation that may materially change the results of the valuation, Segal should be advised, so that we can evaluate it.
- Segal does not provide investment, legal, accounting, or tax advice. Segal's valuation is based on our understanding of applicable guidance in these areas and of the plan's provisions, but they may be subject to alternative interpretations. The Board should look to their other advisors for expertise in these areas.

As Segal Consulting has no discretionary authority with respect to the management or assets of CCCERA, it is not a fiduciary in its capacity as actuaries and consultants with respect to CCCERA.

EXHIBIT 1

General Information – "Financial Statements", Note Disclosures and Required Supplementary Information for a Cost-Sharing Pension Plan

Plan Description

Plan administration. The Contra Costa County Employees' Retirement Association (CCCERA) was established by the County of Contra Costa in 1945. CCCERA is governed by the County Employees' Retirement Law of 1937 (California Government Code Section 31450 et seq.), the California Public Employees' Pension Reform Act of 2013 (PEPRA), and the regulations, procedures, and policies adopted by CCCERA's Board of Retirement. CCCERA is a cost-sharing multiple employer public employee retirement association whose main function is to provide service retirement, disability, death and survivor benefits to the General and Safety members employed by the County of Contra Costa. CCCERA also provides retirement benefits to the employee members for 16 other participating agencies which are members of CCCERA.

The management of CCCERA is vested with the CCCERA Board of Retirement. The Board consists of twelve trustees. Of the twelve members, three are alternates. Four trustees are appointed by the County Board of Supervisors; four trustees (including the Safety alternate) are elected by CCCERA's active members; two trustees (including one alternate) are elected by the retired membership. Board members serve three-year terms, with the exception of the County Treasurer who is elected by the general public and serves during his tenure in office.

Plan membership. At December 31, 2017, pension plan membership consisted of the following:

Retired members or beneficiaries currently receiving benefits	9,267
Vested terminated members entitled to, but not yet receiving benefits(1)	3,327
Active members	10,038
Total	22,632

(1) *Includes members who terminate with less than five years of service and leave accumulated contributions on deposit*

Note: Data as of December 31, 2017 is not used in the measurement of the TPL as of December 31, 2017.

Benefits provided. CCCERA provides service retirement, disability, death and survivor benefits to eligible employees. All regular full-time employees of the County of Contra Costa or participating agencies become members of CCCERA effective on the first day of the first full pay period after employment. Part-time employees in permanent positions must work at least 20 hours a week in order to be a member of CCCERA. There are separate retirement plans for General and Safety members. Safety membership is extended to those involved in active law enforcement, fire suppression, and certain other "Safety" classifications. There are currently five tiers applicable to Safety members. Safety members with membership dates before January 1, 2013 are included in Tier A (Enhanced and Non-Enhanced). County Sheriff's Department Safety members hired on or after January 1, 2007, but before January 1, 2013 are placed in Safety Tier C Enhanced. Any new Safety Member who becomes a member on or after January 1, 2013 is designated PEPRA Safety Tier D or E (Safety members from certain bargaining units) and is subject to the provisions of California Government Code 7522 et seq.

All other employees are classified as General members. There are currently eight tiers applicable to General members. General Tier 1 (Enhanced and Non-Enhanced) includes general members hired before July 1, 1980 and electing not to transfer to Tier 2 Plan. In addition, certain General members with membership dates before January 1, 2013 hired by specific employers who did not adopt Tier 2 are placed in Tier 1. General Tier 2 includes most General members hired on or after August 1, 1980 and all General members hired before July 1, 1980 electing to transfer to the Tier 2 Plan. Effective October 1, 2002, for the County, Tier 2 was eliminated and all County employees (excluding CNA employees) in Tier 2 were placed in Tier 3 (Enhanced and Non-Enhanced). Effective January 1, 2005, all CNA employees in Tier 2 were placed in Tier 3. New General Members who become a member on or after January 1, 2013 are designated as PEPRA General Tier 4 (hired by specific employers who did not adopt Tier 2) and Tier 5 (with 2%/3% maximum COLAs) and are subject to the provisions of California Government Code 7522 et seq.

General members prior to January 1, 2013, are eligible to retire once they attain the age of 70 regardless of service or at age 50 and have acquired 10 or more years of retirement service credit. A member with 30 years of service is eligible to retire regardless of age. General members who are first hired on or after January 1, 2013, are eligible to retire once they have attained the age of 70 regardless of service or at age 52, and have acquired five years of retirement service credit.

Safety members prior to January 1, 2013, are eligible to retire once they attain the age of 70 regardless of service or at age 50 and have acquired 10 or more years of retirement service credit. A member with 20 years of service is eligible to retire regardless of age. Safety members who are first hired on or after January 1, 2013, are eligible to retire once they have attained the age of 70 regardless of service or at age 50, and have acquired five years of retirement service credit.

The retirement benefit the member will receive is based upon age at retirement, final average compensation, years of retirement service credit and retirement plan and tier.

General Tier 1 and Tier 3 benefits are calculated pursuant to the provisions of Sections §31676.11 and §31676.16 for Non-Enhanced and Enhanced benefit formulae, respectively. The monthly allowance is equal to 1/60th (Non-Enhanced) and 1/50th (Enhanced) of final compensation times years of accrued retirement service credit times age factor from either section §31676.11 (Non-Enhanced) or §31676.16 (Enhanced). Note that for members previously covered under the Non-Enhanced formula (§31676.11), they are entitled to at least the benefits they could have received under the Non-Enhanced formula (§31676.11). General Tier 2 benefit is calculated pursuant to the provisions of Sections §31752. General member benefits for those with membership dates on or after January 1, 2013 (PEPRA General Tier 4 and Tier 5) are calculated pursuant to the provisions found in California Government Code Section §7522.20(a). The monthly allowance is equal to the final compensation multiplied by years of accrued retirement credit multiplied by the age factor from Section §7522.20(a).

Safety member benefits are calculated pursuant to the provisions of California Government Code Sections §31664 and §31664.1 for Non-Enhanced and Enhanced formulae, respectively. The monthly allowance is equal to 1/50th (or 2%) of final compensation times years of accrued retirement service credit times age factor from Section §31664 (Non-Enhanced) or 3% of final compensation times years of accrued retirement service credit times age factor from §31664.1 (Enhanced). For those Safety member with membership dates on or after January 1, 2013 (PEPRA Safety Tier D and Tier E) benefits are calculated pursuant to the provisions found in California Government Code Section §7522.25(d). The monthly allowance is equal to the final compensation multiplied by years of accrued retirement service credit multiplied by the age factor from Section §7522.25(d).

For members with membership dates before January 1, 2013, the maximum monthly retirement allowance is 100% of final compensation. There is no final compensation limit on the maximum retirement benefit for members with membership dates on or after January 1, 2013. However, the maximum amount of compensation earnable that can be taken into account for 2017 for members with membership dates on or after January 1, 1996 but before January 1, 2013 is $270,000. For members with membership dates on or after January 1, 2013 the maximum amount of pensionable compensation that can be taken into account for 2017 is equal to $118,775 for those enrolled in Social Security ($142,530 for those not enrolled in Social Security). These limits are adjusted on an annual basis. Members are exempt from paying member contributions and employers are exempt from paying employer contributions on compensation in excess of the annual cap.

Final average compensation consists of the highest 12 consecutive months for General Tier 1, General Tier 3 (non-disability) and Safety Tier A members and the highest 36 consecutive months for General Tier 2, General Tier 3 (disability), PEPRA General Tier 4, PEPRA General Tier 5, Safety Tier C, PEPRA Safety Tier D and PEPRA Safety Tier E members.

The member may elect an unmodified retirement allowance, or choose an optional retirement allowance. The unmodified retirement allowance provides the highest monthly benefit and a 60% continuance to an eligible surviving spouse or domestic partner. An eligible surviving spouse or domestic partner is one married to or registered with the member one year prior to the effective retirement date or at least two years prior to the date of death and has attained age 55 on or prior to the date of death. There are four optional retirement allowances the member may choose. Each of the optional retirement allowances requires a reduction in the unmodified retirement allowance in order to allow the member the ability to provide certain benefits to a surviving spouse, domestic partner, or named beneficiary having an insurable interest in the life of the member.

CCCERA provides an annual cost-of-living benefit to all retirees. The cost-of-living adjustment, based upon the Consumer Price Index for the San Francisco-Oakland-San Jose Area, is capped at 3.0% for General Tier 1, General Tier 3 (non-disability benefits), PEPRA General Tier 4, PEPRA General Tier 5-3% (non-disability benefits), Safety Tier A and PEPRA Safety Tier D. The cost-of-living adjustment is capped at 4.0% for General Tier 3 (disability benefits), General Tier 2 and PEPRA General Tier 5-3% (disability benefits). The cost-of-living adjustment is capped at 2.0% for General Tier 5-2%, Safety Tier C and PEPRA Safety Tier E.

The County of Contra Costa and participating agencies contribute to the retirement plan based upon actuarially determined contribution rates adopted by the Board of Retirement. Employer contribution rates are adopted annually based upon recommendations received from CCCERA's actuary after the completion of the annual actuarial valuation. The average employer contribution rate as of December 31, 2017 for the fiscal year beginning July 1, 2017 (based on the December 31, 2015 valuation) was 39.23% of compensation.

Members are required to make contributions to CCCERA regardless of the retirement plan or tier in which they are included. The average member contribution rate as of December 31, 2017 for the fiscal year beginning July 1, 2017 (based on the December 31, 2015 valuation) was 12.09% of compensation.

EXHIBIT 2

Net Pension Liability

Reporting Date for Employer under GAS 68	June 30, 2018	June 30, 2017
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
The components of the Net Pension Liability are as follows:		
Total Pension Liability	$9,202,017,660	$8,838,974,427
Plan's Fiduciary Net Position	(8,390,581,049)	(7,438,519,504)
Net Pension Liability	$811,436,611	$1,400,454,923
Plan's Fiduciary Net Position as a percentage of the Total Pension Liability	91.18%	84.16%

The Net Pension Liability (NPL) was measured as of December 31, 2017 and 2016. The Plan's Fiduciary Net Position (plan assets) was valued as of the measurement date while the Total Pension Liability (TPL) was determined based upon rolling forward the TPL from actuarial valuations as of December 31, 2016 and 2015, respectively.

Plan provisions. The plan provisions used in the measurement of the NPL as of December 31, 2017 and 2016 are the same as those used in the CCCERA actuarial valuation as of December 31, 2017 and 2016, respectively. The TPL and the Plan's Fiduciary Net Position include liabilities and assets held for the Post Retirement Death Benefit Reserve.

Actuarial assumptions and methods. The TPL as of December 31, 2017 and December 31, 2016 were determined by actuarial valuations as of December 31, 2016 and December 31, 2015, respectively. The actuarial assumptions used were based on the results of an experience study for the period January 1, 2012 through December 31, 2014. They are the same as the assumptions used in the December 31, 2017 and December 31, 2016 funding actuarial valuations for CCCERA. The assumptions used in the funding valuations are outlined on page 10 of this report. In particular, the following actuarial assumptions were applied to all periods included in the measurement for both the December 31, 2017 and December 31, 2016 actuarial valuations:

EXHIBIT 2 (continued)

Net Pension Liability

Inflation	2.75%
Salary increases	General: 4.00% to 13.25% and Safety: 4.00% to 13.75%, varying by service, including inflation.
Investment rate of return	7.00%, net of pension plan investment expense, including inflation.
Administrative expenses for December 31, 2017 valuation	1.13% of payroll allocated to both the employer and member based on the components of the Normal Cost rates for the employer and member.
Administrative expenses for December 31, 2016 valuation	1.12% of payroll allocated to both the employer and member based on the components of the Normal Cost rates for the employer and member.
Other assumptions	Same as those that will be used in December 31, 2017 funding valuation.

EXHIBIT 3

Target Asset Allocation

The long-term expected rate of return on pension plan investments was determined in 2016 using a building-block method in which expected future real rates of return (expected returns, net of inflation) are developed for each major asset class. These returns are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage, adding expected inflation and subtracting expected investment expenses and a risk margin. The target allocation and projected arithmetic real rates of return for each major asset class, after deducting inflation but before deducting investment expenses, used in the derivation of the December 31, 2017 and 2016 long-term expected investment rate of return assumption are summarized in the following table. This information will change every three years based on the actuarial experience study.

Asset Class	Target Allocation	Long-Term Expected Arithmetic Real Rate of Return
Large Cap U.S. Equity	6%	5.75%
Developed International Equity	10%	6.99%
Emerging Markets Equity	14%	8.95%
Short-Term Govt/Credit	24%	0.20%
U.S. Treasury	2%	0.30%
Real Estate	7%	4.45%
Cash & Equivalents	1%	-0.46%
Risk Diversifying Strategies	2%	4.30%
Private Credit	17%	6.30%
Private Equity	17%	8.10%
Total	100%	

EXHIBIT 3 (continued)

Target Asset Allocation

Discount rate: The discount rate used to measure the TPL was 7.00% as of December 31, 2017 and December 31, 2016. The projection of cash flows used to determine the discount rate assumed employer and employee contributions will be made at rates equal to the actuarially determined contribution rates. For this purpose, only employer and employee contributions that are intended to fund benefits for current plan members and their beneficiaries are included. Projected employer contributions that are intended to fund the service costs for future plan members and their beneficiaries, as well as projected contributions from future plan members, are not included. Based on those assumptions, the Plan's Fiduciary Net Position was projected to be available to make all projected future benefit payments for current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the TPL as of both December 31, 2017 and December 31, 2016.

EXHIBIT 4

Discount Rate Sensitivity

Sensitivity of the Net Pension Liability to changes in the discount rate. The following presents the NPL of the CCCERA as of December 31, 2017, which is allocated to all employers, calculated using the discount rate of 7.00%, as well as what the CCCERA's NPL would be if it were calculated using a discount rate that is 1-percentage-point lower (6.00%) or 1-percentage-point higher (8.00%) than the current rate. The determination of the NPL by employer is shown later in Exhibit 7.

Employer	1% Decrease (6.00%)	Current Discount Rate (7.00%)	1% Increase (8.00%)
1 - BIMID	$343,436	$157,443	$5,662
2 - Union Cemetery	229,598	29,395	(133,982)
3 - CC Mosquito	6,583,075	3,017,908	108,523
4 - CCCFPD	244,960,003	110,215,347	255,816
5 - CCCSD	116,617,009	63,806,000	20,709,123
6 - First 5	3,977,230	1,289,083	(904,603)
7 - County	1,403,634,019	503,558,908	(230,955,099)
8 - CCCERA (the employer)	9,351,598	4,287,094	154,162
9 - ECCFPD	28,049,031	16,350,262	6,803,382
10 - Housing Authority	14,553,821	6,267,604	(494,435)
11 - IHSS	1,733,014	794,473	28,569
12 - LAFCO	429,118	181,268	(20,992)
13 - MOFD	49,778,525	23,498,575	2,052,597
14 - Rodeo SD	874,535	111,965	(510,336)
15 - RHFD	17,854,236	11,693,174	6,665,386
16 - SRVFPD	107,572,630	47,110,096	(2,230,873)
17 - Court	40,379,254	12,606,159	(10,058,313)
18 - DDSD (Term)	3,334,473	1,435,257	(114,614)
19 - DWD (Term)	1,210,138	827,520	515,282
20 - Pittsburg (Term)	10,684,009	4,199,080	(1,093,001)
Total for all Employers	$2,062,148,752	$811,436,611	$(209,217,746)

EXHIBIT 5

Schedule of Changes in Net Pension Liability – Last Two Plan Years

Reporting Date for Employer under GAS 68	June 30, 2018	June 30, 2017
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Total Pension Liability		
1. Service cost	$212,257,626	$202,697,041
2. Interest	616,272,848	591,971,317
3. Change of benefit terms	0	0
4. Differences between expected and actual experience	(29,192,221)	(19,957,982)
5. Changes of assumptions	0	0
6. Benefit payments, including refunds of member contributions	(436,295,020)	(419,445,517)
7. Net change in Total Pension Liability	$363,043,233	$355,264,859
8. Total Pension Liability – beginning	8,838,974,427	8,483,709,568
9. Total Pension Liability – ending	$9,202,017,660	$8,838,974,427
Plan's Fiduciary Net Position		
10. Contributions – employer[1]	$314,836,561	$307,909,509
11. Contributions – plan members[1]	96,466,906	88,787,806
12. Net investment income[2]	987,415,981	493,874,242
13. Benefit payments, including refunds of member contributions	(436,295,020)	(419,445,517)
14. Administrative expense	(9,146,115)	(8,486,463)
15. Other expenses	(1,216,768)	(702,501)
16. Net change in Plan's Fiduciary Net Position	$952,061,545	$461,937,076
17. Plan's Fiduciary Net Position – beginning	7,438,519,504	6,976,582,428
18. Plan's Fiduciary Net Position – ending	$8,390,581,049	$7,438,519,504
19. Net Pension Liability – ending (9) – (18)	$811,436,611	$1,400,454,923
20. Plan's Fiduciary Net Position as a percentage of the Total Pension Liability	91.18%	84.16%
21. Covered payroll[3]	$809,960,088	$755,138,882
22. Plan Net Pension Liability as percentage of covered payroll	100.18%	185.46%

(1) *See footnote (1) under Exhibit 6 on page 11.*

(2) *Includes Contribution Prepayment Discount.*

(3) *Covered payroll represents payroll on which contributions to the pension plan are based.*

Notes to Schedule:

Benefit changes: *None*

EXHIBIT 6

Schedule of Employer Contributions – Last Ten Plan Years

Year Ended December 31	Actuarially Determined Contributions[(1)]	Contributions in Relation to the Actuarially Determined Contributions[(1)]	Contribution Deficiency/(Excess)	Covered Payroll[(2)]	Contributions as a Percentage of Covered Payroll
2008	$206,518,693	$206,518,693	$0	$671,617,932	30.75%
2009	195,631,673	195,631,673	0	704,947,668	27.75%
2010	183,950,930	183,950,930	0	694,443,999	26.49%
2011	200,388,994	200,388,994	0	687,443,206	29.15%
2012	212,321,325	212,321,325	0	666,394,146	31.86%
2013	228,017,452	228,017,452[(3)]	0	638,635,912	35.70%
2014	288,760,413	288,760,413[(4)]	0	671,485,798	43.00%
2015	321,220,270	321,220,270[(5)]	0	709,818,858	45.25%
2016	307,909,509	307,909,509	0	755,138,882	40.78%
2017	314,512,561	314,512,561[(6)]	0	809,960,088	38.83%

[(1)] *Starting with the year ended December 31, 2016, includes "member subvention of employer contributions" and excludes "employer subvention of member contributions". Prior to that year, the contributions excluded "member subvention of employer contributions" and included "employer subvention of member contributions".*

[(2)] *Covered payroll represents payroll on which contributions to the pension plan are based.*

[(3)] *Excludes additional contributions towards UAAL of $7,000,000.*

[(4)] *Excludes additional contributions towards UAAL of $5,000,000.*

[(5)] *Excludes additional contributions towards UAAL of $2,500,000.*

[(6)] *Excludes additional contributions towards UAAL of $324,000.*

See accompanying notes to this schedule on next page.

Notes to Exhibit 6

Methods and assumptions used to establish "actuarially determined contribution" rates:

Valuation date	Actuarially determined contribution rates are calculated as of December 31, two and a half years prior to the end of the fiscal year in which contributions are reported	
Actuarial cost method	Entry Age Actuarial Cost Method	
Amortization method	Level percent of payroll	
Remaining amortization period	Remaining balance of December 31, 2007 UAAL is amortized over a fixed (decreasing or closed) period with 6 years remaining as of December 31, 2016. Any changes in UAAL after December 31, 2007 will be separately amortized over a fixed 18-year period effective with that valuation. Effective December 31, 2013, any changes in UAAL due to plan amendments (with the exception of a change due to retirement incentives) will be amortized over a 10-year fixed period effective with that valuation. The entire increase in UAAL resulting from a temporary retirement incentive will be funded in full upon adoption of the incentive.	
Asset valuation method	Market value of assets less unrecognized returns in each of the last nine semi-annual accounting periods. Unrecognized return is equal to the difference between the actual market return and the expected return on the market value, and is recognized semi-annually over a five-year period. The Actuarial Value of Assets is reduced by the value of the non-valuation reserves and designations.	
Actuarial assumptions:	December 31, 2017 Valuation Date	December 31, 2016 Valuation Date
Investment rate of return	7.00%, net of pension plan investment expenses, including inflation	7.00%, net of pension plan investment expenses, including inflation
Inflation rate	2.75%	2.75%
Administrative expenses	1.13% of payroll allocated to both the employer and member based on the components of the Normal Cost rates for the employer and member.	1.12% of payroll allocated to both the employer and member based on the components of the Normal Cost rates for the employer and member.
Real across-the-board salary increase	0.50%	0.50%
Projected salary increases[1]	General: 4.00% to 13.25% and Safety: 4.00% to 13.75%	General: 4.00% to 13.25% and Safety: 4.00% to 13.75%
Cost of living adjustments	2.75% per year except for Safety Tier C, PEPRA Tier E benefits and PEPRA Tier 4 (2% COLA) and Tier 5 (2% COLA) benefits for members covered under certain memoranda of understanding are assumed to increase at 2% per year. All increases are contingent upon actual increases in CPI.	2.75% per year except for Safety Tier C, PEPRA Tier E benefits and PEPRA Tier 4 (2% COLA) and Tier 5 (2% COLA) benefits for members covered under certain memoranda of understanding are assumed to increase at 2% per year. All increases are contingent upon actual increases in CPI.
Other assumptions	Same as those used in the December 31, 2017 funding actuarial valuation	Same as those used in the December 31, 2016 funding actuarial valuation

[1] *Includes inflation at 2.75% plus real across-the-board salary increases of 0.50% plus promotional and merit increases that vary by service for December 31, 2017 and December 31, 2016.*

EXHIBIT 7

Determination of Proportionate Share

Actual Compensation by Employer and Cost Group
January 1, 2017 to December 31, 2017

Employer	Cost Group #1 & 2	Cost Group #1 & 2 Percentage	Cost Group #3	Cost Group #3 Percentage	Cost Group #4	Cost Group #4 Percentage
1 - BIMID	$166,430	0.027%	$0	0.000%	$0	0.000%
2 - Union Cemetery	0	0.000%	0	0.000%	0	0.000%
3 - CC Mosquito	3,190,169	0.522%	0	0.000%	0	0.000%
4 - CCCFPD	0	0.000%	0	0.000%	0	0.000%
5 - CCCSD	0	0.000%	33,306,938	100.000%	0	0.000%
6 - First 5	2,405,397	0.394%	0	0.000%	0	0.000%
7 - County	570,303,416	93.336%	0	0.000%	0	0.000%
8 - CCCERA (the employer)	4,531,800	0.742%	0	0.000%	0	0.000%
9 - ECCFPD	61,149	0.010%	0	0.000%	0	0.000%
10 - Housing Authority	0	0.000%	0	0.000%	5,183,762	100.000%
11 - IHSS	839,821	0.137%	0	0.000%	0	0.000%
12 - LAFCO	221,780	0.036%	0	0.000%	0	0.000%
13 - MOFD	739,827	0.121%	0	0.000%	0	0.000%
14 - Rodeo SD	0	0.000%	0	0.000%	0	0.000%
15 - RHFD	71,410	0.012%	0	0.000%	0	0.000%
16 - SRVFPD	3,642,063	0.596%	0	0.000%	0	0.000%
17 - Court	24,851,809	4.067%	0	0.000%	0	0.000%
18 - DDSD (Term)	N/A	N/A	N/A	N/A	N/A	N/A
19 - DWD (Term)	N/A	N/A	N/A	N/A	N/A	N/A
20 - Pittsburg (Term)	N/A	N/A	N/A	N/A	N/A	N/A
Total	$611,025,072	100.000%	$33,306,938	100.000%	$5,183,762	100.000%

Note: Results may not add due to rounding.

EXHIBIT 7 (continued)

Determination of Proportionate Share

Actual Compensation by Employer and Cost Group
January 1, 2017 to December 31, 2017

Employer	Cost Group #5	Cost Group #5 Percentage	Cost Group #6	Cost Group #6 Percentage
1 - BIMID	$0	0.000%	$0	0.000%
2 - Union Cemetery	0	0.000%	166,890	20.794%
3 - CC Mosquito	0	0.000%	0	0.000%
4 - CCCFPD	4,600,602	100.000%	0	0.000%
5 - CCCSD	0	0.000%	0	0.000%
6 - First 5	0	0.000%	0	0.000%
7 - County	0	0.000%	0	0.000%
8 - CCCERA (the employer)	0	0.000%	0	0.000%
9 - ECCFPD	0	0.000%	0	0.000%
10 - Housing Authority	0	0.000%	0	0.000%
11 - IHSS	0	0.000%	0	0.000%
12 - LAFCO	0	0.000%	0	0.000%
13 - MOFD	0	0.000%	0	0.000%
14 - Rodeo SD	0	0.000%	635,682	79.206%
15 - RHFD	0	0.000%	0	0.000%
16 - SRVFPD	0	0.000%	0	0.000%
17 - Court	0	0.000%	0	0.000%
18 - DDSD (Term)	N/A	N/A	N/A	N/A
19 - DWD (Term)	N/A	N/A	N/A	N/A
20 - Pittsburg (Term)	N/A	N/A	N/A	N/A
Total	$4,600,602	100.000%	$802,572	100.000%

Note: Results may not add due to rounding.

EXHIBIT 7 (continued)

Determination of Proportionate Share

Actual Compensation by Employer and Cost Group
January 1, 2017 to December 31, 2017

Employer	Cost Group #7 & 9	Cost Group #7 & 9 Percentage	Cost Group #8	Cost Group #8 Percentage	Cost Group #10	Cost Group #10 Percentage
1 - BIMID	$0	0.000%	$0	0.000%	$0	0.000%
2 - Union Cemetery	0	0.000%	0	0.000%	0	0.000%
3 - CC Mosquito	0	0.000%	0	0.000%	0	0.000%
4 - CCCFPD	0	0.000%	31,428,170	91.628%	0	0.000%
5 - CCCSD	0	0.000%	0	0.000%	0	0.000%
6 - First 5	0	0.000%	0	0.000%	0	0.000%
7 - County	91,271,780	100.000%	0	0.000%	0	0.000%
8 - CCCERA (the employer)	0	0.000%	0	0.000%	0	0.000%
9 - ECCFPD	0	0.000%	2,871,722	8.372%	0	0.000%
10 - Housing Authority	0	0.000%	0	0.000%	0	0.000%
11 - IHSS	0	0.000%	0	0.000%	0	0.000%
12 - LAFCO	0	0.000%	0	0.000%	0	0.000%
13 - MOFD	0	0.000%	0	0.000%	7,220,389	100.000%
14 - Rodeo SD	0	0.000%	0	0.000%	0	0.000%
15 - RHFD	0	0.000%	0	0.000%	0	0.000%
16 - SRVFPD	0	0.000%	0	0.000%	0	0.000%
17 - Court	0	0.000%	0	0.000%	0	0.000%
18 - DDSD (Term)	N/A	N/A	N/A	N/A	N/A	N/A
19 - DWD (Term)	N/A	N/A	N/A	N/A	N/A	N/A
20 - Pittsburg (Term)	N/A	N/A	N/A	N/A	N/A	N/A
Total	$91,271,780	100.000%	$34,299,893	100.000%	$7,220,389	100.000%

Note: Results may not add due to rounding.

EXHIBIT 7 (continued)

Determination of Proportionate Share

Actual Compensation by Employer and Cost Group
January 1, 2017 to December 31, 2017

Employer	Cost Group #11	Cost Group #11 Percentage	Cost Group #12	Cost Group #12 Percentage	Total Compensation	Total Percentage
1 - BIMID	$0	0.000%	$0	0.000%	$166,430	0.021%
2 - Union Cemetery	0	0.000%	0	0.000%	166,890	0.021%
3 - CC Mosquito	0	0.000%	0	0.000%	3,190,169	0.394%
4 - CCCFPD	0	0.000%	0	0.000%	36,028,772	4.448%
5 - CCCSD	0	0.000%	0	0.000%	33,306,938	4.112%
6 - First 5	0	0.000%	0	0.000%	2,405,397	0.297%
7 - County	0	0.000%	0	0.000%	661,575,196	81.680%
8 - CCCERA (the employer)	0	0.000%	0	0.000%	4,531,800	0.560%
9 - ECCFPD	0	0.000%	0	0.000%	2,932,872	0.362%
10 - Housing Authority	0	0.000%	0	0.000%	5,183,762	0.640%
11 - IHSS	0	0.000%	0	0.000%	839,821	0.104%
12 - LAFCO	0	0.000%	0	0.000%	221,780	0.027%
13 - MOFD	0	0.000%	0	0.000%	7,960,215	0.983%
14 - Rodeo SD	0	0.000%	0	0.000%	635,682	0.078%
15 - RHFD	0	0.000%	2,123,195	100.000%	2,194,605	0.271%
16 - SRVFPD	20,125,886	100.000%	0	0.000%	23,767,950	2.934%
17 - Court	0	0.000%	0	0.000%	24,851,809	3.068%
18 - DDSD (Term)	N/A	N/A	N/A	N/A	N/A	N/A
19 - DWD (Term)	N/A	N/A	N/A	N/A	N/A	N/A
20 - Pittsburg (Term)	N/A	N/A	N/A	N/A	N/A	N/A
Total	$20,125,886	100.000%	$2,123,195	100.000%	$809,960,088	100.000%

Note: Results may not add due to rounding.

EXHIBIT 7 (continued)

Determination of Proportionate Share

PART ONE - Allocation of December 31, 2017 Net Pension Liability (NPL)
Excluding Pension Obligation Bonds (POB) and UAAL Prepayments for Certain Employers

Employer	Cost Group #1 & 2	Cost Group #1 & 2 Percentage	Cost Group #3	Cost Group #3 Percentage	Cost Group #4	Cost Group #4 Percentage
1 - BIMID	$157,443	0.027%	$0	0.000%	$0	0.000%
2 - Union Cemetery	0	0.000%	0	0.000%	0	0.000%
3 - CC Mosquito	3,017,908	0.522%	0	0.000%	0	0.000%
4 - CCCFPD	0	0.000%	0	0.000%	0	0.000%
5 - CCCSD	0	0.000%	63,806,000	100.000%	0	0.000%
6 - First 5	2,275,512	0.394%	0	0.000%	0	0.000%
7 - County	539,508,482	93.336%	0	0.000%	0	0.000%
8 - CCCERA (the employer)	4,287,094	0.742%	0	0.000%	0	0.000%
9 - ECCFPD	57,847	0.010%	0	0.000%	0	0.000%
10 - Housing Authority	0	0.000%	0	0.000%	6,267,604	100.000%
11 - IHSS	794,473	0.137%	0	0.000%	0	0.000%
12 - LAFCO	209,805	0.036%	0	0.000%	0	0.000%
13 - MOFD	699,878	0.121%	0	0.000%	0	0.000%
14 - Rodeo SD	0	0.000%	0	0.000%	0	0.000%
15 - RHFD	67,554	0.012%	0	0.000%	0	0.000%
16 - SRVFPD	3,445,401	0.596%	0	0.000%	0	0.000%
17 - Court	23,509,875	4.067%	0	0.000%	0	0.000%
18 - DDSD (Term)	0	0.000%	0	0.000%	0	0.000%
19 - DWD (Term)	0	0.000%	0	0.000%	0	0.000%
20 - Pittsburg (Term)	0	0.000%	0	0.000%	0	0.000%
Total	$578,031,272	100.000%	$63,806,000	100.000%	$6,267,604	100.000%

Note: Results may not add due to rounding.

EXHIBIT 7 (continued)

Determination of Proportionate Share

PART ONE - Allocation of December 31, 2017 Net Pension Liability (NPL)
Excluding Pension Obligation Bonds (POB) and UAAL Prepayments for Certain Employers

Employer	Cost Group #5	Cost Group #5 Percentage	Cost Group #6	Cost Group #6 Percentage	Cost Group #7 & 9	Cost Group #7 & 9 Percentage
1 - BIMID	$0	0.000%	$0	0.000%	$0	0.000%
2 - Union Cemetery	0	0.000%	29,395	20.794%	0	0.000%
3 - CC Mosquito	0	0.000%	0	0.000%	0	0.000%
4 - CCCFPD	5,254,103	100.000%	0	0.000%	0	0.000%
5 - CCCSD	0	0.000%	0	0.000%	0	0.000%
6 - First 5	0	0.000%	0	0.000%	0	0.000%
7 - County	0	0.000%	0	0.000%	214,270,694	100.000%
8 - CCCERA (the employer)	0	0.000%	0	0.000%	0	0.000%
9 - ECCFPD	0	0.000%	0	0.000%	0	0.000%
10 - Housing Authority	0	0.000%	0	0.000%	0	0.000%
11 - IHSS	0	0.000%	0	0.000%	0	0.000%
12 - LAFCO	0	0.000%	0	0.000%	0	0.000%
13 - MOFD	0	0.000%	0	0.000%	0	0.000%
14 - Rodeo SD	0	0.000%	111,965	79.206%	0	0.000%
15 - RHFD	0	0.000%	0	0.000%	0	0.000%
16 - SRVFPD	0	0.000%	0	0.000%	0	0.000%
17 - Court	0	0.000%	0	0.000%	0	0.000%
18 - DDSD (Term)	0	0.000%	0	0.000%	0	0.000%
19 - DWD (Term)	0	0.000%	0	0.000%	0	0.000%
20 - Pittsburg (Term)	0	0.000%	0	0.000%	0	0.000%
Total	$5,254,103	100.000%	$141,360	100.000%	$214,270,694	100.000%

Note: Results may not add due to rounding.

EXHIBIT 7 (continued)

Determination of Proportionate Share

PART ONE - Allocation of December 31, 2017 Net Pension Liability (NPL)
Excluding Pension Obligation Bonds (POB) and UAAL Prepayments for Certain Employers

Employer	Cost Group #8	Cost Group #8 Percentage	Cost Group #10	Cost Group #10 Percentage	Cost Group #11	Cost Group #11 Percentage
1 - BIMID	$0	0.000%	$0	0.000%	$0	0.000%
2 - Union Cemetery	0	0.000%	0	0.000%	0	0.000%
3 - CC Mosquito	0	0.000%	0	0.000%	0	0.000%
4 - CCCFPD	178,304,418	91.628%	0	0.000%	0	0.000%
5 - CCCSD	0	0.000%	0	0.000%	0	0.000%
6 - First 5	0	0.000%	0	0.000%	0	0.000%
7 - County	0	0.000%	0	0.000%	0	0.000%
8 - CCCERA (the employer)	0	0.000%	0	0.000%	0	0.000%
9 - ECCFPD	16,292,415	8.372%	0	0.000%	0	0.000%
10 - Housing Authority	0	0.000%	0	0.000%	0	0.000%
11 - IHSS	0	0.000%	0	0.000%	0	0.000%
12 - LAFCO	0	0.000%	0	0.000%	0	0.000%
13 - MOFD	0	0.000%	23,202,147	100.000%	0	0.000%
14 - Rodeo SD	0	0.000%	0	0.000%	0	0.000%
15 - RHFD	0	0.000%	0	0.000%	0	0.000%
16 - SRVFPD	0	0.000%	0	0.000%	43,664,695	100.000%
17 - Court	0	0.000%	0	0.000%	0	0.000%
18 - DDSD (Term)	0	0.000%	0	0.000%	0	0.000%
19 - DWD (Term)	0	0.000%	0	0.000%	0	0.000%
20 - Pittsburg (Term)	0	0.000%	0	0.000%	0	0.000%
Total	$194,596,833	100.000%	$23,202,147	100.000%	$43,664,695	100.000%

Note: Results may not add due to rounding.

EXHIBIT 7 (continued)

Determination of Proportionate Share

PART ONE - Allocation of December 31, 2017 Net Pension Liability (NPL)
Excluding Pension Obligation Bonds (POB) and UAAL Prepayments for Certain Employers

Employer	Cost Group #12	Cost Group #12 Percentage	Terminated Employers	Terminated Employers Percentage	Total NPL	Total Percentage
1 - BIMID	$0	0.000%	$0	0.000%	$157,443	0.014%
2 - Union Cemetery	0	0.000%	0	0.000%	29,395	0.003%
3 - CC Mosquito	0	0.000%	0	0.000%	3,017,908	0.263%
4 - CCCFPD	0	0.000%	0	0.000%	183,558,521	15.999%
5 - CCCSD	0	0.000%	0	0.000%	63,806,000	5.561%
6 - First 5	0	0.000%	0	0.000%	2,275,512	0.198%
7 - County	0	0.000%	0	0.000%	753,779,176	65.699%
8 - CCCERA (the employer)	0	0.000%	0	0.000%	4,287,094	0.374%
9 - ECCFPD	0	0.000%	0	0.000%	16,350,262	1.425%
10 - Housing Authority	0	0.000%	0	0.000%	6,267,604	0.546%
11 - IHSS	0	0.000%	0	0.000%	794,473	0.069%
12 - LAFCO	0	0.000%	0	0.000%	209,805	0.018%
13 - MOFD	0	0.000%	0	0.000%	23,902,025	2.083%
14 - Rodeo SD	0	0.000%	0	0.000%	111,965	0.010%
15 - RHFD	11,625,620	100.000%	0	0.000%	11,693,174	1.019%
16 - SRVFPD	0	0.000%	0	0.000%	47,110,096	4.106%
17 - Court	0	0.000%	0	0.000%	23,509,875	2.049%
18 - DDSD (Term) (1)	0	0.000%	1,435,257	22.211%	1,435,257	0.125%
19 - DWD (Term) (1)	0	0.000%	827,520	12.806%	827,520	0.072%
20 - Pittsburg (Term) (1)	0	0.000%	4,199,080	64.983%	4,199,080	0.366%
Total	$11,625,620	100.000%	$6,461,857	100.000%	$1,147,322,185	100.000%

(1) *The NPLs for the three terminated employers are determined based on the Plan's Fiduciary Net Positions from the December 31, 2017 bookkeeping account letters and the TPLs obtained from internal valuation results (by rolling forward their TPLs from December 31, 2016).*

Note: Results may not add due to rounding.

EXHIBIT 7 (continued)

Determination of Proportionate Share

PART TWO - Allocation of December 31, 2017 Net Pension Liability (NPL)
Including Pension Obligation Bonds (POB) and UAAL Prepayments for Certain Employers

Employer	Cost Group #1 & 2	Cost Group #1 & 2 Percentage	Cost Group #3	Cost Group #3 Percentage	Cost Group #4	Cost Group #4 Percentage
1 - BIMID	$157,443	0.050%	$0	0.000%	$0	0.000%
2 - Union Cemetery	0	0.000%	0	0.000%	0	0.000%
3 - CC Mosquito	3,017,908	0.957%	0	0.000%	0	0.000%
4 - CCCFPD	0	0.000%	0	0.000%	0	0.000%
5 - CCCSD	0	0.000%	63,806,000	100.000%	0	0.000%
6 - First 5	1,289,083	0.409%	0	0.000%	0	0.000%
7 - County	289,288,214	91.695%	0	0.000%	0	0.000%
8 - CCCERA (the employer)	4,287,094	1.359%	0	0.000%	0	0.000%
9 - ECCFPD	57,847	0.018%	0	0.000%	0	0.000%
10 - Housing Authority	0	0.000%	0	0.000%	6,267,604	100.000%
11 - IHSS	794,473	0.252%	0	0.000%	0	0.000%
12 - LAFCO	181,268	0.057%	0	0.000%	0	0.000%
13 - MOFD	296,428	0.094%	0	0.000%	0	0.000%
14 - Rodeo SD	0	0.000%	0	0.000%	0	0.000%
15 - RHFD	67,554	0.021%	0	0.000%	0	0.000%
16 - SRVFPD	3,445,401	1.092%	0	0.000%	0	0.000%
17 - Court	12,606,159	3.996%	0	0.000%	0	0.000%
18 - DDSD (Term)	0	0.000%	0	0.000%	0	0.000%
19 - DWD (Term)	0	0.000%	0	0.000%	0	0.000%
20 - Pittsburg (Term)	0	0.000%	0	0.000%	0	0.000%
Total	$315,488,872	100.000%	$63,806,000	100.000%	$6,267,604	100.000%

Note: Results may not add due to rounding.

EXHIBIT 7 (continued)

Determination of Proportionate Share

PART TWO - Allocation of December 31, 2017 Net Pension Liability (NPL)
Including Pension Obligation Bonds (POB) and UAAL Prepayments for Certain Employers

Employer	Cost Group #5	Cost Group #5 Percentage	Cost Group #6	Cost Group #6 Percentage	Cost Group #7 & 9	Cost Group #7 & 9 Percentage
1 - BIMID	$0	0.000%	$0	0.000%	$0	0.000%
2 - Union Cemetery	0	0.000%	29,395	20.794%	0	0.000%
3 - CC Mosquito	0	0.000%	0	0.000%	0	0.000%
4 - CCCFPD	5,254,103	100.000%	0	0.000%	0	0.000%
5 - CCCSD	0	0.000%	0	0.000%	0	0.000%
6 - First 5	0	0.000%	0	0.000%	0	0.000%
7 - County	0	0.000%	0	0.000%	214,270,694	100.000%
8 - CCCERA (the employer)	0	0.000%	0	0.000%	0	0.000%
9 - ECCFPD	0	0.000%	0	0.000%	0	0.000%
10 - Housing Authority	0	0.000%	0	0.000%	0	0.000%
11 - IHSS	0	0.000%	0	0.000%	0	0.000%
12 - LAFCO	0	0.000%	0	0.000%	0	0.000%
13 - MOFD	0	0.000%	0	0.000%	0	0.000%
14 - Rodeo SD	0	0.000%	111,965	79.206%	0	0.000%
15 - RHFD	0	0.000%	0	0.000%	0	0.000%
16 - SRVFPD	0	0.000%	0	0.000%	0	0.000%
17 - Court	0	0.000%	0	0.000%	0	0.000%
18 - DDSD (Term)	0	0.000%	0	0.000%	0	0.000%
19 - DWD (Term)	0	0.000%	0	0.000%	0	0.000%
20 - Pittsburg (Term)	0	0.000%	0	0.000%	0	0.000%
Total	$5,254,103	100.000%	$141,360	100.000%	$214,270,694	100.000%

Note: Results may not add due to rounding.

EXHIBIT 7 (continued)

Determination of Proportionate Share

PART TWO - Allocation of December 31, 2017 Net Pension Liability (NPL)
Including Pension Obligation Bonds (POB) and UAAL Prepayments for Certain Employers

Employer	Cost Group #8	Cost Group #8 Percentage	Cost Group #10	Cost Group #10 Percentage	Cost Group #11	Cost Group #11 Percentage
1 - BIMID	$0	0.000%	$0	0.000%	$0	0.000%
2 - Union Cemetery	0	0.000%	0	0.000%	0	0.000%
3 - CC Mosquito	0	0.000%	0	0.000%	0	0.000%
4 - CCCFPD	104,961,244	86.563%	0	0.000%	0	0.000%
5 - CCCSD	0	0.000%	0	0.000%	0	0.000%
6 - First 5	0	0.000%	0	0.000%	0	0.000%
7 - County	0	0.000%	0	0.000%	0	0.000%
8 - CCCERA (the employer)	0	0.000%	0	0.000%	0	0.000%
9 - ECCFPD	16,292,415	13.437%	0	0.000%	0	0.000%
10 - Housing Authority	0	0.000%	0	0.000%	0	0.000%
11 - IHSS	0	0.000%	0	0.000%	0	0.000%
12 - LAFCO	0	0.000%	0	0.000%	0	0.000%
13 - MOFD	0	0.000%	23,202,147	100.000%	0	0.000%
14 - Rodeo SD	0	0.000%	0	0.000%	0	0.000%
15 - RHFD	0	0.000%	0	0.000%	0	0.000%
16 - SRVFPD	0	0.000%	0	0.000%	43,664,695	100.000%
17 - Court	0	0.000%	0	0.000%	0	0.000%
18 - DDSD (Term)	0	0.000%	0	0.000%	0	0.000%
19 - DWD (Term)	0	0.000%	0	0.000%	0	0.000%
20 - Pittsburg (Term)	0	0.000%	0	0.000%	0	0.000%
Total	$121,253,659	100.000%	$23,202,147	100.000%	$43,664,695	100.000%

Note: Results may not add due to rounding.

EXHIBIT 7 (continued)

Determination of Proportionate Share

PART TWO - Allocation of December 31, 2017 Net Pension Liability (NPL)
Including Pension Obligation Bonds (POB) and UAAL Prepayments for Certain Employers

Employer	Cost Group #12	Cost Group #12 Percentage	Terminated Employers	Terminated Employers Percentage	Total NPL	Total Percentage	Total Percentage Excluding Terminated Employers[1]
1 - BIMID	$0	0.000%	$0	0.000%	$157,443	0.019%	0.020%
2 - Union Cemetery	0	0.000%	0	0.000%	29,395	0.004%	0.004%
3 - CC Mosquito	0	0.000%	0	0.000%	3,017,908	0.372%	0.375%
4 - CCCFPD	0	0.000%	0	0.000%	110,215,347	13.583%	13.692%
5 - CCCSD	0	0.000%	0	0.000%	63,806,000	7.863%	7.926%
6 - First 5	0	0.000%	0	0.000%	1,289,083	0.159%	0.160%
7 - County	0	0.000%	0	0.000%	503,558,908	62.058%	62.556%
8 - CCCERA (the employer)	0	0.000%	0	0.000%	4,287,094	0.528%	0.533%
9 - ECCFPD	0	0.000%	0	0.000%	16,350,262	2.015%	2.031%
10 - Housing Authority	0	0.000%	0	0.000%	6,267,604	0.772%	0.779%
11 - IHSS	0	0.000%	0	0.000%	794,473	0.098%	0.099%
12 - LAFCO	0	0.000%	0	0.000%	181,268	0.022%	0.023%
13 - MOFD	0	0.000%	0	0.000%	23,498,575	2.896%	2.919%
14 - Rodeo SD	0	0.000%	0	0.000%	111,965	0.014%	0.014%
15 - RHFD	11,625,620	100.000%	0	0.000%	11,693,174	1.441%	1.453%
16 - SRVFPD	0	0.000%	0	0.000%	47,110,096	5.806%	5.852%
17 - Court	0	0.000%	0	0.000%	12,606,159	1.554%	1.566%
18 - DDSD (Term)[2]	0	0.000%	1,435,257	22.211%	1,435,257	0.177%	N/A
19 - DWD (Term)[2]	0	0.000%	827,520	12.806%	827,520	0.102%	N/A
20 - Pittsburg (Term)[2]	0	0.000%	4,199,080	64.983%	4,199,080	0.517%	N/A
Total	$11,625,620	100.000%	$6,461,857	100.000%	$811,436,611	100.000%	100.000%

[1] *For informational purposes; these percentages show the allocation of the NPL for employers excluding terminated employers.*

[2] *The NPLs for the three terminated employers are determined based on the Plan's Fiduciary Net Positions from the December 31, 2017 bookkeeping account letters and the TPLs obtained from internal valuation results (by rolling forward their TPLs from December 31, 2016).*

Note: Results may not add due to rounding.

EXHIBIT 7 (continued)

Determination of Proportionate Share

Notes Regarding Determination of Proportionate Share as of December 31, 2017 Measurement Date:

1. Based on actual January 1, 2017 through December 31, 2017 compensation information that was provided by CCCERA.
2. The Net Pension Liability (NPL) for each Cost Group is the Total Pension Liability (TPL) minus the Plan's Fiduciary Net Position (plan assets). The TPL for each Cost Group is obtained from internal valuation results based on the actual participants in each Cost Group. The Plan's Fiduciary Net Position for each Cost Group was determined by adjusting the Valuation Value of Assets (VVA) for each Cost Group (which is used to determine employer contribution rates) by the ratio of the total CCCERA Plan's Fiduciary Net Position (excluding the terminated employers' assets and the Post Retirement Death Benefit reserve) to total CCCERA VVA (excluding the terminated employers' VVA). The Post Retirement Death Benefit reserve is allocated to Cost Group #1 and #2. The liability for the post-retirement death benefit up to the amount in the Post Retirement Death Benefit reserve is also allocated to Cost Group #1 and #2.
3. For terminated employers, the TPL is obtained from internal valuation results for each employer. The Plan's Fiduciary Net Position for each terminated employer has been set equal to the amount in their respective bookkeeping account. The NPL is then determined separately for each terminated employer.
4. For Cost Groups that have one employer, all of the NPL for that Cost Group is allocated to the corresponding employer. The NPL has already been reduced by any proceeds from Pension Obligation Bonds and any UAAL prepayments.
5. For Cost Groups that have multiple employers, the NPL is allocated based on the actual compensation within the Cost Group.
    a. Calculate ratio of employer's compensation to the total compensation for the Cost Group.
    b. Multiply this ratio by an "adjusted" NPL. This adjusted NPL is larger than the actual NPL as it excludes proceeds from Pension Obligation Bonds and any Unfunded Actuarial Accrued Liability (UAAL) prepayments from the Cost Group's assets when determining the employer's proportionate share of the NPL for the Cost Group. It also excludes the NPLs for the three terminated employers. The allocation of the adjusted NPL is shown above in PART ONE of Exhibit 7.
    c. The amounts of the proceeds from Pension Obligation Bonds and UAAL prepayments as of December 31, 2017 allocated to those employers within each Cost Group are as follows:

Cost Group #1: County	$250,220,268
Cost Group #1: Court	$10,903,716
Cost Group #1: MOFD	$403,450
Cost Group #1: LAFCO	$28,537
Cost Group #1: First 5	$986,429
Cost Group #8: CCCFPD	$73,343,174

Note that the proceeds from Pension Obligation Bonds for Contra Costa County and the Superior Court as of December 31, 2017 (total of $261,123,984) were allocated proportionally based on the compensation information.

EXHIBIT 7 (continued)

Determination of Proportionate Share

Notes Regarding Determination of Proportionate Share as of December 31, 2017 Measurement Date:

d. Subtract from the adjusted NPL in PART ONE the outstanding balance of the proceeds from any Pension Obligation Bonds and any UAAL prepayments for those employers in each Cost Group that are subject to these adjustments. The resulting actual NPL is shown in PART TWO of Exhibit 7.

6. If the employer is in several Cost Groups, the employer's total allocated NPL is the sum of its allocated NPL from each Cost Group.

7. Cost Group #1 and Cost Group #2 were combined and Cost Group #7 and Cost Group #9 were combined consistent with the determination of the UAAL rate in the annual funding actuarial valuation.

The following items are allocated based on the corresponding employer allocation percentage or proportionate share shown above after excluding terminated employers.

- 1) Net Pension Liability
- 2) Service Cost
- 3) Interest on the Total Pension Liability
- 4) Expensed portion of current-period benefit changes
- 5) Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability
- 6) Expensed portion of current-period changes of assumptions or other inputs
- 7) Member contributions
- 8) Projected earnings on plan investments
- 9) Expensed portion of current-period differences between actual and projected earnings on plan investments
- 10) Administrative expense
- 11) Other expenses
- 12) Recognition of beginning of year deferred outflows of resources as pension expense
- 13) Recognition of beginning of year deferred inflows of resources as pension expense

EXHIBIT 7 (continued)

Determination of Proportionate Share

Actual Compensation by Employer and Cost Group
January 1, 2016 to December 31, 2016

Employer	Cost Group #1 & 2	Cost Group #1 & 2 Percentage	Cost Group #3	Cost Group #3 Percentage	Cost Group #4	Cost Group #4 Percentage
1 - BIMID	$82,174	0.014%	$0	0.000%	$0	0.000%
2 - Union Cemetery	0	0.000%	0	0.000%	0	0.000%
3 - CC Mosquito	3,081,368	0.543%	0	0.000%	0	0.000%
4 - CCCFPD	0	0.000%	0	0.000%	0	0.000%
5 - CCCSD	0	0.000%	31,584,169	100.000%	0	0.000%
6 - First 5	2,140,380	0.377%	0	0.000%	0	0.000%
7 - County	528,783,808	93.253%	0	0.000%	0	0.000%
8 - CCCERA (the employer)	3,881,797	0.685%	0	0.000%	0	0.000%
9 - ECCFPD	57,358	0.010%	0	0.000%	0	0.000%
10 - Housing Authority	0	0.000%	0	0.000%	5,215,890	100.000%
11 - IHSS	775,987	0.137%	0	0.000%	0	0.000%
12 - LAFCO	215,396	0.038%	0	0.000%	0	0.000%
13 - MOFD	568,802	0.100%	0	0.000%	0	0.000%
14 - Rodeo SD	0	0.000%	0	0.000%	0	0.000%
15 - RHFD	66,601	0.012%	0	0.000%	0	0.000%
16 - SRVFPD	3,323,048	0.586%	0	0.000%	0	0.000%
17 - Court	24,062,771	4.244%	0	0.000%	0	0.000%
18 - DDSD (Term)	N/A	N/A	N/A	N/A	N/A	N/A
19 - DWD (Term)	N/A	N/A	N/A	N/A	N/A	N/A
20 - Pittsburg (Term)	N/A	N/A	N/A	N/A	N/A	N/A
Total	$567,039,490	100.000%	$31,584,169	100.000%	$5,215,890	100.000%

Note: Results may not add due to rounding.

EXHIBIT 7 (continued)

Determination of Proportionate Share

Actual Compensation by Employer and Cost Group January 1, 2016 to December 31, 2016				
Employer	Cost Group #5	Cost Group #5 Percentage	Cost Group #6	Cost Group #6 Percentage
1 - BIMID	$0	0.000%	$0	0.000%
2 - Union Cemetery	0	0.000%	226,811	27.115%
3 - CC Mosquito	0	0.000%	0	0.000%
4 - CCCFPD	4,291,448	100.000%	0	0.000%
5 - CCCSD	0	0.000%	0	0.000%
6 - First 5	0	0.000%	0	0.000%
7 - County	0	0.000%	0	0.000%
8 - CCCERA (the employer)	0	0.000%	0	0.000%
9 - ECCFPD	0	0.000%	0	0.000%
10 - Housing Authority	0	0.000%	0	0.000%
11 - IHSS	0	0.000%	0	0.000%
12 - LAFCO	0	0.000%	0	0.000%
13 - MOFD	0	0.000%	0	0.000%
14 - Rodeo SD	0	0.000%	609,667	72.885%
15 - RHFD	0	0.000%	0	0.000%
16 - SRVFPD	0	0.000%	0	0.000%
17 - Court	0	0.000%	0	0.000%
18 - DDSD (Term)	N/A	N/A	N/A	N/A
19 - DWD (Term)	N/A	N/A	N/A	N/A
20 - Pittsburg (Term)	N/A	N/A	N/A	N/A
Total	$4,291,448	100.000%	$836,478	100.000%

Note: Results may not add due to rounding.

EXHIBIT 7 (continued)

Determination of Proportionate Share

Actual Compensation by Employer and Cost Group
January 1, 2016 to December 31, 2016

Employer	Cost Group #7 & 9	Cost Group #7 & 9 Percentage	Cost Group #8	Cost Group #8 Percentage	Cost Group #10	Cost Group #10 Percentage
1 - BIMID	$0	0.000%	$0	0.000%	$0	0.000%
2 - Union Cemetery	0	0.000%	0	0.000%	0	0.000%
3 - CC Mosquito	0	0.000%	0	0.000%	0	0.000%
4 - CCCFPD	0	0.000%	30,720,530	91.308%	0	0.000%
5 - CCCSD	0	0.000%	0	0.000%	0	0.000%
6 - First 5	0	0.000%	0	0.000%	0	0.000%
7 - County	84,781,260	100.000%	0	0.000%	0	0.000%
8 - CCCERA (the employer)	0	0.000%	0	0.000%	0	0.000%
9 - ECCFPD	0	0.000%	2,924,553	8.692%	0	0.000%
10 - Housing Authority	0	0.000%	0	0.000%	0	0.000%
11 - IHSS	0	0.000%	0	0.000%	0	0.000%
12 - LAFCO	0	0.000%	0	0.000%	0	0.000%
13 - MOFD	0	0.000%	0	0.000%	6,778,955	100.000%
14 - Rodeo SD	0	0.000%	0	0.000%	0	0.000%
15 - RHFD	0	0.000%	0	0.000%	0	0.000%
16 - SRVFPD	0	0.000%	0	0.000%	0	0.000%
17 - Court	0	0.000%	0	0.000%	0	0.000%
18 - DDSD (Term)	N/A	N/A	N/A	N/A	N/A	N/A
19 - DWD (Term)	N/A	N/A	N/A	N/A	N/A	N/A
20 - Pittsburg (Term)	N/A	N/A	N/A	N/A	N/A	N/A
Total	$84,781,260	100.000%	$33,645,083	100.000%	$6,778,955	100.000%

Note: Results may not add due to rounding.

EXHIBIT 7 (continued)

Determination of Proportionate Share

Actual Compensation by Employer and Cost Group January 1, 2016 to December 31, 2016						
Employer	**Cost Group #11**	**Cost Group #11 Percentage**	**Cost Group #12**	**Cost Group #12 Percentage**	**Total Compensation**	**Total Percentage**
1 - BIMID	$0	0.000%	$0	0.000%	$82,174	0.011%
2 - Union Cemetery	0	0.000%	0	0.000%	226,811	0.030%
3 - CC Mosquito	0	0.000%	0	0.000%	3,081,368	0.408%
4 - CCCFPD	0	0.000%	0	0.000%	35,011,978	4.636%
5 - CCCSD	0	0.000%	0	0.000%	31,584,169	4.183%
6 - First 5	0	0.000%	0	0.000%	2,140,380	0.283%
7 - County	0	0.000%	0	0.000%	613,565,068	81.252%
8 - CCCERA (the employer)	0	0.000%	0	0.000%	3,881,797	0.514%
9 - ECCFPD	0	0.000%	0	0.000%	2,981,911	0.395%
10 - Housing Authority	0	0.000%	0	0.000%	5,215,890	0.691%
11 - IHSS	0	0.000%	0	0.000%	775,987	0.103%
12 - LAFCO	0	0.000%	0	0.000%	215,396	0.029%
13 - MOFD	0	0.000%	0	0.000%	7,347,757	0.973%
14 - Rodeo SD	0	0.000%	0	0.000%	609,667	0.081%
15 - RHFD	0	0.000%	2,175,185	100.000%	2,241,786	0.297%
16 - SRVFPD	18,790,925	100.000%	0	0.000%	22,113,973	2.928%
17 - Court	0	0.000%	0	0.000%	24,062,771	3.187%
18 - DDSD (Term)	N/A	N/A	N/A	N/A	N/A	N/A
19 - DWD (Term)	N/A	N/A	N/A	N/A	N/A	N/A
20 - Pittsburg (Term)	N/A	N/A	N/A	N/A	N/A	N/A
Total	$18,790,925	100.000%	$2,175,185	100.000%	$755,138,882	100.000%

Note: Results may not add due to rounding.

EXHIBIT 7 (continued)

Determination of Proportionate Share

PART ONE - Allocation of December 31, 2016 Net Pension Liability (NPL)
Excluding Pension Obligation Bonds (POB) and UAAL Prepayments for Certain Employers

Employer	Cost Group #1 & 2	Cost Group #1 & 2 Percentage	Cost Group #3	Cost Group #3 Percentage	Cost Group #4	Cost Group #4 Percentage
1 - BIMID	$137,084	0.014%	$0	0.000%	$0	0.000%
2 - Union Cemetery	0	0.000%	0	0.000%	0	0.000%
3 - CC Mosquito	5,140,418	0.540%	0	0.000%	0	0.000%
4 - CCCFPD	0	0.000%	0	0.000%	0	0.000%
5 - CCCSD	0	0.000%	87,847,116	100.000%	0	0.000%
6 - First 5	3,570,637	0.375%	0	0.000%	0	0.000%
7 - County	882,130,780	92.709%	0	0.000%	0	0.000%
8 - CCCERA (the employer)	6,475,713	0.681%	0	0.000%	0	0.000%
9 - ECCFPD	95,687	0.010%	0	0.000%	0	0.000%
10 - Housing Authority	0	0.000%	0	0.000%	10,162,604	100.000%
11 - IHSS	1,294,522	0.136%	0	0.000%	0	0.000%
12 - LAFCO	359,329	0.038%	0	0.000%	0	0.000%
13 - MOFD	948,891	0.100%	0	0.000%	0	0.000%
14 - Rodeo SD	0	0.000%	0	0.000%	0	0.000%
15 - RHFD	111,106	0.012%	0	0.000%	0	0.000%
16 - SRVFPD	5,543,595	0.583%	0	0.000%	0	0.000%
17 - Court	40,142,135	4.219%	0	0.000%	0	0.000%
18 - DDSD (Term) (1)	1,918,215	0.202%	0	0.000%	0	0.000%
19 - DWD (Term) (1)	823,144	0.087%	0	0.000%	0	0.000%
20 - Pittsburg (Term) (1)	2,818,558	0.296%	0	0.000%	0	0.000%
Total	$951,509,814	100.000%	$87,847,116	100.000%	$10,162,604	100.000%

(1) *The NPLs for the three terminated employers are determined based on the Plan's Fiduciary Net Positions from the December 31, 2016 bookkeeping account letters and the TPLs obtained from internal valuation results (by rolling forward their TPLs from December 31, 2015).*

Note: Results may not add due to rounding.

EXHIBIT 7 (continued)

Determination of Proportionate Share

PART ONE - Allocation of December 31, 2016 Net Pension Liability (NPL)
Excluding Pension Obligation Bonds (POB) and UAAL Prepayments for Certain Employers

Employer	Cost Group #5	Cost Group #5 Percentage	Cost Group #6	Cost Group #6 Percentage
1 - BIMID	$0	0.000%	$0	0.000%
2 - Union Cemetery	0	0.000%	75,800	27.115%
3 - CC Mosquito	0	0.000%	0	0.000%
4 - CCCFPD	6,505,067	100.000%	0	0.000%
5 - CCCSD	0	0.000%	0	0.000%
6 - First 5	0	0.000%	0	0.000%
7 - County	0	0.000%	0	0.000%
8 - CCCERA (the employer)	0	0.000%	0	0.000%
9 - ECCFPD	0	0.000%	0	0.000%
10 - Housing Authority	0	0.000%	0	0.000%
11 - IHSS	0	0.000%	0	0.000%
12 - LAFCO	0	0.000%	0	0.000%
13 - MOFD	0	0.000%	0	0.000%
14 - Rodeo SD	0	0.000%	203,750	72.885%
15 - RHFD	0	0.000%	0	0.000%
16 - SRVFPD	0	0.000%	0	0.000%
17 - Court	0	0.000%	0	0.000%
18 - DDSD (Term)	0	0.000%	0	0.000%
19 - DWD (Term)	0	0.000%	0	0.000%
20 - Pittsburg (Term)	0	0.000%	0	0.000%
Total	$6,505,067	100.000%	$279,550	100.000%

Note: Results may not add due to rounding.

EXHIBIT 7 (continued)

Determination of Proportionate Share

PART ONE - Allocation of December 31, 2016 Net Pension Liability (NPL)
Excluding Pension Obligation Bonds (POB) and UAAL Prepayments for Certain Employers

Employer	Cost Group #7 & 9	Cost Group #7 & 9 Percentage	Cost Group #8	Cost Group #8 Percentage	Cost Group #10	Cost Group #10 Percentage
1 - BIMID	$0	0.000%	$0	0.000%	$0	0.000%
2 - Union Cemetery	0	0.000%	0	0.000%	0	0.000%
3 - CC Mosquito	0	0.000%	0	0.000%	0	0.000%
4 - CCCFPD	0	0.000%	244,402,232	91.308%	0	0.000%
5 - CCCSD	0	0.000%	0	0.000%	0	0.000%
6 - First 5	0	0.000%	0	0.000%	0	0.000%
7 - County	342,485,207	98.826%	0	0.000%	0	0.000%
8 - CCCERA (the employer)	0	0.000%	0	0.000%	0	0.000%
9 - ECCFPD	0	0.000%	23,266,760	8.692%	0	0.000%
10 - Housing Authority	0	0.000%	0	0.000%	0	0.000%
11 - IHSS	0	0.000%	0	0.000%	0	0.000%
12 - LAFCO	0	0.000%	0	0.000%	0	0.000%
13 - MOFD	0	0.000%	0	0.000%	32,081,901	100.000%
14 - Rodeo SD	0	0.000%	0	0.000%	0	0.000%
15 - RHFD	0	0.000%	0	0.000%	0	0.000%
16 - SRVFPD	0	0.000%	0	0.000%	0	0.000%
17 - Court	0	0.000%	0	0.000%	0	0.000%
18 - DDSD (Term) [1]	0	0.000%	0	0.000%	0	0.000%
19 - DWD (Term) [1]	0	0.000%	0	0.000%	0	0.000%
20 - Pittsburg (Term) [1]	4,069,769	1.174%	0	0.000%	0	0.000%
Total	$346,554,976	100.000%	$267,668,992	100.000%	$32,081,901	100.000%

[1] *The NPLs for the three terminated employers are determined based on the Plan's Fiduciary Net Positions from the December 31, 2016 bookkeeping account letters and the TPLs obtained from internal valuation results (by rolling forward their TPLs from December 31, 2015).*

Note: Results may not add due to rounding.

EXHIBIT 7 (continued)

Determination of Proportionate Share

PART ONE - Allocation of December 31, 2016 Net Pension Liability (NPL)
Excluding Pension Obligation Bonds (POB) and UAAL Prepayments for Certain Employers

Employer	Cost Group #11	Cost Group #11 Percentage	Cost Group #12	Cost Group #12 Percentage	Total NPL	Total Percentage
1 - BIMID	$0	0.000%	$0	0.000%	$137,084	0.008%
2 - Union Cemetery	0	0.000%	0	0.000%	75,800	0.004%
3 - CC Mosquito	0	0.000%	0	0.000%	5,140,418	0.288%
4 - CCCFPD	0	0.000%	0	0.000%	250,907,299	14.063%
5 - CCCSD	0	0.000%	0	0.000%	87,847,116	4.924%
6 - First 5	0	0.000%	0	0.000%	3,570,637	0.200%
7 - County	0	0.000%	0	0.000%	1,224,615,987	68.639%
8 - CCCERA (the employer)	0	0.000%	0	0.000%	6,475,713	0.363%
9 - ECCFPD	0	0.000%	0	0.000%	23,362,447	1.309%
10 - Housing Authority	0	0.000%	0	0.000%	10,162,604	0.570%
11 - IHSS	0	0.000%	0	0.000%	1,294,522	0.073%
12 - LAFCO	0	0.000%	0	0.000%	359,329	0.020%
13 - MOFD	0	0.000%	0	0.000%	33,030,792	1.851%
14 - Rodeo SD	0	0.000%	0	0.000%	203,750	0.011%
15 - RHFD	0	0.000%	14,582,000	100.000%	14,693,106	0.824%
16 - SRVFPD	66,947,600	100.000%	0	0.000%	72,491,195	4.063%
17 - Court	0	0.000%	0	0.000%	40,142,135	2.250%
18 - DDSD (Term) [1]	0	0.000%	0	0.000%	1,918,215	0.108%
19 - DWD (Term) [1]	0	0.000%	0	0.000%	823,144	0.046%
20 - Pittsburg (Term) [1]	0	0.000%	0	0.000%	6,888,327	0.386%
Total	$66,947,600	100.000%	$14,582,000	100.000%	$1,784,139,620	100.000%

[1] *The NPLs for the three terminated employers are determined based on the Plan's Fiduciary Net Positions from the December 31, 2016 bookkeeping account letters and the TPLs obtained from internal valuation results (by rolling forward their TPLs from December 31, 2015).*

Note: Results may not add due to rounding.

EXHIBIT 7 (continued)

Determination of Proportionate Share

PART TWO - Allocation of December 31, 2016 Net Pension Liability (NPL)
Including Pension Obligation Bonds (POB) and UAAL Prepayments for Certain Employers

Employer	Cost Group #1 & 2	Cost Group #1 & 2 Percentage	Cost Group #3	Cost Group #3 Percentage	Cost Group #4	Cost Group #4 Percentage
1 - BIMID	$137,084	0.021%	$0	0.000%	$0	0.000%
2 - Union Cemetery	0	0.000%	0	0.000%	0	0.000%
3 - CC Mosquito	5,140,418	0.789%	0	0.000%	0	0.000%
4 - CCCFPD	0	0.000%	0	0.000%	0	0.000%
5 - CCCSD	0	0.000%	87,847,116	100.000%	0	0.000%
6 - First 5	2,423,899	0.372%	0	0.000%	0	0.000%
7 - County	596,820,257	91.592%	0	0.000%	0	0.000%
8 - CCCERA (the employer)	6,475,713	0.994%	0	0.000%	0	0.000%
9 - ECCFPD	95,687	0.015%	0	0.000%	0	0.000%
10 - Housing Authority	0	0.000%	0	0.000%	10,162,604	100.000%
11 - IHSS	1,294,522	0.199%	0	0.000%	0	0.000%
12 - LAFCO	359,329	0.055%	0	0.000%	0	0.000%
13 - MOFD	488,012	0.075%	0	0.000%	0	0.000%
14 - Rodeo SD	0	0.000%	0	0.000%	0	0.000%
15 - RHFD	111,106	0.017%	0	0.000%	0	0.000%
16 - SRVFPD	5,543,595	0.851%	0	0.000%	0	0.000%
17 - Court	27,158,829	4.168%	0	0.000%	0	0.000%
18 - DDSD (Term) [1]	1,918,215	0.294%	0	0.000%	0	0.000%
19 - DWD (Term) [1]	823,144	0.126%	0	0.000%	0	0.000%
20 - Pittsburg (Term) [1]	2,818,558	0.433%	0	0.000%	0	0.000%
Total	$651,608,368	100.000%	$87,847,116	100.000%	$10,162,604	100.000%

[1] *The NPLs for the three terminated employers are determined based on the Plan's Fiduciary Net Positions from the December 31, 2016 bookkeeping account letters and the TPLs obtained from internal valuation results (by rolling forward their TPLs from December 31, 2015).*

Note: Results may not add due to rounding.

EXHIBIT 7 (continued)

Determination of Proportionate Share

PART TWO - Allocation of December 31, 2016 Net Pension Liability (NPL)
Including Pension Obligation Bonds (POB) and UAAL Prepayments for Certain Employers

Employer	Cost Group #5	Cost Group #5 Percentage	Cost Group #6	Cost Group #6 Percentage
1 - BIMID	$0	0.000%	$0	0.000%
2 - Union Cemetery	0	0.000%	75,800	27.115%
3 - CC Mosquito	0	0.000%	0	0.000%
4 - CCCFPD	6,505,067	100.000%	0	0.000%
5 - CCCSD	0	0.000%	0	0.000%
6 - First 5	0	0.000%	0	0.000%
7 - County	0	0.000%	0	0.000%
8 - CCCERA (the employer)	0	0.000%	0	0.000%
9 - ECCFPD	0	0.000%	0	0.000%
10 - Housing Authority	0	0.000%	0	0.000%
11 - IHSS	0	0.000%	0	0.000%
12 - LAFCO	0	0.000%	0	0.000%
13 - MOFD	0	0.000%	0	0.000%
14 - Rodeo SD	0	0.000%	203,750	72.885%
15 - RHFD	0	0.000%	0	0.000%
16 - SRVFPD	0	0.000%	0	0.000%
17 - Court	0	0.000%	0	0.000%
18 - DDSD (Term)	0	0.000%	0	0.000%
19 - DWD (Term)	0	0.000%	0	0.000%
20 - Pittsburg (Term)	0	0.000%	0	0.000%
Total	$6,505,067	100.000%	$279,550	100.000%

Note: Results may not add due to rounding.

EXHIBIT 7 (continued)

Determination of Proportionate Share

PART TWO - Allocation of December 31, 2016 Net Pension Liability (NPL)
Including Pension Obligation Bonds (POB) and UAAL Prepayments for Certain Employers

Employer	Cost Group #7 & 9	Cost Group #7 & 9 Percentage	Cost Group #8	Cost Group #8 Percentage	Cost Group #10	Cost Group #10 Percentage
1 - BIMID	$0	0.000%	$0	0.000%	$0	0.000%
2 - Union Cemetery	0	0.000%	0	0.000%	0	0.000%
3 - CC Mosquito	0	0.000%	0	0.000%	0	0.000%
4 - CCCFPD	0	0.000%	160,618,981	87.347%	0	0.000%
5 - CCCSD	0	0.000%	0	0.000%	0	0.000%
6 - First 5	0	0.000%	0	0.000%	0	0.000%
7 - County	342,485,207	98.826%	0	0.000%	0	0.000%
8 - CCCERA (the employer)	0	0.000%	0	0.000%	0	0.000%
9 - ECCFPD	0	0.000%	23,266,760	12.653%	0	0.000%
10 - Housing Authority	0	0.000%	0	0.000%	0	0.000%
11 - IHSS	0	0.000%	0	0.000%	0	0.000%
12 - LAFCO	0	0.000%	0	0.000%	0	0.000%
13 - MOFD	0	0.000%	0	0.000%	32,081,901	100.000%
14 - Rodeo SD	0	0.000%	0	0.000%	0	0.000%
15 - RHFD	0	0.000%	0	0.000%	0	0.000%
16 - SRVFPD	0	0.000%	0	0.000%	0	0.000%
17 - Court	0	0.000%	0	0.000%	0	0.000%
18 - DDSD (Term) [1]	0	0.000%	0	0.000%	0	0.000%
19 - DWD (Term) [1]	0	0.000%	0	0.000%	0	0.000%
20 - Pittsburg (Term) [1]	4,069,769	1.174%	0	0.000%	0	0.000%
Total	$346,554,976	100.000%	$183,885,741	100.000%	$32,081,901	100.000%

[1] *The NPLs for the three terminated employers are determined based on the Plan's Fiduciary Net Positions from the December 31, 2016 bookkeeping account letters and the TPLs obtained from internal valuation results (by rolling forward their TPLs from December 31, 2015).*

Note: Results may not add due to rounding.

EXHIBIT 7 (continued)

Determination of Proportionate Share

PART TWO - Allocation of December 31, 2016 Net Pension Liability (NPL)
Including Pension Obligation Bonds (POB) and UAAL Prepayments for Certain Employers

Employer	Cost Group #11	Cost Group #11 Percentage	Cost Group #12	Cost Group #12 Percentage	Total NPL	Total Percentage	Total Percentage Excluding Terminated Employers[1]
1 - BIMID	$0	0.000%	$0	0.000%	$137,084	0.010%	0.010%
2 - Union Cemetery	0	0.000%	0	0.000%	75,800	0.005%	0.005%
3 - CC Mosquito	0	0.000%	0	0.000%	5,140,418	0.367%	0.370%
4 - CCCFPD	0	0.000%	0	0.000%	167,124,048	11.934%	12.016%
5 - CCCSD	0	0.000%	0	0.000%	87,847,116	6.273%	6.316%
6 - First 5	0	0.000%	0	0.000%	2,423,899	0.173%	0.174%
7 - County	0	0.000%	0	0.000%	939,305,464	67.071%	67.536%
8 - CCCERA (the employer)	0	0.000%	0	0.000%	6,475,713	0.462%	0.466%
9 - ECCFPD	0	0.000%	0	0.000%	23,362,447	1.668%	1.680%
10 - Housing Authority	0	0.000%	0	0.000%	10,162,604	0.726%	0.731%
11 - IHSS	0	0.000%	0	0.000%	1,294,522	0.092%	0.093%
12 - LAFCO	0	0.000%	0	0.000%	359,329	0.026%	0.026%
13 - MOFD	0	0.000%	0	0.000%	32,569,913	2.326%	2.342%
14 - Rodeo SD	0	0.000%	0	0.000%	203,750	0.015%	0.015%
15 - RHFD	0	0.000%	14,582,000	100.000%	14,693,106	1.049%	1.056%
16 - SRVFPD	66,947,600	100.000%	0	0.000%	72,491,195	5.176%	5.212%
17 - Court	0	0.000%	0	0.000%	27,158,829	1.939%	1.953%
18 - DDSD (Term)[2]	0	0.000%	0	0.000%	1,918,215	0.137%	N/A
19 - DWD (Term)[2]	0	0.000%	0	0.000%	823,144	0.059%	N/A
20 - Pittsburg (Term)[2]	0	0.000%	0	0.000%	6,888,327	0.492%	N/A
Total	$66,947,600	100.000%	$14,582,000	100.000%	$1,400,454,923	100.000%	100.000%

[1] *For informational purposes; these percentages show the allocation of the NPL for employers excluding terminated employers.*

[2] *The NPLs for the three terminated employers are determined based on the Plan Fiduciary Net Positions from the December 31, 2016 bookkeeping account letter and the TPLs obtained from internal valuation results (by rolling forward their TPLs from December 31, 2015).*

Note: Results may not add due to rounding.

EXHIBIT 7 (continued)

Determination of Proportionate Share

Notes Regarding Determination of Proportionate Share as of December 31, 2016 Measurement Date:

1. Based on actual January 1, 2016 through December 31, 2016 compensation information that was provided by CCCERA.
2. The Net Pension Liability (NPL) for each Cost Group is the Total Pension Liability (TPL) minus the Plan's Fiduciary Net Position (plan assets). The TPL for each Cost Group is obtained from internal valuation results based on the actual participants in each Cost Group. The Plan's Fiduciary Net Position for each Cost Group was determined by adjusting the Valuation Value of Assets (VVA) for each Cost Group (which is used to determine employer contribution rates) by the ratio of the total CCCERA Plan's Fiduciary Net Position to total CCCERA VVA. Based on this methodology, any non-valuation reserves (such as the Post Retirement Death Benefit) are allocated amongst the cost groups based on each cost group's valuation value of assets.
3. For terminated employers, the TPL is obtained from internal valuation results for each employer. The Plan's Fiduciary Net Position for each terminated employer has been set equal to the amount in their respective bookkeeping account. The NPL is then determined separately for each terminated employer.
4. For Cost Groups that have one employer, all of the NPL for that Cost Group is allocated to the corresponding employer. The NPL has already been reduced by any proceeds from Pension Obligation Bonds and any UAAL prepayments.
5. For Cost Groups that have multiple employers, the NPL is allocated based on the actual compensation within the Cost Group.
    a. Calculate ratio of employer's compensation to the total compensation for the Cost Group.
    b. Multiply this ratio by an "adjusted" NPL. This adjusted NPL is larger than the actual NPL as it excludes proceeds from Pension Obligation Bonds and any Unfunded Actuarial Accrued Liability (UAAL) prepayments from the Cost Group's assets when determining the employer's proportionate share of the NPL for the Cost Group. It also excludes the NPLs for the three terminated employers. The allocation of the adjusted NPL is shown above in PART ONE of Exhibit 7.
    c. The amounts of the proceeds from Pension Obligation Bonds and UAAL prepayments as of December 31, 2016 allocated to those employers within each Cost Group are as follows:

Cost Group #1:	County	$285,310,523
Cost Group #1:	Court	$12,983,306
Cost Group #1:	MOFD	$460,879
Cost Group #1:	First 5	$1,146,738
Cost Group #8:	CCCFPD	$83,783,251

    Note that the proceeds from Pension Obligation Bonds for Contra Costa County and the Superior Court as of December 31, 2016 (total of $298,293,829) were allocated proportionally based on the compensation information.

    d. Subtract from the adjusted NPL in PART ONE the outstanding balance of the proceeds from any Pension Obligation Bonds and any UAAL prepayments for those employers in each Cost Group that are subject to these adjustments. The resulting actual NPL is shown in PART TWO of Exhibit 7.

EXHIBIT 7 (continued)

Determination of Proportionate Share

Notes Regarding Determination of Proportionate Share as of December 31, 2016 Measurement Date:

6. If the employer is in several Cost Groups, the employer's total allocated NPL is the sum of its allocated NPL from each Cost Group.
7. Cost Group #1 and Cost Group #2 were combined and Cost Group #7 and Cost Group #9 were combined consistent with the determination of the UAAL rate in the annual funding actuarial valuation.

The following items are allocated based on the corresponding employer allocation percentage or proportionate share shown above after excluding terminated employers.

- 1) Net Pension Liability
- 2) Service Cost
- 3) Interest on the Total Pension Liability
- 4) Expensed portion of current-period benefit changes
- 5) Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability
- 6) Expensed portion of current-period changes of assumptions or other inputs
- 7) Member contributions
- 8) Projected earnings on plan investments
- 9) Expensed portion of current-period differences between actual and projected earnings on plan investments
- 10) Administrative expense
- 11) Other expenses
- 12) Recognition of beginning of year deferred outflows of resources as pension expense
- 13) Recognition of beginning of year deferred inflows of resources as pension expense

EXHIBIT 8

Pension Expense: Total for all Employers

Reporting Date for Employer under GAS 68	**June 30, 2018**	**June 30, 2017**
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Components of Pension Expense		
1. Service Cost	$212,257,626	$202,697,041
2. Interest on the Total Pension Liability	616,272,848	591,971,317
3. Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	0	0
4. Expensed portion of current-period benefit changes	0	0
5. Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	(6,373,848)	(4,367,173)
6. Expensed portion of current-period changes of assumptions or other inputs	0	0
7. Member contributions[1]	(96,466,906)	(88,787,806)
8. Projected earnings on plan investments	(519,447,895)	(487,231,904)
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	(93,593,617)	(1,328,468)
10. Administrative expense	9,146,115	8,486,463
11. Other expenses	1,216,768	702,501
12. Recognition of beginning of year deferred outflows of resources as pension expense	101,362,730	101,362,730
13. Recognition of beginning of year deferred inflows of resources as pension expense	(62,040,753)	(56,345,112)
14. Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	0	0
Pension Expense	$162,333,068	$267,159,589

[1] *Includes "employer subvention of member contributions" and excludes "member subvention of employer contributions".*

EXHIBIT 8 (continued)

Pension Expense: 1 - BIMID

Reporting Date for Employer under GAS 68	June 30, 2018	June 30, 2017
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Components of Pension Expense		
1. Service Cost	$41,515	$19,978
2. Interest on the Total Pension Liability	119,675	58,347
3. Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	26,337	7,677
4. Expensed portion of current-period benefit changes	0	0
5. Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	(1,273)	(430)
6. Expensed portion of current-period changes of assumptions or other inputs	0	0
7. Member contributions[1]	(18,868)	(8,751)
8. Projected earnings on plan investments	(100,872)	(48,023)
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	(18,173)	(131)
10. Administrative expense	1,789	836
11. Other expenses	238	(880)
12. Recognition of beginning of year deferred outflows of resources as pension expense	19,825	9,991
13. Recognition of beginning of year deferred inflows of resources as pension expense	(12,134)	(5,554)
14. Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	2,524	(5,153)
Pension Expense	$60,583	$27,907

[1] *Includes "employer subvention of member contributions" and excludes "member subvention of employer contributions".*

EXHIBIT 8 (continued)

Pension Expense: 2 - Union Cemetery

Reporting Date for Employer under GAS 68	June 30, 2018	June 30, 2017
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Components of Pension Expense		
1. Service Cost	$7,752	$11,047
2. Interest on the Total Pension Liability	22,344	32,262
3. Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	1,974	(2,261)
4. Expensed portion of current-period benefit changes	0	0
5. Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	(238)	(238)
6. Expensed portion of current-period changes of assumptions or other inputs	0	0
7. Member contributions[1]	(3,523)	(4,839)
8. Projected earnings on plan investments	(18,833)	(26,554)
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	(3,393)	(72)
10. Administrative expense	334	463
11. Other expenses	44	(487)
12. Recognition of beginning of year deferred outflows of resources as pension expense	3,701	5,524
13. Recognition of beginning of year deferred inflows of resources as pension expense	(2,266)	(3,071)
14. Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	30,379	32,640
Pension Expense	$38,275	$44,414

[1] *Includes "employer subvention of member contributions" and excludes "member subvention of employer contributions".*

EXHIBIT 8 (continued)

Pension Expense: 3 - CC Mosquito

Reporting Date for Employer under GAS 68	June 30, 2018	June 30, 2017
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Components of Pension Expense		
1. Service Cost	$795,771	$749,158
2. Interest on the Total Pension Liability	2,293,954	2,187,895
3. Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	28,662	12,992
4. Expensed portion of current-period benefit changes	0	0
5. Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	(24,401)	(16,141)
6. Expensed portion of current-period changes of assumptions or other inputs	0	0
7. Member contributions[1]	(361,657)	(328,155)
8. Projected earnings on plan investments	(1,933,538)	(1,800,784)
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	(348,352)	(4,910)
10. Administrative expense	34,289	31,366
11. Other expenses	4,562	(32,994)
12. Recognition of beginning of year deferred outflows of resources as pension expense	380,016	374,631
13. Recognition of beginning of year deferred inflows of resources as pension expense	(232,595)	(208,249)
14. Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	(94,336)	(107,328)
Pension Expense	$542,375	$857,481

[1] *Includes "employer subvention of member contributions" and excludes "member subvention of employer contributions".*

EXHIBIT 8 (continued)

Pension Expense: 4 - CCCFPD

Reporting Date for Employer under GAS 68	June 30, 2018	June 30, 2017
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Components of Pension Expense		
1. Service Cost	$29,061,841	$24,356,439
2. Interest on the Total Pension Liability	83,776,234	71,132,332
3. Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	576,584	(1,464,214)
4. Expensed portion of current-period benefit changes	0	0
5. Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	(891,122)	(524,767)
6. Expensed portion of current-period changes of assumptions or other inputs	0	0
7. Member contributions[1]	(13,207,881)	(10,668,902)
8. Projected earnings on plan investments	(70,613,667)	(58,546,657)
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	(12,721,974)	(159,631)
10. Administrative expense	1,252,266	1,019,749
11. Other expenses	166,597	(1,072,707)
12. Recognition of beginning of year deferred outflows of resources as pension expense	13,878,359	12,179,927
13. Recognition of beginning of year deferred inflows of resources as pension expense	(8,494,481)	(6,770,529)
14. Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	(1,426,820)	37,394
Pension Expense	$21,355,936	$29,518,434

(1) *Includes "employer subvention of member contributions" and excludes "member subvention of employer contributions".*

EXHIBIT 8 (continued)

Pension Expense: 5 - CCCSD

Reporting Date for Employer under GAS 68	**June 30, 2018**	**June 30, 2017**
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Components of Pension Expense		
1. Service Cost	$16,824,515	$12,802,725
2. Interest on the Total Pension Liability	48,499,837	37,390,012
3. Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	2,760,509	327,813
4. Expensed portion of current-period benefit changes	0	0
5. Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	(515,890)	(275,839)
6. Expensed portion of current-period changes of assumptions or other inputs	0	0
7. Member contributions[1]	(7,646,322)	(5,608,003)
8. Projected earnings on plan investments	(40,879,748)	(30,774,476)
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	(7,365,020)	(83,909)
10. Administrative expense	724,963	536,021
11. Other expenses	96,447	(563,858)
12. Recognition of beginning of year deferred outflows of resources as pension expense	8,034,476	6,402,259
13. Recognition of beginning of year deferred inflows of resources as pension expense	(4,917,635)	(3,558,862)
14. Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	(2,648,365)	(2,976,178)
Pension Expense	$12,967,767	$13,617,705

[1] *Includes "employer subvention of member contributions" and excludes "member subvention of employer contributions".*

EXHIBIT 8 (continued)

Pension Expense: 6 - First 5

Reporting Date for Employer under GAS 68	June 30, 2018	June 30, 2017
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Components of Pension Expense		
1. Service Cost	$339,909	$353,256
2. Interest on the Total Pension Liability	979,850	1,031,674
3. Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	(4,242)	42,469
4. Expensed portion of current-period benefit changes	0	0
5. Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	(10,423)	(7,611)
6. Expensed portion of current-period changes of assumptions or other inputs	0	0
7. Member contributions[1]	(154,480)	(154,737)
8. Projected earnings on plan investments	(825,900)	(849,137)
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	(148,797)	(2,315)
10. Administrative expense	14,647	14,790
11. Other expenses	1,949	(15,558)
12. Recognition of beginning of year deferred outflows of resources as pension expense	162,322	176,653
13. Recognition of beginning of year deferred inflows of resources as pension expense	(99,352)	(98,197)
14. Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	151,860	109,391
Pension Expense	$407,343	$600,678

[1] *Includes "employer subvention of member contributions" and excludes "member subvention of employer contributions".*

EXHIBIT 8 (continued)

Pension Expense: 7 - County

Reporting Date for Employer under GAS 68	June 30, 2018	June 30, 2017
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Components of Pension Expense		
1. Service Cost	$132,779,588	$136,893,146
2. Interest on the Total Pension Liability	382,762,203	399,792,785
3. Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	(6,433,519)	2,219,235
4. Expensed portion of current-period benefit changes	0	0
5. Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	(4,071,415)	(2,949,408)
6. Expensed portion of current-period changes of assumptions or other inputs	0	0
7. Member contributions[1]	(60,345,008)	(59,963,588)
8. Projected earnings on plan investments	(322,624,227)	(329,056,144)
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	(58,124,964)	(897,193)
10. Administrative expense	5,721,430	5,731,402
11. Other expenses	761,159	(6,029,048)
12. Recognition of beginning of year deferred outflows of resources as pension expense	63,408,332	68,456,169
13. Recognition of beginning of year deferred inflows of resources as pension expense	(38,810,128)	(38,053,145)
14. Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	11,141,807	8,922,572
Pension Expense	$106,165,258	$185,066,783

[1] *Includes "employer subvention of member contributions" and excludes "member subvention of employer contributions".*

EXHIBIT 8 (continued)

Pension Expense: 8 - CCCERA (the employer)

Reporting Date for Employer under GAS 68	June 30, 2018	June 30, 2017
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Components of Pension Expense		
1. Service Cost	$1,130,431	$943,761
2. Interest on the Total Pension Liability	3,258,680	2,756,232
3. Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	196,325	9,625
4. Expensed portion of current-period benefit changes	0	0
5. Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	(34,662)	(20,334)
6. Expensed portion of current-period changes of assumptions or other inputs	0	0
7. Member contributions[1]	(513,753)	(413,398)
8. Projected earnings on plan investments	(2,746,690)	(2,268,562)
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	(494,852)	(6,185)
10. Administrative expense	48,710	39,513
11. Other expenses	6,480	(41,565)
12. Recognition of beginning of year deferred outflows of resources as pension expense	539,833	471,947
13. Recognition of beginning of year deferred inflows of resources as pension expense	(330,414)	(262,344)
14. Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	(7,613)	(17,238)
Pension Expense	$1,052,475	$1,191,452

[1] *Includes "employer subvention of member contributions" and excludes "member subvention of employer contributions".*

EXHIBIT 8 (continued)

Pension Expense: 9 - ECCFPD

Reporting Date for Employer under GAS 68	June 30, 2018	June 30, 2017
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Components of Pension Expense		
1. Service Cost	$4,311,275	$3,404,812
2. Interest on the Total Pension Liability	12,428,064	9,943,664
3. Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	348,019	118,603
4. Expensed portion of current-period benefit changes	0	0
5. Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	(132,197)	(73,358)
6. Expensed portion of current-period changes of assumptions or other inputs	0	0
7. Member contributions[1]	(1,959,367)	(1,491,417)
8. Projected earnings on plan investments	(10,475,419)	(8,184,299)
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	(1,887,283)	(22,315)
10. Administrative expense	185,772	142,552
11. Other expenses	24,714	(149,955)
12. Recognition of beginning of year deferred outflows of resources as pension expense	2,058,831	1,702,645
13. Recognition of beginning of year deferred inflows of resources as pension expense	(1,260,142)	(946,459)
14. Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	(2,332,198)	(2,450,801)
Pension Expense	$1,310,069	$1,993,672

[1] *Includes "employer subvention of member contributions" and excludes "member subvention of employer contributions".*

EXHIBIT 8 (continued)

Pension Expense: 10 - Housing Authority

Reporting Date for Employer under GAS 68	**June 30, 2018**	**June 30, 2017**
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Components of Pension Expense		
1. Service Cost	$1,652,657	$1,481,084
2. Interest on the Total Pension Liability	4,764,094	4,325,468
3. Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	63,691	25,837
4. Expensed portion of current-period benefit changes	0	0
5. Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	(50,675)	(31,910)
6. Expensed portion of current-period changes of assumptions or other inputs	0	0
7. Member contributions[1]	(751,091)	(648,763)
8. Projected earnings on plan investments	(4,015,580)	(3,560,149)
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	(723,459)	(9,707)
10. Administrative expense	71,212	62,010
11. Other expenses	9,474	(65,230)
12. Recognition of beginning of year deferred outflows of resources as pension expense	789,219	740,646
13. Recognition of beginning of year deferred inflows of resources as pension expense	(483,055)	(411,707)
14. Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	(2,030)	(27,867)
Pension Expense	$1,324,457	$1,879,712

[1] *Includes "employer subvention of member contributions" and excludes "member subvention of employer contributions".*

EXHIBIT 8 (continued)

Pension Expense: 11 - IHSS

Reporting Date for Employer under GAS 68	June 30, 2018	June 30, 2017
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Components of Pension Expense		
1. Service Cost	$209,489	$188,661
2. Interest on the Total Pension Liability	603,890	550,982
3. Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	16,574	24,416
4. Expensed portion of current-period benefit changes	0	0
5. Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	(6,424)	(4,065)
6. Expensed portion of current-period changes of assumptions or other inputs	0	0
7. Member contributions[1]	(95,207)	(82,640)
8. Projected earnings on plan investments	(509,009)	(453,495)
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	(91,705)	(1,236)
10. Administrative expense	9,027	7,899
11. Other expenses	1,201	(8,309)
12. Recognition of beginning of year deferred outflows of resources as pension expense	100,040	94,344
13. Recognition of beginning of year deferred inflows of resources as pension expense	(61,231)	(52,444)
14. Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	22,019	(2,397)
Pension Expense	$198,664	$261,716

[1] *Includes "employer subvention of member contributions" and excludes "member subvention of employer contributions".*

EXHIBIT 8 (continued)

Pension Expense: 12 - LAFCO

Reporting Date for Employer under GAS 68	June 30, 2018	June 30, 2017
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Components of Pension Expense		
1. Service Cost	$47,797	$52,367
2. Interest on the Total Pension Liability	137,784	152,940
3. Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	1,698	390
4. Expensed portion of current-period benefit changes	0	0
5. Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	(1,466)	(1,128)
6. Expensed portion of current-period changes of assumptions or other inputs	0	0
7. Member contributions[1]	(21,723)	(22,939)
8. Projected earnings on plan investments	(116,136)	(125,880)
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	(20,923)	(343)
10. Administrative expense	2,060	2,193
11. Other expenses	274	(2,306)
12. Recognition of beginning of year deferred outflows of resources as pension expense	22,825	26,188
13. Recognition of beginning of year deferred inflows of resources as pension expense	(13,971)	(14,557)
14. Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	(5,715)	(6,105)
Pension Expense	$32,504	$60,820

[1] *Includes "employer subvention of member contributions" and excludes "member subvention of employer contributions".*

EXHIBIT 8 (continued)

Pension Expense: 13 - MOFD

Reporting Date for Employer under GAS 68	June 30, 2018	June 30, 2017
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Components of Pension Expense		
1. Service Cost	$6,196,159	$4,746,696
2. Interest on the Total Pension Liability	17,861,597	13,862,600
3. Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	679,531	(1,240,642)
4. Expensed portion of current-period benefit changes	0	0
5. Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	(189,993)	(102,269)
6. Expensed portion of current-period changes of assumptions or other inputs	0	0
7. Member contributions[1]	(2,816,000)	(2,079,205)
8. Projected earnings on plan investments	(15,055,259)	(11,409,845)
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	(2,712,401)	(31,110)
10. Administrative expense	266,991	198,733
11. Other expenses	35,520	(209,054)
12. Recognition of beginning of year deferred outflows of resources as pension expense	2,958,950	2,373,681
13. Recognition of beginning of year deferred inflows of resources as pension expense	(1,811,075)	(1,319,472)
14. Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	(2,135,837)	(895,195)
Pension Expense	$3,278,183	$3,894,918

[1] *Includes "employer subvention of member contributions" and excludes "member subvention of employer contributions".*

EXHIBIT 8 (continued)

Pension Expense: 14 - Rodeo SD

Reporting Date for Employer under GAS 68	**June 30, 2018**	**June 30, 2017**
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Components of Pension Expense		
1. Service Cost	$29,524	$29,694
2. Interest on the Total Pension Liability	85,106	86,721
3. Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	24,166	(5,449)
4. Expensed portion of current-period benefit changes	0	0
5. Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	(905)	(640)
6. Expensed portion of current-period changes of assumptions or other inputs	0	0
7. Member contributions[1]	(13,418)	(13,007)
8. Projected earnings on plan investments	(71,735)	(71,377)
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	(12,924)	(195)
10. Administrative expense	1,272	1,243
11. Other expenses	169	(1,308)
12. Recognition of beginning of year deferred outflows of resources as pension expense	14,099	14,849
13. Recognition of beginning of year deferred inflows of resources as pension expense	(8,629)	(8,254)
14. Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	82,643	88,092
Pension Expense	$129,368	$120,369

[1] *Includes "employer subvention of member contributions" and excludes "member subvention of employer contributions".*

EXHIBIT 8 (continued)

Pension Expense: 15 – RHFD

Reporting Date for Employer under GAS 68	June 30, 2018	June 30, 2017
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Components of Pension Expense		
1. Service Cost	$3,083,283	$2,141,354
2. Interest on the Total Pension Liability	8,888,146	6,253,767
3. Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	520,596	(138,010)
4. Expensed portion of current-period benefit changes	0	0
5. Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	(94,543)	(46,136)
6. Expensed portion of current-period changes of assumptions or other inputs	0	0
7. Member contributions[(1)]	(1,401,275)	(937,982)
8. Projected earnings on plan investments	(7,491,678)	(5,147,268)
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	(1,349,724)	(14,034)
10. Administrative expense	132,858	89,654
11. Other expenses	17,675	(94,310)
12. Recognition of beginning of year deferred outflows of resources as pension expense	1,472,409	1,070,827
13. Recognition of beginning of year deferred inflows of resources as pension expense	(901,213)	(595,247)
14. Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	(1,239,294)	(1,101,284)
Pension Expense	$1,637,240	$1,481,331

(1) *Includes "employer subvention of member contributions" and excludes "member subvention of employer contributions".*

EXHIBIT 8 (continued)

Pension Expense: 16 - SRVFPD

Reporting Date for Employer under GAS 68	June 30, 2018	June 30, 2017
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Components of Pension Expense		
1. Service Cost	$12,422,099	$10,564,772
2. Interest on the Total Pension Liability	35,809,046	30,854,134
3. Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	1,727,187	(85,757)
4. Expensed portion of current-period benefit changes	0	0
5. Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	(380,898)	(227,621)
6. Expensed portion of current-period changes of assumptions or other inputs	0	0
7. Member contributions(1)	(5,645,534)	(4,627,709)
8. Projected earnings on plan investments	(30,182,880)	(25,395,012)
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	(5,437,840)	(69,241)
10. Administrative expense	535,264	442,323
11. Other expenses	71,210	(465,294)
12. Recognition of beginning of year deferred outflows of resources as pension expense	5,932,121	5,283,126
13. Recognition of beginning of year deferred inflows of resources as pension expense	(3,630,854)	(2,936,763)
14. Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	(2,740,034)	(2,654,277)
Pension Expense	$8,478,887	$10,682,681

(1) *Includes "employer subvention of member contributions" and excludes "member subvention of employer contributions".*

EXHIBIT 8 (continued)

Pension Expense: 17 - Court

Reporting Date for Employer under GAS 68	June 30, 2018	June 30, 2017
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Components of Pension Expense		
1. Service Cost	$3,324,021	$3,958,091
2. Interest on the Total Pension Liability	9,582,119	11,559,502
3. Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	(534,092)	147,276
4. Expensed portion of current-period benefit changes	0	0
5. Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	(101,924)	(85,278)
6. Expensed portion of current-period changes of assumptions or other inputs	0	0
7. Member contributions[1]	(1,510,685)	(1,733,771)
8. Projected earnings on plan investments	(8,076,617)	(9,514,242)
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	(1,455,108)	(25,941)
10. Administrative expense	143,231	165,716
11. Other expenses	19,055	(174,322)
12. Recognition of beginning of year deferred outflows of resources as pension expense	1,587,372	1,979,323
13. Recognition of beginning of year deferred inflows of resources as pension expense	(971,578)	(1,100,258)
14. Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	1,201,010	1,053,734
Pension Expense	$3,206,804	$6,229,830

[1] *Includes "employer subvention of member contributions" and excludes "member subvention of employer contributions".*

EXHIBIT 8 (continued)

Pension Expense: 18 - DDSD (Term)

Reporting Date for Employer under GAS 68	**June 30, 2018**	**June 30, 2017**
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Components of Pension Expense		
1. Service Cost	$0	$0
2. Interest on the Total Pension Liability	949,272	0
3. Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	0	0
4. Expensed portion of current-period benefit changes	0	0
5. Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	66,799	0
6. Expensed portion of current-period changes of assumptions or other inputs	0	0
7. Member contributions(1)	0	0
8. Projected earnings on plan investments	(793,581)	0
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	(144,620)	0
10. Administrative expense	0	0
11. Other expenses	0	1,918,215(2)
12. Recognition of beginning of year deferred outflows of resources as pension expense	0	0
13. Recognition of beginning of year deferred inflows of resources as pension expense	0	0
14. Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	0	0
Pension Expense	$77,870	$1,918,215

(1) *Includes "employer subvention of member contributions" and excludes "member subvention of employer contributions".*

(2) *Equals the NPL allocated to this employer on December 31, 2016.*

EXHIBIT 8 (continued)

Pension Expense: 19 - DWD (Term)

Reporting Date for Employer under GAS 68	June 30, 2018	June 30, 2017
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Components of Pension Expense		
1. Service Cost	$0	$0
2. Interest on the Total Pension Liability	197,688	0
3. Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	0	0
4. Expensed portion of current-period benefit changes	0	0
5. Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	32,871	0
6. Expensed portion of current-period changes of assumptions or other inputs	0	0
7. Member contributions(1)	0	0
8. Projected earnings on plan investments	(129,530)	0
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	(23,933)	0
10. Administrative expense	0	0
11. Other expenses	0	823,144(2)
12. Recognition of beginning of year deferred outflows of resources as pension expense	0	0
13. Recognition of beginning of year deferred inflows of resources as pension expense	0	0
14. Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	0	0
Pension Expense	$77,096	$823,144

(1) *Includes "employer subvention of member contributions" and excludes "member subvention of employer contributions".*

(2) *Equals the NPL allocated to this employer on December 31, 2016.*

EXHIBIT 8 (continued)

Pension Expense: 20 - Pittsburg (Term)

Reporting Date for Employer under GAS 68	June 30, 2018	June 30, 2017
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Components of Pension Expense		
1. Service Cost	$0	$0
2. Interest on the Total Pension Liability	3,253,265	0
3. Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	0	0
4. Expensed portion of current-period benefit changes	0	0
5. Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	34,931	0
6. Expensed portion of current-period changes of assumptions or other inputs	0	0
7. Member contributions[1]	(1,114)	0
8. Projected earnings on plan investments	(2,786,996)	0
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	(508,172)	0
10. Administrative expense	0	0
11. Other expenses	0	6,888,327[2]
12. Recognition of beginning of year deferred outflows of resources as pension expense	0	0
13. Recognition of beginning of year deferred inflows of resources as pension expense	0	0
14. Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	0	0
Pension Expense	$(8,086)	$6,888,327

[1] *Includes "employer subvention of member contributions" and excludes "member subvention of employer contributions".*

[2] *Equals the NPL allocated to this employer on December 31, 2016.*

EXHIBIT 9

Deferred Outflows of Resources and Deferred Inflows of Resources: Total for all Employers

Reporting Date for Employer under GAS 68	**June 30, 2018**	**June 30, 2017**
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Deferred Outflows of Resources		
1. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$47,965,240	$39,064,503
2. Changes of assumptions or other inputs	24,275,041	40,245,463
3. Net excess of projected over actual earnings on pension plan investments (if any)	0	245,519,675
4. Difference between expected and actual experience in the Total Pension Liability	481,873	0
5. Total Deferred Outflows of Resources	$72,722,154	$324,829,641
Deferred Inflows of Resources		
6. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$47,965,240	$39,064,503
7. Changes of assumptions or other inputs	9,860	26,297
8. Net excess of actual over projected earnings on pension plan investments (if any)	210,246,943	0
9. Difference between expected and actual experience in the Total Pension Liability	79,361,548	114,085,459
10. Total Deferred Inflows of Resources	$337,583,591	$153,176,259

Deferred outflows of resources and deferred inflows of resources related to pension will be recognized as follows:

Reporting Date for Employer under GAS 68 Year Ended June 30:		
2018	N/A	$39,321,977
2019	$(44,673,281)	55,294,184
2020	(19,112,488)	80,854,977
2021	(103,785,221)	(3,817,756)
2022	(97,290,447)	0
2023	0	0
Thereafter	0	0

[1] *Calculated in accordance with Paragraphs 54 and 55 of GAS 68.*

EXHIBIT 9 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources: 1 – BIMID

Reporting Date for Employer under GAS 68	June 30, 2018	June 30, 2017
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Deferred Outflows of Resources		
1. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$114,216	$27,937
2. Changes of assumptions or other inputs	4,748	3,967
3. Net excess of projected over actual earnings on pension plan investments (if any)	0	24,199
4. Difference between expected and actual experience in the Total Pension Liability	0	0
5. Total Deferred Outflows of Resources	$118,964	$56,103
Deferred Inflows of Resources		
6. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$8,336	$13,820
7. Changes of assumptions or other inputs	2	3
8. Net excess of actual over projected earnings on pension plan investments (if any)	40,592	0
9. Difference between expected and actual experience in the Total Pension Liability	15,522	11,245
10. Total Deferred Inflows of Resources	$64,452	$25,068

Deferred outflows of resources and deferred inflows of resources related to pension will be recognized as follows:

Reporting Date for Employer under GAS 68 Year Ended June 30:		
2018	N/A	$6,400
2019	$20,098	7,843
2020	27,530	12,794
2021	10,519	3,998
2022	(3,635)	0
2023	0	0
Thereafter	0	0

(1) *Calculated in accordance with Paragraphs 54 and 55 of GAS 68.*

EXHIBIT 9 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources: 2 - Union Cemetery

Reporting Date for Employer under GAS 68	**June 30, 2018**	**June 30, 2017**
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Deferred Outflows of Resources		
1. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$46,391	$71,965
2. Changes of assumptions or other inputs	886	2,193
3. Net excess of projected over actual earnings on pension plan investments (if any)	0	13,381
4. Difference between expected and actual experience in the Total Pension Liability	0	0
5. Total Deferred Outflows of Resources	$47,277	$87,539
Deferred Inflows of Resources		
6. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$5,810	$8,071
7. Changes of assumptions or other inputs	0	1
8. Net excess of actual over projected earnings on pension plan investments (if any)	7,579	0
9. Difference between expected and actual experience in the Total Pension Liability	2,898	6,218
10. Total Deferred Inflows of Resources	$16,287	$14,290

Deferred outflows of resources and deferred inflows of resources related to pension will be recognized as follows:

Reporting Date for Employer under GAS 68 Year Ended June 30:		
2018	N/A	$32,522
2019	$26,268	28,920
2020	10,193	13,304
2021	(3,084)	(1,497)
2022	(2,387)	0
2023	0	0
Thereafter	0	0

[1] *Calculated in accordance with Paragraphs 54 and 55 of GAS 68.*

EXHIBIT 9 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources: 3 - CC Mosquito

Reporting Date for Employer under GAS 68	June 30, 2018	June 30, 2017
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Deferred Outflows of Resources		
1. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$140,600	$58,652
2. Changes of assumptions or other inputs	91,009	148,745
3. Net excess of projected over actual earnings on pension plan investments (if any)	0	907,428
4. Difference between expected and actual experience in the Total Pension Liability	0	0
5. Total Deferred Outflows of Resources	$231,609	$1,114,825
Deferred Inflows of Resources		
6. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$174,797	$289,795
7. Changes of assumptions or other inputs	37	97
8. Net excess of actual over projected earnings on pension plan investments (if any)	778,082	0
9. Difference between expected and actual experience in the Total Pension Liability	297,532	421,654
10. Total Deferred Inflows of Resources	$1,250,448	$711,546

Deferred outflows of resources and deferred inflows of resources related to pension will be recognized as follows:

Reporting Date for Employer under GAS 68 Year Ended June 30:		
2018	N/A	$50,996
2019	$(234,195)	106,958
2020	(87,767)	252,029
2021	(350,998)	(6,704)
2022	(345,879)	0
2023	0	0
Thereafter	0	0

(1) *Calculated in accordance with Paragraphs 54 and 55 of GAS 68.*

EXHIBIT 9 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources: 4 - CCCFPD

Reporting Date for Employer under GAS 68	June 30, 2018	June 30, 2017
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Deferred Outflows of Resources		
1. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$5,669,284	$5,976,900
2. Changes of assumptions or other inputs	3,323,684	4,835,967
3. Net excess of projected over actual earnings on pension plan investments (if any)	0	29,502,083
4. Difference between expected and actual experience in the Total Pension Liability	0	0
5. Total Deferred Outflows of Resources	$8,992,968	$40,314,950
Deferred Inflows of Resources		
6. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$5,163,668	$8,962,274
7. Changes of assumptions or other inputs	1,350	3,160
8. Net excess of actual over projected earnings on pension plan investments (if any)	28,415,919	0
9. Difference between expected and actual experience in the Total Pension Liability	10,866,006	13,708,713
10. Total Deferred Inflows of Resources	$44,446,943	$22,674,147

Deferred outflows of resources and deferred inflows of resources related to pension will be recognized as follows:

Reporting Date for Employer under GAS 68 Year Ended June 30:		
2018	N/A	$3,298,179
2019	$(5,958,820)	6,151,184
2020	(2,196,915)	9,484,793
2021	(14,393,834)	(1,293,353)
2022	(12,904,406)	0
2023	0	0
Thereafter	0	0

[1] *Calculated in accordance with Paragraphs 54 and 55 of GAS 68.*

EXHIBIT 9 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources: 5 - CCCSD

Reporting Date for Employer under GAS 68	June 30, 2018	June 30, 2017
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Deferred Outflows of Resources		
1. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$11,045,200	$2,023,895
2. Changes of assumptions or other inputs	1,924,151	2,541,979
3. Net excess of projected over actual earnings on pension plan investments (if any)	0	15,507,481
4. Difference between expected and actual experience in the Total Pension Liability	0	0
5. Total Deferred Outflows of Resources	$12,969,351	$20,073,355
Deferred Inflows of Resources		
6. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$5,334,713	$8,844,394
7. Changes of assumptions or other inputs	782	1,661
8. Net excess of actual over projected earnings on pension plan investments (if any)	16,450,578	0
9. Difference between expected and actual experience in the Total Pension Liability	6,290,561	7,205,850
10. Total Deferred Inflows of Resources	$28,076,634	$16,051,905

Deferred outflows of resources and deferred inflows of resources related to pension will be recognized as follows:

Reporting Date for Employer under GAS 68 Year Ended June 30:		
2018	N/A	$(164,716)
2019	$(3,599,296)	630,717
2020	(208,682)	3,609,732
2021	(5,236,162)	(54,283)
2022	(6,063,143)	0
2023	0	0
Thereafter	0	0

[1] *Calculated in accordance with Paragraphs 54 and 55 of GAS 68.*

EXHIBIT 9 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources: 6 - First 5

Reporting Date for Employer under GAS 68	June 30, 2018	June 30, 2017
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Deferred Outflows of Resources		
1. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$253,585	$405,445
2. Changes of assumptions or other inputs	38,874	70,139
3. Net excess of projected over actual earnings on pension plan investments (if any)	0	427,886
4. Difference between expected and actual experience in the Total Pension Liability	0	0
5. Total Deferred Outflows of Resources	$292,459	$903,470
Deferred Inflows of Resources		
6. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$15,187	$0
7. Changes of assumptions or other inputs	16	46
8. Net excess of actual over projected earnings on pension plan investments (if any)	332,354	0
9. Difference between expected and actual experience in the Total Pension Liability	127,089	198,826
10. Total Deferred Inflows of Resources	$474,646	$198,872

Deferred outflows of resources and deferred inflows of resources related to pension will be recognized as follows:

Reporting Date for Employer under GAS 68 Year Ended June 30:		
2018	N/A	$220,389
2019	$67,454	238,732
2020	53,032	227,924
2021	(145,369)	17,553
2022	(157,304)	0
2023	0	0
Thereafter	0	0

(1) *Calculated in accordance with Paragraphs 54 and 55 of GAS 68.*

EXHIBIT 9 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources: 7 - County

Reporting Date for Employer under GAS 68	**June 30, 2018**	**June 30, 2017**
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Deferred Outflows of Resources		
1. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$15,776,802	$26,918,609
2. Changes of assumptions or other inputs	15,185,462	27,180,109
3. Net excess of projected over actual earnings on pension plan investments (if any)	0	165,813,768
4. Difference between expected and actual experience in the Total Pension Liability	0	0
5. Total Deferred Outflows of Resources	$30,962,264	$219,912,486
Deferred Inflows of Resources		
6. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$23,031,988	$0
7. Changes of assumptions or other inputs	6,168	17,759
8. Net excess of actual over projected earnings on pension plan investments (if any)	129,828,465	0
9. Difference between expected and actual experience in the Total Pension Liability	49,645,301	77,048,568
10. Total Deferred Inflows of Resources	$202,511,922	$77,066,327

Deferred outflows of resources and deferred inflows of resources related to pension will be recognized as follows:

Reporting Date for Employer under GAS 68 Year Ended June 30:		
2018	N/A	$37,698,234
2019	$(24,415,272)	46,968,264
2020	(13,163,410)	59,493,047
2021	(69,753,164)	(1,313,386)
2022	(64,217,812)	0
2023	0	0
Thereafter	0	0

[1] *Calculated in accordance with Paragraphs 54 and 55 of GAS 68.*

EXHIBIT 9 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources: 8 - CCCERA (the employer)

Reporting Date for Employer under GAS 68	**June 30, 2018**	**June 30, 2017**
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Deferred Outflows of Resources		
1. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$727,934	$35,304
2. Changes of assumptions or other inputs	129,283	187,384
3. Net excess of projected over actual earnings on pension plan investments (if any)	0	1,143,145
4. Difference between expected and actual experience in the Total Pension Liability	0	0
5. Total Deferred Outflows of Resources	$857,217	$1,365,833
Deferred Inflows of Resources		
6. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$27,096	$44,921
7. Changes of assumptions or other inputs	53	122
8. Net excess of actual over projected earnings on pension plan investments (if any)	1,105,306	0
9. Difference between expected and actual experience in the Total Pension Liability	422,660	531,184
10. Total Deferred Inflows of Resources	$1,555,115	$576,227

Deferred outflows of resources and deferred inflows of resources related to pension will be recognized as follows:

Reporting Date for Employer under GAS 68 Year Ended June 30:		
2018	N/A	$175,471
2019	$(46,552)	249,605
2020	97,778	376,817
2021	(348,034)	(12,287)
2022	(401,090)	0
2023	0	0
Thereafter	0	0

(1) *Calculated in accordance with Paragraphs 54 and 55 of GAS 68.*

EXHIBIT 9 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources: 9 - ECCFPD

Reporting Date for Employer under GAS 68	**June 30, 2018**	**June 30, 2017**
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Deferred Outflows of Resources		
1. Changes in proportion and differences between employer's contributions and proportionate share of contributions[(1)]	$1,550,714	$423,411
2. Changes of assumptions or other inputs	493,063	676,025
3. Net excess of projected over actual earnings on pension plan investments (if any)	0	4,124,127
4. Difference between expected and actual experience in the Total Pension Liability	0	0
5. Total Deferred Outflows of Resources	$2,043,777	$5,223,563
Deferred Inflows of Resources		
6. Changes in proportion and differences between employer's contributions and proportionate share of contributions[(1)]	$3,197,693	$5,648,494
7. Changes of assumptions or other inputs	200	442
8. Net excess of actual over projected earnings on pension plan investments (if any)	4,215,454	0
9. Difference between expected and actual experience in the Total Pension Liability	1,611,954	1,916,355
10. Total Deferred Inflows of Resources	$9,025,301	$7,565,291

Deferred outflows of resources and deferred inflows of resources related to pension will be recognized as follows:

Reporting Date for Employer under GAS 68 Year Ended June 30:		
2018	N/A	$(1,671,685)
2019	$(2,651,192)	(1,174,034)
2020	(886,820)	500,518
2021	(1,681,403)	3,473
2022	(1,762,109)	0
2023	0	0
Thereafter	0	0

[(1)] *Calculated in accordance with Paragraphs 54 and 55 of GAS 68.*

EXHIBIT 9 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources: 10 - Housing Authority

Reporting Date for Employer under GAS 68	June 30, 2018	June 30, 2017
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Deferred Outflows of Resources		
1. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$294,415	$92,240
2. Changes of assumptions or other inputs	189,008	294,069
3. Net excess of projected over actual earnings on pension plan investments (if any)	0	1,793,985
4. Difference between expected and actual experience in the Total Pension Liability	0	0
5. Total Deferred Outflows of Resources	$483,423	$2,180,294
Deferred Inflows of Resources		
6. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$35,713	$63,580
7. Changes of assumptions or other inputs	77	192
8. Net excess of actual over projected earnings on pension plan investments (if any)	1,615,925	0
9. Difference between expected and actual experience in the Total Pension Liability	617,916	833,610
10. Total Deferred Inflows of Resources	$2,269,631	$897,382

Deferred outflows of resources and deferred inflows of resources related to pension will be recognized as follows:

Reporting Date for Employer under GAS 68 Year Ended June 30:		
2018	N/A	$285,291
2019	$(279,059)	404,887
2020	(65,797)	605,900
2021	(725,440)	(13,166)
2022	(715,912)	0
2023	0	0
Thereafter	0	0

(1) *Calculated in accordance with Paragraphs 54 and 55 of GAS 68.*

EXHIBIT 9 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources: 11 - IHSS

Reporting Date for Employer under GAS 68	June 30, 2018	June 30, 2017
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Deferred Outflows of Resources		
1. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$122,132	$87,245
2. Changes of assumptions or other inputs	23,958	37,459
3. Net excess of projected over actual earnings on pension plan investments (if any)	0	228,519
4. Difference between expected and actual experience in the Total Pension Liability	0	0
5. Total Deferred Outflows of Resources	$146,090	$353,223
Deferred Inflows of Resources		
6. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$1,456	$3,885
7. Changes of assumptions or other inputs	10	24
8. Net excess of actual over projected earnings on pension plan investments (if any)	204,832	0
9. Difference between expected and actual experience in the Total Pension Liability	78,326	106,186
10. Total Deferred Inflows of Resources	$284,624	$110,095

Deferred outflows of resources and deferred inflows of resources related to pension will be recognized as follows:

Reporting Date for Employer under GAS 68 Year Ended June 30:		
2018	N/A	$58,618
2019	$(3,989)	74,458
2020	22,680	99,690
2021	(71,407)	10,362
2022	(85,818)	0
2023	0	0
Thereafter	0	0

[1] *Calculated in accordance with Paragraphs 54 and 55 of GAS 68.*

EXHIBIT 9 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources: 12 - LAFCO

Reporting Date for Employer under GAS 68	June 30, 2018	June 30, 2017
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Deferred Outflows of Resources		
1. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$8,177	$4,303
2. Changes of assumptions or other inputs	5,466	10,398
3. Net excess of projected over actual earnings on pension plan investments (if any)	0	63,432
4. Difference between expected and actual experience in the Total Pension Liability	0	0
5. Total Deferred Outflows of Resources	$13,643	$78,133
Deferred Inflows of Resources		
6. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$12,043	$19,965
7. Changes of assumptions or other inputs	2	7
8. Net excess of actual over projected earnings on pension plan investments (if any)	46,735	0
9. Difference between expected and actual experience in the Total Pension Liability	17,871	29,475
10. Total Deferred Inflows of Resources	$76,651	$49,447

Deferred outflows of resources and deferred inflows of resources related to pension will be recognized as follows:

Reporting Date for Employer under GAS 68 Year Ended June 30:		
2018	N/A	$4,444
2019	$(14,680)	7,846
2020	(6,215)	17,158
2021	(21,327)	(762)
2022	(20,786)	0
2023	0	0
Thereafter	0	0

[1] *Calculated in accordance with Paragraphs 54 and 55 of GAS 68.*

EXHIBIT 9 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources: 13 - MOFD

Reporting Date for Employer under GAS 68	June 30, 2018	June 30, 2017
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Deferred Outflows of Resources		
1. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$2,432,720	$0
2. Changes of assumptions or other inputs	708,630	942,456
3. Net excess of projected over actual earnings on pension plan investments (if any)	0	5,749,503
4. Difference between expected and actual experience in the Total Pension Liability	0	0
5. Total Deferred Outflows of Resources	$3,141,350	$6,691,959
Deferred Inflows of Resources		
6. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$3,959,470	$6,095,307
7. Changes of assumptions or other inputs	288	616
8. Net excess of actual over projected earnings on pension plan investments (if any)	6,058,445	0
9. Difference between expected and actual experience in the Total Pension Liability	2,316,698	2,671,618
10. Total Deferred Inflows of Resources	$12,334,901	$8,767,541

Deferred outflows of resources and deferred inflows of resources related to pension will be recognized as follows:

Reporting Date for Employer under GAS 68 Year Ended June 30:		
2018	N/A	$(1,215,007)
2019	$(2,488,188)	(584,594)
2020	(1,235,418)	520,588
2021	(3,041,475)	(796,569)
2022	(2,428,470)	0
2023	0	0
Thereafter	0	0

(1) *Calculated in accordance with Paragraphs 54 and 55 of GAS 68.*

EXHIBIT 9 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources: 14 - Rodeo SD

Reporting Date for Employer under GAS 68	June 30, 2018	June 30, 2017
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Deferred Outflows of Resources		
1. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$190,893	$192,472
2. Changes of assumptions or other inputs	3,376	5,896
3. Net excess of projected over actual earnings on pension plan investments (if any)	0	35,968
4. Difference between expected and actual experience in the Total Pension Liability	0	0
5. Total Deferred Outflows of Resources	$194,269	$234,336
Deferred Inflows of Resources		
6. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$14,003	$19,452
7. Changes of assumptions or other inputs	1	4
8. Net excess of actual over projected earnings on pension plan investments (if any)	28,867	0
9. Difference between expected and actual experience in the Total Pension Liability	11,039	16,713
10. Total Deferred Inflows of Resources	$53,910	$36,169

Deferred outflows of resources and deferred inflows of resources related to pension will be recognized as follows:

Reporting Date for Employer under GAS 68 Year Ended June 30:		
2018	N/A	$88,404
2019	$87,835	77,907
2020	45,258	35,520
2021	6,701	(3,664)
2022	565	0
2023	0	0
Thereafter	0	0

(1) *Calculated in accordance with Paragraphs 54 and 55 of GAS 68.*

EXHIBIT 9 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources: 15 - RHFD

Reporting Date for Employer under GAS 68	June 30, 2018	June 30, 2017
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Deferred Outflows of Resources		
1. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$1,863,733	$0
2. Changes of assumptions or other inputs	352,623	425,165
3. Net excess of projected over actual earnings on pension plan investments (if any)	0	2,593,745
4. Difference between expected and actual experience in the Total Pension Liability	0	0
5. Total Deferred Outflows of Resources	$2,216,356	$3,018,910
Deferred Inflows of Resources		
6. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$1,558,600	$2,797,894
7. Changes of assumptions or other inputs	143	278
8. Net excess of actual over projected earnings on pension plan investments (if any)	3,014,755	0
9. Difference between expected and actual experience in the Total Pension Liability	1,152,817	1,205,234
10. Total Deferred Inflows of Resources	$5,726,315	$4,003,406

Deferred outflows of resources and deferred inflows of resources related to pension will be recognized as follows:

Reporting Date for Employer under GAS 68 Year Ended June 30:		
2018	N/A	$(823,885)
2019	$(1,155,388)	(450,784)
2020	(194,166)	409,171
2021	(1,057,792)	(118,998)
2022	(1,102,613)	0
2023	0	0
Thereafter	0	0

[1] *Calculated in accordance with Paragraphs 54 and 55 of GAS 68.*

EXHIBIT 9 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources: 16 - SRVFPD

Reporting Date for Employer under GAS 68	June 30, 2018	June 30, 2017
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Deferred Outflows of Resources		
1. Changes in proportion and differences between employer's contributions and proportionate share of contributions[(1)]	$6,183,329	$0
2. Changes of assumptions or other inputs	1,420,665	2,097,634
3. Net excess of projected over actual earnings on pension plan investments (if any)	0	12,796,730
4. Difference between expected and actual experience in the Total Pension Liability	0	0
5. Total Deferred Outflows of Resources	$7,603,994	$14,894,364
Deferred Inflows of Resources		
6. Changes in proportion and differences between employer's contributions and proportionate share of contributions[(1)]	$3,512,617	$6,252,651
7. Changes of assumptions or other inputs	577	1,371
8. Net excess of actual over projected earnings on pension plan investments (if any)	12,146,010	0
9. Difference between expected and actual experience in the Total Pension Liability	4,644,531	5,946,248
10. Total Deferred Inflows of Resources	$20,303,735	$12,200,270

Deferred outflows of resources and deferred inflows of resources related to pension will be recognized as follows:

Reporting Date for Employer under GAS 68 Year Ended June 30:		
2018	N/A	$(690,533)
2019	$(3,272,835)	464,684
2020	(406,050)	3,167,811
2021	(4,363,862)	(247,868)
2022	(4,656,994)	0
2023	0	0
Thereafter	0	0

(1) *Calculated in accordance with Paragraphs 54 and 55 of GAS 68.*

EXHIBIT 9 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources: 17 - Court

Reporting Date for Employer under GAS 68	June 30, 2018	June 30, 2017
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Deferred Outflows of Resources		
1. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$1,545,115	$2,746,125
2. Changes of assumptions or other inputs	380,155	785,878
3. Net excess of projected over actual earnings on pension plan investments (if any)	0	4,794,295
4. Difference between expected and actual experience in the Total Pension Liability	0	0
5. Total Deferred Outflows of Resources	$1,925,270	$8,326,298
Deferred Inflows of Resources		
6. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$1,912,050	$0
7. Changes of assumptions or other inputs	154	514
8. Net excess of actual over projected earnings on pension plan investments (if any)	3,250,143	0
9. Difference between expected and actual experience in the Total Pension Liability	1,242,827	2,227,762
10. Total Deferred Inflows of Resources	$6,405,174	$2,228,276

Deferred outflows of resources and deferred inflows of resources related to pension will be recognized as follows:

Reporting Date for Employer under GAS 68 Year Ended June 30:		
2018	N/A	$1,968,855
2019	$(213,346)	2,091,591
2020	(375,595)	2,028,181
2021	(2,066,966)	9,395
2022	(1,823,997)	0
2023	0	0
Thereafter	0	0

[1] *Calculated in accordance with Paragraphs 54 and 55 of GAS 68.*

EXHIBIT 9 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources: 18 - DDSD (Term)

Reporting Date for Employer under GAS 68	June 30, 2018	June 30, 2017
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Deferred Outflows of Resources		
1. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$0	$0
2. Changes of assumptions or other inputs	0	0
3. Net excess of projected over actual earnings on pension plan investments (if any)	0	0
4. Difference between expected and actual experience in the Total Pension Liability	239,142	0
5. Total Deferred Outflows of Resources	$239,142	$0
Deferred Inflows of Resources		
6. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$0	$0
7. Changes of assumptions or other inputs	0	0
8. Net excess of actual over projected earnings on pension plan investments (if any)	578,481	0
9. Difference between expected and actual experience in the Total Pension Liability	0	0
10. Total Deferred Inflows of Resources	$578,481	$0

Deferred outflows of resources and deferred inflows of resources related to pension will be recognized as follows:

Reporting Date for Employer under GAS 68 Year Ended June 30:		
2018	N/A	$0
2019	$(77,821)	0
2020	(77,821)	0
2021	(77,821)	0
2022	(105,876)	0
2023	0	0
Thereafter	0	0

(1) *Calculated in accordance with Paragraphs 54 and 55 of GAS 68.*

EXHIBIT 9 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources: 19 - DWD (Term)

Reporting Date for Employer under GAS 68	June 30, 2018	June 30, 2017
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Deferred Outflows of Resources		
1. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$0	$0
2. Changes of assumptions or other inputs	0	0
3. Net excess of projected over actual earnings on pension plan investments (if any)	0	0
4. Difference between expected and actual experience in the Total Pension Liability	117,680	0
5. Total Deferred Outflows of Resources	$117,680	$0
Deferred Inflows of Resources		
6. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$0	$0
7. Changes of assumptions or other inputs	0	0
8. Net excess of actual over projected earnings on pension plan investments (if any)	95,732	0
9. Difference between expected and actual experience in the Total Pension Liability	0	0
10. Total Deferred Inflows of Resources	$95,732	$0

Deferred outflows of resources and deferred inflows of resources related to pension will be recognized as follows:

Reporting Date for Employer under GAS 68 Year Ended June 30:		
2018	N/A	$0
2019	$8,938	0
2020	8,938	0
2021	8,938	0
2022	(4,866)	0
2023	0	0
Thereafter	0	0

(1) *Calculated in accordance with Paragraphs 54 and 55 of GAS 68.*

EXHIBIT 9 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources: 20 - Pittsburg (Term)

Reporting Date for Employer under GAS 68	**June 30, 2018**	**June 30, 2017**
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Deferred Outflows of Resources		
1. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$0	$0
2. Changes of assumptions or other inputs	0	0
3. Net excess of projected over actual earnings on pension plan investments (if any)	0	0
4. Difference between expected and actual experience in the Total Pension Liability	125,051	0
5. Total Deferred Outflows of Resources	$125,051	$0
Deferred Inflows of Resources		
6. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$0	$0
7. Changes of assumptions or other inputs	0	0
8. Net excess of actual over projected earnings on pension plan investments (if any)	2,032,689	0
9. Difference between expected and actual experience in the Total Pension Liability	0	0
10. Total Deferred Inflows of Resources	$2,032,689	$0

Deferred outflows of resources and deferred inflows of resources related to pension will be recognized as follows:

Reporting Date for Employer under GAS 68 Year Ended June 30:		
2018	N/A	$0
2019	$(473,241)	0
2020	(473,241)	0
2021	(473,241)	0
2022	(487,915)	0
2023	0	0
Thereafter	0	0

[1] *Calculated in accordance with Paragraphs 54 and 55 of GAS 68.*

EXHIBIT 9 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources

There are changes in each employer's proportionate share of the total Net Pension Liability (NPL) during the measurement period ended December 31, 2017. The net effect of the change on the employer's proportionate share of the collective NPL and collective deferred outflows of resources and deferred inflows of resources for the current period is recognized over the average of the expected remaining service lives of all employees that are provided with pensions through CCCERA which is 4.58 years determined as of December 31, 2016 (the beginning of the measurement period ending December 31, 2017). This is described in Paragraph 33a. of GAS 68.

In addition, the difference between the actual employer contributions and the proportionate share of the employer contributions during the measurement period ended December 31, 2017 is recognized over the same period. This difference is calculated based on actual employer contributions reported to us by CCCERA for each active employer. Those contributions are then further adjusted so that the employer contributions in total match the employer contributions reported on CCCERA's financial statements.

The net effects of the change on the employer's proportionate share of the collective NPL and collective deferred outflows of resources and deferred inflows of resources and the difference between the actual employer contributions and the proportionate share of the employer contributions for prior periods are continued to be recognized based on the expected remaining service lives of all employees calculated as of those prior measurement dates.

The average of the expected service lives of all employees is determined by:

- Calculating each active employee's expected remaining service life as the present value of $1 per year of future service at zero percent interest.
- Setting the remaining service life to zero for each nonactive or retired member.
- Dividing the sum of the above amounts by the total number of active employee, nonactive and retired members.

EXHIBIT 10

Schedule of Proportionate Share of the Net Pension Liability: Total for all Employers

Reporting Date for Employer under GAS 68 as of June 30	Proportion of the Net Pension Liability	Proportionate share of Net Pension Liability	Covered payroll[1]	Proportionate share of the Net Pension Liability as a percentage of its covered payroll	Plan's Fiduciary Net Position as a percentage of the Total Pension Liability
2014	100.000%	$1,471,449,251	$638,635,912	230.41%	81.44%
2015	100.000%	1,195,701,397	671,485,798	178.07%	85.25%
2016	100.000%	1,507,127,140	709,818,858	212.33%	82.24%
2017	100.000%	1,400,454,923	755,138,882	185.46%	84.16%
2018	100.000%	811,436,611	809,960,088	100.18%	91.18%

(1) *Covered payroll represents payroll on which contributions to the pension plan are based.*

EXHIBIT 10 (continued)

Schedule of Proportionate Share of the Net Pension Liability: 1 - BIMID

Reporting Date for Employer under GAS 68 as of June 30	Proportion of the Net Pension Liability	Proportionate share of Net Pension Liability	Covered payroll[1]	Proportionate share of the Net Pension Liability as a percentage of its covered payroll	Plan's Fiduciary Net Position as a percentage of the Total Pension Liability
2014	0.010%	$141,029	$98,547	143.11%	74.40%
2015	0.010%	114,600	63,762	179.73%	79.57%
2016	0.007%	111,818	58,347	191.64%	77.84%
2017	0.010%	137,084	82,174	166.82%	80.32%
2018	0.019%	157,443	166,430	94.60%	88.49%

[1] *Covered payroll represents payroll on which contributions to the pension plan are based.*

EXHIBIT 10 (continued)

Schedule of Proportionate Share of the Net Pension Liability: 2 - Union Cemetery

Reporting Date for Employer under GAS 68 as of June 30	Proportion of the Net Pension Liability	Proportionate share of Net Pension Liability	Covered payroll[1]	Proportionate share of the Net Pension Liability as a percentage of its covered payroll	Plan's Fiduciary Net Position as a percentage of the Total Pension Liability
2014	0.006%	$81,639	$202,342	40.35%	94.52%
2015	0.006%	66,340	213,716	31.04%	95.83%
2016	0.010%	147,774	213,336	69.27%	91.43%
2017	0.005%	75,800	226,811	33.42%	95.67%
2015	0.004%	29,395	166,890	17.61%	98.00%

[1] *Covered payroll represents payroll on which contributions to the pension plan are based.*

EXHIBIT 10 (continued)

Schedule of Proportionate Share of the Net Pension Liability: 3 - CC Mosquito

Reporting Date for Employer under GAS 68 as of June 30	Proportion of the Net Pension Liability	Proportionate share of Net Pension Liability	Covered payroll[(1)]	Proportionate share of the Net Pension Liability as a percentage of its covered payroll	Plan's Fiduciary Net Position as a percentage of the Total Pension Liability
2014	0.427%	$6,281,902	$2,787,246	225.38%	74.40%
2015	0.427%	5,104,681	2,840,172	179.73%	79.57%
2016	0.376%	5,665,700	2,956,365	191.64%	77.84%
2017	0.367%	5,140,418	3,081,368	166.82%	80.32%
2018	0.372%	3,017,908	3,190,169	94.60%	88.49%

(1) *Covered payroll represents payroll on which contributions to the pension plan are based.*

EXHIBIT 10 (continued)

Schedule of Proportionate Share of the Net Pension Liability: 4 - CCCFPD

Reporting Date for Employer under GAS 68 as of June 30	Proportion of the Net Pension Liability	Proportionate share of Net Pension Liability	Covered payroll[1]	Proportionate share of the Net Pension Liability as a percentage of its covered payroll	Plan's Fiduciary Net Position as a percentage of the Total Pension Liability
2014	9.723%	$143,074,496	$30,880,667	463.31%	83.82%
2015	9.723%	116,262,504	29,582,625	393.01%	86.85%
2016	11.568%	174,340,795	32,275,397	540.17%	81.54%
2017	11.934%	167,124,048	35,011,978	477.33%	82.69%
2018	13.583%	110,215,347	36,028,772	305.91%	88.88%

(1) *Covered payroll represents payroll on which contributions to the pension plan are based.*

EXHIBIT 10 (continued)

Schedule of Proportionate Share of the Net Pension Liability: 5 - CCCSD

Reporting Date for Employer under GAS 68 as of June 30	Proportion of the Net Pension Liability	Proportionate share of Net Pension Liability	Covered payroll[1]	Proportionate share of the Net Pension Liability as a percentage of its covered payroll	Plan's Fiduciary Net Position as a percentage of the Total Pension Liability
2014	7.488%	$110,183,830	$25,791,346	427.21%	67.22%
2015	7.488%	89,535,510	26,906,131	332.77%	73.86%
2016	6.088%	91,746,888	29,061,743	315.70%	74.14%
2017	6.273%	87,847,116	31,584,169	278.14%	76.44%
2018	7.863%	63,806,000	33,306,938	191.57%	83.58%

[1] *Covered payroll represents payroll on which contributions to the pension plan are based.*

EXHIBIT 10 (continued)

Schedule of Proportionate Share of the Net Pension Liability: 6 - First 5

Reporting Date for Employer under GAS 68 as of June 30	Proportion of the Net Pension Liability	Proportionate share of Net Pension Liability	Covered payroll[1]	Proportionate share of the Net Pension Liability as a percentage of its covered payroll	Plan's Fiduciary Net Position as a percentage of the Total Pension Liability
2014	0.141%	$2,071,332	$1,631,923	126.93%	86.00%
2015	0.141%	1,683,167	1,735,009	97.01%	88.97%
2016	0.164%	2,465,341	1,962,961	125.59%	85.48%
2017	0.173%	2,423,899	2,140,380	113.25%	86.64%
2018	0.159%	1,289,083	2,405,397	53.59%	93.48%

(1) *Covered payroll represents payroll on which contributions to the pension plan are based.*

EXHIBIT 10 (continued)

Schedule of Proportionate Share of the Net Pension Liability: 7 - County

Reporting Date for Employer under GAS 68 as of June 30	Proportion of the Net Pension Liability	Proportionate share of Net Pension Liability	Covered payroll[1]	Proportionate share of the Net Pension Liability as a percentage of its covered payroll	Plan's Fiduciary Net Position as a percentage of the Total Pension Liability
2014	67.521%	$993,538,168	$513,965,613	193.31%	82.57%
2015	67.521%	807,350,288	547,669,428	147.42%	86.21%
2016	67.951%	1,024,104,604	578,312,679	177.08%	83.30%
2017	67.071%	939,305,464	613,565,068	153.09%	85.20%
2018	62.058%	503,558,908	661,575,196	76.12%	92.40%

[1] *Covered payroll represents payroll on which contributions to the pension plan are based.*

EXHIBIT 10 (continued)

Schedule of Proportionate Share of the Net Pension Liability: 8 - CCCERA (the employer)

Reporting Date for Employer under GAS 68 as of June 30	Proportion of the Net Pension Liability	Proportionate share of Net Pension Liability	Covered payroll[1]	Proportionate share of the Net Pension Liability as a percentage of its covered payroll	Plan's Fiduciary Net Position as a percentage of the Total Pension Liability
2014	0.490%	$7,215,926	$3,280,849	219.94%	74.40%
2015	0.490%	5,863,670	3,262,463	179.73%	79.57%
2016	0.474%	7,138,680	3,724,967	191.64%	77.84%
2017	0.462%	6,475,713	3,881,797	166.82%	80.32%
2018	0.528%	4,287,094	4,531,800	94.60%	88.49%

(1) *Covered payroll represents payroll on which contributions to the pension plan are based.*

EXHIBIT 10 (continued)

Schedule of Proportionate Share of the Net Pension Liability: 9 - ECCFPD

Reporting Date for Employer under GAS 68 as of June 30	Proportion of the Net Pension Liability	Proportionate share of Net Pension Liability	Covered payroll[1]	Proportionate share of the Net Pension Liability as a percentage of its covered payroll	Plan's Fiduciary Net Position as a percentage of the Total Pension Liability
2014	2.033%	$29,920,976	$3,075,280	972.95%	69.43%
2015	2.033%	24,313,820	3,033,964	801.39%	74.65%
2016	1.526%	22,992,216	2,578,801	891.59%	70.89%
2017	1.668%	23,362,447	2,981,911	783.47%	73.30%
2018	2.015%	16,350,262	2,932,872	557.48%	81.00%

[1] *Covered payroll represents payroll on which contributions to the pension plan are based.*

EXHIBIT 10 (continued)

Schedule of Proportionate Share of the Net Pension Liability: 10 - Housing Authority

Reporting Date for Employer under GAS 68 as of June 30	Proportion of the Net Pension Liability	Proportionate share of Net Pension Liability	Covered payroll[1]	Proportionate share of the Net Pension Liability as a percentage of its covered payroll	Plan's Fiduciary Net Position as a percentage of the Total Pension Liability
2014	0.724%	$10,648,283	$4,677,572	227.65%	80.04%
2015	0.724%	8,652,807	4,691,885	184.42%	84.06%
2016	0.716%	10,788,391	4,841,907	222.81%	80.83%
2017	0.726%	10,162,604	5,215,890	194.84%	82.73%
2018	0.772%	6,267,604	5,183,762	120.91%	89.72%

(1) *Covered payroll represents payroll on which contributions to the pension plan are based.*

EXHIBIT 10 (continued)

Schedule of Proportionate Share of the Net Pension Liability: 11 - IHSS

Reporting Date for Employer under GAS 68 as of June 30	Proportion of the Net Pension Liability	Proportionate share of Net Pension Liability	Covered payroll[1]	Proportionate share of the Net Pension Liability as a percentage of its covered payroll	Plan's Fiduciary Net Position as a percentage of the Total Pension Liability
2014	0.087%	$1,280,362	$600,371	213.26%	74.40%
2015	0.087%	1,040,424	578,877	179.73%	79.57%
2016	0.086%	1,292,792	674,579	191.64%	77.84%
2017	0.092%	1,294,522	775,987	166.82%	80.32%
2018	0.098%	794,473	839,821	94.60%	88.49%

[1] *Covered payroll represents payroll on which contributions to the pension plan are based.*

EXHIBIT 10 (continued)

Schedule of Proportionate Share of the Net Pension Liability: 12 - LAFCO

Reporting Date for Employer under GAS 68 as of June 30	Proportion of the Net Pension Liability	Proportionate share of Net Pension Liability	Covered payroll[1]	Proportionate share of the Net Pension Liability as a percentage of its covered payroll	Plan's Fiduciary Net Position as a percentage of the Total Pension Liability
2014	0.030%	$448,684	$202,880	221.16%	74.40%
2015	0.030%	364,601	202,859	179.73%	79.57%
2016	0.027%	400,173	208,810	191.64%	77.84%
2017	0.026%	359,329	215,396	166.82%	80.32%
2018	0.022%	181,268	221,780	81.73%	90.06%

(1) *Covered payroll represents payroll on which contributions to the pension plan are based.*

EXHIBIT 10 (continued)

Schedule of Proportionate Share of the Net Pension Liability: 13 - MOFD

Reporting Date for Employer under GAS 68 as of June 30	Proportion of the Net Pension Liability	Proportionate share of Net Pension Liability	Covered payroll[1]	Proportionate share of the Net Pension Liability as a percentage of its covered payroll	Plan's Fiduciary Net Position as a percentage of the Total Pension Liability
2014	2.393%	$35,211,427	$7,353,174	478.86%	80.06%
2015	2.393%	28,612,847	7,350,163	389.28%	83.79%
2016	2.608%	39,299,357	6,858,003	573.04%	78.77%
2017	2.326%	32,569,913	7,347,757	443.26%	82.41%
2018	2.896%	23,498,575	7,960,215	295.20%	87.85%

(1) *Covered payroll represents payroll on which contributions to the pension plan are based.*

EXHIBIT 10 (continued)

Schedule of Proportionate Share of the Net Pension Liability: 14 - Rodeo SD

Reporting Date for Employer under GAS 68 as of June 30	Proportion of the Net Pension Liability	Proportionate share of Net Pension Liability	Covered payroll[1]	Proportionate share of the Net Pension Liability as a percentage of its covered payroll	Plan's Fiduciary Net Position as a percentage of the Total Pension Liability
2014	0.015%	$225,142	$546,354	41.21%	94.52%
2015	0.015%	182,951	589,379	31.04%	95.83%
2016	0.026%	393,628	568,265	69.27%	91.43%
2017	0.015%	203,750	609,667	33.42%	95.67%
2018	0.014%	111,965	635,682	17.61%	98.00%

[1] *Covered payroll represents payroll on which contributions to the pension plan are based.*

EXHIBIT 10 (continued)

Schedule of Proportionate Share of the Net Pension Liability: 15 - RHFD

Reporting Date for Employer under GAS 68 as of June 30	Proportion of the Net Pension Liability	Proportionate share of Net Pension Liability	Covered payroll[1]	Proportionate share of the Net Pension Liability as a percentage of its covered payroll	Plan's Fiduciary Net Position as a percentage of the Total Pension Liability
2014	1.129%	$16,612,346	$1,766,704	940.30%	59.86%
2015	1.129%	13,499,212	2,069,510	652.29%	65.89%
2016	1.012%	15,252,152	2,342,844	651.01%	63.59%
2017	1.049%	14,693,106	2,241,786	655.42%	66.55%
2018	1.441%	11,693,174	2,194,605	532.81%	74.20%

(1) *Covered payroll represents payroll on which contributions to the pension plan are based.*

EXHIBIT 10 (continued)

Schedule of Proportionate Share of the Net Pension Liability: 16 - SRVFPD

Reporting Date for Employer under GAS 68 as of June 30	Proportion of the Net Pension Liability	Proportionate share of Net Pension Liability	Covered payroll[1]	Proportionate share of the Net Pension Liability as a percentage of its covered payroll	Plan's Fiduciary Net Position as a percentage of the Total Pension Liability
2014	5.815%	$85,561,055	$19,053,093	449.07%	76.94%
2015	5.815%	69,527,014	18,614,252	373.51%	81.67%
2016	5.357%	80,736,003	19,540,557	413.17%	79.70%
2017	5.176%	72,491,195	22,113,973	327.81%	82.68%
2018	5.806%	47,110,096	23,767,950	198.21%	89.41%

[1] *Covered payroll represents payroll on which contributions to the pension plan are based.*

EXHIBIT 10 (continued)

Schedule of Proportionate Share of the Net Pension Liability: 17 - Court

Reporting Date for Employer under GAS 68 as of June 30	Proportion of the Net Pension Liability	Proportionate share of Net Pension Liability	Covered payroll[1]	Proportionate share of the Net Pension Liability as a percentage of its covered payroll	Plan's Fiduciary Net Position as a percentage of the Total Pension Liability
2014	1.968%	$28,952,654	$22,721,953	127.42%	84.75%
2015	1.968%	23,526,961	22,081,605	106.55%	87.89%
2016	2.007%	30,250,828	23,639,297	127.97%	85.21%
2017	1.939%	27,158,829	24,062,771	112.87%	86.68%
2018	1.554%	12,606,159	24,851,809	50.73%	93.83%

[1] *Covered payroll represents payroll on which contributions to the pension plan are based.*

EXHIBIT 10 (continued)

Schedule of Proportionate Share of the Net Pension Liability: 18 - DDSD (Term)

Reporting Date for Employer under GAS 68 as of June 30	Proportion of the Net Pension Liability	Proportionate share of Net Pension Liability	Covered payroll[1]	Proportionate share of the Net Pension Liability as a percentage of its covered payroll	Plan's Fiduciary Net Position as a percentage of the Total Pension Liability
2014	N/A	N/A	N/A	N/A	N/A
2015	N/A	N/A	N/A	N/A	N/A
2016	N/A	N/A	N/A	N/A	N/A
2017	0.137%	$1,918,215	$0	N/A	86.09%
2018	0.177%	1,435,257	0	N/A	89.73%

[1] *Covered payroll represents payroll on which contributions to the pension plan are based.*

EXHIBIT 10 (continued)

Schedule of Proportionate Share of the Net Pension Liability: 19 - DWD (Term)

Reporting Date for Employer under GAS 68 as of June 30	Proportion of the Net Pension Liability	Proportionate share of Net Pension Liability	Covered payroll[1]	Proportionate share of the Net Pension Liability as a percentage of its covered payroll	Plan's Fiduciary Net Position as a percentage of the Total Pension Liability
2014	N/A	N/A	N/A	N/A	N/A
2015	N/A	N/A	N/A	N/A	N/A
2016	N/A	N/A	N/A	N/A	N/A
2017	0.059%	$823,144	$0	N/A	71.42%
2018	0.102%	827,520	0	N/A	70.60%

[1] *Covered payroll represents payroll on which contributions to the pension plan are based.*

EXHIBIT 10 (continued)

Schedule of Proportionate Share of the Net Pension Liability: 20 - Pittsburg (Term)

Reporting Date for Employer under GAS 68 as of June 30	Proportion of the Net Pension Liability	Proportionate share of Net Pension Liability	Covered payroll[1]	Proportionate share of the Net Pension Liability as a percentage of its covered payroll	Plan's Fiduciary Net Position as a percentage of the Total Pension Liability
2014	N/A	N/A	N/A	N/A	N/A
2015	N/A	N/A	N/A	N/A	N/A
2016	N/A	N/A	N/A	N/A	N/A
2017	0.492%	$6,888,327	$0	N/A	85.75%
2018	0.517%	4,199,080	0	N/A	91.20%

[1] *Covered payroll represents payroll on which contributions to the pension plan are based.*

EXHIBIT 11

Schedule of Reconciliation of Net Pension Liability: Total for all Employers

Reporting Date for Employer under GAS 68	**June 30, 2018**	**June 30, 2017**
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Reconciliation of Net Pension Liability		
1. Beginning Net Pension Liability	$1,400,454,923	$1,507,127,140
2. Pension Expense	162,333,068	267,159,589
3. Employer Contributions[(1)]	(314,836,561)	(307,909,509)
4. New Net Deferred Inflows/Outflows	(397,192,842)	(20,904,679)
5. Change in Allocation of Prior Deferred Inflows/Outflows	0	0
6. New Net Deferred Flows Due to Change in Proportion[(2)]	0	0
7. Recognition of Prior Deferred Inflows/Outflows	(39,321,977)	(45,017,618)
8. Recognition of Prior Deferred Flows Due to Change in Proportion[(2)]	0	0
9. Ending Net Pension Liability	$811,436,611	$1,400,454,923

(1) *Includes "member subvention of employer contributions" and excludes "employer subvention of member contributions".*

(2) *Includes differences between employer contributions and proportionate share of contributions.*

EXHIBIT 11 (continued)

Schedule of Reconciliation of Net Pension Liability: 1 - BIMID

Reporting Date for Employer under GAS 68	**June 30, 2018**	**June 30, 2017**
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Reconciliation of Net Pension Liability		
1. Beginning Net Pension Liability	$137,084	$111,818
2. Pension Expense	60,583	27,907
3. Employer Contributions[1]	(63,700)	(34,493)
4. New Net Deferred Inflows/Outflows	(77,251)	(2,060)
5. Change in Allocation of Prior Deferred Inflows/Outflows	16,655	5,790
6. New Net Deferred Flows Due to Change in Proportion[2]	94,287	27,406
7. Recognition of Prior Deferred Inflows/Outflows	(7,691)	(4,437)
8. Recognition of Prior Deferred Flows Due to Change in Proportion[2]	(2,524)	5,153
9. Ending Net Pension Liability	$157,443	$137,084

(1) *Includes "member subvention of employer contributions" and excludes "employer subvention of member contributions".*

(2) *Includes differences between employer contributions and proportionate share of contributions.*

EXHIBIT 11 (continued)

Schedule of Reconciliation of Net Pension Liability: 2 - Union Cemetery

Reporting Date for Employer under GAS 68	June 30, 2018	June 30, 2017
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Reconciliation of Net Pension Liability		
1. Beginning Net Pension Liability	$75,800	$147,774
2. Pension Expense	38,275	44,414
3. Employer Contributions[1]	(42,422)	(61,739)
4. New Net Deferred Inflows/Outflows	(14,423)	(1,139)
5. Change in Allocation of Prior Deferred Inflows/Outflows	(3,087)	(10,346)
6. New Net Deferred Flows Due to Change in Proportion[2]	7,066	(8,071)
7. Recognition of Prior Deferred Inflows/Outflows	(1,435)	(2,453)
8. Recognition of Prior Deferred Flows Due to Change in Proportion[2]	(30,379)	(32,640)
9. Ending Net Pension Liability	$29,395	$75,800

(1) *Includes "member subvention of employer contributions" and excludes "employer subvention of member contributions".*

(2) *Includes differences between employer contributions and proportionate share of contributions.*

EXHIBIT 11 (continued)

Schedule of Reconciliation of Net Pension Liability: 3 - CC Mosquito

Reporting Date for Employer under GAS 68	**June 30, 2018**	**June 30, 2017**
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Reconciliation of Net Pension Liability		
1. Beginning Net Pension Liability	$5,140,418	$5,665,700
2. Pension Expense	542,375	857,481
3. Employer Contributions[(1)]	(1,242,766)	(1,277,784)
4. New Net Deferred Inflows/Outflows	(1,480,763)	(77,263)
5. Change in Allocation of Prior Deferred Inflows/Outflows	9,119	(15,044)
6. New Net Deferred Flows Due to Change in Proportion[(2)]	102,610	46,382
7. Recognition of Prior Deferred Inflows/Outflows	(147,421)	(166,382)
8. Recognition of Prior Deferred Flows Due to Change in Proportion[(2)]	94,336	107,328
9. Ending Net Pension Liability	$3,017,908	$5,140,418

(1) *Includes "member subvention of employer contributions" and excludes "employer subvention of member contributions".*

(2) *Includes differences between employer contributions and proportionate share of contributions.*

EXHIBIT 11 (continued)

Schedule of Reconciliation of Net Pension Liability: 4 - CCCFPD

Reporting Date for Employer under GAS 68	June 30, 2018	June 30, 2017
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Reconciliation of Net Pension Liability		
1. Beginning Net Pension Liability	$167,124,048	$174,340,795
2. Pension Expense	21,355,936	29,518,434
3. Employer Contributions[1]	(25,169,858)	(24,614,542)
4. New Net Deferred Inflows/Outflows	(54,078,112)	(2,511,944)
5. Change in Allocation of Prior Deferred Inflows/Outflows	2,876,221	1,065,343
6. New Net Deferred Flows Due to Change in Proportion[2]	2,064,170	(5,227,246)
7. Recognition of Prior Deferred Inflows/Outflows	(5,383,878)	(5,409,398)
8. Recognition of Prior Deferred Flows Due to Change in Proportion[2]	1,426,820	(37,394)
9. Ending Net Pension Liability	$110,215,347	$167,124,048

(1) *Includes "member subvention of employer contributions" and excludes "employer subvention of member contributions".*

(2) *Includes differences between employer contributions and proportionate share of contributions.*

EXHIBIT 11 (continued)

Schedule of Reconciliation of Net Pension Liability: 5 - CCCSD

Reporting Date for Employer under GAS 68	**June 30, 2018**	**June 30, 2017**
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Reconciliation of Net Pension Liability		
1. Beginning Net Pension Liability	$87,847,116	$91,746,888
2. Pension Expense	12,967,767	13,617,705
3. Employer Contributions[1]	(17,880,152)	(18,043,391)
4. New Net Deferred Inflows/Outflows	(31,306,965)	(1,320,379)
5. Change in Allocation of Prior Deferred Inflows/Outflows	2,764,089	543,221
6. New Net Deferred Flows Due to Change in Proportion[2]	9,882,621	1,170,291
7. Recognition of Prior Deferred Inflows/Outflows	(3,116,841)	(2,843,397)
8. Recognition of Prior Deferred Flows Due to Change in Proportion[2]	2,648,365	2,976,178
9. Ending Net Pension Liability	$63,806,000	$87,847,116

[1] *Includes "member subvention of employer contributions" and excludes "employer subvention of member contributions".*

[2] *Includes differences between employer contributions and proportionate share of contributions.*

EXHIBIT 11 (continued)

Schedule of Reconciliation of Net Pension Liability: 6 - First 5

Reporting Date for Employer under GAS 68	June 30, 2018	June 30, 2017
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Reconciliation of Net Pension Liability		
1. Beginning Net Pension Liability	$2,423,899	$2,465,341
2. Pension Expense	407,343	600,678
3. Employer Contributions[1]	(655,373)	(594,872)
4. New Net Deferred Inflows/Outflows	(632,500)	(36,432)
5. Change in Allocation of Prior Deferred Inflows/Outflows	(24,269)	25,418
6. New Net Deferred Flows Due to Change in Proportion[2]	(15,187)	151,613
7. Recognition of Prior Deferred Inflows/Outflows	(62,970)	(78,456)
8. Recognition of Prior Deferred Flows Due to Change in Proportion[2]	(151,860)	(109,391)
9. Ending Net Pension Liability	$1,289,083	$2,423,899

(1) *Includes "member subvention of employer contributions" and excludes "employer subvention of member contributions".*

(2) *Includes differences between employer contributions and proportionate share of contributions.*

EXHIBIT 11 (continued)

Schedule of Reconciliation of Net Pension Liability: 7 - County

Reporting Date for Employer under GAS 68	**June 30, 2018**	**June 30, 2017**
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Reconciliation of Net Pension Liability		
1. Beginning Net Pension Liability	$939,305,464	$1,024,104,604
2. Pension Expense	106,165,258	185,066,783
3. Employer Contributions[1]	(227,515,999)	(223,359,050)
4. New Net Deferred Inflows/Outflows	(247,075,523)	(14,118,151)
5. Change in Allocation of Prior Deferred Inflows/Outflows	(8,548,293)	(985,797)
6. New Net Deferred Flows Due to Change in Proportion[2]	(23,031,988)	7,922,671
7. Recognition of Prior Deferred Inflows/Outflows	(24,598,204)	(30,403,024)
8. Recognition of Prior Deferred Flows Due to Change in Proportion[2]	(11,141,807)	(8,922,572)
9. Ending Net Pension Liability	$503,558,908	$939,305,464

(1) *Includes "member subvention of employer contributions" and excludes "employer subvention of member contributions".*

(2) *Includes differences between employer contributions and proportionate share of contributions.*

EXHIBIT 11 (continued)

Schedule of Reconciliation of Net Pension Liability: 8 - CCCERA (the employer)

Reporting Date for Employer under GAS 68	**June 30, 2018**	**June 30, 2017**
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Reconciliation of Net Pension Liability		
1. Beginning Net Pension Liability	$6,475,713	$7,138,680
2. Pension Expense	1,052,475	1,191,452
3. Employer Contributions[1]	(1,753,591)	(1,579,937)
4. New Net Deferred Inflows/Outflows	(2,103,500)	(97,333)
5. Change in Allocation of Prior Deferred Inflows/Outflows	114,961	(19,147)
6. New Net Deferred Flows Due to Change in Proportion[2]	702,842	34,363
7. Recognition of Prior Deferred Inflows/Outflows	(209,419)	(209,603)
8. Recognition of Prior Deferred Flows Due to Change in Proportion[2]	7,613	17,238
9. Ending Net Pension Liability	$4,287,094	$6,475,713

[1] *Includes "member subvention of employer contributions" and excludes "employer subvention of member contributions".*

[2] *Includes differences between employer contributions and proportionate share of contributions.*

EXHIBIT 11 (continued)

Schedule of Reconciliation of Net Pension Liability: 9 - ECCFPD

Reporting Date for Employer under GAS 68	**June 30, 2018**	**June 30, 2017**
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Reconciliation of Net Pension Liability		
1. Beginning Net Pension Liability	$23,362,447	$22,992,216
2. Pension Expense	1,310,069	1,993,672
3. Employer Contributions[1]	(3,682,458)	(3,756,634)
4. New Net Deferred Inflows/Outflows	(8,022,397)	(351,147)
5. Change in Allocation of Prior Deferred Inflows/Outflows	603,186	366,314
6. New Net Deferred Flows Due to Change in Proportion[2]	1,245,906	423,411
7. Recognition of Prior Deferred Inflows/Outflows	(798,689)	(756,186)
8. Recognition of Prior Deferred Flows Due to Change in Proportion[2]	2,332,198	2,450,801
9. Ending Net Pension Liability	$16,350,262	$23,362,447

[1] *Includes "member subvention of employer contributions" and excludes "employer subvention of member contributions".*

[2] *Includes differences between employer contributions and proportionate share of contributions.*

EXHIBIT 11 (continued)

Schedule of Reconciliation of Net Pension Liability: 10 - Housing Authority

Reporting Date for Employer under GAS 68	**June 30, 2018**	**June 30, 2017**
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Reconciliation of Net Pension Liability		
1. Beginning Net Pension Liability	$10,162,604	$10,788,391
2. Pension Expense	1,324,457	1,879,712
3. Employer Contributions[1]	(2,150,337)	(2,179,232)
4. New Net Deferred Inflows/Outflows	(3,075,254)	(152,748)
5. Change in Allocation of Prior Deferred Inflows/Outflows	82,256	35,313
6. New Net Deferred Flows Due to Change in Proportion[2]	228,012	92,240
7. Recognition of Prior Deferred Inflows/Outflows	(306,164)	(328,939)
8. Recognition of Prior Deferred Flows Due to Change in Proportion[2]	2,030	27,867
9. Ending Net Pension Liability	$6,267,604	$10,162,604

[1] *Includes "member subvention of employer contributions" and excludes "employer subvention of member contributions".*

[2] *Includes differences between employer contributions and proportionate share of contributions.*

EXHIBIT 11 (continued)

Schedule of Reconciliation of Net Pension Liability: 11 - IHSS

Reporting Date for Employer under GAS 68	**June 30, 2018**	**June 30, 2017**
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Reconciliation of Net Pension Liability		
1. Beginning Net Pension Liability	$1,294,522	$1,292,792
2. Pension Expense	198,664	261,716
3. Employer Contributions[(1)]	(317,051)	(305,526)
4. New Net Deferred Inflows/Outflows	(389,815)	(19,457)
5. Change in Allocation of Prior Deferred Inflows/Outflows	9,646	17,337
6. New Net Deferred Flows Due to Change in Proportion[(2)]	59,335	87,163
7. Recognition of Prior Deferred Inflows/Outflows	(38,809)	(41,900)
8. Recognition of Prior Deferred Flows Due to Change in Proportion[(2)]	(22,019)	2,397
9. Ending Net Pension Liability	$794,473	$1,294,522

(1) *Includes "member subvention of employer contributions" and excludes "employer subvention of member contributions".*

(2) *Includes differences between employer contributions and proportionate share of contributions.*

EXHIBIT 11 (continued)

Schedule of Reconciliation of Net Pension Liability: 12 - LAFCO

Reporting Date for Employer under GAS 68	**June 30, 2018**	**June 30, 2017**
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Reconciliation of Net Pension Liability		
1. Beginning Net Pension Liability	$359,329	$400,173
2. Pension Expense	32,504	60,820
3. Employer Contributions[1]	(118,872)	(90,429)
4. New Net Deferred Inflows/Outflows	(88,941)	(5,401)
5. Change in Allocation of Prior Deferred Inflows/Outflows	(5,694)	(1,702)
6. New Net Deferred Flows Due to Change in Proportion[2]	6,081	1,394
7. Recognition of Prior Deferred Inflows/Outflows	(8,854)	(11,631)
8. Recognition of Prior Deferred Flows Due to Change in Proportion[2]	5,715	6,105
9. Ending Net Pension Liability	$181,268	$359,329

(1) *Includes "member subvention of employer contributions" and excludes "employer subvention of member contributions".*

(2) *Includes differences between employer contributions and proportionate share of contributions.*

EXHIBIT 11 (continued)

Schedule of Reconciliation of Net Pension Liability: 13 - MOFD

Reporting Date for Employer under GAS 68	**June 30, 2018**	**June 30, 2017**
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Reconciliation of Net Pension Liability		
1. Beginning Net Pension Liability	$32,569,913	$39,299,357
2. Pension Expense	3,278,183	3,894,918
3. Employer Contributions[1]	(5,231,551)	(4,915,245)
4. New Net Deferred Inflows/Outflows	(11,529,779)	(489,539)
5. Change in Allocation of Prior Deferred Inflows/Outflows	991,127	(631,473)
6. New Net Deferred Flows Due to Change in Proportion[2]	2,432,720	(4,429,091)
7. Recognition of Prior Deferred Inflows/Outflows	(1,147,875)	(1,054,209)
8. Recognition of Prior Deferred Flows Due to Change in Proportion[2]	2,135,837	895,195
9. Ending Net Pension Liability	$23,498,575	$32,569,913

(1) *Includes "member subvention of employer contributions" and excludes "employer subvention of member contributions".*

(2) *Includes differences between employer contributions and proportionate share of contributions.*

EXHIBIT 11 (continued)

Schedule of Reconciliation of Net Pension Liability: 14 - Rodeo SD

Reporting Date for Employer under GAS 68	June 30, 2018	June 30, 2017
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Reconciliation of Net Pension Liability		
1. Beginning Net Pension Liability	$203,750	$393,628
2. Pension Expense	129,368	120,369
3. Employer Contributions[1]	(163,345)	(165,800)
4. New Net Deferred Inflows/Outflows	(54,937)	(3,062)
5. Change in Allocation of Prior Deferred Inflows/Outflows	(1,271)	(27,246)
6. New Net Deferred Flows Due to Change in Proportion[2]	86,513	(19,452)
7. Recognition of Prior Deferred Inflows/Outflows	(5,470)	(6,595)
8. Recognition of Prior Deferred Flows Due to Change in Proportion[2]	(82,643)	(88,092)
9. Ending Net Pension Liability	$111,965	$203,750

(1) *Includes "member subvention of employer contributions" and excludes "employer subvention of member contributions".*

(2) *Includes differences between employer contributions and proportionate share of contributions.*

EXHIBIT 11 (continued)

Schedule of Reconciliation of Net Pension Liability: 15 - RHFD

Reporting Date for Employer under GAS 68	**June 30, 2018**	**June 30, 2017**
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Reconciliation of Net Pension Liability		
1. Beginning Net Pension Liability	$14,693,106	$15,252,152
2. Pension Expense	1,637,240	1,481,331
3. Employer Contributions(1)	(2,111,707)	(2,058,096)
4. New Net Deferred Inflows/Outflows	(5,737,357)	(220,843)
5. Change in Allocation of Prior Deferred Inflows/Outflows	680,061	105,553
6. New Net Deferred Flows Due to Change in Proportion(2)	1,863,733	(492,695)
7. Recognition of Prior Deferred Inflows/Outflows	(571,196)	(475,580)
8. Recognition of Prior Deferred Flows Due to Change in Proportion(2)	1,239,294	1,101,284
9. Ending Net Pension Liability	$11,693,174	$14,693,106

(1) *Includes "member subvention of employer contributions" and excludes "employer subvention of member contributions".*

(2) *Includes differences between employer contributions and proportionate share of contributions.*

EXHIBIT 11 (continued)

Schedule of Reconciliation of Net Pension Liability: 16 - SRVFPD

Reporting Date for Employer under GAS 68	**June 30, 2018**	**June 30, 2017**
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Reconciliation of Net Pension Liability		
1. Beginning Net Pension Liability	$72,491,195	$80,736,003
2. Pension Expense	8,478,887	10,682,681
3. Employer Contributions[1]	(18,466,152)	(17,495,554)
4. New Net Deferred Inflows/Outflows	(23,114,975)	(1,089,573)
5. Change in Allocation of Prior Deferred Inflows/Outflows	1,099,045	(344,123)
6. New Net Deferred Flows Due to Change in Proportion[2]	6,183,329	(306,153)
7. Recognition of Prior Deferred Inflows/Outflows	(2,301,267)	(2,346,363)
8. Recognition of Prior Deferred Flows Due to Change in Proportion[2]	2,740,034	2,654,277
9. Ending Net Pension Liability	$47,110,096	$72,491,195

(1) *Includes "member subvention of employer contributions" and excludes "employer subvention of member contributions".*

(2) *Includes differences between employer contributions and proportionate share of contributions.*

EXHIBIT 11 (continued)

Schedule of Reconciliation of Net Pension Liability: 17 - Court

Reporting Date for Employer under GAS 68	**June 30, 2018**	**June 30, 2017**
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Reconciliation of Net Pension Liability		
1. Beginning Net Pension Liability	$27,158,829	$30,250,828
2. Pension Expense	3,206,804	6,229,830
3. Employer Contributions[1]	(7,181,547)	(7,377,185)
4. New Net Deferred Inflows/Outflows	(6,185,321)	(408,208)
5. Change in Allocation of Prior Deferred Inflows/Outflows	(663,752)	(129,411)
6. New Net Deferred Flows Due to Change in Proportion[2]	(1,912,050)	525,774
7. Recognition of Prior Deferred Inflows/Outflows	(615,794)	(879,065)
8. Recognition of Prior Deferred Flows Due to Change in Proportion[2]	(1,201,010)	(1,053,734)
9. Ending Net Pension Liability	$12,606,159	$27,158,829

[1] *Includes "member subvention of employer contributions" and excludes "employer subvention of member contributions".*

[2] *Includes differences between employer contributions and proportionate share of contributions.*

EXHIBIT 11 (continued)

Schedule of Reconciliation of Net Pension Liability: 18 - DDSD (Term)

Reporting Date for Employer under GAS 68	**June 30, 2018**	**June 30, 2017**
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Reconciliation of Net Pension Liability		
1. Beginning Net Pension Liability	$1,918,215	N/A
2. Pension Expense	77,870	$1,918,215
3. Employer Contributions[1]	(221,489)	N/A[2]
4. New Net Deferred Inflows/Outflows	(339,339)	N/A
5. Change in Allocation of Prior Deferred Inflows/Outflows	0	N/A
6. New Net Deferred Flows Due to Change in Proportion[3]	0	N/A
7. Recognition of Prior Deferred Inflows/Outflows	0	N/A
8. Recognition of Prior Deferred Flows Due to Change in Proportion[3]	0	N/A
9. Ending Net Pension Liability	$1,435,257	$1,918,215

[1] *Includes "member subvention of employer contributions" and excludes "employer subvention of member contributions".*

[2] *Since the December 31, 2016 measurement date is the effective date for separating the NPL for Delta Diablo Sanitation District from Cost Group #1, the employer contribution of $221,489 made by Delta Diablo Sanitation District during 2016 has been allocated to other employers.*

[3] *Includes differences between employer contributions and proportionate share of contributions.*

EXHIBIT 11 (continued)

Schedule of Reconciliation of Net Pension Liability: 19 - DWD (Term)

Reporting Date for Employer under GAS 68	**June 30, 2018**	**June 30, 2017**
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Reconciliation of Net Pension Liability		
1. Beginning Net Pension Liability	$823,144	N/A
2. Pension Expense	77,096	$823,144
3. Employer Contributions(1)	(94,668)	N/A(2)
4. New Net Deferred Inflows/Outflows	21,948	N/A
5. Change in Allocation of Prior Deferred Inflows/Outflows	0	N/A
6. New Net Deferred Flows Due to Change in Proportion(3)	0	N/A
7. Recognition of Prior Deferred Inflows/Outflows	0	N/A
8. Recognition of Prior Deferred Flows Due to Change in Proportion(3)	0	N/A
9. Ending Net Pension Liability	$827,520	$823,144

(1) *Includes "member subvention of employer contributions" and excludes "employer subvention of member contributions".*

(2) *Since the December 31, 2016 measurement date is the effective date for separating the NPL for Diablo Water District from Cost Group #1, the employer contribution of $56,393 made by Diablo Water District during 2016 has been allocated to other employers.*

(3) *Includes differences between employer contributions and proportionate share of contributions.*

EXHIBIT 11 (continued)

Schedule of Reconciliation of Net Pension Liability: 20 - Pittsburg (Term)

Reporting Date for Employer under GAS 68	**June 30, 2018**	**June 30, 2017**
Measurement Date for Employer under GAS 68	**December 31, 2017**	**December 31, 2016**
Reconciliation of Net Pension Liability		
1. Beginning Net Pension Liability	$6,888,327	N/A
2. Pension Expense	(8,086)	$6,888,327
3. Employer Contributions[1]	(773,523)	N/A[2]
4. New Net Deferred Inflows/Outflows	(1,907,638)	N/A
5. Change in Allocation of Prior Deferred Inflows/Outflows	0	N/A
6. New Net Deferred Flows Due to Change in Proportion[3]	0	N/A
7. Recognition of Prior Deferred Inflows/Outflows	0	N/A
8. Recognition of Prior Deferred Flows Due to Change in Proportion[3]	0	N/A
9. Ending Net Pension Liability	$4,199,080	$6,888,327

[1] *Includes "member subvention of employer contributions" and excludes "employer subvention of member contributions".*

[2] *Since the December 31, 2016 measurement date is the effective date for separating the NPL for City of Pittsburg from Cost Groups #1, #2 and #7, the employer contribution of $1,306,656 made by City of Pittsburg during 2016 has been allocated to other employers.*

[3] *Includes differences between employer contributions and proportionate share of contributions.*

EXHIBIT 12

Schedule of Recognition of Changes in Total Net Pension Liability

Increase (Decrease) in Pension Expense Arising from the Recognition of the Effects of Differences between Expected and Actual Experience on Total Pension Liability

Reporting Date for Employer under GAS 68 Year Ended June 30	Differences between Expected and Actual Experience	Recognition Period (Years)	Reporting Date for Employer under GAS 68 Year Ended June 30: 2015	2016	2017	2018	2019	2020	2021	2022
2015	$(183,604,761)	4.60	$(39,914,078)	$(39,914,078)	$(39,914,078)	$(39,914,078)	$(23,948,449)	$0	$0	$0
2016	(62,117,935)	4.52	N/A	(13,742,906)	(13,742,906)	(13,742,906)	(13,742,906)	(7,146,311)	0	0
2017	(19,957,982)	4.57	N/A	N/A	(4,367,173)	(4,367,173)	(4,367,173)	(4,367,173)	(2,489,290)	0
2018	(29,192,221)	4.58	N/A	N/A	N/A	(6,373,848)	(6,373,848)	(6,373,848)	(6,373,848)	(3,696,829)
Net increase (decrease) in pension expense			$(39,914,078)	$(53,656,984)	$(58,024,157)	$(64,398,005)	$(48,432,376)	$(17,887,332)	$(8,863,138)	$(3,696,829)

Increase (Decrease) in Pension Expense Arising from the Recognition of the Effects of Differences between Expected and Actual Experience on Total Pension Liability

Reporting Date for Employer under GAS 68 Year Ended June 30	Differences between Expected and Actual Experience	Recognition Period (Years)	Reporting Date for Employer under GAS 68 Year Ended June 30: 2023	2024	2025	2026	2027	2028	2029	2030
2015	$(183,604,761)	4.60	$0	$0	$0	$0	$0	$0	$0	$0
2016	(62,117,935)	4.52	0	0	0	0	0	0	0	0
2017	(19,957,982)	4.57	0	0	0	0	0	0	0	0
2018	(29,192,221)	4.58	0	0	0	0	0	0	0	0
Net increase (decrease) in pension expense			$0	$0	$0	$0	$0	$0	$0	$0

As described in Exhibit 9, for the current period, the average of the expected remaining service lives of all employees that are provided with pensions through CCCERA (active and inactive employees) determined as of December 31, 2016 (the beginning of the measurement period ending December 31, 2017) is 4.58 years.

EXHIBIT 12

Schedule of Recognition of Changes in Total Net Pension Liability

Increase (Decrease) in Pension Expense Arising from the Recognition of the Effects of Assumption Changes

Reporting Date for Employer under GAS 68 Year Ended June 30	Effects of Assumption Changes	Recognition Period (Years)	Reporting Date for Employer under GAS 68 Year Ended June 30: 2015	2016	2017	2018	2019	2020	2021	2022
2015	$(75,608)	4.60	$(16,437)	$(16,437)	$(16,437)	$(16,437)	$(9,860)	$0	$0	$0
2016	72,186,307	4.52	N/A	15,970,422	15,970,422	15,970,422	15,970,422	8,304,619	0	0
2017	0	4.57	N/A	N/A	0	0	0	0	0	0
2018	0	4.58	N/A	N/A	N/A	0	0	0	0	0
Net increase (decrease) in pension expense			$(16,437)	$15,953,985	$15,953,985	$15,953,985	$15,960,562	$8,304,619	$0	$0

Increase (Decrease) in Pension Expense Arising from the Recognition of the Effects of Assumption Changes

Reporting Date for Employer under GAS 68 Year Ended June 30	Effects of Assumption Changes	Recognition Period (Years)	Reporting Date for Employer under GAS 68 Year Ended June 30: 2023	2024	2025	2026	2027	2028	2029	2030
2015	$(75,608)	4.60	$0	$0	$0	$0	$0	$0	$0	$0
2016	72,186,307	4.52	0	0	0	0	0	0	0	0
2017	0	4.57	0	0	0	0	0	0	0	0
2018	0	4.58	0	0	0	0	0	0	0	0
Net increase (decrease) in pension expense			$0	$0	$0	$0	$0	$0	$0	$0

As described in Exhibit 9, for the current period, the average of the expected remaining service lives of all employees that are provided with pensions through CCCERA (active and inactive employees) determined as of December 31, 2016 (the beginning of the measurement period ending December 31, 2017) is 4.58 years.

EXHIBIT 12 (continued)

Schedule of Recognition of Changes in Total Net Pension Liability

Increase (Decrease) in Pension Expense Arising from the Recognition of Differences between Projected and Actual Earnings on Pension Plan Investments

Reporting Date for Employer under GAS 68 Year Ended June 30	Differences between Projected and Actual Earnings	Recognition Period (Years)	Reporting Date for Employer under GAS 68 Year Ended June 30: 2015	2016	2017	2018	2019	2020	2021	2022
2015	$(13,358,454)	5.00	$(2,671,691)	$(2,671,691)	$(2,671,691)	$(2,671,691)	$(2,671,690)	$0	$0	$0
2016	426,961,542	5.00	N/A	85,392,308	85,392,308	85,392,308	85,392,308	85,392,310	0	0
2017	(6,642,338)	5.00	N/A	N/A	(1,328,468)	(1,328,468)	(1,328,468)	(1,328,468)	(1,328,466)	0
2018	(467,968,086)	5.00	N/A	N/A	N/A	(93,593,617)	(93,593,617)	(93,593,617)	(93,593,617)	(93,593,618)
Net increase (decrease) in pension expense			$(2,671,691)	$82,720,617	$81,392,149	$(12,201,468)	$(12,201,467)	$(9,529,775)	$(94,922,083)	$(93,593,618)

Increase (Decrease) in Pension Expense Arising from the Recognition of Differences between Projected and Actual Earnings on Pension Plan Investments

Reporting Date for Employer under GAS 68 Year Ended June 30	Differences between Projected and Actual Earnings	Recognition Period (Years)	Reporting Date for Employer under GAS 68 Year Ended June 30: 2023	2024	2025	2026	2027	2028	2029	2030
2015	$(13,358,454)	5.00	$0	$0	$0	$0	$0	$0	$0	$0
2016	426,961,542	5.00	0	0	0	0	0	0	0	0
2017	(6,642,338)	5.00	0	0	0	0	0	0	0	0
2018	(467,968,086)	5.00	0	0	0	0	0	0	0	0
Net increase (decrease) in pension expense			0	0	$0	$0	$0	$0	$0	$0

The differences between projected and actual earnings on pension plan investments are recognized over a five-year period per Paragraph 33b. of GAS 68.

EXHIBIT 12 (continued)

Schedule of Recognition of Changes in Total Net Pension Liability

Total Increase (Decrease) in Pension Expense

Reporting Date for Employer under GAS 68 Year Ended June 30:

Reporting Date for Employer under GAS 68 Year Ended June 30	Total Differences	2015	2016	2017	2018	2019	2020	2021	2022
2015	$(197,038,823)	$(42,602,206)	$(42,602,206)	$(42,602,206)	$(42,602,206)	$(26,629,999)	$0	$0	$0
2016	437,029,914	N/A	87,619,824	87,619,824	87,619,824	87,619,824	86,550,618	0	0
2017	(26,600,320)	N/A	N/A	(5,695,641)	(5,695,641)	(5,695,641)	(5,695,641)	(3,817,756)	0
2018	(497,160,307)	N/A	N/A	N/A	(99,967,465)	(99,967,465)	(99,967,465)	(99,967,465)	(97,290,447)
Net increase (decrease) in pension expense		$(42,602,206)	$45,017,618	$39,321,977	$(60,645,488)	$(44,673,281)	$(19,112,488)	$(103,785,221)	$(97,290,447)

Total Increase (Decrease) in Pension Expense

Reporting Date for Employer under GAS 68 Year Ended June 30:

Reporting Date for Employer under GAS 68 Year Ended June 30	Total Differences	2023	2024	2025	2026	2027	2028	2029	2030
2015	$(197,038,823)	$0	$0	$0	$0	$0	$0	$0	$0
2016	437,029,914	0	0	0	0	0	0	0	0
2017	(26,600,320)	0	0	0	0	0	0	0	0
2018	(497,160,307)	0	0	0	0	0	0	0	0
Net increase (decrease) in pension expense		$0	$0	$0	$0	$0	$0	$0	$0

EXHIBIT 13

Allocation of Changes in Total Net Pension Liability

In addition to the amounts shown in Exhibit 12, there are changes in each employer's proportionate share of the total Net Pension Liability (NPL) during the measurement period ending on December 31, 2017. The net effect of the change in the employer's proportionate share of the collective NPL and collective deferred outflows of resources and deferred inflows of resources is also recognized over the average of the expected remaining service lives of all employees shown previously. The difference between the actual employer contributions and the proportionate share of the employer contributions during the measurement period ending on December 31, 2017 is recognized over the same period. These amounts are shown on the following page, with the corresponding amounts for the measurement periods ending on December 31, 2016, December 31, 2015 and December 31, 2014 shown on the pages after that. While these amounts are different for each employer, they sum to zero over the entire CCCERA.

EXHIBIT 13 (continued)

Allocation of Changes in Total Net Pension Liability

Increase (Decrease) in Pension Expense Arising from the Recognition of the Effects of the Change in Proportion and Change in Employer Contributions for the Year Ended December 31, 2017

	Total Change to be Recognized	Recognition Period (Years)	Reporting Date for Employer under GAS 68 Year Ended June 30: 2018	2019	2020	2021	2022	Thereafter
1 - BIMID	$120,624	4.58	$26,337	$26,337	$26,337	$26,337	$15,276	$0
2 - Union Cemetery	9,040	4.58	1,974	1,974	1,974	1,974	1,144	0
3 - CC Mosquito	131,272	4.58	28,662	28,662	28,662	28,662	16,624	0
4 - CCCFPD	2,640,754	4.58	576,584	576,584	576,584	576,584	334,418	0
5 - CCCSD	12,643,130	4.58	2,760,509	2,760,509	2,760,509	2,760,509	1,601,094	0
6 - First 5	(19,429)	4.58	(4,242)	(4,242)	(4,242)	(4,242)	(2,461)	0
7 - County	(29,465,507)	4.58	(6,433,519)	(6,433,519)	(6,433,519)	(6,433,519)	(3,731,431)	0
8 - CCCERA (the employer)	899,167	4.58	196,325	196,325	196,325	196,325	113,867	0
9 - ECCFPD	1,593,925	4.58	348,019	348,019	348,019	348,019	201,849	0
10 - Housing Authority	291,703	4.58	63,691	63,691	63,691	63,691	36,939	0
11 - IHSS	75,909	4.58	16,574	16,574	16,574	16,574	9,613	0
12 - LAFCO	7,779	4.58	1,698	1,698	1,698	1,698	987	0
13 - MOFD	3,112,251	4.58	679,531	679,531	679,531	679,531	394,127	0
14 - Rodeo SD	110,679	4.58	24,166	24,166	24,166	24,166	14,015	0
15 - RHFD	2,384,329	4.58	520,596	520,596	520,596	520,596	301,945	0
16 - SRVFPD	7,910,516	4.58	1,727,187	1,727,187	1,727,187	1,727,187	1,001,768	0
17 - Court	(2,446,142)	4.58	(534,092)	(534,092)	(534,092)	(534,092)	(309,774)	0
18 - DDSD (Term)	0	4.58	0	0	0	0	0	0
19 - DWD (Term)	0	4.58	0	0	0	0	0	0
20 - Pittsburg (Term)	0	4.58	0	0	0	0	0	0
Total for all Employers	$0		$0	$0	$0	$0	$0	$0

EXHIBIT 13 (continued)

Allocation of Changes in Total Net Pension Liability

The corresponding amounts for the measurement period ending December 31, 2016 are as follows:

Increase (Decrease) in Pension Expense Arising from the Recognition of the Effects of the Change in Proportion and Change in Employer Contributions for the Year Ended December 31, 2016

	Total Change to be Recognized	Recognition Period (Years)	Reporting Date for Employer under GAS 68 Year Ended June 30: 2017	2018	2019	2020	2021	Thereafter
1 - BIMID	$35,083	4.57	$7,677	$7,677	$7,677	$7,677	$4,375	$0
2 - Union Cemetery	(10,332)	4.57	(2,261)	(2,261)	(2,261)	(2,261)	(1,288)	0
3 - CC Mosquito	59,374	4.57	12,992	12,992	12,992	12,992	7,406	0
4 - CCCFPD	(6,691,460)	4.57	(1,464,214)	(1,464,214)	(1,464,214)	(1,464,214)	(834,604)	0
5 - CCCSD	1,498,104	4.57	327,813	327,813	327,813	327,813	186,852	0
6 - First 5	194,082	4.57	42,469	42,469	42,469	42,469	24,206	0
7 - County	10,141,906	4.57	2,219,235	2,219,235	2,219,235	2,219,235	1,264,966	0
8 - CCCERA (the employer)	43,988	4.57	9,625	9,625	9,625	9,625	5,488	0
9 - ECCFPD	542,014	4.57	118,603	118,603	118,603	118,603	67,602	0
10 - Housing Authority	118,077	4.57	25,837	25,837	25,837	25,837	14,729	0
11 - IHSS	111,579	4.57	24,416	24,416	24,416	24,416	13,915	0
12 - LAFCO	1,784	4.57	390	390	390	390	224	0
13 - MOFD	(5,669,733)	4.57	(1,240,642)	(1,240,642)	(1,240,642)	(1,240,642)	(707,165)	0
14 - Rodeo SD	(24,901)	4.57	(5,449)	(5,449)	(5,449)	(5,449)	(3,105)	0
15 - RHFD	(630,705)	4.57	(138,010)	(138,010)	(138,010)	(138,010)	(78,665)	0
16 - SRVFPD	(391,910)	4.57	(85,757)	(85,757)	(85,757)	(85,757)	(48,882)	0
17 - Court	673,050	4.57	147,276	147,276	147,276	147,276	83,946	0
18 - DDSD (Term)	0	4.57	0	0	0	0	0	0
19 - DWD (Term)	0	4.57	0	0	0	0	0	0
20 - Pittsburg (Term)	0	4.57	0	0	0	0	0	0
Total for all Employers	$0		$0	$0	$0	$0	$0	$0

EXHIBIT 13 (continued)

Allocation of Changes in Total Net Pension Liability

The corresponding amounts for the measurement period ending December 31, 2015 are as follows:

Increase (Decrease) in Pension Expense Arising from the Recognition of the Effects of the Change in Proportion and Change in Employer Contributions for the Year Ended December 31, 2015

	Total Change to be Recognized	Recognition Period (Years)	Reporting Date for Employer under GAS 68 Year Ended June 30: 2016	2017	2018	2019	2020	Thereafter
1 - BIMID	$(24,788)	4.52	$(5,484)	$(5,484)	$(5,484)	$(5,484)	$(2,852)	$0
2 - Union Cemetery	96,986	4.52	21,457	21,457	21,457	21,457	11,158	0
3 - CC Mosquito	(519,791)	4.52	(114,998)	(114,998)	(114,998)	(114,998)	(59,799)	0
4 - CCCFPD	10,720,472	4.52	2,371,786	2,371,786	2,371,786	2,371,786	1,233,328	0
5 - CCCSD	(15,863,756)	4.52	(3,509,681)	(3,509,681)	(3,509,681)	(3,509,681)	(1,825,032)	0
6 - First 5	387,179	4.52	85,659	85,659	85,659	85,659	44,543	0
7 - County	23,188,647	4.52	5,130,230	5,130,230	5,130,230	5,130,230	2,667,727	0
8 - CCCERA (the employer)	(80,571)	4.52	(17,825)	(17,825)	(17,825)	(17,825)	(9,271)	0
9 - ECCFPD	(8,485,858)	4.52	(1,877,402)	(1,877,402)	(1,877,402)	(1,877,402)	(976,250)	0
10 - Housing Authority	(93,307)	4.52	(20,643)	(20,643)	(20,643)	(20,643)	(10,735)	0
11 - IHSS	146	4.52	32	32	32	32	18	0
12 - LAFCO	(35,809)	4.52	(7,922)	(7,922)	(7,922)	(7,922)	(4,121)	0
13 - MOFD	(1,149,167)	4.52	(254,240)	(254,240)	(254,240)	(254,240)	(132,207)	0
14 - Rodeo SD	253,152	4.52	56,007	56,007	56,007	56,007	29,124	0
15 - RHFD	(2,668,492)	4.52	(590,374)	(590,374)	(590,374)	(590,374)	(306,996)	0
16 - SRVFPD	(8,350,466)	4.52	(1,847,448)	(1,847,448)	(1,847,448)	(1,847,448)	(960,674)	0
17 - Court	2,625,423	4.52	580,846	580,846	580,846	580,846	302,039	0
Total for all Employers	$0		$0	$0	$0	$0	$0	$0

EXHIBIT 13 (continued)

Allocation of Changes in Total Net Pension Liability

The corresponding amounts for the measurement period ending December 31, 2014 are as follows:

Increase (Decrease) in Pension Expense Arising from the Recognition of the Effects of the Change in Proportion and Change in Employer Contributions for the Year Ended December 31, 2014

	Total Change to be Recognized	Recognition Period (Years)	Reporting Date for Employer under GAS 68 Year Ended June 30: 2015	2016	2017	2018	2019	Thereafter
1 - BIMID	$1,524	4.60	$331	$331	$331	$331	$200	$0
2 - Union Cemetery	51,442	4.60	11,183	11,183	11,183	11,183	6,710	0
3 - CC Mosquito	35,280	4.60	7,670	7,670	7,670	7,670	4,600	0
4 - CCCFPD	(10,738,204)	4.60	(2,334,392)	(2,334,392)	(2,334,392)	(2,334,392)	(1,400,636)	0
5 - CCCSD	2,454,113	4.60	533,503	533,503	533,503	533,503	320,101	0
6 - First 5	109,167	4.60	23,732	23,732	23,732	23,732	14,239	0
7 - County	17,444,777	4.60	3,792,342	3,792,342	3,792,342	3,792,342	2,275,409	0
8 - CCCERA (the employer)	2,702	4.60	587	587	587	587	354	0
9 - ECCFPD	(2,637,637)	4.60	(573,399)	(573,399)	(573,399)	(573,399)	(344,041)	0
10 - Housing Authority	(33,231)	4.60	(7,224)	(7,224)	(7,224)	(7,224)	(4,335)	0
11 - IHSS	(11,172)	4.60	(2,429)	(2,429)	(2,429)	(2,429)	(1,456)	0
12 - LAFCO	8,360	4.60	1,817	1,817	1,817	1,817	1,092	0
13 - MOFD	(2,948,394)	4.60	(640,955)	(640,955)	(640,955)	(640,955)	(384,574)	0
14 - Rodeo SD	147,589	4.60	32,085	32,085	32,085	32,085	19,249	0
15 - RHFD	(2,350,185)	4.60	(510,910)	(510,910)	(510,910)	(510,910)	(306,545)	0
16 - SRVFPD	(3,711,415)	4.60	(806,829)	(806,829)	(806,829)	(806,829)	(484,099)	0
17 - Court	2,175,284	4.60	472,888	472,888	472,888	472,888	283,732	0
Total for all Employers	$0		$0	$0	$0	$0	$0	$0

Actuarial Assumptions and Methods
For December 31, 2017 Measurement Date and Employer Reporting as of June 30, 2018

Rationale for Assumptions: The information and analysis used in selecting each demographic (non-economic) assumption that has a significant effect on this actuarial valuation is shown in the January 1, 2012 through December 31, 2014 Actuarial Experience Study dated June 1, 2016. The information and analysis used in selecting each economic assumption is shown in our Review of Economic Actuarial Assumptions dated April 19, 2016. Unless otherwise noted, all actuarial assumptions and methods shown below apply to both PEPRA and Non-PEPRA members.

Economic Assumptions

Net Investment Return: 7.00%, net of investment expenses

Administration Expenses: 1.13% of payroll allocated to both the employer and the member based on normal cost (before expenses) for the employer and member. This assumption changes each year based on the actual administrative expenses as a percent of actual compensation during the calendar year leading up to the valuation date.

Employee Contribution Crediting Rate: 7.00%, compounded semi-annually

Consumer Price Index: Increase of 2.75% per year; retiree COLA increases due to CPI subject to a 3.00% maximum change per year (valued as a 2.75% increase) except for Tier 3 and PEPRA Tier 5 disability benefits and Tier 2 benefits which are subject to a 4.00% maximum change per year (valued as a 2.75% increase). Safety Tier C benefits, Safety PEPRA Tier E benefits and benefits for PEPRA Tier 4 and Tier 5 members covered under certain memoranda of understanding are subject to a 2.00% maximum change per year. For members that have COLA banks, they are reflected in projected future COLA's.

Payroll Growth: Inflation of 2.75% per year plus "across the board" real salary increases of 0.50% per year.

Increase in Internal Revenue Code Section 401(a)(17) Compensation Limit: Increase of 2.75% per year from the valuation date.

Increase in Section 7522.10 Compensation Limit: Increase of 2.75% per year from the valuation date.

Individual Salary Increases:

Annual Rate of Compensation Increase

Inflation: 2.75% per year, plus "across the board" salary increases of 0.50% per year, plus the following merit and promotional increases:

Years of Service	General	Safety
Less than 1	10.00%	10.50%
1	7.25	7.25
2	5.25	5.75
3	3.75	4.50
4	2.75	3.00
5	2.25	1.75
6	1.75	1.25
7	1.50	1.20
8	1.25	1.15
9	1.20	1.10
10	1.15	1.05
11	1.10	1.00
12	1.00	0.95
13	0.90	0.85
14	0.80	0.80
15	0.75	0.75
16	0.75	0.75
17	0.75	0.75
18	0.75	0.75
19	0.75	0.75
20 or more	0.75	0.75

Demographic Assumptions

Post – Retirement Mortality Rates:

Healthy:	For General Members: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table, projected generationally with the two-dimensional MP-2015 projection scale. For Safety Members: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table set back three years, projected generationally with the two-dimensional MP-2015 projection scale.
Disabled:	For General Members: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table set forward eight years, projected generationally with the two-dimensional MP-2015 projection scale. For Safety Members: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table set forward three years, projected generationally with the two-dimensional MP-2015 projection scale.
Beneficiaries:	Beneficiaries are assumed to have the same mortality as a General Member of the opposite sex who has taken a service (non-disability) retirement.

The RP-2014 mortality tables and adjustments as shown above reflect the mortality experience as of the measurement date. The generational projection is a provision for future mortality improvement.

Member Contribution Rates: For General Members: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table, projected to 2034 with the two-dimensional MP-2015 projection scale, weighted 30% male and 70% female.

For Safety Members: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table set back three years, projected to 2034 with the two-dimensional MP-2015 projection scale, weighted 85% male and 15% female.

Pre – Retirement Mortality Rates: Headcount-Weighted RP-2014 Employee Mortality Table times 75%, projected generationally with the two-dimensional MP-2015 projection scale.

Termination Rates Before Retirement:

	Rate (%) Mortality[1]	
Age	**Male**	**Female**
25	0.05	0.02
30	0.05	0.02
35	0.05	0.03
40	0.06	0.04
45	0.09	0.06
50	0.16	0.10
55	0.26	0.16
60	0.42	0.23
65	0.73	0.33

(1) All pre-retirement deaths are assumed to be non-service connected. Note that generational projections beyond the base year (2014) are not reflected in the above mortality rates.

Termination Rates Before Retirement (continued):

	Rate (%)		
	Disability		
Age	General Tier 1 and Tier 4[(1)]	General Tier 3 and Tier 5[(2)]	Safety[(3)]
20	0.01	0.01	0.02
25	0.02	0.02	0.22
30	0.04	0.03	0.42
35	0.08	0.05	0.56
40	0.22	0.08	0.66
45	0.36	0.13	1.00
50	0.52	0.16	2.88
55	0.60	0.20	4.60
60	0.60	0.28	5.00
65	0.60	0.32	5.00
70	0.60	0.32	5.00

(1) 65% of General Tier 1 and Tier 4 disabilities are assumed to be duty disabilities. The other 35% are assumed to be ordinary disabilities.

(2) 30% of General Tier 3 and Tier 5 disabilities are assumed to be duty disabilities. The other 70% are assumed to be ordinary disabilities.

(3) 100% of Safety disabilities are assumed to be duty disabilities.

Termination Rates Before Retirement (continued):

	Rate (%) Withdrawal[1]	
Years of Service	**General**	**Safety**
Less than 1	13.50	13.00
1	9.25	8.00
2	9.00	7.00
3	6.00	5.50
4	4.50	3.75
5	4.25	3.25
6	3.75	3.00
7	3.50	2.75
8	3.25	2.50
9	3.00	2.25
10	2.75	2.00
11	2.50	1.90
12	2.40	1.80
13	2.30	1.70
14	2.20	1.60
15	2.10	1.50
16	2.00	1.40
17	2.00	1.30
18	2.00	1.20
19	1.75	1.10
20 or more	1.50	1.00

(1) The member is assumed to receive the greater of the member's contribution balance or a deferred retirement benefit. No withdrawal is assumed after a member is first assumed to retire.

Retirement Rates (General):

	Rate (%)			
Age	**General Tier 1 (Enhanced)**	**General Tier 3 (Enhanced)**	**General Tier 1 (Non-enhanced)**	**PEPRA General Tiers 4 and 5**
50	5.00	4.00	3.00	0.00
51	4.00	3.00	3.00	0.00
52	5.00	3.00	3.00	2.00
53	5.00	5.00	3.00	3.00
54	14.00	6.00	3.00	3.00
55	20.00	10.00	10.00	5.00
56	20.00	10.00	10.00	5.00
57	20.00	10.00	10.00	6.00
58	20.00	12.00	10.00	8.00
59	25.00	13.00	10.00	9.00
60	28.00	15.00	25.00	10.00
61	35.00	20.00	15.00	14.00
62	35.00	25.00	40.00	20.00
63	30.00	25.00	35.00	20.00
64	30.00	30.00	30.00	20.00
65	35.00	35.00	40.00	25.00
66	40.00	35.00	35.00	30.00
67	40.00	35.00	35.00	30.00
68	40.00	35.00	35.00	30.00
69	40.00	35.00	35.00	30.00
70	50.00	40.00	50.00	50.00
71	50.00	40.00	50.00	50.00
72	50.00	40.00	50.00	50.00
73	50.00	40.00	50.00	50.00
74	50.00	40.00	50.00	50.00
75	100.00	100.00	100.00	100.00

Retirement Rates (Safety):

	Rate (%)			
Age	**Safety Tier A (Enhanced)**	**Safety Tier C (Enhanced)**	**Safety Tier A (Non-enhanced)**	**PEPRA Safety Tiers D and E**
45	4.00	2.00	0.00	0.00
46	3.00	1.00	0.00	0.00
47	10.00	4.00	0.00	0.00
48	10.00	4.00	0.00	0.00
49	25.00	12.00	0.00	0.00
50	30.00	18.00	5.00	5.00
51	30.00	18.00	4.00	4.00
52	25.00	15.00	4.00	4.00
53	25.00	15.00	5.00	5.00
54	25.00	15.00	8.00	6.00
55	28.00	18.00	10.00	10.00
56	25.00	15.00	10.00	10.00
57	25.00	15.00	12.00	18.00
58	35.00	25.00	18.00	18.00
59	35.00	25.00	20.00	18.00
60	35.00	30.00	20.00	18.00
61	35.00	30.00	20.00	20.00
62	35.00	30.00	20.00	20.00
63	35.00	30.00	20.00	20.00
64	50.00	40.00	100.00	30.00
65	100.00	100.00	100.00	30.00
66	100.00	100.00	100.00	100.00

Retirement Age and Benefit for Deferred Vested Members:	For deferred vested benefits, we make the following retirement assumption: General: Age 59 Safety: Age 54 We assume that 40% and 65% of future General and Safety deferred vested members, respectively, will continue to work for a reciprocal employer. For reciprocals, we assume 4.75% compensation increases per annum.
Future Benefit Accruals:	1.0 year of service per year for full-time employees. Continuation of current partial service accrual for part-time employees.
Unknown Data for Members:	Same as those exhibited by members with similar known characteristics. If not specified, members are assumed to be male.
Percent Married:	75% of male members and 50% of female members are assumed to be married at pre-retirement death or retirement. There is no explicit assumption for children's benefits.
Age of Spouse:	Male retirees are 3 years older than their spouses, and Female retirees are 2 years younger than their spouses.
Offsets by Other Plans of the Employer for Disability Benefits:	The Plan requires members who retire because of disability from General Tier 3 and PEPRA General Tier 5 to offset the Plan's disability benefits with other Plans of the employer. We have not assumed any offsets in this valuation.

Leave Cashout Assumptions:

The following assumptions for leave cashouts as a percentage of final average pay are used:

General Tiers 1, 2 and 3
Safety Tiers A and C

Cost Group 1:	1.25%
Cost Group 2:	0.50% for Tier 2 1.00% for Tier 3
Cost Group 3:	5.50%
Cost Group 4:	0.50%
Cost Group 5:	1.00%
Cost Group 6:	0.75%
Cost Group 7:	1.00%
Cost Group 8:	0.75%
Cost Group 9:	0.00%
Cost Group 10:	1.00%
Cost Group 11:	2.50%
Cost Group 12:	2.50%

The cost of this pay element is recognized in the valuation as an employer and member cost in both basic and COLA components.

PEPRA General Tiers 4 and 5
PEPRA Safety Tiers D and E

None

Service From Accumulated Sick Leave Conversion:

The following assumptions for service converted from accumulated sick leave as a percentage of service at retirement are used:

Service Retirements:

General:	1.20%
Safety:	1.90%

Disability Retirements:

General:	0.08%
Safety:	1.30%

Pursuant to Section 31641.01, the cost of this benefit for the non-PEPRA tiers will be charged only to employers and will not affect member contribution rates.

Actuarial Methods

Actuarial Cost Method:	Entry Age Actuarial Cost Method. Entry Age is calculated as age on the valuation date minus years of service. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are based on costs allocated as a level percentage of compensation.
Expected Remaining Service Lives:	The average of the expected service lives of all employees is determined by: • Calculating each active employee's expected remaining service life as the present value of $1 per year of future service at zero percent interest. • Setting the remaining service life to zero for each nonactive or retired member. • Dividing the sum of the above amounts by the total number of active employee, nonactive and retired members.

Changes in Actuarial Assumptions and Methods:	The following assumptions was changed. Previously, this assumption was as follows:
Administration Expenses:	1.12% of payroll allocated to both the employer and the member based on normal cost (before expenses) for the employer and member. This assumption changes each year based on the actual administrative expenses as a percent of actual compensation during the calendar year leading up to the valuation date.

APPENDIX A

Projection of Plan's Fiduciary Net Position for Use in Calculation of Discount Rate as of December 31, 2017 ($ in millions)

Year Beginning January 1	Projected Beginning Plan's Fiduciary Net Position (a)	Projected Total Contributions (b)	Projected Benefit Payments (c)	Projected Administrative Expenses (d)	Projected Investment Earnings (e)	Projected Ending Plan's Fiduciary Net Position (f) = (a) + (b) - (c) - (d) + (e)
2017	$7,439	$411	$438	$9	$987	$8,391
2018	8,391	353	475	8	583	8,844
2019	8,844	347	499	8	614	9,298
2020	9,298	344	524	7	644	9,755
2021	9,755	335	549	7	675	10,209
2022	10,209	322	575	7	706	10,655
2023	10,655	234	602	6	733	11,014
2024	11,014	227	628	6	757	11,364
2025	11,364	221	655	6	780	11,705
2026	11,705	216	681	5	803	12,038
2042	13,757	34	1,007	2	929	13,712
2043	13,712	30	1,017	2	926	13,649
2044	13,649	26	1,026	1	921	13,568
2045	13,568	23	1,033	1	915	13,471
2046	13,471	19	1,038	1	908	13,359
2091	27,222	0	63	0	1,903	29,062
2092	29,062	0	52	0	2,033	31,043
2093	31,043	0	42	0	2,172	33,173
2094	33,173	0	33	0	2,321	35,461
2095	35,461	0	26	0	2,481	37,917
2127	308,312	0	0 *	0	21,582	329,894
2128	329,894					
2128	Discounted Value: 193 **					

* Less than $1 million, when rounded.

** $329,894 million when discounted with interest at the rate of 7.00% per annum has a value of $193 million as of December 31, 2017.

APPENDIX A (continued)

Projection of Plan's Fiduciary Net Position for Use in Calculation of Discount Rate as of December 31, 2017 ($ in millions)

Notes:

(1) Amounts may not total exactly due to rounding.

(2) Amounts shown in the year beginning January 1, 2017 row are actual amounts, based on the unaudited financial statements provided by CCCERA.

(3) Years 2027-2041, 2047-2090, and 2096-2126 have been omitted from this table.

(4) Column (a): Except for the "discounted value" shown for 2128, none of the projected beginning Plan's Fiduciary Net Position amounts shown have been adjusted for the time value of money.

(5) Column (b): Projected total contributions include member and employer normal cost rates applied to closed group projected payroll (based on covered active members as of December 31, 2016); plus employer contributions to the Unfunded Actuarial Accrued Liability; Contributions are assumed to occur halfway through the year, on average.

(6) Column (c): Projected benefit payments have been determined in accordance with paragraph 39 of GASB Statement No. 67, and are based on the closed group of active, inactive vested, retired members, and beneficiaries as of December 31, 2016. The projected benefit payments reflect the cost of living increase assumptions adopted for use in the December 31, 2017 valuation report and include projected benefits associated with the Post Retirement Death Benefit Reserve.

(7) Column (d): Projected administrative expenses are assumed to be 1.13% of closed group projected payroll and are assumed to occur halfway through the year, on average.

(8) Column (e): Projected investment earnings are based on the assumed investment rate of return of 7.00% per annum.

(9) As illustrated in this Exhibit, the Plan's Fiduciary Net Position was projected to be available to make all projected future benefit payments for current Plan members. In other words, there is no projected "cross-over date" when projected benefits are not covered by projected assets. Therefore, the long-term expected rate of return on Plan investments of 7.00% per annum was applied to all periods of projected benefit payments to determine the Total Pension Liability as of December 31, 2017 shown earlier in this report, pursuant to paragraph 44 of GASB Statement No. 67.

APPENDIX B

Glossary of Terms

Definitions of certain terms *as they are used in Statement 68;* the terms may have different meanings in other contexts.

Active employees
Individuals employed at the end of the reporting or measurement period, as applicable.

Actual contributions
Cash contributions recognized as additions to a Pension Plan's Fiduciary Net Position.

Actuarial present value of projected benefit payments
Projected benefit payments discounted to reflect the expected effects of the time value (present value) of money and the probabilities of payment.

Actuarial valuation
The determination, as of a point in time (the actuarial valuation date), of the service cost, Total Pension Liability, and related actuarial present value of projected benefit payments for pensions performed in conformity with Actuarial Standards of Practice unless otherwise specified by the GASB.

Actuarial valuation date
The date as of which an actuarial valuation is performed.

Actuarially determined contribution
A target or recommended contribution to a defined benefit pension plan for the reporting period, determined in conformity with Actuarial Standards of Practice based on the most recent measurement available when the contribution for the reporting period was adopted.

Ad hoc cost-of-living adjustments (ad hoc COLAs)
Cost-of-living adjustments that require a decision to grant by the authority responsible for making such decisions.

APPENDIX B (continued)

Glossary of Terms

Automatic cost-of-living adjustments (automatic COLAs)
Cost-of-living adjustments that occur without a requirement for a decision to grant by a responsible authority, including those for which the amounts are determined by reference to a specified experience factor (such as the earnings experience of the pension plan) or to another variable (such as an increase in the consumer price index).

Closed period
A specific number of years that is counted from one date and declines to zero with the passage of time. For example, if the recognition period initially is five years on a closed basis, four years remain after the first year, three years after the second year, and so forth.

Collective deferred outflows of resources and deferred inflows of resources related to pensions
Deferred outflows of resources and deferred inflows of resources related to pensions arising from certain changes in the collective Net Pension Liability.

Collective Net Pension Liability
The Net Pension Liability for benefits provided through (1) a cost-sharing pension plan or (2) a single-employer or agent pension plan in circumstances in which there is a special funding situation.

Collective pension expense
Pension expense arising from certain changes in the collective Net Pension Liability.

Contributions
Additions to a Pension Plan's Fiduciary Net Position for amounts from employers, nonemployer contributing entities (for example, state government contributions to a local government pension plan), or employees. Contributions can result from cash receipts by the pension plan or from recognition by the pension plan of a receivable from one of these sources.

Cost-of-living adjustments
Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.

Cost-sharing employer
An employer whose employees are provided with pensions through a cost-sharing multiple-employer defined benefit pension plan.

APPENDIX B (continued)

Glossary of Terms

Cost-sharing multiple-employer defined benefit pension plan (cost-sharing pension plan)
A multiple-employer defined benefit pension plan in which the pension obligations to the employees of more than one employer are pooled and pension plan assets can be used to pay the benefits of the employees of any employer that provides pensions through the pension plan.

Covered payroll
The payroll on which contributions to a pension plan are based.

Defined benefit pension plans
Pension plans that are used to provide defined benefit pensions.

Defined benefit pensions
Pensions for which the income or other benefits that the employee will receive at or after separation from employment are defined by the benefit terms. The pensions may be stated as a specified dollar amount or as an amount that is calculated based on one or more factors such as age, years of service, and compensation. (A pension that does not meet the criteria of a defined contribution pension is classified as a defined benefit pension for purposes of Statement 68.)

Defined contribution pension plans
Pension plans that are used to provide defined contribution pensions.

Defined contribution pensions
Pensions having terms that (1) provide an individual account for each employee; (2) define the contributions that an employer is required to make (or the credits that it is required to provide) to an active employee's account for periods in which that employee renders service; and (3) provide that the pensions an employee will receive will depend only on the contributions (or credits) to the employee's account, actual earnings on investments of those contributions (or credits), and the effects of forfeitures of contributions (or credits) made for other employees, as well as pension plan administrative costs, that are allocated to the employee's account.

APPENDIX B (continued)

Glossary of Terms

Discount rate
The single rate of return that, when applied to all projected benefit payments, results in an actuarial present value of projected benefit payments equal to the total of the following:

1. The actuarial present value of benefit payments projected to be made in future periods in which (a) the amount of the Pension Plan's Fiduciary Net Position is projected (under the requirements of Statement 68) to be greater than the benefit payments that are projected to be made in that period and (b) pension plan assets up to that point are expected to be invested using a strategy to achieve the long-term expected rate of return, calculated using the long-term expected rate of return on pension plan investments.

2. The actuarial present value of projected benefit payments not included in (1), calculated using the municipal bond rate.

Entry age actuarial cost method
A method under which the actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis over the earnings or service of the individual between entry age and assumed exit age(s). The portion of this actuarial present value allocated to a valuation year is called the *normal cost.* The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future normal costs is called the *actuarial accrued liability.*

Inactive employees
Terminated individuals that have accumulated benefits but are not yet receiving them, and retirees or their beneficiaries currently receiving benefits.

Measurement period
The period between the prior and the current measurement dates.

Multiple-employer defined benefit pension plan
A defined benefit pension plan that is used to provide pensions to the employees of more than one employer.

APPENDIX B (continued)

Glossary of Terms

Net Pension Liability
The liability of employers and nonemployer contributing entities to employees for benefits provided through a defined benefit pension plan.

Pension plans
Arrangements through which pensions are determined, assets dedicated for pensions are accumulated and managed, and benefits are paid as they come due.

Pensions
Retirement income and, if provided through a pension plan, postemployment benefits other than retirement income (such as death benefits, life insurance, and disability benefits). Pensions do not include postemployment healthcare benefits and termination benefits.

Plan members
Individuals that are covered under the terms of a pension plan. Plan members generally include (1) employees in active service (active plan members) and (2) terminated employees who have accumulated benefits but are not yet receiving them and retirees or their beneficiaries currently receiving benefits (inactive plan members).

Postemployment
The period after employment.

Postemployment benefit changes
Adjustments to the pension of an inactive employee.

Projected benefit payments
All benefits estimated to be payable through the pension plan to current active and inactive employees as a result of their past service and their expected future service.

Public employee retirement system
A special-purpose government that administers one or more pension plans; also may administer other types of employee benefit plans, including postemployment healthcare plans and deferred compensation plans.

APPENDIX B (continued)

Glossary of Terms

Real rate of return
The rate of return on an investment after adjustment to eliminate inflation.

Service costs
The portions of the actuarial present value of projected benefit payments that are attributed to valuation years.

Termination benefits
Inducements offered by employers to active employees to hasten the termination of services, or payments made in consequence of the early termination of services. Termination benefits include early-retirement incentives, severance benefits, and other termination-related benefits.

Total Pension Liability
The portion of the actuarial present value of projected benefit payments that is attributed to past periods of employee service in conformity with the requirements of Statement 68.

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CONTRA COSTA COUNTY CCCERA Employees' Retirement Association

Meeting Date
9/26/18
Agenda Item
#6

Growth Sub-Portfolio Review

Timothy Price, CFA
Chief Investment Officer

Growth Program Review

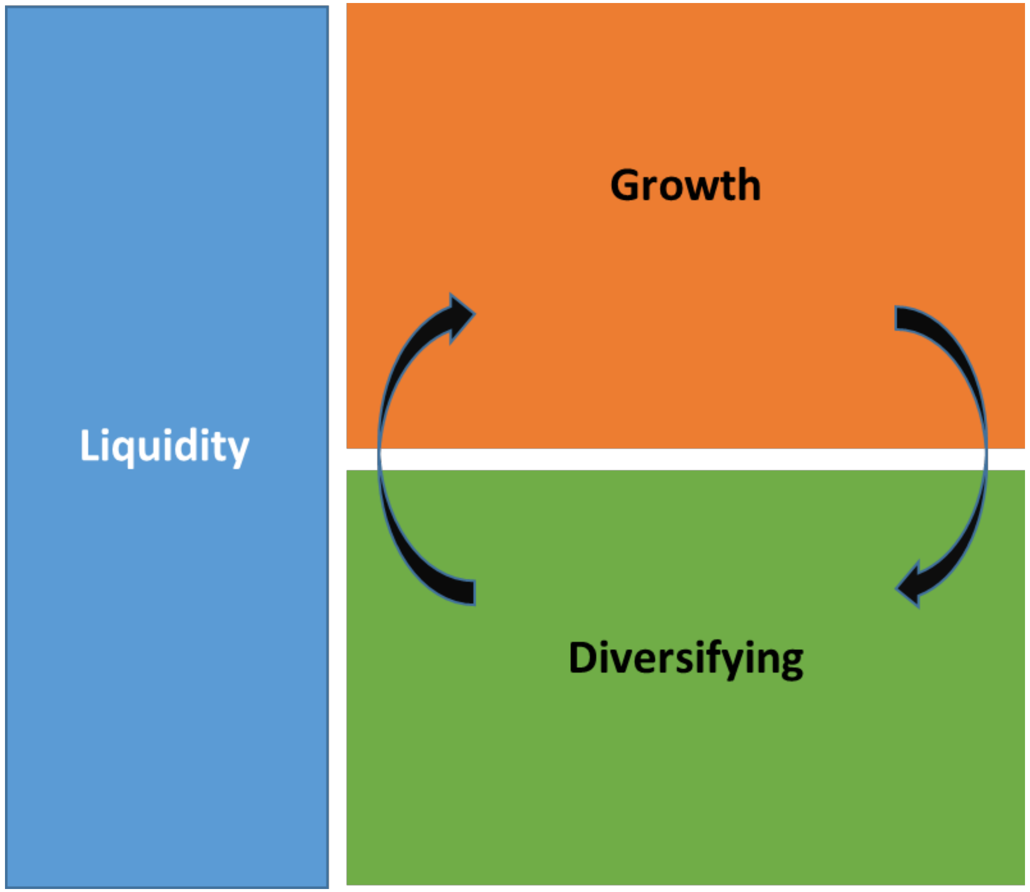
1) Role in CCCERA framework
2) Composition of program
3) Recent Enhancements
4) Strategic Decisions

Role of Growth in CCCERA Portfolio

- Defined as assets that benefit from global economic growth, primarily through capital appreciation

- Typically thought of as equities, but for CCCERA can include high yield, real estate and private markets

- Expected to be the dominant engine of returns to fund *future* liabilities



Growth

- The growth portfolio is allocated in a way such that CCCERA can benefit from a number of different growth engines, spanning equity, credit, and real estate globally.

- Manager Roles
  - Public Markets: growth + liquidity
  - Private Markets: growth + advantage over public markets due to longer investment period, in addition to traded markets focusing more on developed, established companies & technologies.

Asset Class	Current Target Allocation
Domestic Equity	11%
International Equity	11%
Global Equity	8%
Emerging Markets Equity	8%
Private Equity	10%
Private Credit	4%
Real Estate	10%
Risk Parity	5%
*High Yield**	*2%*

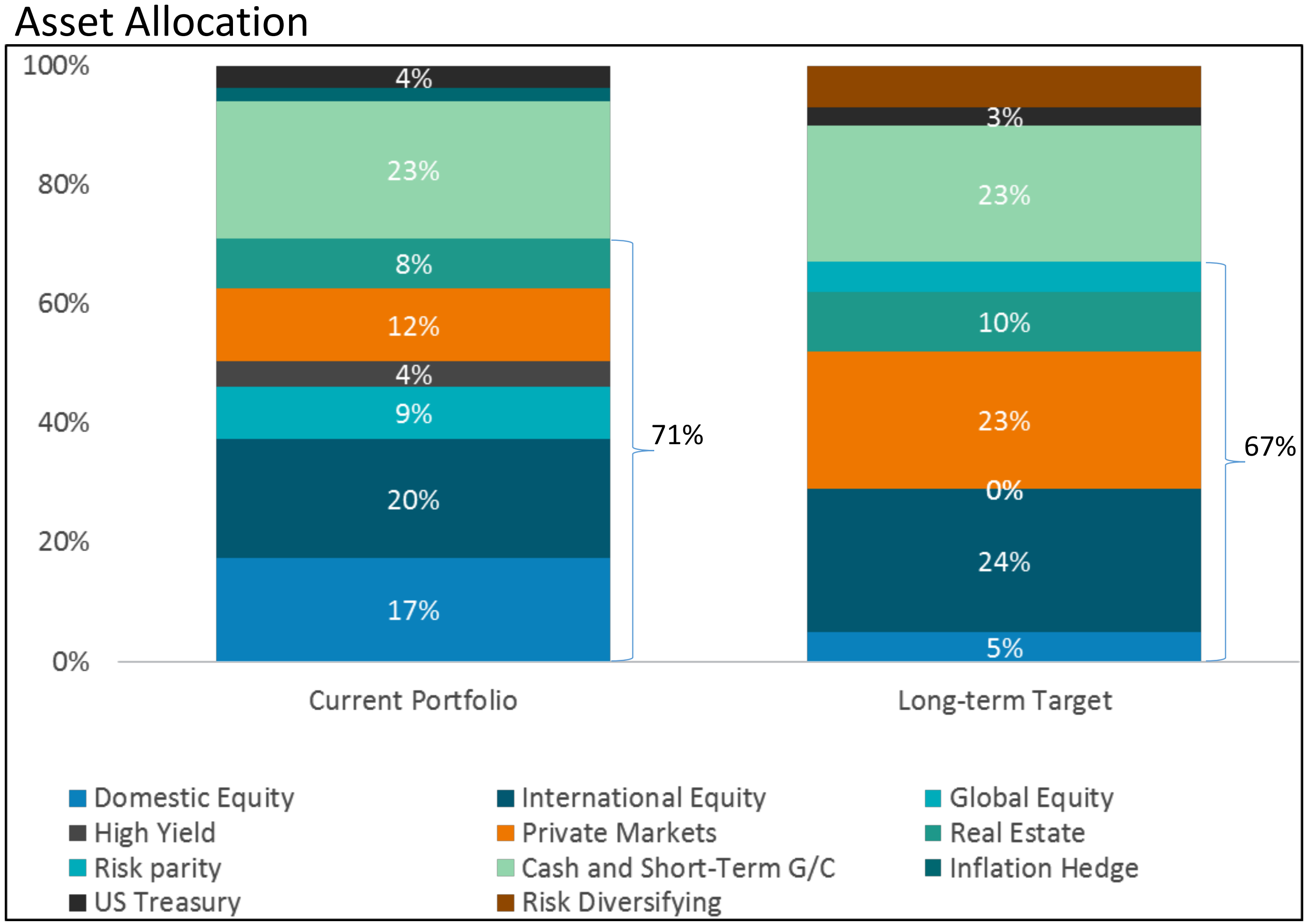
*High yield remains in the portfolio as a funding source for private credit

Growth

- The Growth sub-portfolio houses the majority of CCCERA's assets, and is critical for CCCERA to meet long-liabilities
- The growth portfolio has expanded private market allocations while reducing public markets exposure (primarily coming from domestic equities)
- The expansion into private markets is aided by the recent retention of StepStone as an advisor to CCCERA's private equity and private credit programs. The buildout of these programs is ongoing.

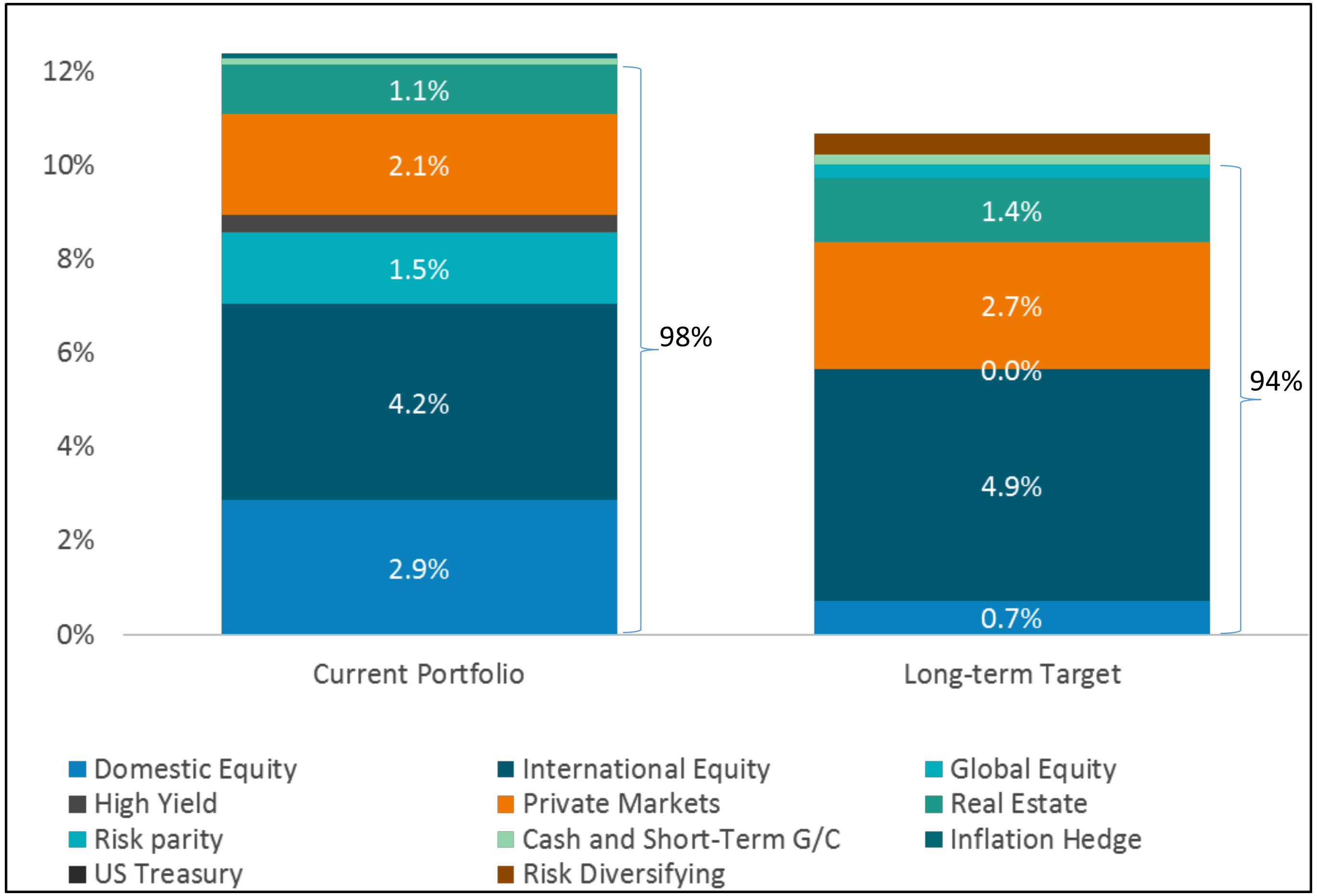
Objective	Measurement
Grow Assets to Satisfy Future Benefits	Absolute Returns Benchmark Relative Returns
Efficient Deployment of Capital	Sharpe Ratio

Growth does the heavy lifting…



…but comes with Volatility

Projected Risk Contribution



Accept and Manage Volatility

- The three sub-portfolio approach allows for volatility to be part of the program
  - Growth accepts volatility
  - Diversifying offers an offset to Growth volatility and a liquid source of funds to rebalance
  - Liquidity meets near-term needs and is insulated from equity market volatility

- Allows CCCERA to maintain a growth-oriented position without impairing our ability to meet short term liquidity needs

Performance as of June 30, 2018

Objective	Measurement	Data	Assessment
Growth of Plan Assets	Absolute Returns	Trailing 5yr return of 9.6%	Meeting Expectations
	Benchmark Relative Returns	0.2% over ACWI over trailing 5 years	Below Expectations
Efficient Deployment of Capital	Sharpe Ratio	CCCERA: 1.61 MSCI ACWI: 0.89 (over trailing 5 years)	Meeting Expectations

Recent Decisions

- CCCERA has historically been heavily allocated to growth assets
  - Made strategic decision to lessen this overweight in 2016
  - Increased the illiquid asset class targets, with an expectation to build out private equity and private credit over approximately three years
  - Tilted liquid allocation towards non-US markets beginning in 2017 based upon relative attractiveness of overseas public markets

Emerging Markets

- Dedicated emerging market mandate was new for CCCERA
    - Target allocation approved in early 2016
    - Search conducted in mid-late 2016
    - Funded PIMCO/Research Affiliates strategy in February 2017
    - Funded TT International in July 2017

Periods Ending 6/30/18	MSCI EM Index
Quarter	-8.0%
YTD	-6.7%
1 Year	8.2%
3 Years	5.6%
5 Years	5.0%

Private Credit

- Private Credit is a new and large allocation for CCCERA
    - Target allocation approved in early 2016 (initially 12%, later reduced to 10%)
    - Search for manager/consultant conducted in 2016
    - Staff recommended fund-of-one structure with StepStone in 2017
    - Strategy funded December 2017

Risk Parity

- Risk Parity is a new allocation for CCCERA
  - Strategy that seeks to balance contribution to risk from multiple asset classes
  - Risk Parity approved in 2017
  - Reallocated from Diversifying to Growth Sub-portfolio March 2018
  - Board education provided June 2018
  - Recommended strategies to be presented to the Board September 26, 2018

Conclusion

- Growth sub-portfolio nearing the final phase of its restructuring

- We will periodically review the asset class allocations within the Growth program to seek best prospective risk-adjusted returns

- Expect the performance results to reflect the reconstituted program within the next three years

Meeting Date
9/26/18
Agenda Item
#7

STEPSTONE
inside private markets

CCCERA Private Debt Update

September 2018

Disclosure

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An investment involves a number of risks and there are conflicts of interest. Please refer to the risks and conflicts disclosed herein.

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All data as of August 31, 2018 unless otherwise noted.

PAST PERFORMANCE IS NOT NECESSARILY INDICATIVE OF FUTURE RESULTS. ACTUAL PERFORMANCE MAY VARY.

Agenda

I. Summary and Update StepStone Private Debt

II. Market Update

III. Mandate / Portfolio Update

IV. Activities Report

V. Outlook Pipeline / Pacing

I. SUMMARY AND UPDATE

STEPSTONE PRIVATE DEBT

Summary

WHAT HAS BEEN DONE SO FAR

- In **April 2017** the CCCERA Board **approved a Private Debt mandate** and selected **StepStone as implementation partner**
- StepStone and CCCERA management **worked closely to establish investment guidelines** and the **implementation** of the mandate already **started in H2 2017**
- During **bi-weekly calls** and **regular in person meetings** the investment approach has been further refined. In spring 2018 it was decided to **slightly reduce the deployment speed**. As a consequence, the envisage ramp-up of 2-3 years in the original plan was extended to 3-4 years
- Overall, the portfolio has been implemented according to plan. To date **US$ 450m have been committed to Core managers**. **US$ 120m have been committed to Satellite funds** and **US$ 34m have been funded in to co-investments.** Total funded investments are approx. US$ 154m
- In addition, StepStone provided further insights and proposals to topics such as **regulatory capital, risk diversifying strategies** and other

OUTLOOK H2 2018 / 2019

- We intend to continue the implementation as defined in close coordination with the CIO and the investment team
- Potentially a 3rd core SMA will be implemented during Q4 2018/Q1 2019
- 3-4 additional fund commitments are planned over the next 12 months
- For co-investments we foresee to continue the investment pace of approx. < US$ 20m per quarter

StepStone Private Debt

StepStone's Private Debt program leverages the Firm's global platform to target privately negotiated debt transactions across corporate, real estate and infrastructure debt

$19B+ AUM / AUA

$1B+ approved in 2017

45 investment professionals

13 partners

STEPSTONE PRIVATE DEBT PLATFORM

EXPERIENCED TEAM

Dedicated team located across 5 continents that has been **active in the private debt market since the late 1990's** with the ability to execute through multiple credit cycles

PROVEN STRATEGY

Income strategy with an emphasis on **capital preservation** and potential for **capital appreciation** through performing and non-performing investment strategies

CUSTOMIZED SOLUTIONS

Flexible and **adaptive** solutions across the full breadth of illiquid debt markets through separate accounts and commingled funds

EXTENSIVE EXPERTISE

Direct investment background facilitates understanding of mezzanine underwriting and structuring capabilities, allowing the team to identify managers with differentiated investment approaches

PREQIN RANKING[1]

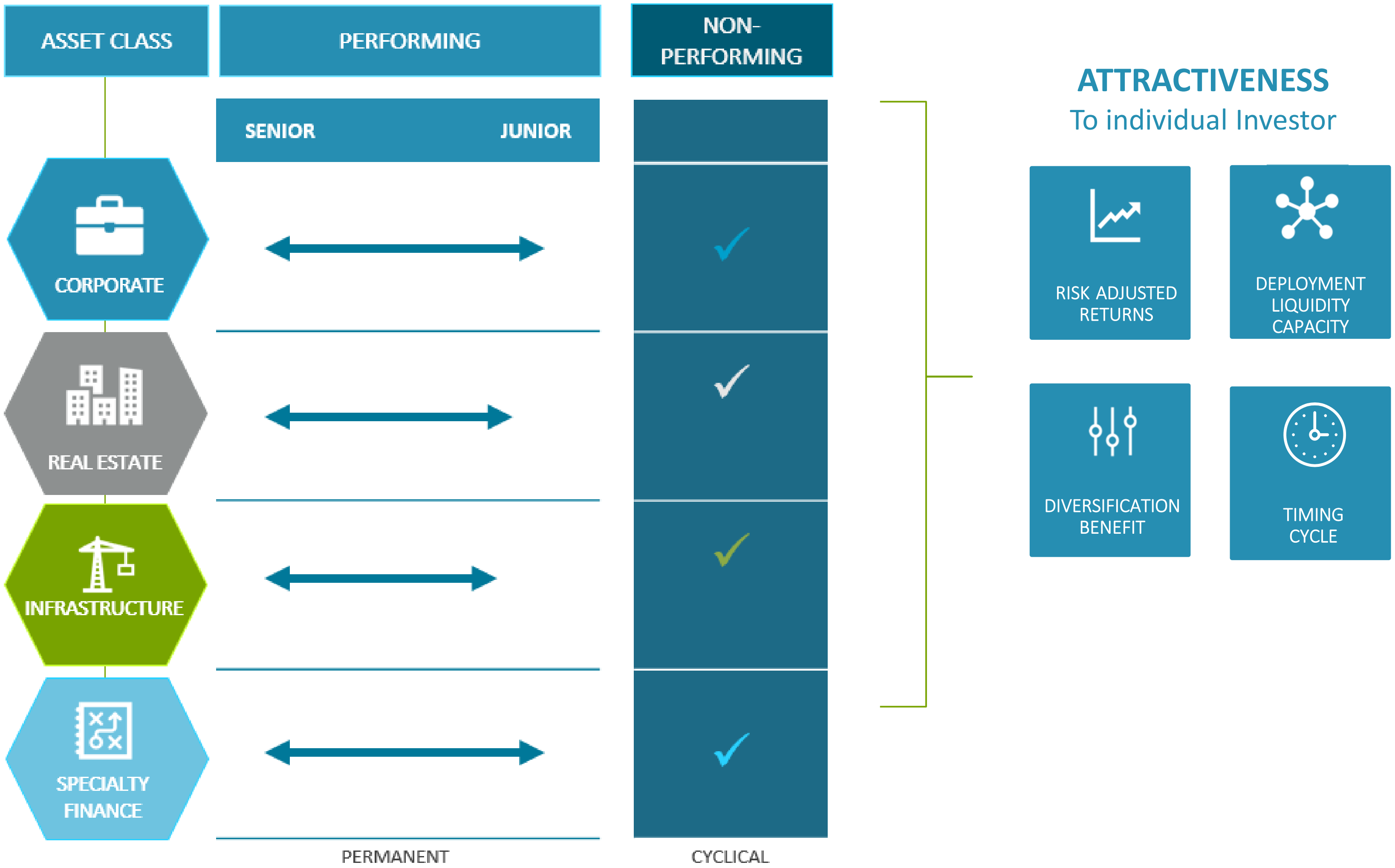
Preqin ranks the largest investors both by region and by type. In **Europe StepStone Private Debt** ranked **as largest investor** and **globally ranked as second largest**

[1] Source: Preqin Global Private Debt Report as of May 2018

As of August 2018. AUM & AUA as of March 31, 2018; All dollars are US$.

Private Debt Investment Coverage

StepStone covers the full range of opportunities in the Private Debt market, including both performing and non-performing debt; we have the **flexibility**, **resources**, and **experience** to move where we believe opportunities are most attractive



For illustrative purposes

II. MARKET UPDATE

Market Update

I. FUNDAMENTALS

- Financial markets continue to drive upward, characterized by:
  - Steady economic growth
  - Borrower friendly environment led to relative and absolute high corporate debt levels; default rates remain moderate
  - Long-running equity bull market in spite of geopolitical risks and potential trade wars
  - Private Equity funds with significant amounts of dry powder
- The Fed is expected to announce several rate increases in 2018-2019; consequently we believe that LIBOR will continue to rise
- Given this backdrop, we believe that Private Debt managers shall focus on prudent deployment of capital with an eye towards value preservation. We also recommend to keep some dry powder to help profit from future opportunities/market disruptions

II. PRIVATE DEBT MARKETS

- As usual during periods of strengths, the liquid credit markets experience a trend of declining credit quality. To some extent these trends are finding their way into the middle-market. The key to remain in control of investment quality lays in a) implementing investment guidelines and investment restrictions; or b) selecting disciplined GPs that ideally are active in less competitive niche markets.
- Capital raising continues to be driven by strong LP demand resulting in some managers focusing on asset aggregation in lieu of asset quality

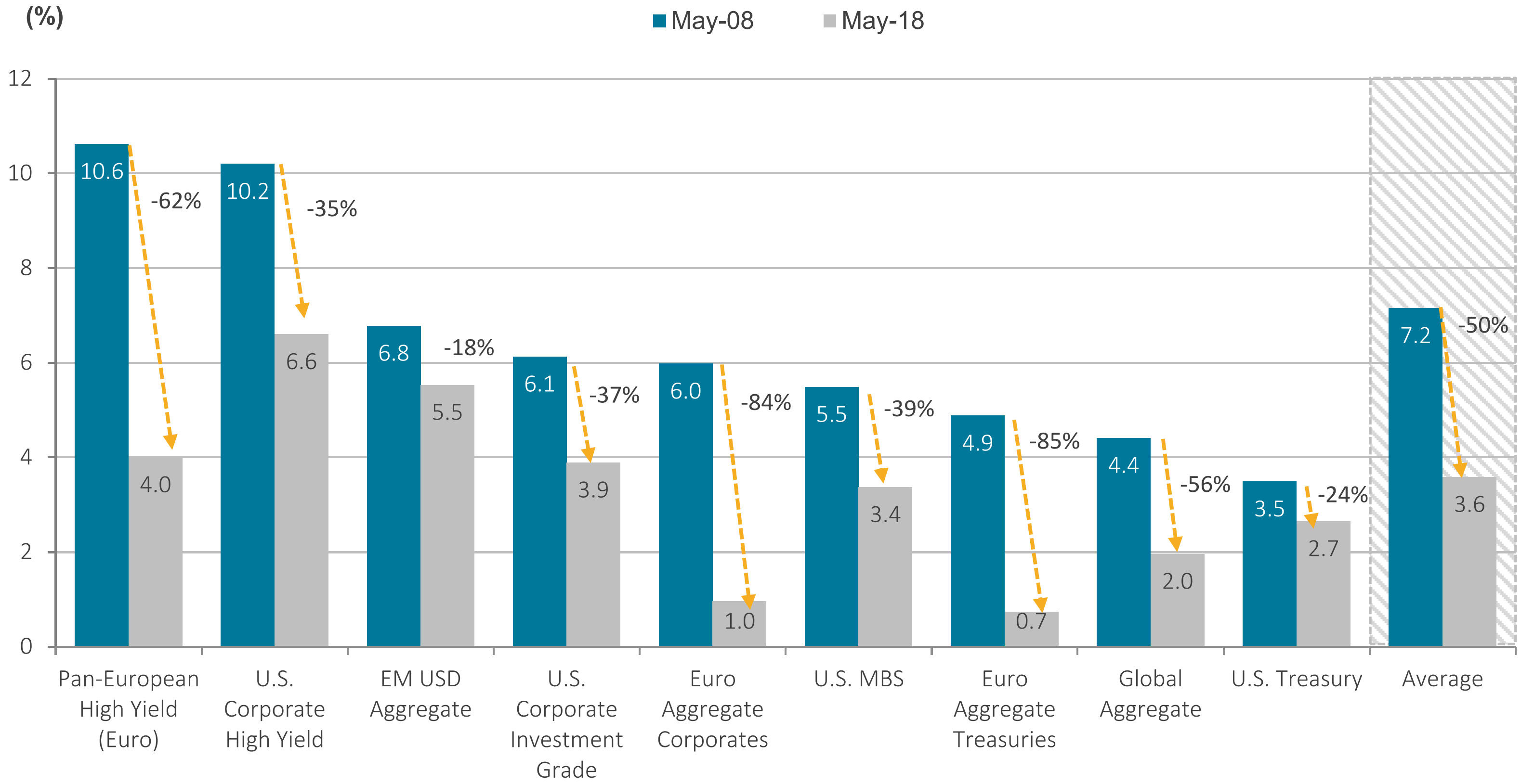
The opinions expressed herein reflect the current opinions of Stepstone as of the date appearing in this material only. There can be no assurance that views and opinions expressed in this document will come to pass

Monetary Accommodation has Led to Significant Yield Compression

Yields across all fixed income asset classes have dramatically reduced over the past decade

- The average yield of the 9 fixed income asset classes below has fallen from 7.2% to 3.6% (-50%)

YIELDS TODAY VS. TEN YEARS AGO ACROSS VARIOUS FIXED INCOME ASSET CLASSES[1]



1 Bloomberg Barclays, data as of May 30, 2008 and May 31, 2018.

Source: KingStreet as of May 2018

Credit Markets Have Experienced Record Growth Over the Past Decade

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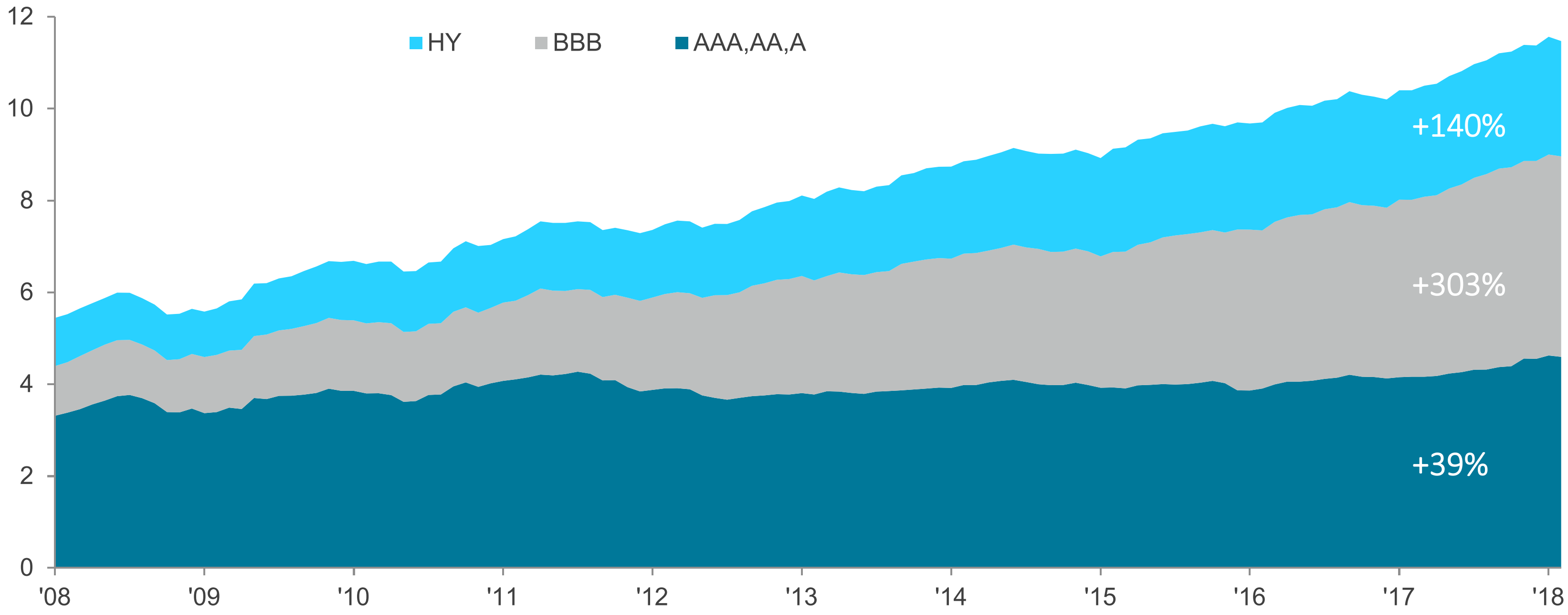
inside private markets

Over half of the Global IG credit today is BBB rated - up from 25% ten years ago

GLOBAL CORPORATE DEBT[1]

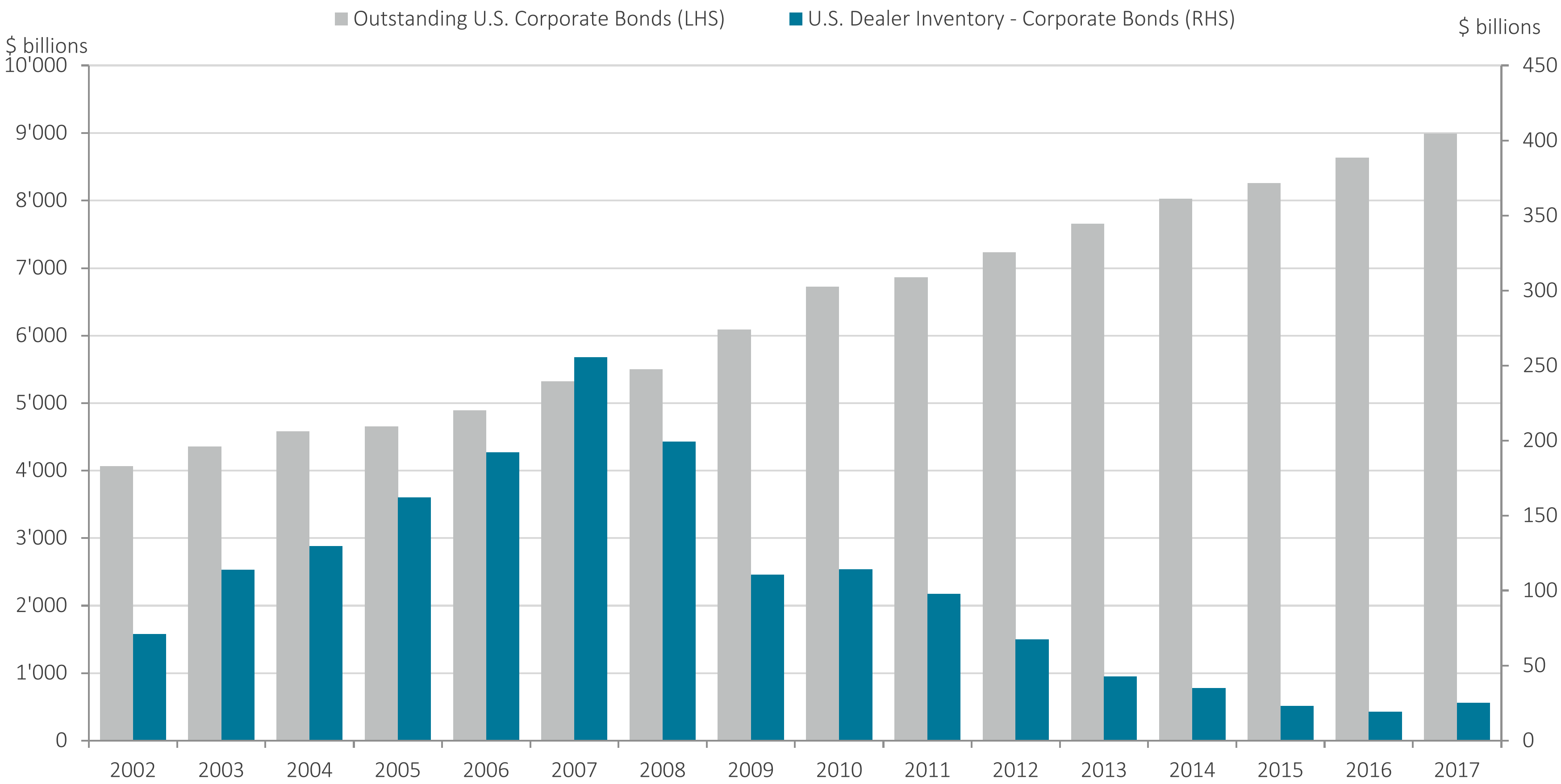
$ trillions



1 Bloomberg Barclays, data as of February 28, 2018.
Source: KingStreet May 2018

Outstanding Debt Increasing While Inventory Generally Declines

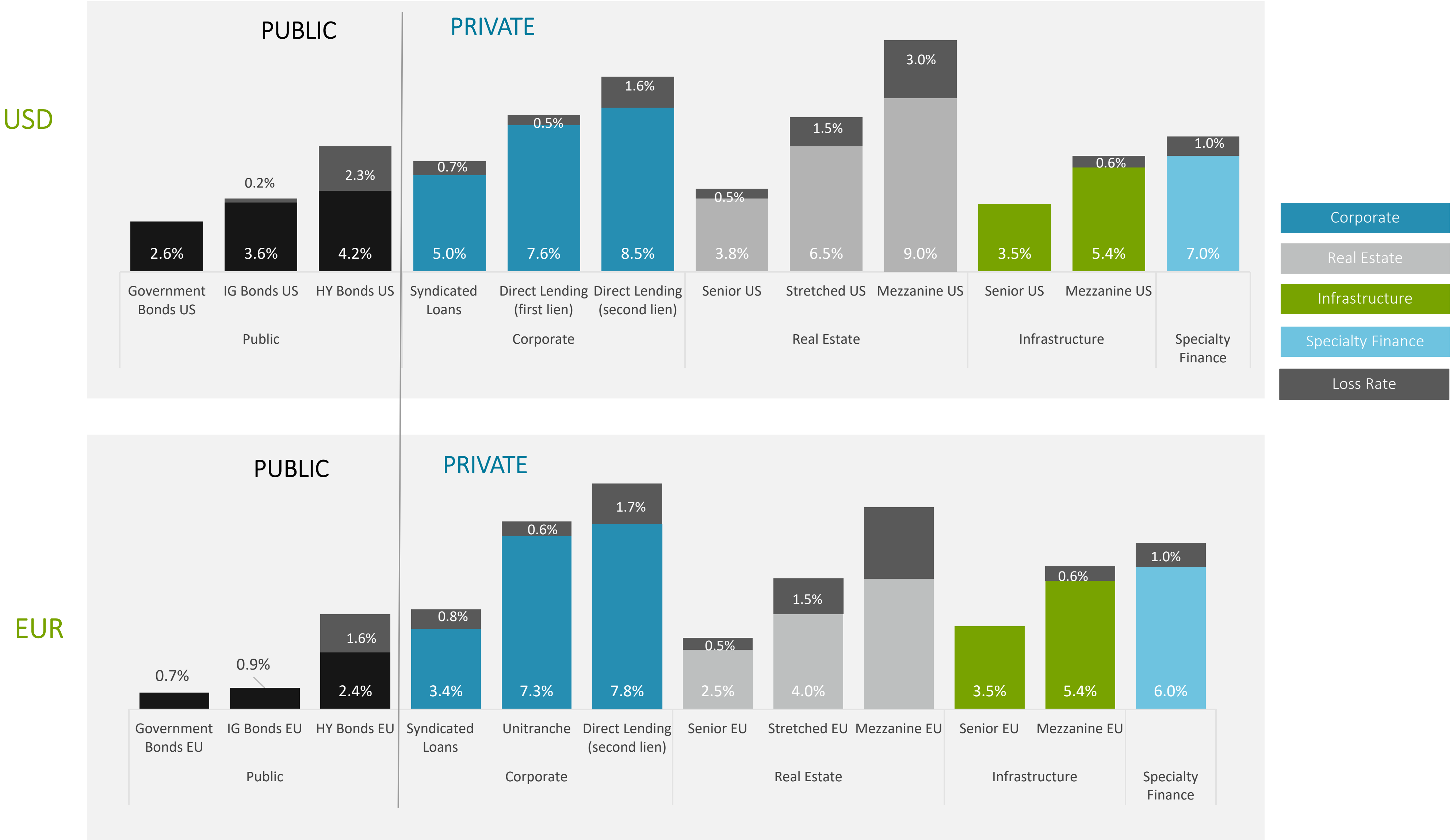
Credit has been particularly impacted by the changes in capital and liquidity regulations.



Source: Federal Reserve Bank of New York, Primary Dealer Average Weekly Net Positions (includes commercial paper and maturities within 13 months, note that prior to April 2013, data included some non-corporate securities such as collateralized mortgage obligations issued by entities other than US federal agencies or government sponsored enterprises) and SIFMA, year-end Outstanding Corporate Debt (includes all non-convertible debt, MTNs and Yankee bonds, but excludes CDs and federal agency debt).

Source: KingStreet as of May 2018

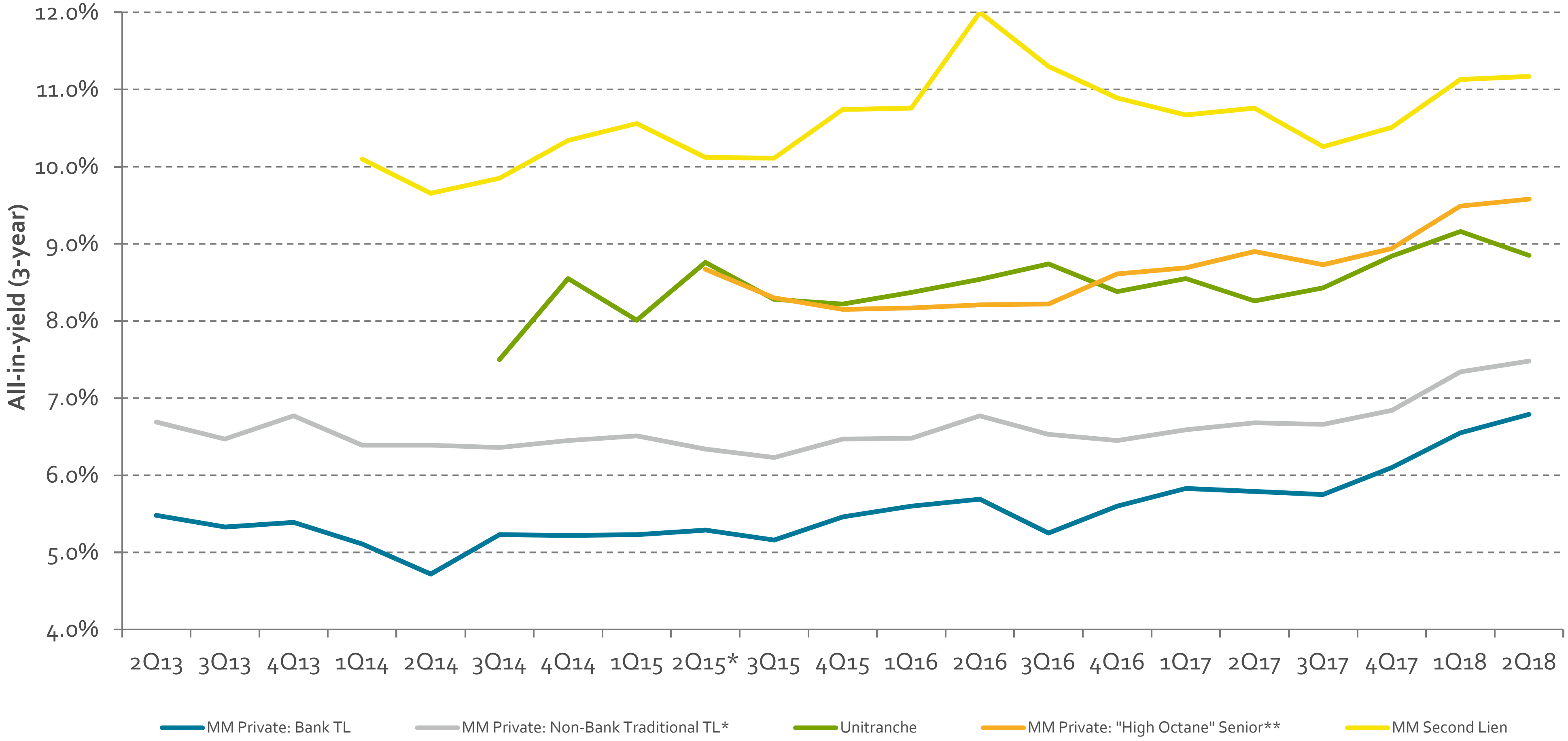
Indicative unlevered gross & risk-adjusted returns



Source for the US Market: "Government Bonds" Data based on Barclays US Agg. Treasuries; "Investment Grade Credit" reflects the yield to worst of the Barclays Global Agg. Corporate index; "HY Bonds" Data base"d on CS HY Index; "Syndicated Loans" based on yield (3yrs life) on BB rated loans and the Broad index (CS data) minus the historical loss rate since 2010; "Direct Lending First Lien based on average First Lien, Unitranche and High Octane Loans minus the estimated loss rate for first liens (estimation on internal database): Data as of April 2018. Source for the EU Market: " Government Bonds EU" Data based on Barclays Euro Aggregate Treasuries Index. "Corporate Bonds EU" Data based on average of Barclays Euro Aggregate Corporate Index. Corporate Bonds loss rates are calculated by assuming 80% recovery rates. "High Yield Bonds EU" Data based on CS Western European High Yield Index EU. High Yield Bonds loss rates are calculated by assuming 40% recovery rate. " Syndicated Loans EU" based on CS Western European Leverage Loan Index. Syndicated Loans loss rates calculated by assuming 80% recovery rate. "Direct Lending EU" yield based on average yields of First LIen and Unitranche loans within the StepStone database. Direct Lending loss rates based on StepStone database. Data as of April 2018

Direct Lending: Gross Asset Yields

QUARTERLY MIDDLE MARKET YIELDS ACROSS THE CAPITAL STRUCUTRE



* Non-bank traditional TL is for “traditional” senior deals priced below 600bps, breakout/spread ceiling began in 2Q15, average EBITDA = $31M in 1Q18

**High octane senior are non-bank term loans that are not unitranche but rather senior deals for tougher credits priced 600bps and up; average EBITDA for high octane senior was $10.3M in 1Q18

Source: Thomson Reuters LPC 2Q 2018

Timing & Cycle → Thinking in Scenarios

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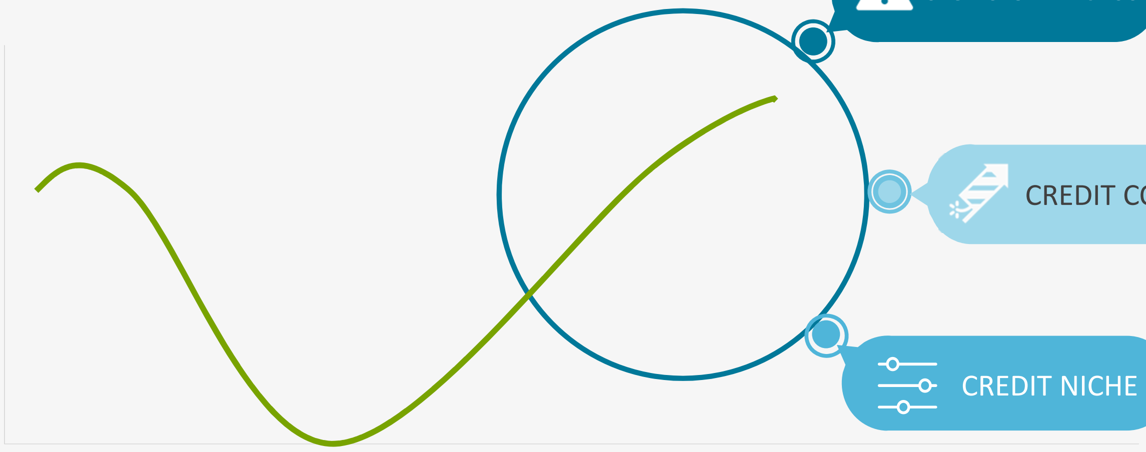
CHALLENGES TO BE MANAGED		STEPSTONE SOLUTION
SIGNS OF EXCESS	• VALUATION • CREDIT STRUCTURES • LEVERAGE • LIQUIDITY MISMATCH • RISK TAKING BEHAVIOUR	✓ SMA (DISCIPLINE) ✓ DIVERSIFICATION ✓ KEEP DRY POWEDER
CREDIT CORE	• SPREAD COMPRESSION • DETORIATION OF TERMS	
CREDIT NICHE	• «THE GRASS IS GREENER!» • *REALLY?* • *HOW MUCH GRASS IS THERE?*	✓ BE SELECTIVE



Generic Credit Cycle

For illustrative purposes only.

III. MANDATE / PORTFOLIO UPDATE

Investment objectives – Private Debt

Contra Costa County ERA's investment objectives:

❖ Investment amount:	USD 1 bn (mid term plan)
❖ Return objectives:	Target net IRR of approximately 10% over a cycle
❖ Cash yield / distribution:	Not primary focus, but welcomed
❖ Eligible Asset Classes:	Mainly corporate debt but other asset classes such as real estate debt are not excluded
❖ Currency	USD (hedging of non-USD investments tbd)
❖ Regional preferences:	Global (i.e. no explicit preference)
❖ Deployment (speed):	Tailored to market conditions
❖ Implementation:	SMAs, primaries, co-investment and secondaries
❖ Over-commitment:	Possible but limited
❖ Flexibility	Retain flexibility to manage and steer allocations over time, especially through or post down cycles

Target returns are hypothetical and are neither guarantees nor predictions or projections of future performance. Future performance indications and financial market scenarios are no guarantee of current or future performance. There can be no assurance that such target net IRRs will be achieved or that the investment will be able to implement its investment strategy, achieve its investment objectives or avoid substantial losses. Further information regarding target net IRR calculations is available upon request.

Recap – Implementation Proposal

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Implementation of Private Debt for CCCERA with allocation thresholds

	Core	Satellite	
	AUM $550 – $700 mm	AUM $150 – $250 mm	up to $200 mm
	Managers 2 - 4	Managers 4 – 6	max. $10 mm per investment
	SMA	**Primaries**	**Co-investments**
	Flexibility & Control • Strategy • Deployment • Operations • Costs	**Fund Investments**	• Accelerated deployment • Reduced costs • Additional diversification
	Up to **70%**	Up to **30%**	Up to **20%**
CURRENT STATUS	• 2 SMA's implemented • Committed Amount: US$ 450m	• 3 Fund commitments • Committed Amount: US$ 120m	• 7 Co-Investments • Invested Amount: US$ 34m

Source: StepStone

Investment Universe - US Direct Lending Market Map

Note: Size of circle denotes deployment size.

Manager references are for illustrative purposes only and do not constitute investment recommendations

Portfolio Snapshot

Estimates as of Aug 2018	Core: Series A Funds	Core: Series A Co-investments	Satellite: Series B	Satellite: Series C	Total Portfolio	Market: Market portfolio 1) Market weighting
Total Commitment	US$ 120m	US$ 100m	US$ 250m	US$ 200m	US$ 670m	
NAV	US$ 3m	US$ 34m	US$ 80m	US$ 37m	US$ 154m	
Number of borrowers	na	7	22	13	>42	
Leverage	na	4.2x	3.8x	4.0x	~4.0	4.6x
EBITDA	na	US$ 20m	US$ 56m	US$ 26m	< US$ 50m	
Target Gross IRR	na	>10%	>10%	>10%	> 10%	
Traditional 1st Lien	100%	100%	75%	80%	82%	60%
Unitranche	0%	0%	25%	20%	18%	25%
Second Lien / Mezzanine	0%	0%	0%	0%	0%	15%

1) The market portfolio for the "Quality" section is based on Thompson Reuter, as of March 2018

PORTFOLIO COMMENTARY

- The portfolio aims for a defensive positioning at this stage of the cycle → 1st Lien, controlled credit metrics
- 2 Core SMAs have been implemented and started deployment in 2018
- 3 Commitments to Satellite Funds to increase diversification including real estate debt, non-sponsor focus and lower middle-market
- Performance according to expectation although too early to assess

For illustrative purposes only. Past performance is not necessarily indicative of future results and there can be no assurance that the investment will achieve comparable results or avoid substantial losses. There can be no assurance that such target gross IRR will be achieved or that the investment will be able to implement its investment strategy, achieve its investment objectives or avoid substantial losses. Further information regarding target gross IRR calculations is available upon request. Gross IRR will ultimately be reduced by management fees, carried interest, taxes, and other fees and expenses.

Source: General Partners and StepStone

IV. ACTIVITIES REPORT

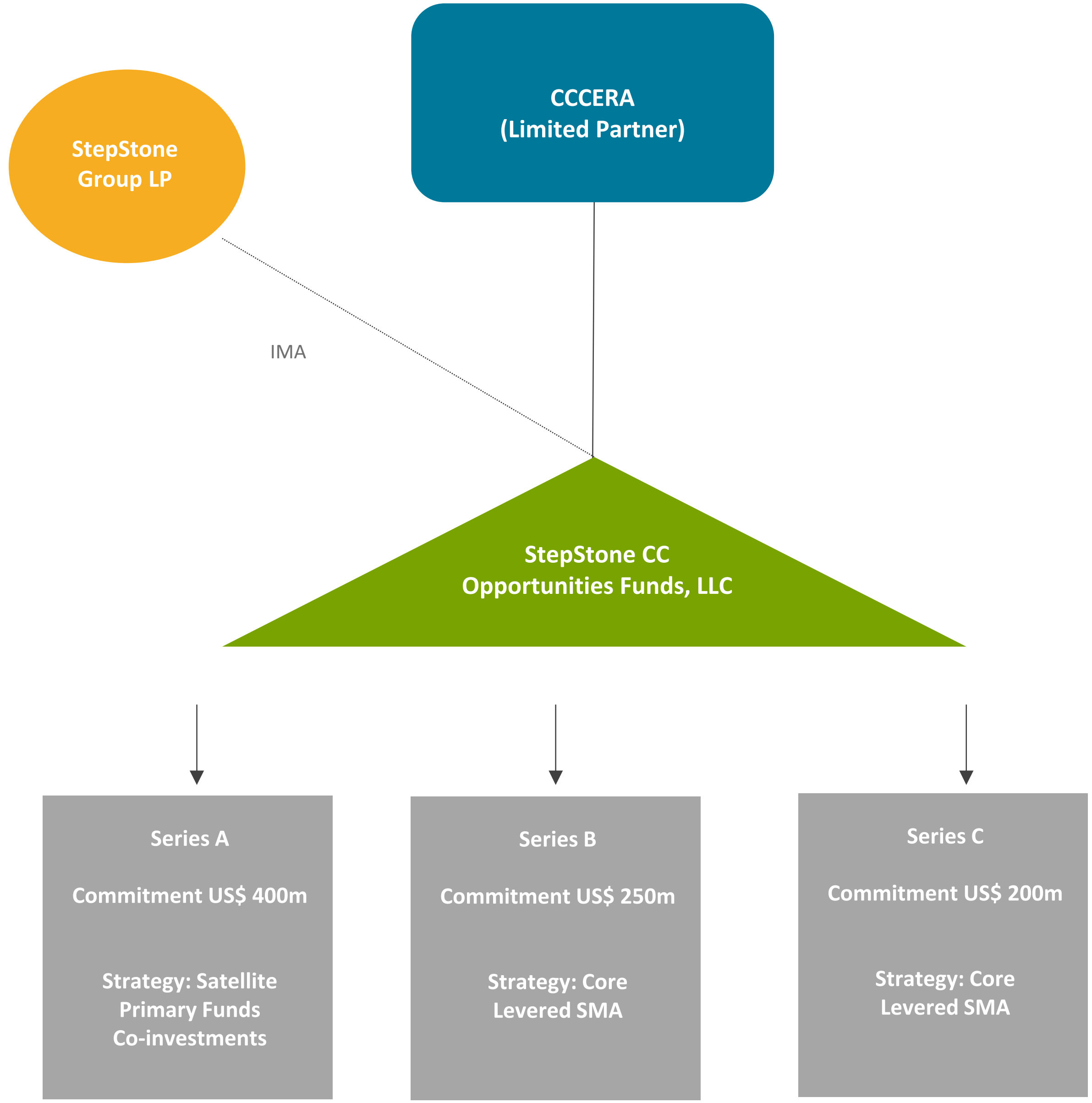
Activities Report

A close coordination has been achieved through

- Bi-weekly progress and co-ordination calls
- 3 in person meetings at CCCERA offices discussing and confirming implementation approach
- Various ad-hoc discussions on specific topics

Core	Satellite	Co-invest / secondaries	❖ Other
• Arranged and co-hosted DD visits to pre-selected GPs • Close interaction on investment guidelines and investment restrictions for individual SMAs • Close interaction in the determination of service providers (SEI as administrator and PWC as auditor) • Sign-off on legal documentation involving CCCERA counsel	• Presented 7 different opportunities in 4 different asset classes • This resulted in 4 Primary Fund investments (the 4th is in execution) • Arranged and co-hosted various due diligence meetings for CCCERA team members	• Reviewed 57 single co-investment opportunities since initiation of the mandate • Invested in 7 co-investments to date	• Introduced regulatory capital investment opportunity • Provided thoughts on transition options from High Yield to Private Debt • Introduced options to complete Contra Costa's "Risk Diversifying Portfolio" including Hedge Funds and Alternative Risk Beta strategies • Provided advice with regards to an amendment request proposal on a legacy investment • Followed-up on a number of investment ideas brought up by the CCCERA team

Mandate Structure – Currently implemented



Set-up Process & Highlights

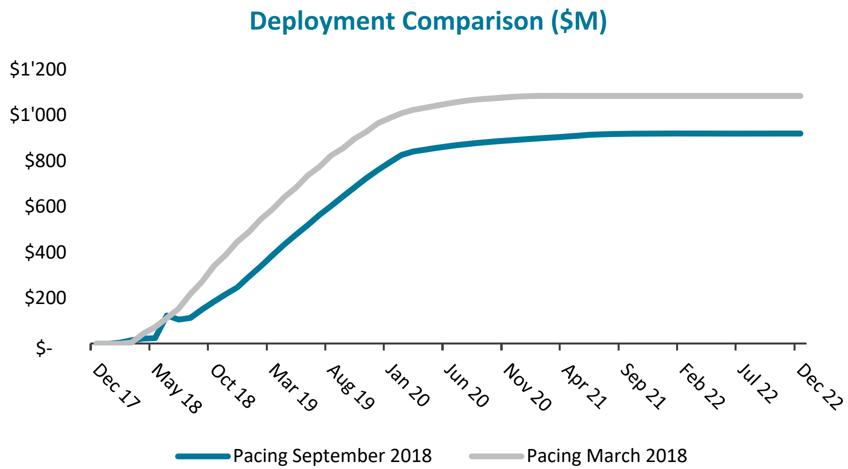
- Set-up and negotiation took approx. 6 months
- In parallel portfolio planning and due diligence took place
- With input from a GP the structure changed from LP to LLC for return optimization purposes (cost savings)
- First fund investment in December 2017
- First SMA implemented in Q2 2018, the second in Q3 2018
- Each SMA took approx. 3-4 months implementation time
- Consistent use of service providers for the fund across series for control purposes: administrator SEI, auditor PWC and Silicon Valley Bank

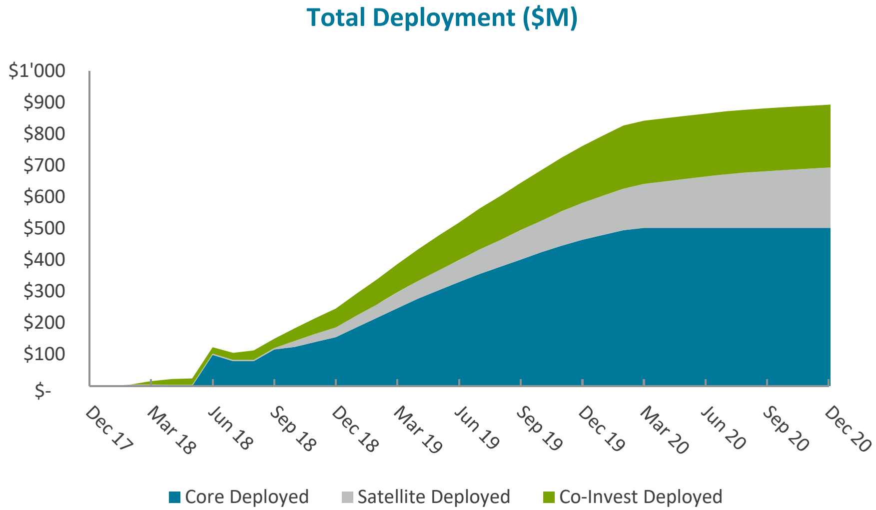
For illustrative purposes only

V. OUTLOOK PIPELINE / PACING

Outlook

Investment Pacing





OUTLOOK

- Investment Pacing slightly reduced to maintain dry powder for market opportunities expected for 2020+
- Target investment level continues to be around US$ 1bn
- 1 Further SMA planned for Q4 2018/Q1 2019
- 3-4 additional fund commitments for Satellite investments
- Continue co-investment strategy with deployment pace < US$ 20m per quarter

For illustrative purposes only.

Source: General Partners and StepStone

Risks and Other Considerations

Risks Associated with Investments. Identifying attractive investment opportunities and the right underlying fund managers is difficult and involves a high degree of uncertainty. There is no assurance that the investments will be profitable and there is a substantial risk that losses and expenses will exceed income and gains.

Restrictions on Transfer and Withdrawal; Illiquidity of Interests; Interests Not Registered. The investment is highly illiquid and subject to transfer restrictions and should only be acquired by an investor able to commit its funds for a significant period of time and to bear the risk inherent in such investment, with no certainty of return. Interests in the investment have not been and will not be registered under the laws of any jurisdiction. Investment has not been recommended by any securities commission or regulatory authority. Furthermore, the aforementioned authorities have not confirmed the accuracy or determined the adequacy of this document.

Limited Diversification of Investments. The investment opportunity does not have fixed guidelines for diversification and may make a limited number of investments.

Reliance on Third Parties. StepStone will require, and rely upon, the services of a variety of third parties, including but not limited to attorneys, accountants, brokers, custodians, consultants and other agents and failure by any of these third parties to perform their duties could have a material adverse effect on the investment.

Reliance on Managers. The investment will be highly dependent on the capabilities of the managers.

Risk Associated with Portfolio Companies. The environment in which the investors directly or indirectly invest will sometimes involve a high degree of business and financial risk. StepStone generally will not seek control over the management of the portfolio companies in which investments are made, and the success of each investment generally will depend on the ability and success of the management of the portfolio company.

Taxation. An investment involves numerous tax risks. Please consult with your independent tax advisor.

Conflicts of Interest. Conflicts of interest may arise between StepStone and investors. Certain potential conflicts of interest are described below; however, they are by no means exhaustive. There can be no assurance that any particular conflict of interest will be resolved in favor of an investor.

Allocation of Investment Opportunities. StepStone currently makes investments, and in the future will make investments, for separate accounts having overlapping investment objectives. In making investments for separate accounts, these accounts may be in competition for investment opportunities.

Existing Relationships. StepStone and its principals have long-term relationships with many private equity managers. StepStone clients may seek to invest in the pooled investment vehicles and/or the portfolio companies managed by those managers.

Carried Interest. In those instances where StepStone and/or the underlying portfolio fund managers receive carried interest over and above their basic management fees, receipt of carried interest could create an incentive for StepStone and the portfolio fund managers to make investments that are riskier or more speculative than would otherwise be the case. StepStone does not receive any carried interest with respect to advice provided to, or investments made on behalf, of its advisory clients.

Other Activities. Employees of StepStone are not required to devote all of their time to the investment and may spend a substantial portion of their time on matters other than the investment.

Material, Non-Public Information. From time to time, StepStone may come into possession of material, non-public information that would limit their ability to buy and sell investments.

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Meeting Date
9/26/18
Agenda Item
#8

Verus

PERSPECTIVES THAT DRIVE ENTERPRISE SUCCESS

SEPTEMBER 2018

Risk Parity Search for

Contra Costa Employees' Retirement Association

Table of Contents

Verus

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Executive summary

Executive summary

— The CCCERA Board approved a Risk Parity search on May 24, 2017.

— After reviewing the strategies and potential fit within the portfolio, it was determined at the March 28, 2018 meeting that risk parity can be additive to the Plan but is best positioned in the Growth sub-portfolio.

— Also at the March 28th meeting, the Board provided direction to proceed with "Alt. Mix 2" as the long-term target asset allocation, which allocates 5% to risk parity.

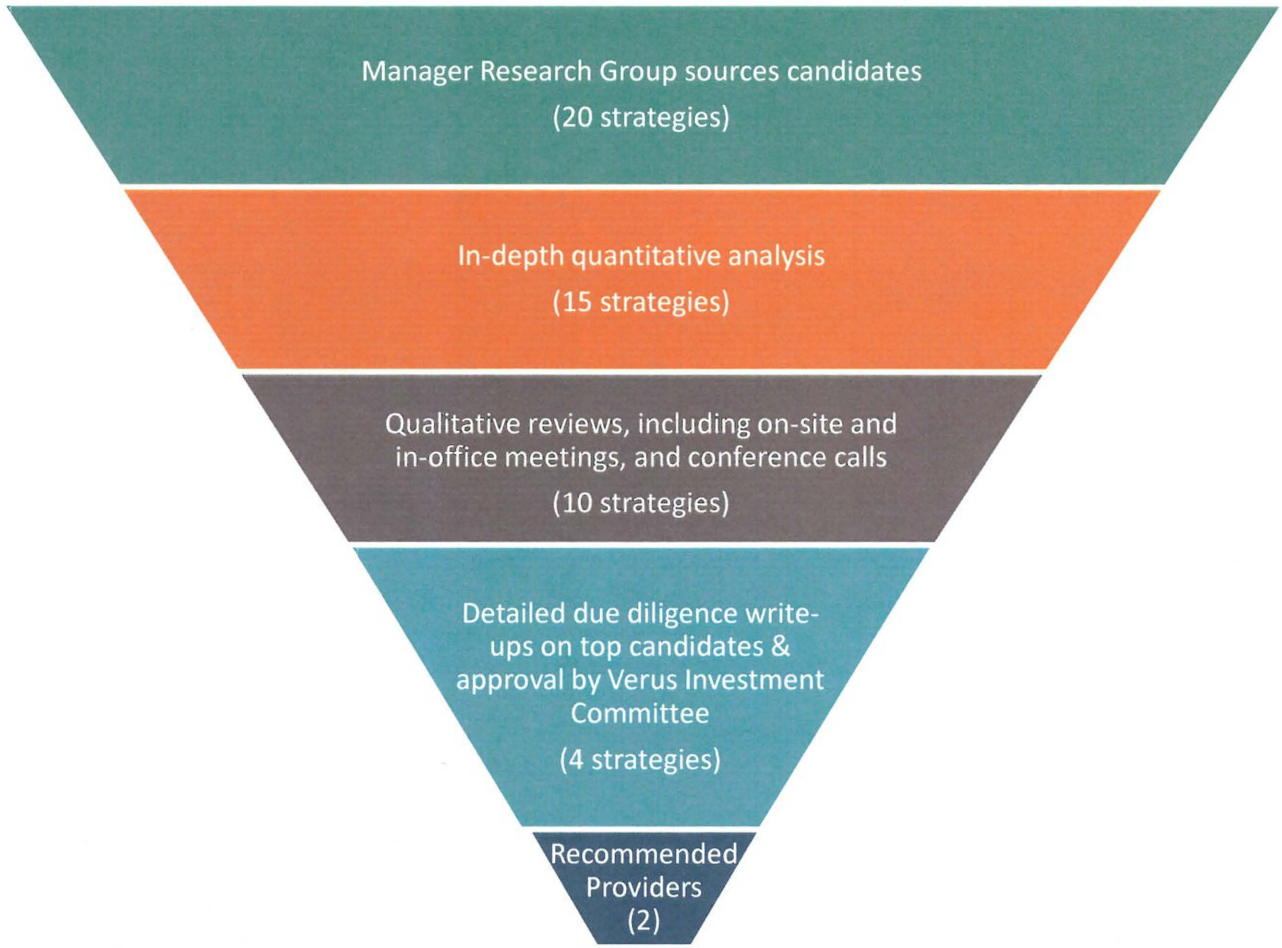
— On June 27th, the Board received additional education on risk parity in reference to both the general investment approach as well as specific questions regarding futures and leverage. At that meeting, the Board provided direction to update the Risk Parity search initiated in 2017 for in-depth analysis of potential providers.

— This presentation provides the additional analysis concluding with a recommendation to allocate 2.5% of Plan assets to PanAgora and 2.5% of Plan assets to AQR.

Search process

Risk parity manager search process

- For this search, CCCERA utilized Verus' "focus list" of Risk Parity managers.
- Verus maintains focus lists that have been developed and are maintained via an RFP type selection process. Identified strategies have met rigorous quantitative and qualitative screens, in-depth investment due diligence meetings, and final approval by Verus' Investment Committee.
- Staff conducted independent diligence of Verus approved providers



Manager overviews

Manager comparison

	AQR GRP-EL	PanAgora
Firm Ownership	70% employee owned, 30% owned by AMG	20% employee owned, 80% owned by Great West Life/ Putnam and Nippon Life Insurance Co.
Firm Name	AQR Capital Management LLC	PanAgora Asset Management, Inc.
Firm Total AUM ($mm)	$225,846	$50,76
Team Headquarters	Greenwich, Connecticut	Boston, Massachusetts
Product Name	Global Risk Premium - EL	Risk Parity Multi Asset
Strategy AUM ($MM)	$14,140**	$11,773
Inception Date	Oct-11*	Jan-06
Standard Risk Target (Annualized Vol)	10%	10%
Max Leverage (Notional)	3.0x (300%)	3.5x (350%)
Strategic Allocation	33% Equities - 33% Rates - 33% Inflation	40% Growth - 40% Contraction - 20% Inflation
Tactical Tilts	No	Yes
Other Vehicles	12%, 20%, 25% Volatility & Tactical	15% Volatility & 12% Volatility Plus (+Premia)
Portfolio Override	Possible in extreme situations	No

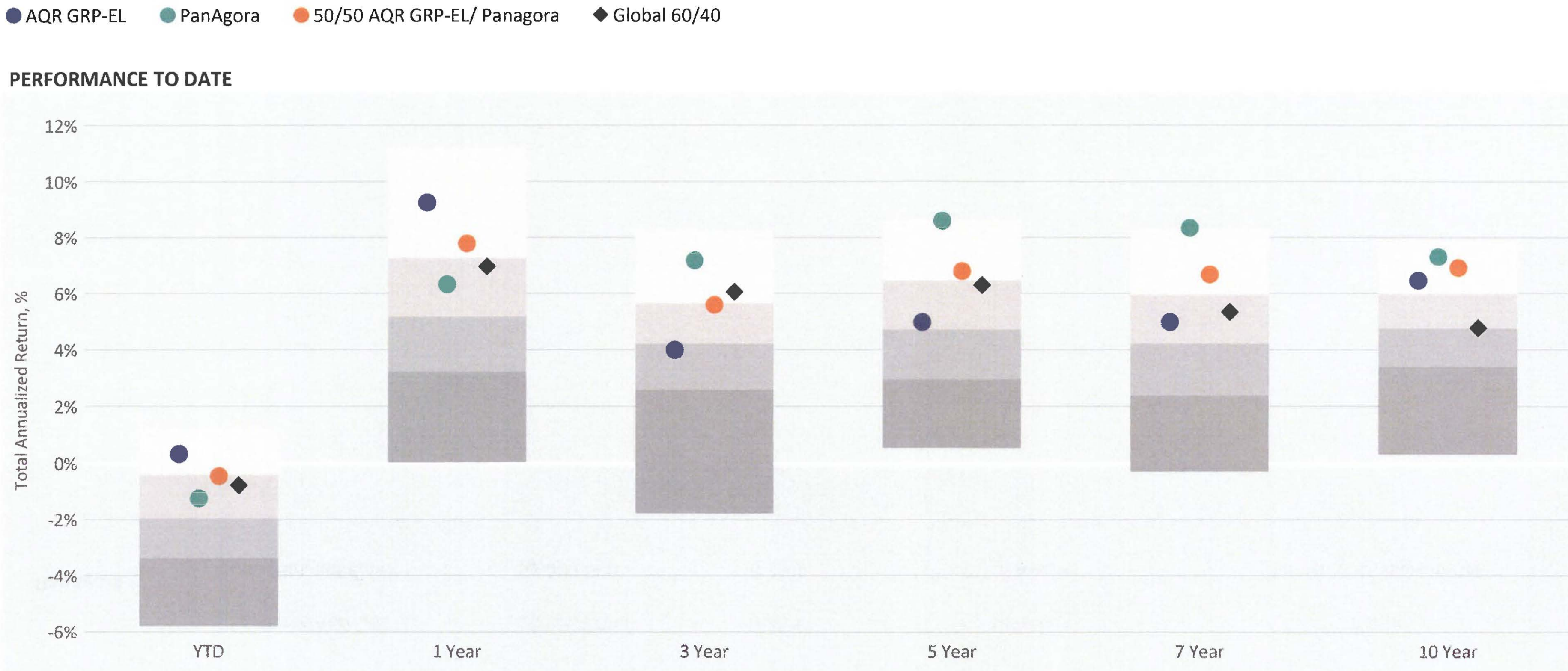
AQR launched its first Risk Parity strategy, AQR GRP, in January 2006. AQR GRP-EL (Enhanced Liquidity) was launched in October 2011. Returns shown for AQR GRP-EL prior to October 2011 represent actual AQR GRP returns adjusted to simulate constraints in place for GRP-EL product.

**Figure represents AUM for specific GRP-EL only. Total Risk Parity assets for AQR as of 6/30/18 are $28.9 billion.*

Investment vehicle information

	Vehicles Available	Minimum	Mgmt Fee	Asset Schedule	Liquidity
AQR GRP-EL	Commingled Fund	$5,000,000	0.38%	ll Assets	Weekly, 5 days notice
PanAgora	Separate Account	$100,000,000	0.35%	ll Assets	Varies
	Commingled Fund	$3,000,000	0.35%	ll Assets	Monthly, 15 days notice

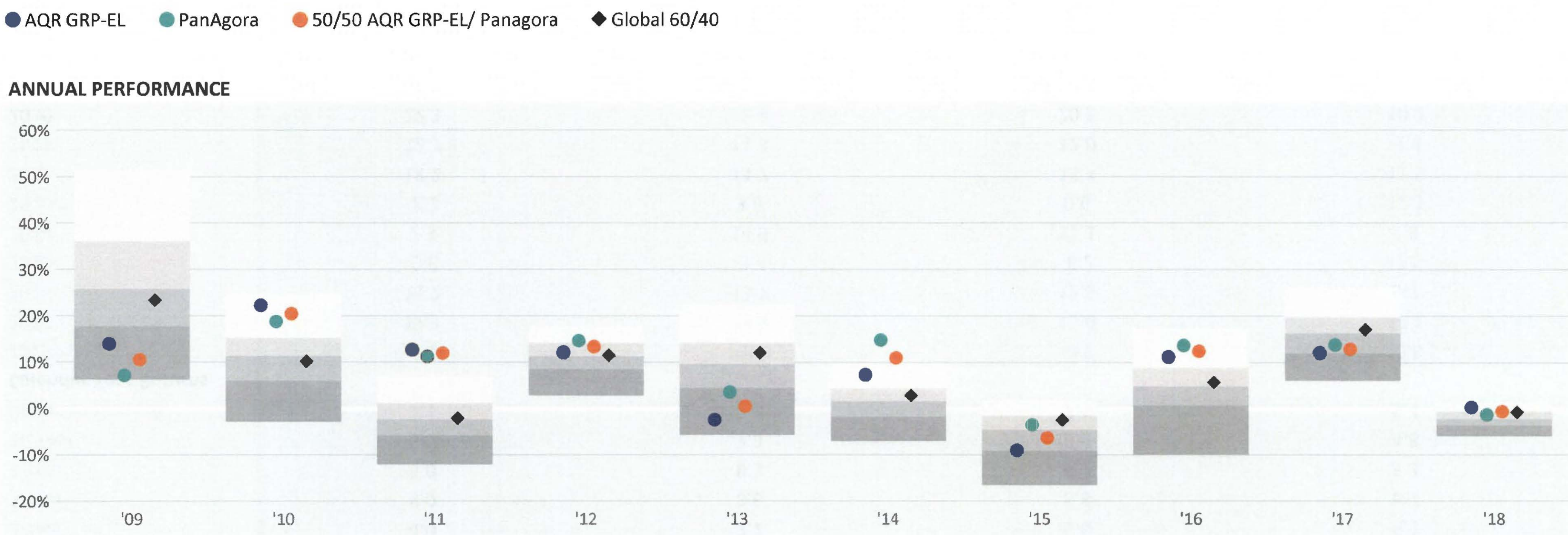
Performance to date - as of June 2018



TOTAL ANNUALIZED RETURN TO DATE, %	YTD	1 Year	3 Year	5 Year	7 Year	10 Year
AQR GRP-EL	0.3	9.3	4.0	5.0	5.0	6.5
PanAgora	-1.2	6.3	7.2	8.6	8.3	7.3
50/50 AQR GRP-EL/ Panagora	-0.5	7.8	5.6	6.8	6.7	6.9
Global 60/40	-0.8	7.0	6.1	6.3	5.3	4.8

Index: 60-40 ACWI-Gbl Agg Returns: Gross of Fees
Data Source: eVestment Alliance Universe: eA All Global Balanced - TAA - Unhedged & Hedged

Calendar year performance



ANNUAL PERFORMANCE AND RANKING	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
AQR GRP-EL	14.0	22.3	12.7	12.2	-2.3	7.3	-9.0	11.2	12.1	0.3
Rank	*85*	*8*	*1*	*45*	*91*	*10*	*76*	*17*	*77*	*14*
PanAgora	7.2	18.8	11.3	14.7	3.6	14.9	-3.4	13.7	13.8	-1.2
Rank	*94*	*12*	*1*	*22*	*79*	*3*	*43*	*10*	*69*	*39*
50/50 AQR GRP-EL/ Panagora	10.5	20.5	12.0	13.4	0.6	11.1	-6.2	12.5	13.0	-0.5
Rank	*90*	*10*	*1*	*34*	*83*	*4*	*62*	*14*	*73*	*26*
Global 60/40	23.3	10.2	-2.1	11.5	12.1	2.8	-2.5	5.7	17.1	-0.8
Rank	*59*	*58*	*50*	*51*	*36*	*42*	*36*	*46*	*46*	*31*

Index: 60-40 ACWI-Gbl Agg Returns: Gross of Fees
Data Source: eVestment Alliance Universe: eA All Global Balanced - TAA - Unhedged & Hedged

Performance summary - as of June 2018

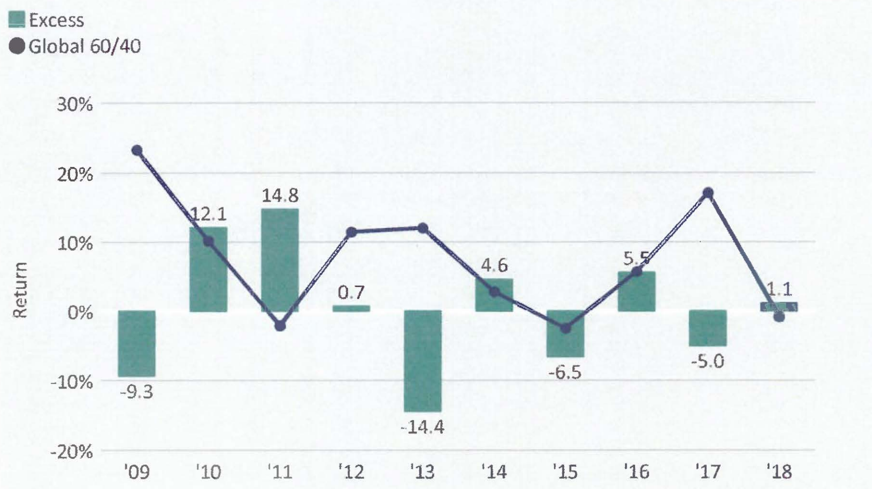
	AQR GRP-EL	PanAgora	50/50 AQR GRP-EL/ Panagora	Global 60/40
Statistics (5 Years)				
Annualized Return, %	5.0	8.6	6.8	6.3
Annualized StdDev, %	6.9	7.8	7.2	6.9
Sharpe Ratio	0.7	1.0	0.9	0.9
Avg Loss, %	-1.7	-1.7	-1.7	-1.5
Loss Frequency, %	38.3	36.7	36.7	36.7
Max Drawdown Return, %	-14.1	-8.5	-10.8	-8.7
Max Drawdown Period	Sep-14 - Dec-15	Apr-15 - Dec-15	May-15 - Dec-15	Sep-14 - Jan-16
Recovery Period	Jan-16 - May-17	Jan-16 - May-16	Jan-16 - Jun-16	Feb-16 - Jul-16
Skewness	-0.5	-0.3	-0.4	0.1
Excess Kurtosis	0.0	1.4	0.9	---
Returns to Date				
1 Year	9.3	6.3	7.8	7.0
3 Year	4.0	7.2	5.6	6.1
5 Year	5.0	8.6	6.8	6.3
7 Year	5.0	8.3	6.7	5.3
10 Year	6.5	7.3	6.9	4.8
Common (Jan-06)	7.1	7.0	7.1	5.4
Calendar Year Returns				
2018	0.3	-1.2	-0.5	-0.8
2017	12.1	13.8	13.0	17.1
2016	11.2	13.7	12.5	5.7
2015	-9.0	-3.4	-6.2	-2.5
2014	7.3	14.9	11.1	2.8
2013	-2.3	3.6	0.6	12.1
2012	12.2	14.7	13.4	11.5
2011	12.7	11.3	12.0	-2.1
2010	22.3	18.8	20.5	10.2
2009	14.0	7.2	10.5	23.3
2008	-7.4	-13.4	-10.3	-25.9
2007	17.0	14.4	15.7	10.9
2006	3.4	-1.2	1.1	15.1

Index: 60-40 ACWI-Gbl Agg Returns: Gross of Fees
Data Source: eVestment Alliance Universe: eA All Global Balanced - TAA - Unhedged & Hedged

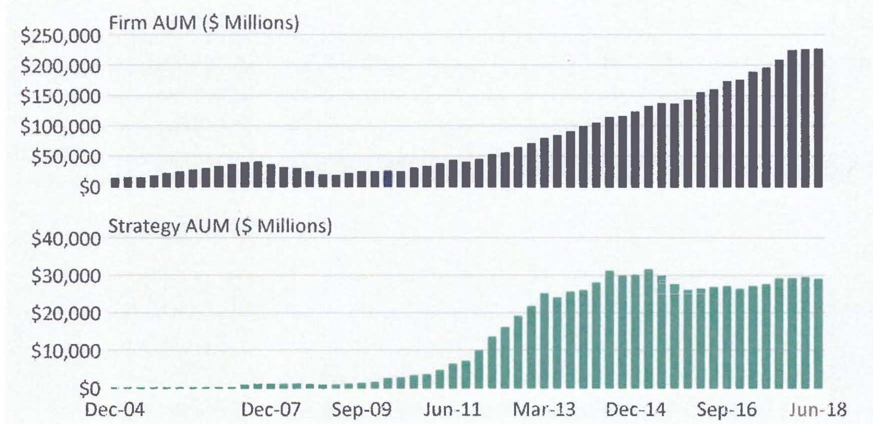
Strategy detail

Strategy overview - AQR GRP-EL

ANNUAL PERFORMANCE



AUM GROWTH



Stategy AUM reflects all Risk Parity assets

INVESTMENT PHILOSOPHY

— GRP-EL is intended to deliver a better risk-adjusted return than a typical institutional portfolio by using a risk-based weighting system to allocate equally (in risk terms) to three "themes": equities, rates, and inflation.

— The strategy targets a 10% average volatility level and expected returns of 5% over cash, for an expected gross Sharpe of 0.5 over the long term.

PORTFOLIO CONSTRUCTION

— Stocks, Bonds, and Commodities are the three asset classes that are utilized in AQR GRP-EL. Credit is excluded in the Enhanced Liquidity vehicle but remains part of the original GRP strategy.

— Each asset's risk is measured using a combination of short-term (<3 months) and long-term (1-2 years) trailing standard deviation to determine the appropriate risk weighting for the portfolio.

— Total fund leverage is capped at 300% gross notional exposure and there is an explicit drawdown mechanism that seeks to limit maximum drawdowns to 15%.

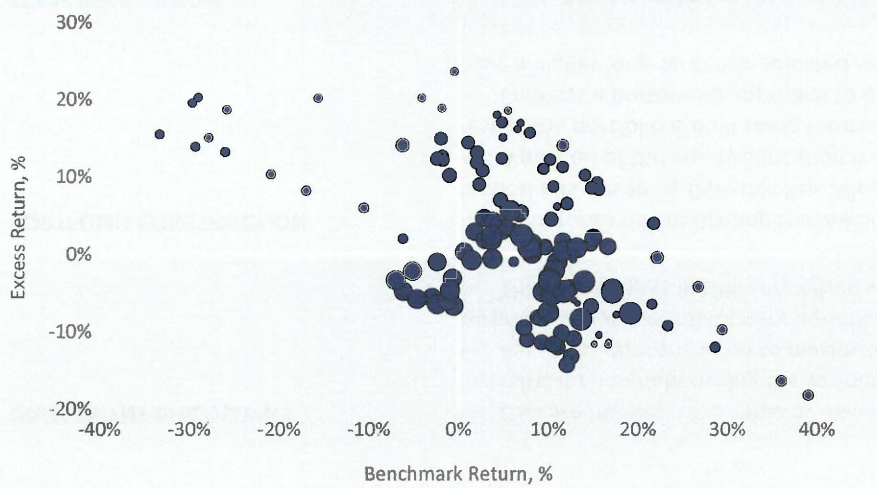
TEAM DESCRIPTION

— Investment committee is comprised of seven senior members of the firm and supported by over 40 asset allocation team members

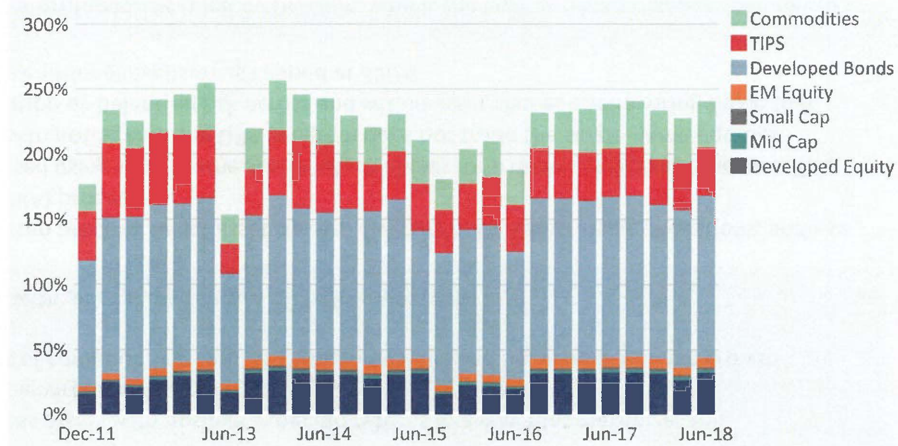
— Three principals of the firm and members of the risk parity investment committee, Brian Hurst, Michael Mendelson, and Yao Hua Ooi, directly oversee portfolio management and strategy research.

Strategy overview - AQR GRP-EL

12 MONTH EXCESS PERFORMANCE VS. BENCHMARK, DEC-06 TO JUN-18



HISTORICAL ASSET EXPOSURE



Use of leverage results in total greater than 100%

PERFORMANCE SENSITIVITY

— The strategy will underperform if there is a sharp increase in rates or downtrend in commodities, or when most asset classes experience negative returns simultaneously.
— The strategy has exhibited a slightly higher sensitivity to commodity indexes than some of its peers which could lead do relative underperformance if commodity markets are weak.

DIFFERENTIATING CHARACTERISTICS

— This risk parity product does not use any tactical tilts across themes but has one of the shorter lookback periods for correlation and volatility which makes the individual themes (stocks, bonds, inflation) quite dynamic compared to peers.
— Explicit drawdown control mechanism that attempts to limit the maximum drawdown to 15% by cutting total portfolio risk (via reducing leverage) by up to 50% in times of market drawdown.

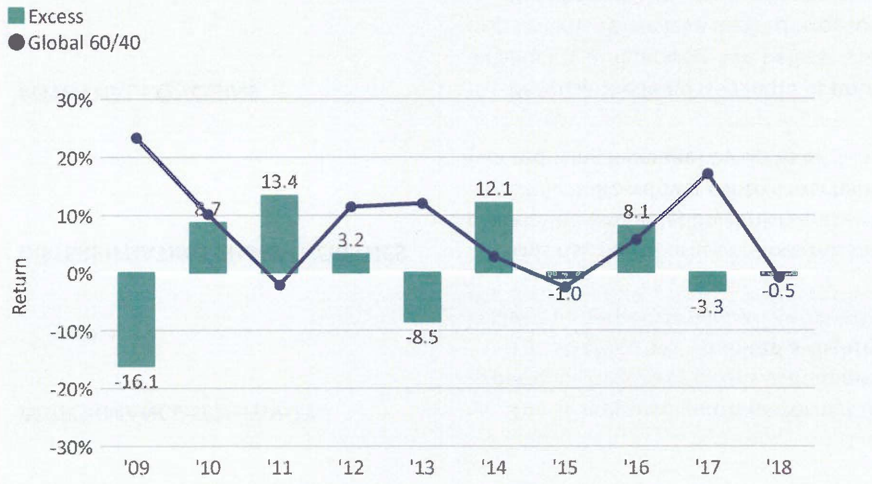
POTENTIAL CONCERNS

— Because the Fund is levered, it potentially faces two important risks: (1) risk of exceptionally large market moves and (2) availability of financing. We believe that these risks are mitigated by a thoughtful portfolio design and selection of liquid financial instruments to achieve desired exposures.
— Rapid growth in assets under management in recent years and continued product proliferation.
— Drawdown control make AQR GRP-EL a forced seller when the best course of action was to remain fully invested (i.e. quick market rebound covering losses while GRP-EL has yet to fully reinvest).

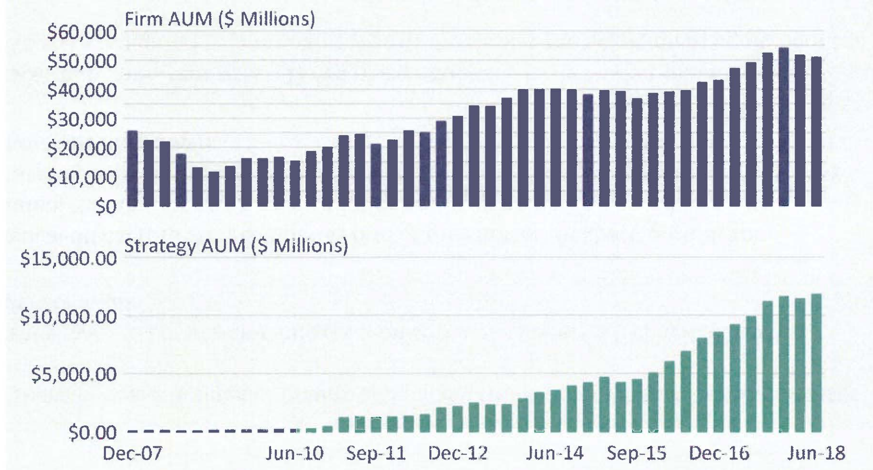
Index: 60-40 ACWI-Gbl Agg Returns: Gross of Fees
Data Source: eVestment Alliance Universe: eA All Global Balanced - TAA - Unhedged & Hedged

Strategy overview - PanAgora

ANNUAL PERFORMANCE



AUM GROWTH



INVESTMENT PHILOSOPHY

— Capture market risk premia by investing across assets with positive expected returns in a way that maximizes the diversification benefit during the various market environments.
— Avoid risk concentration to maximize impact of compounding returns through positive and negative economic growth surprises, as well as inflationary periods.
— The fund targets 8-10% annualized volatility with an expected return of 7-10% over cash.

PORTFOLIO CONSTRUCTION

— PanAgora's risk-budgeting framework is a 4 step process: select asset classes, diversify risks, set strategic allocations, and use tactical tilts driven by Dynamic Risk Allocation (DRA) processes.
— A portion of the equity allocation is constructed using single name stocks which allows for a more controlled exposure. The rest of the portfolio is built using futures. It is worth noting that the DRA program does not trade the single-name equities.
— Employs a bottom-up approach to diversification by balancing risk across and within asset classes and favoring those that have a higher long-term risk-adjusted return. Max notional exposure is capped at 350%.

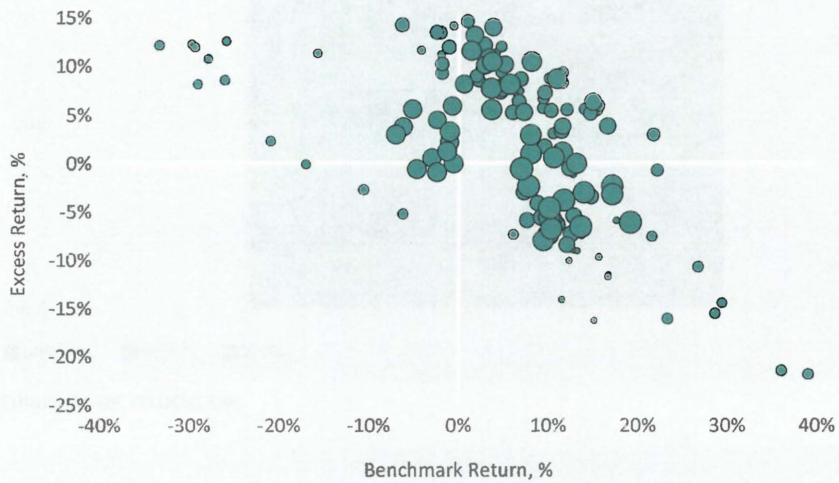
TEAM DESCRIPTION

— Multi Asset investment team of 12 investment professionals is led by Dr. Qian, who is the lead portfolio manager and CIO of the Multi Asset Group

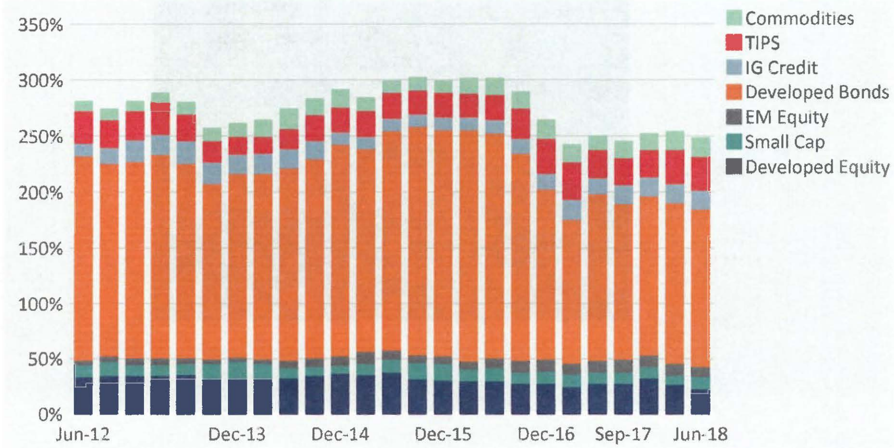
Index: 60-40 ACWI-Gbl Agg Returns: Gross of Fees
Data Source: eVestment Alliance Universe: eA All Global Balanced - TAA - Unhedged & Hedged

Strategy overview - PanAgora

12 MONTH EXCESS PERFORMANCE VS. BENCHMARK, DEC-06 TO JUN-18



HISTORICAL ASSET EXPOSURE



Use of leverage results in total greater than 100%

PERFORMANCE SENSITIVITY

— The strategy will underperform if there is a sharp increase in rates, or when more asset classes experience negative returns simultaneously.

— The strategic decision to underweight inflationary assets (Commodities and TIPS) relative to the two other buckets puts PanAgora at risk of underperforming peers should either of those assets experience strong performance.

DIFFERENTIATING CHARACTERISTICS

— Tactical changes driven by the DRA are an attempt to capitalize on intermediate-term opportunities using technical, behavioral, and fundamental signals.

— Inflationary growth assets are given a 20% risk allocation because of their lower expected Sharpe ratio over the long term.

— Forecasted volatility and correlations at the portfolio level is done with a 5-year half life, exponentially decaying. Within the three buckets there may be specific assets that use shorter or longer lookback periods depending on their stability.

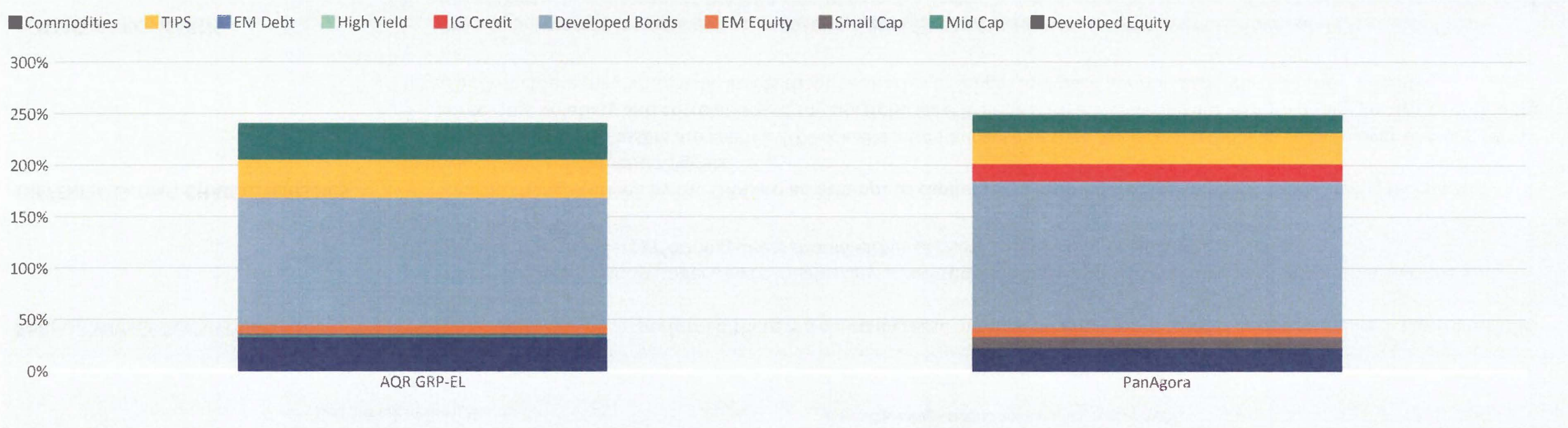
POTENTIAL CONCERNS

— The use of leverage introduces two important risks: (1) risk of exceptionally large market moves and (2) availability of financing. The tactical element of the DRA should help the portfolio shift during shorter term market moves and the fund and firm are of a size now that our financing concerns are mitigated.

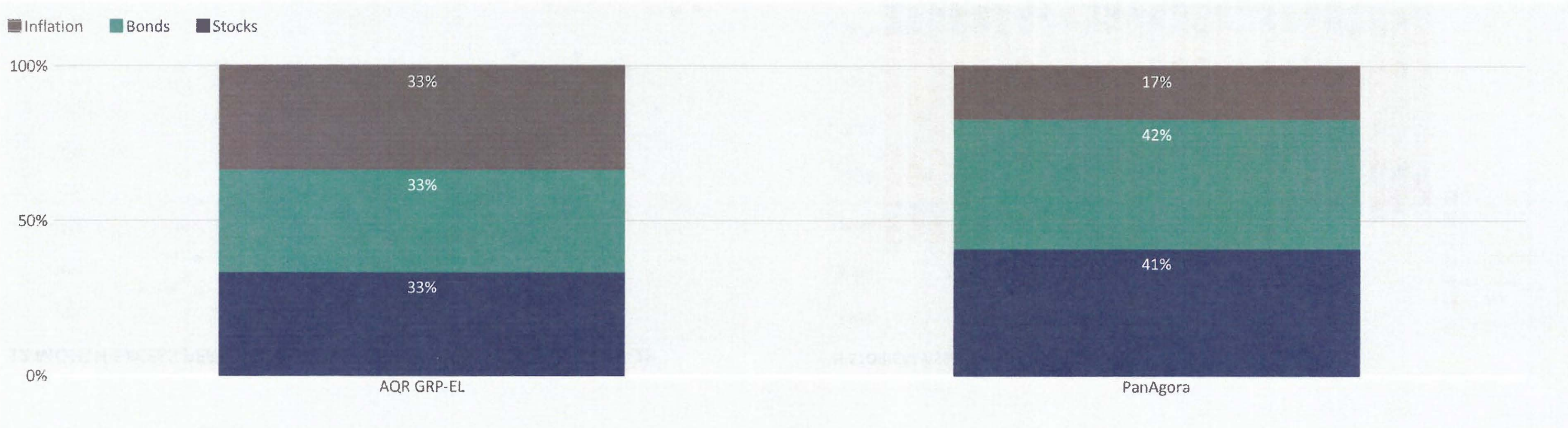
— PanAgora's AUM has grown significantly in recent years and risk parity is been a big part of that success, though capacity estimates are still several billion dollars away. We would not be surprised to see some mean reversion in the fund's relative performance vs. peers given the increased fund size.

Notional and risk weightings - as of June 2018

CURRENT NOTIONAL ALLOCATION

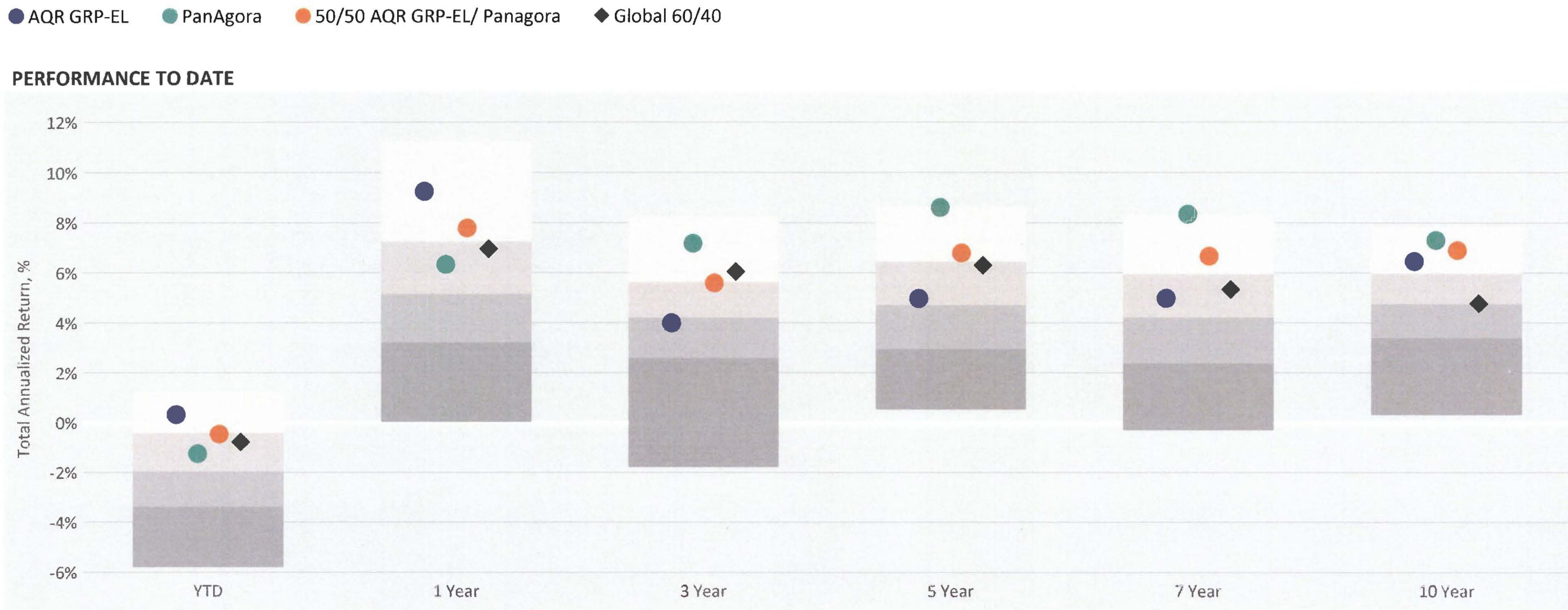


CURRENT RISK ALLOCATION



Manager combinations

Performance to date - as of June 2018



TOTAL ANNUALIZED RETURN TO DATE, %	YTD	1 Year	3 Year	5 Year	7 Year	10 Year
AQR GRP-EL	0.3	9.3	4.0	5.0	5.0	6.5
PanAgora	-1.2	6.3	7.2	8.6	8.3	7.3
50/50 AQR GRP-EL/ Panagora	-0.5	7.8	5.6	6.8	6.7	6.9
Global 60/40	-0.8	7.0	6.1	6.3	5.3	4.8

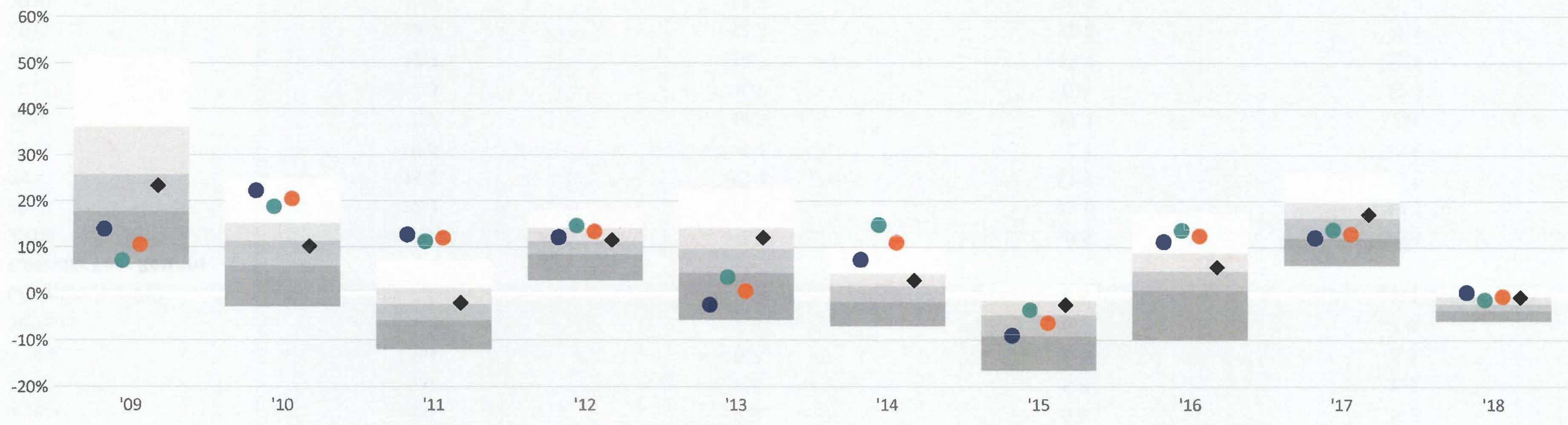
Verus

Index: 60-40 ACWI-Gbl Agg Returns: Gross of Fees
Data Source: eVestment Alliance Universe: eA All Global Balanced - TAA - Unhedged & Hedged

Calendar year performance

● AQR GRP-EL ● PanAgora ● 50/50 AQR GRP-EL/ Panagora ◆ Global 60/40

ANNUAL PERFORMANCE



	3 Months		6 Months		1 Year		3 Years		5 Years		7 Years		10 Years	
	Return	Rank	Return	Rank	Return	Rank	Return	Rank	Return	Rank	Return	Rank	Return	Rank
AQR GRP-EL	4.8	20	8.9	31	12.1	77	4.3	62	3.5	69	6.0	39	6.9	7
PanAgora	4.5	25	7.7	53	13.8	69	7.7	14	8.3	14	9.6	3	7.7	4
50/50 AQR GRP-EL/ Panagora	4.6	22	8.3	42	13.0	73	6.0	35	5.9	41	7.8	13	7.3	5
Global 60/40	3.9	40	7.8	50	17.1	46	6.5	30	6.8	30	6.1	36	4.3	58
5th Percentile	6.6	5	12.6	5	26.0	5	9.1	5	9.8	5	9.0	5	7.1	5
25th Percentile	4.4	25	9.4	25	20.0	25	6.8	25	7.2	25	6.8	25	5.5	25
Median		50		50		50		50		50		50		50
75th Percentile	2.5		5.9		12.3		3.0		3.0		3.4		3.4	
95th Percentile	0.8		2.8		6.2		-0.2		0.2		0.6		0.9	
# of Portfolios		22		42		73		35		41		13		5

Universe Rank: Green = Top Quartile Red = Bottom Quartile **Universe:** eA All Global Balanced - TAA - Unhedged & Hedged

Performance summary - as of June 2018

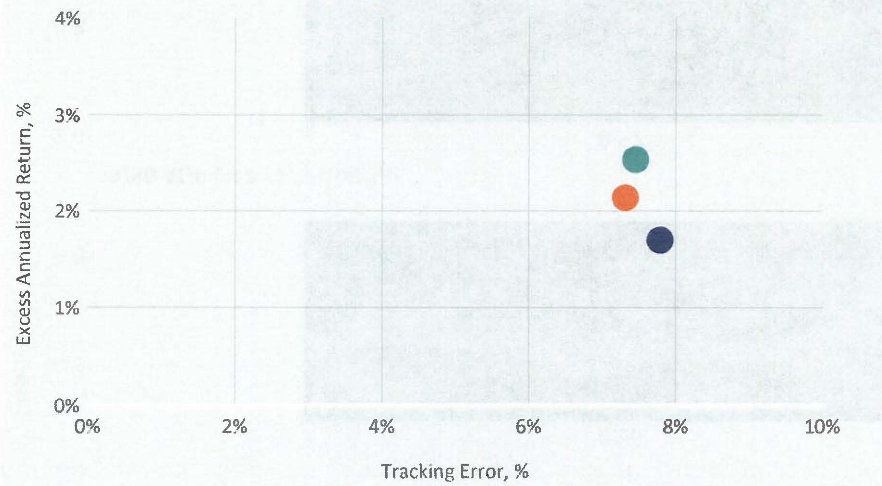
	AQR GRP-EL	PanAgora	50/50 AQR GRP-EL/ Panagora	Global 60/40
Statistics (5 Years)				
Annualized Return, %	5.0	8.6	6.8	6.3
Annualized StdDev, %	6.9	7.8	7.2	6.9
Sharpe Ratio	0.7	1.0	0.9	0.9
Avg Loss, %	-1.7	-1.7	-1.7	-1.5
Loss Frequency, %	38.3	36.7	36.7	36.7
Max Drawdown Return, %	-14.1	-8.5	-10.8	-8.7
Max Drawdown Period	Sep-14 - Dec-15	Apr-15 - Dec-15	May-15 - Dec-15	Sep-14 - Jan-16
Recovery Period	Jan-16 - May-17	Jan-16 - May-16	Jan-16 - Jun-16	Feb-16 - Jul-16
Skewness	-0.5	-0.3	-0.4	0.1
Excess Kurtosis	0.0	1.4	0.9	---
Returns to Date				
1 Year	9.3	6.3	7.8	7.0
3 Year	4.0	7.2	5.6	6.1
5 Year	5.0	8.6	6.8	6.3
7 Year	5.0	8.3	6.7	5.3
10 Year	6.5	7.3	6.9	4.8
Common (Jan-06)	7.1	7.0	7.1	5.4
Calendar Year Returns				
2018	0.3	-1.2	-0.5	-0.8
2017	12.1	13.8	13.0	17.1
2016	11.2	13.7	12.5	5.7
2015	-9.0	-3.4	-6.2	-2.5
2014	7.3	14.9	11.1	2.8
2013	-2.3	3.6	0.6	12.1
2012	12.2	14.7	13.4	11.5
2011	12.7	11.3	12.0	-2.1
2010	22.3	18.8	20.5	10.2
2009	14.0	7.2	10.5	23.3
2008	-7.4	-13.4	-10.3	-25.9
2007	17.0	14.4	15.7	10.9
2006	3.4	-1.2	1.1	15.1

Index: 60-40 ACWI-Gbl Agg Returns: Gross of Fees
Data Source: eVestment Alliance Universe: eA All Global Balanced - TAA - Unhedged & Hedged

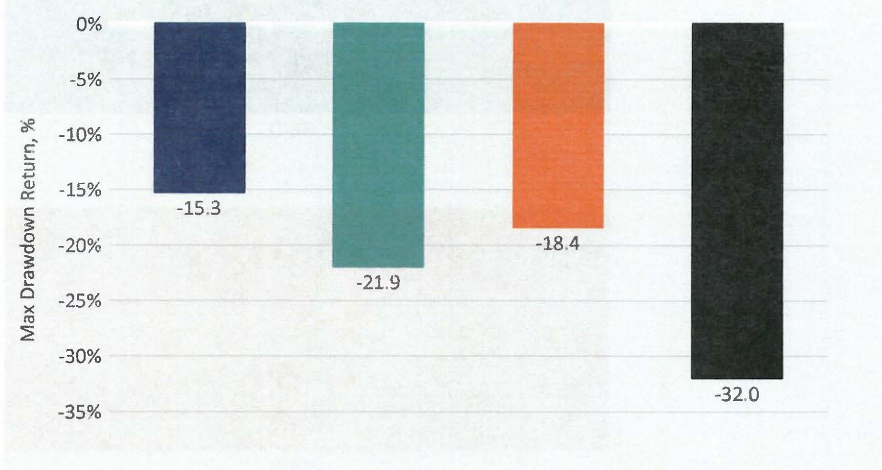
Performance statistics

● AQR GRP-EL ● PanAgora ● 50/50 AQR GRP-EL/ Panagora ◆ Global 60/40

EXCESS PERFORMANCE VS. RISK, JUL-08 TO JUN-18



MAX DRAWDOWN RETURN, JUL-08 TO JUN-18

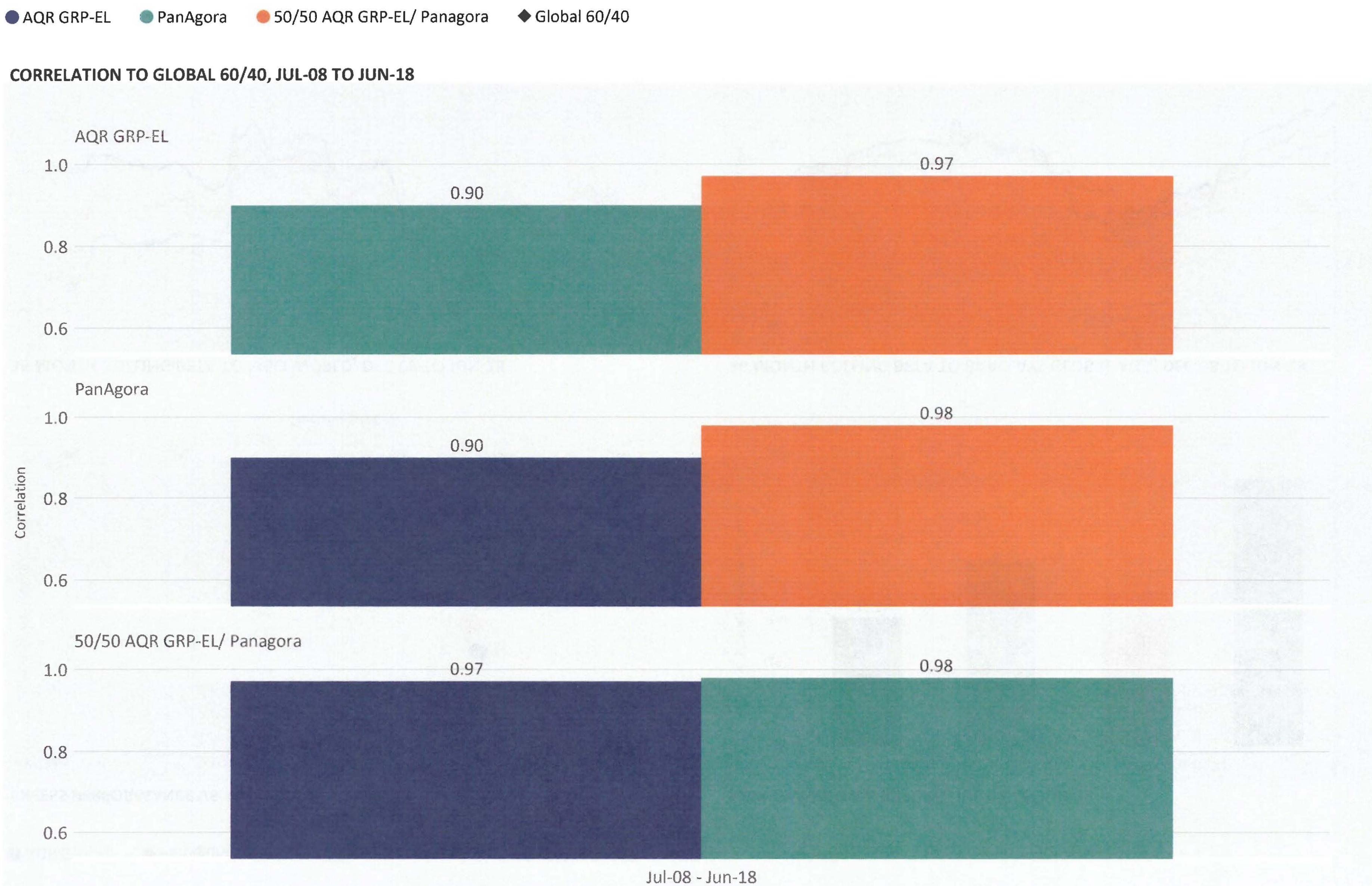


36 MONTH ROLLING BETA TO MSCI WORLD, DEC-08 TO JUN-18

36 MONTH ROLLING BETA TO BARCLAYS GLOBAL AGG, DEC-08 TO JUN-18

Risk and correlation - as of June 2018

CORRELATION TO GLOBAL 60/40, JUL-08 TO JUN-18



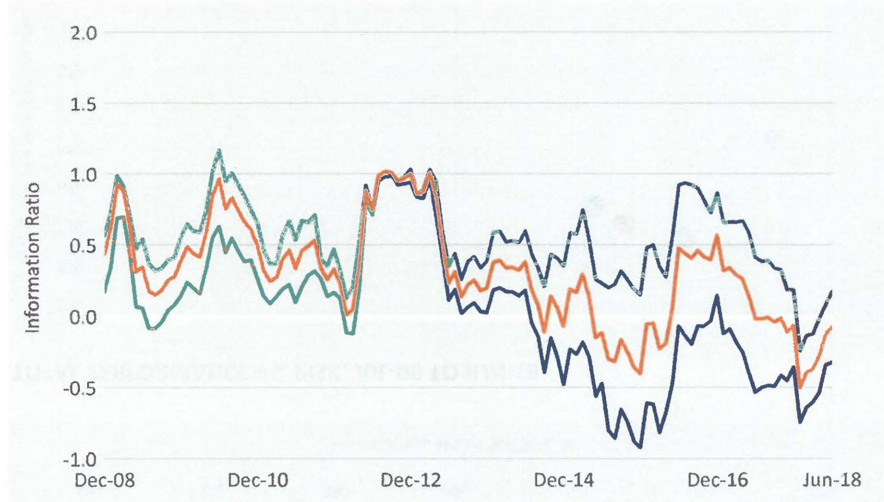
Index: 60-40 ACWI-Gbl Agg Returns: Gross of Fees
Data Source: eVestment Alliance Universe: eA All Global Balanced - TAA - Unhedged & Hedged

Performance statistics

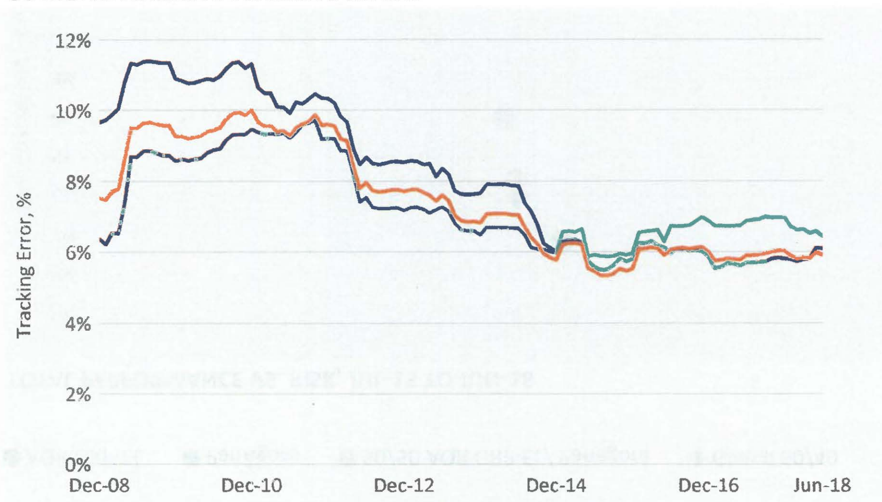
● AQR GRP-EL ● PanAgora ● 50/50 AQR GRP-EL/ Panagora ◆ Global 60/40

36 MONTH ROLLING RISK

36 MONTH ROLLING INFORMATION RATIO



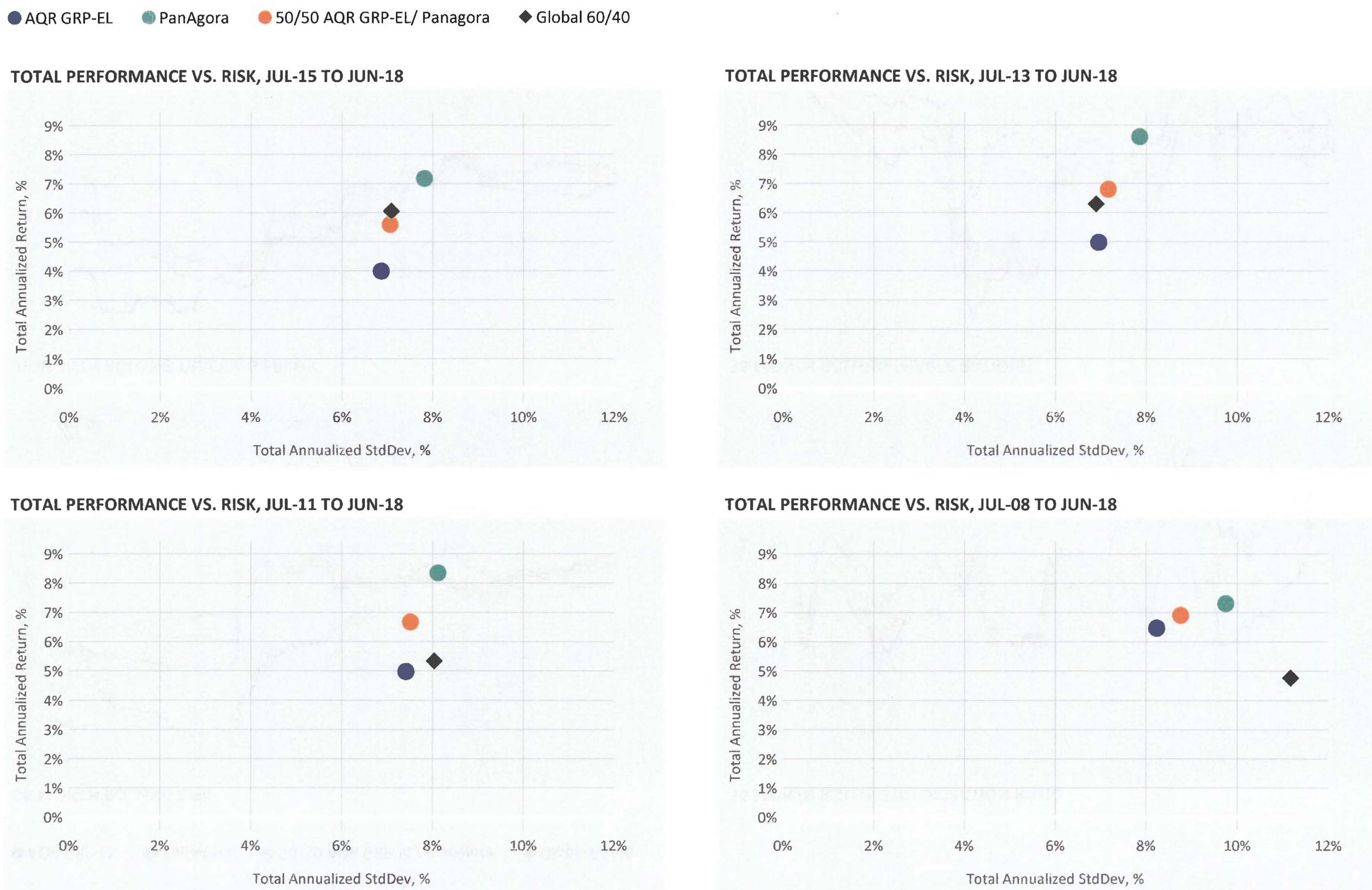
36 MONTH ROLLING TRACKING ERROR



36 MONTH ROLLING SHARPE RATIO(G)

Index: 60-40 ACWI-Gbl Agg Returns: Gross of Fees
Data Source: eVestment Alliance Universe: eA All Global Balanced - TAA - Unhedged & Hedged

Risk vs. return

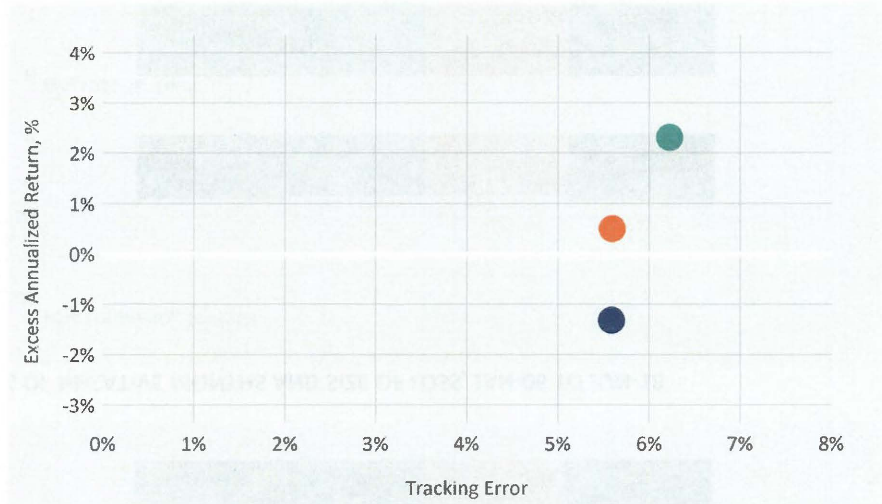


Performance efficiency

● AQR GRP-EL ● PanAgora ● 50/50 AQR GRP-EL/ Panagora ◆ Global 60/40

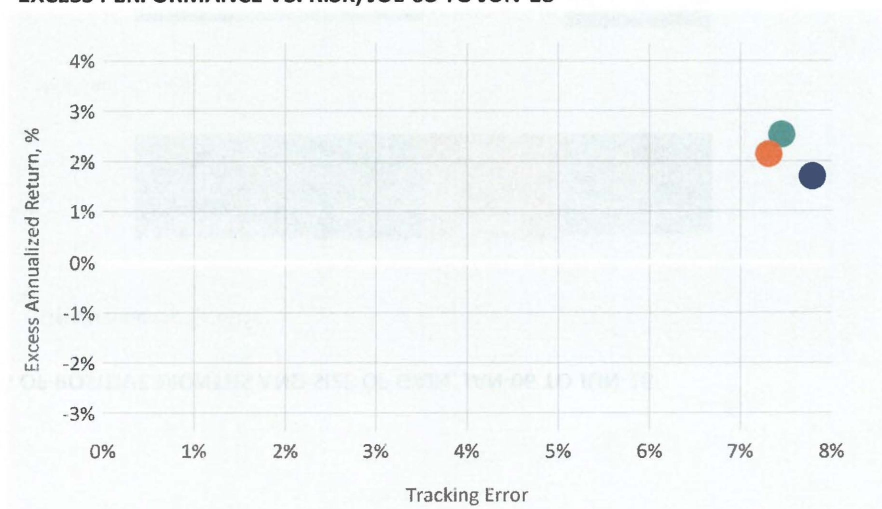
EXCESS PERFORMANCE VS. RISK, JUL-15 TO JUN-18

EXCESS PERFORMANCE VS. RISK, JUL-13 TO JUN-18



EXCESS PERFORMANCE VS. RISK, JUL-11 TO JUN-18

EXCESS PERFORMANCE VS. RISK, JUL-08 TO JUN-18



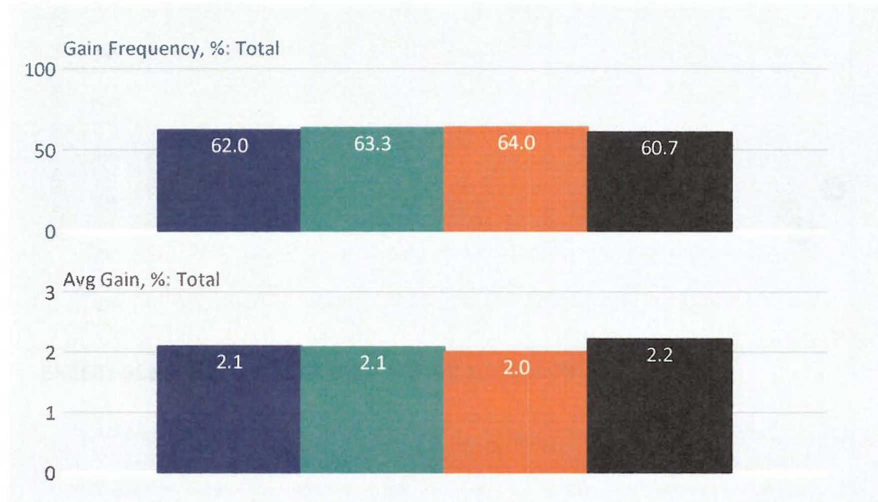
Index: 60-40 ACWI-Gbl Agg Returns: Gross of Fees
Data Source: eVestment Alliance Universe: eA All Global Balanced - TAA - Unhedged & Hedged

Up & down market analysis

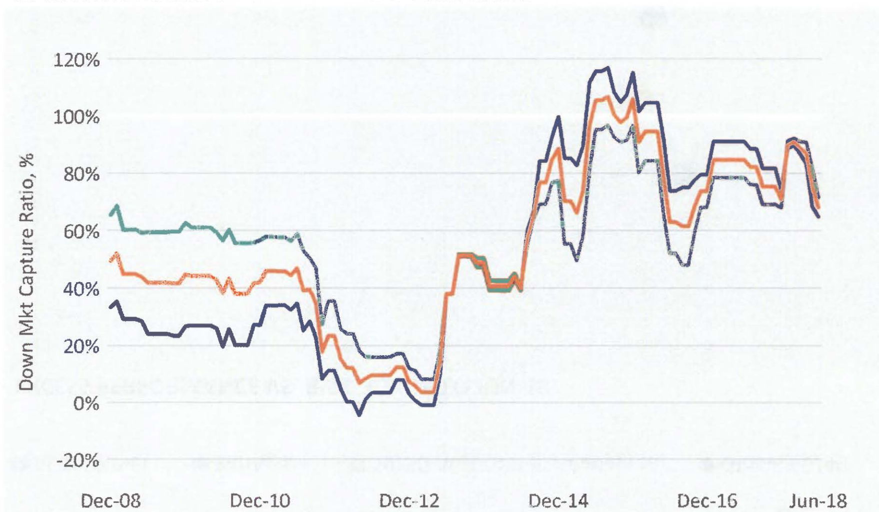
● AQR GRP-EL ● PanAgora ● 50/50 AQR GRP-EL/ Panagora ◆ Global 60/40

36 MONTH ROLLING UP MKT CAPTURE RATIO

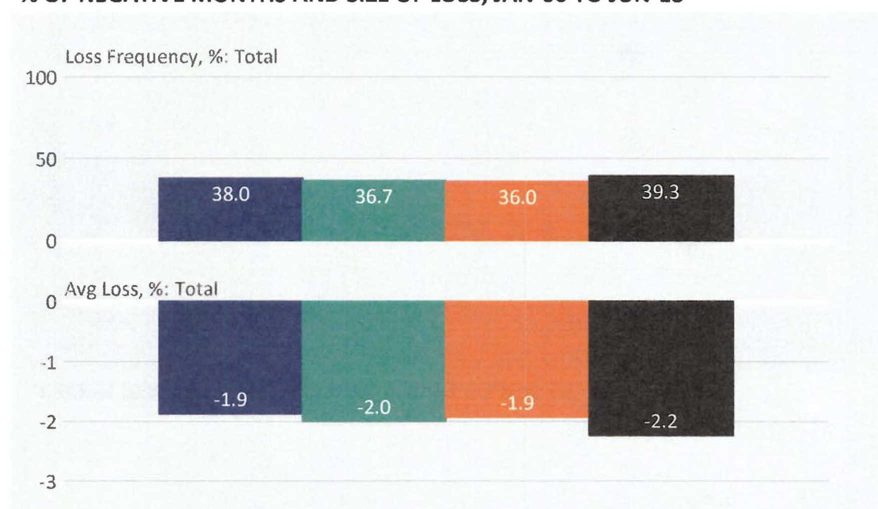
% OF POSITIVE MONTHS AND SIZE OF GAIN, JAN-06 TO JUN-18



36 MONTH ROLLING DOWN MKT CAPTURE RATIO



% OF NEGATIVE MONTHS AND SIZE OF LOSS, JAN-06 TO JUN-18



Index: 60-40 ACWI-Gbl Agg Returns: Gross of Fees
Data Source: eVestment Alliance Universe: eA All Global Balanced - TAA - Unhedged & Hedged

Next steps

Next steps

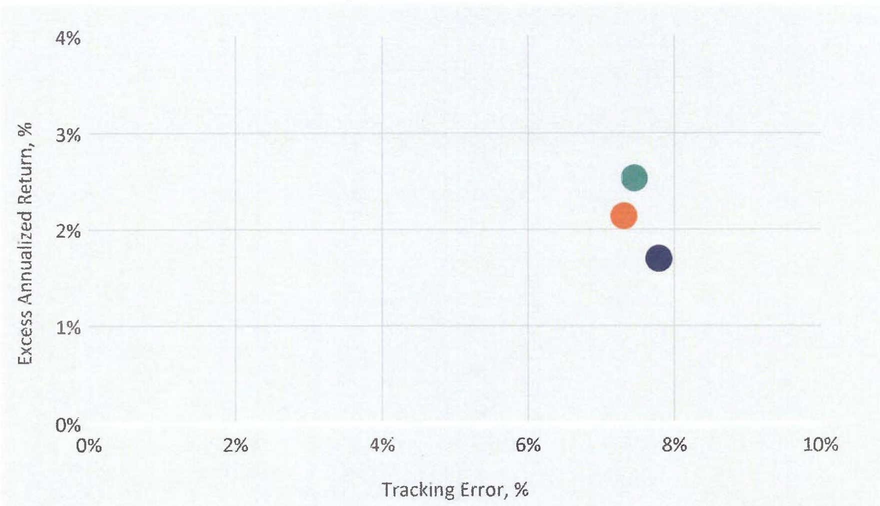
1. Hear presentations from each provider at this meeting.
2. Provide direction to Staff to enter into negotiations with selected provider(s).

Appendix

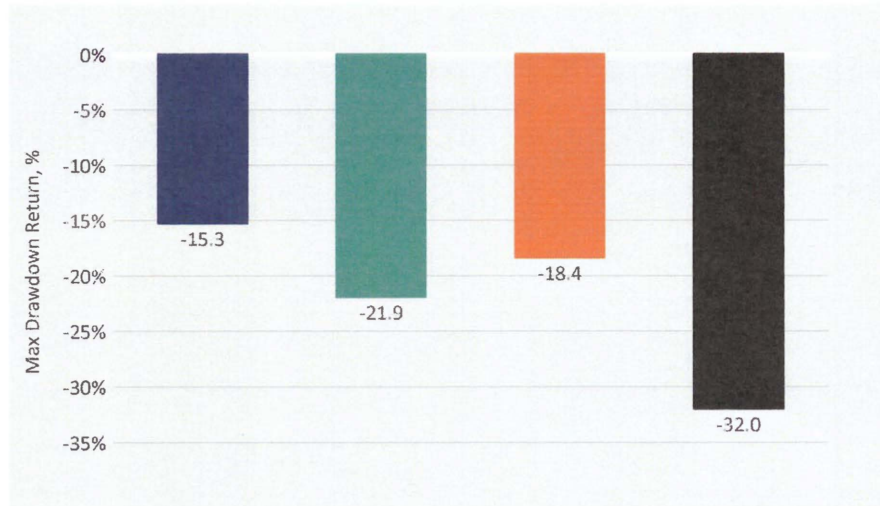
Performance statistics

● AQR GRP-EL ● PanAgora ● 50/50 AQR GRP-EL/ Panagora ◆ Global 60/40

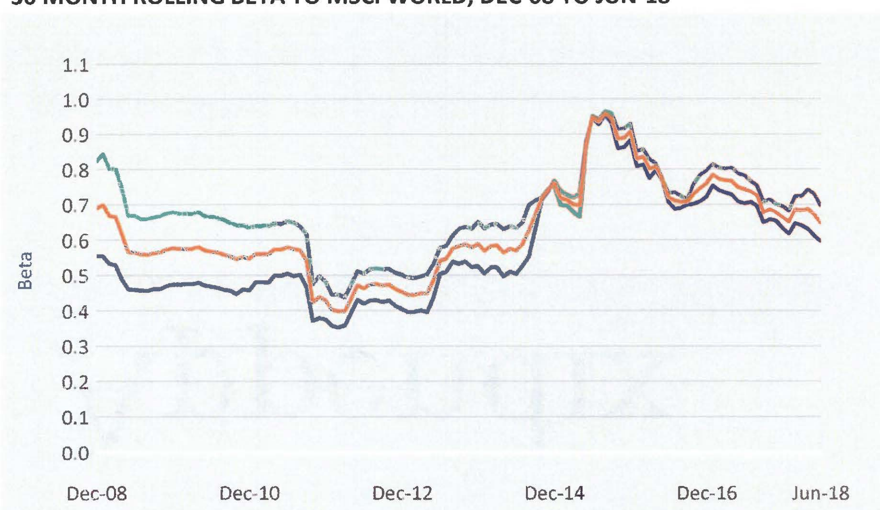
EXCESS PERFORMANCE VS. RISK, JUL-08 TO JUN-18



MAX DRAWDOWN RETURN, JUL-08 TO JUN-18



36 MONTH ROLLING BETA TO MSCI WORLD, DEC-08 TO JUN-18



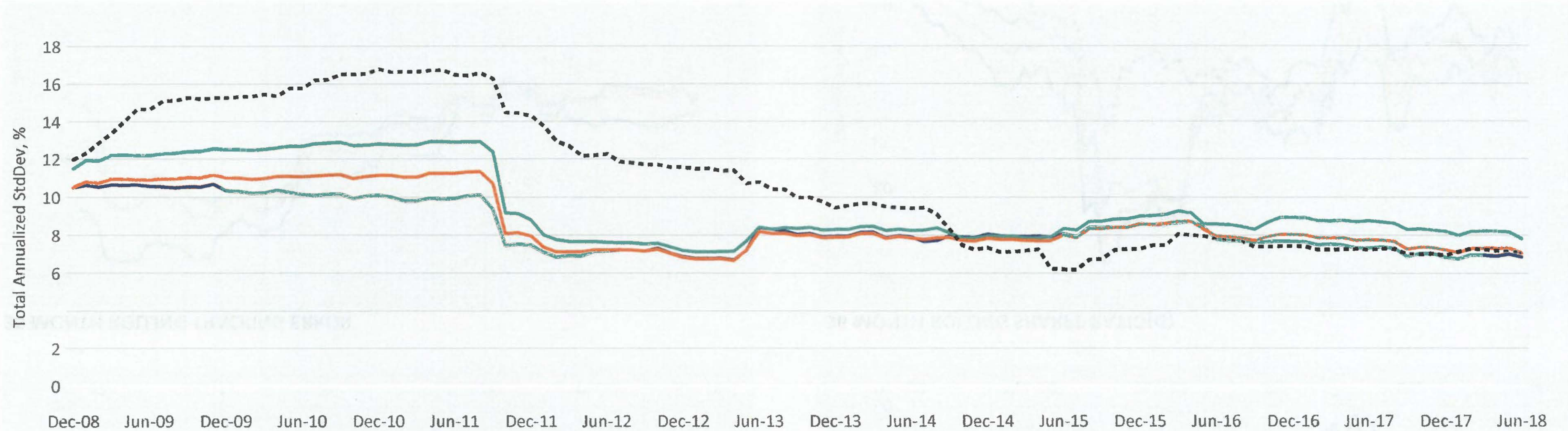
36 MONTH ROLLING BETA TO BARCLAYS GLOBAL AGG, DEC-08 TO JUN-18

Index: 60-40 ACWI-Gbl Agg Returns: Gross of Fees
Data Source: eVestment Alliance Universe: eA All Global Balanced - TAA - Unhedged & Hedged

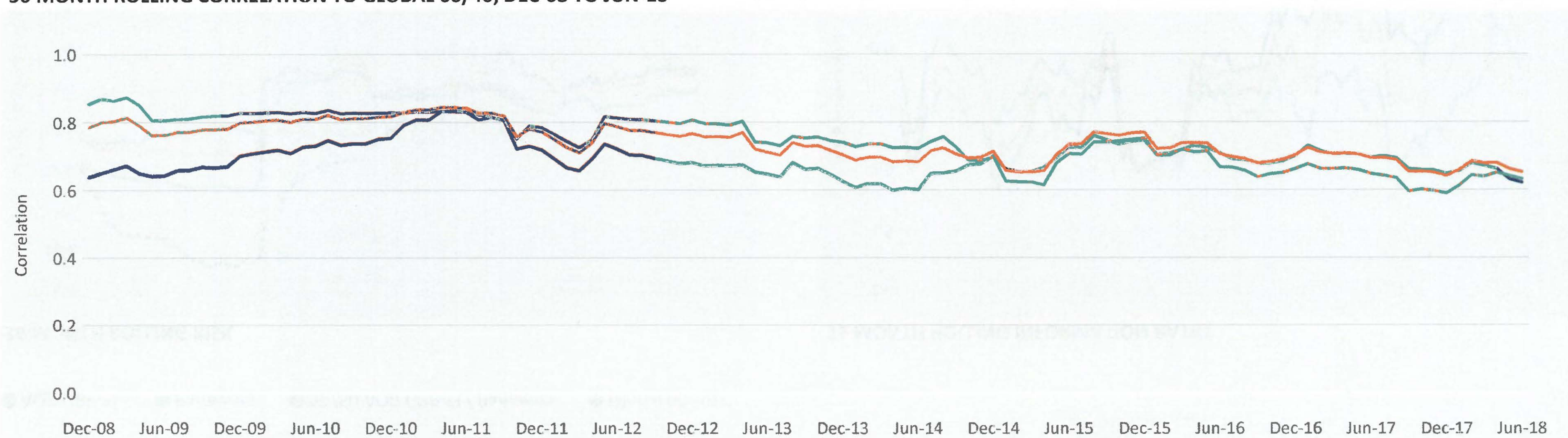
Risk and correlation - as of June 2018

● AQR GRP-EL ● PanAgora ● 50/50 AQR GRP-EL/ Panagora ◆ Global 60/40

36 MONTH ROLLING RISK, DEC-08 TO JUN-18



36 MONTH ROLLING CORRELATION TO GLOBAL 60/40, DEC-08 TO JUN-18

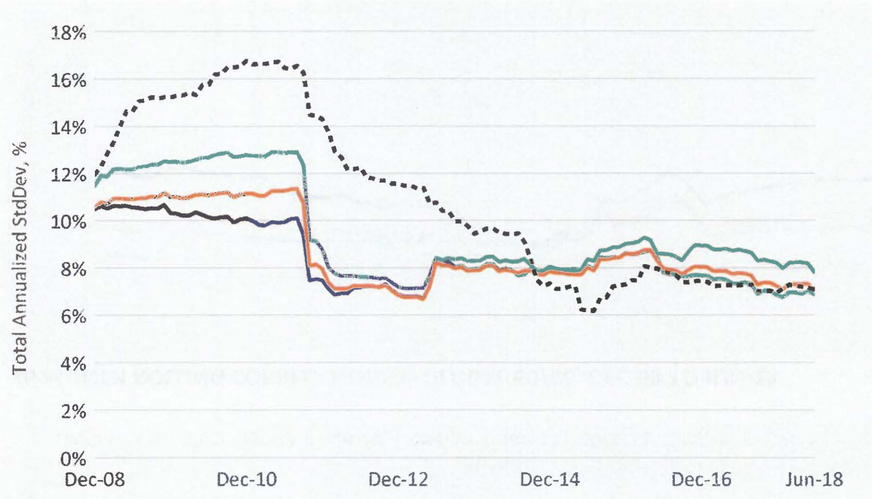


Index: 60-40 ACWI-Gbl Agg Returns: Gross of Fees
Data Source: eVestment Alliance Universe: eA All Global Balanced - TAA - Unhedged & Hedged

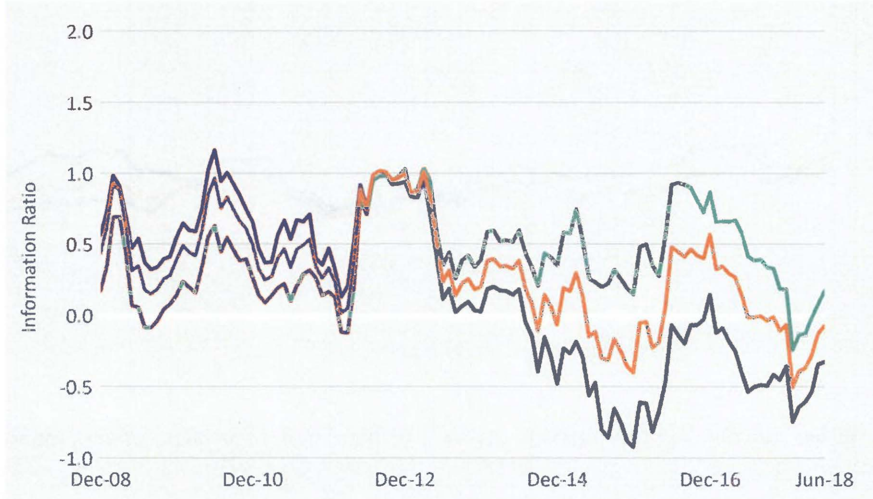
Performance statistics

● AQR GRP-EL ● PanAgora ● 50/50 AQR GRP-EL/ Panagora ◆ Global 60/40

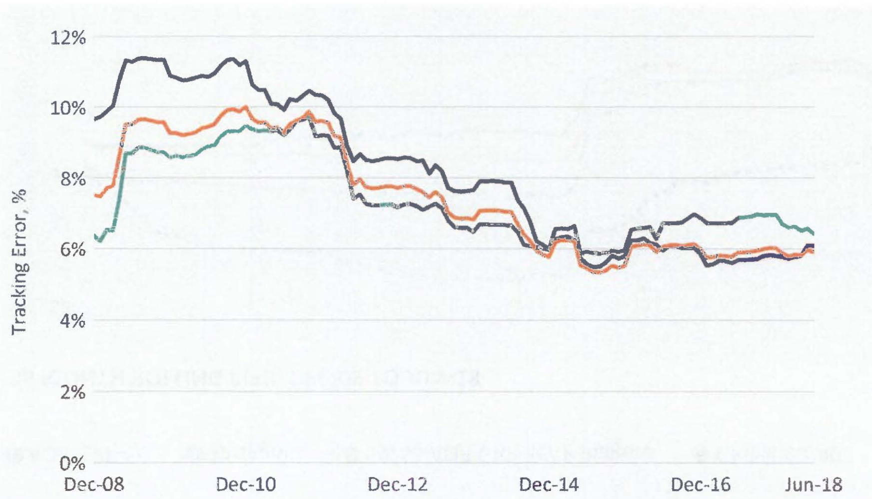
36 MONTH ROLLING RISK



36 MONTH ROLLING INFORMATION RATIO



36 MONTH ROLLING TRACKING ERROR

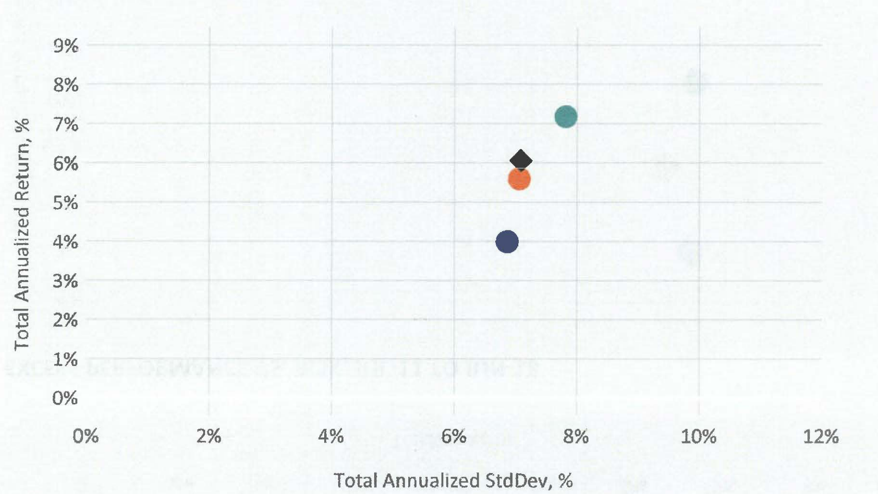


36 MONTH ROLLING SHARPE RATIO(G)

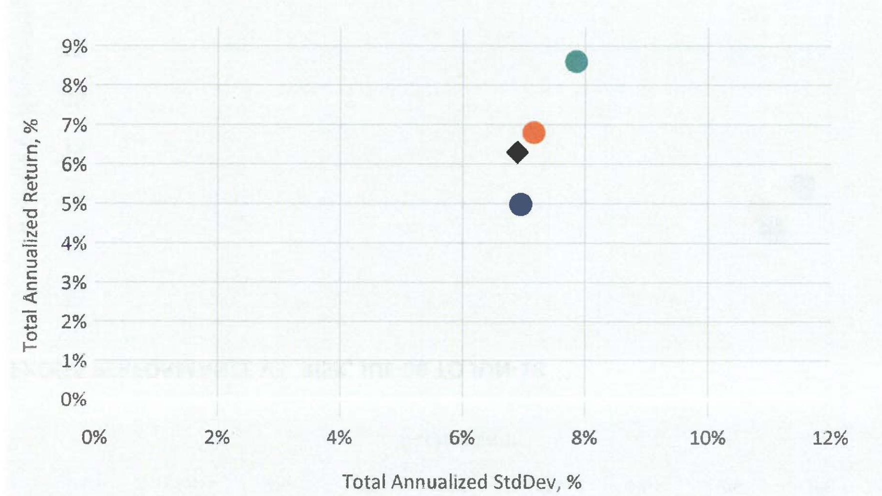
Risk vs. return

● AQR GRP-EL ● PanAgora ● 50/50 AQR GRP-EL/ Panagora ◆ Global 60/40

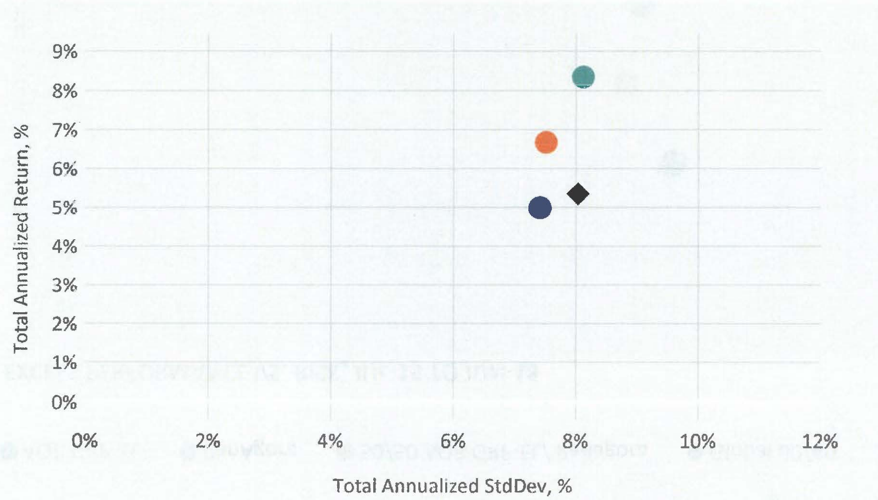
TOTAL PERFORMANCE VS. RISK, JUL-15 TO JUN-18



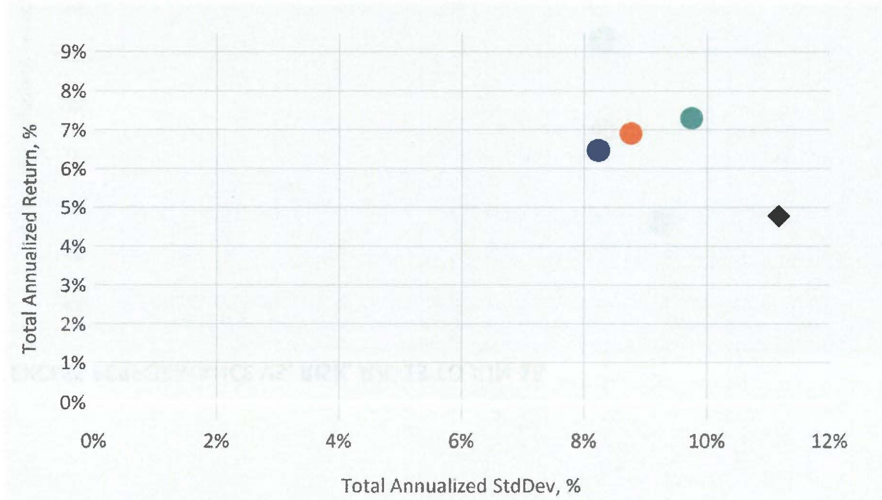
TOTAL PERFORMANCE VS. RISK, JUL-13 TO JUN-18



TOTAL PERFORMANCE VS. RISK, JUL-11 TO JUN-18



TOTAL PERFORMANCE VS. RISK, JUL-08 TO JUN-18



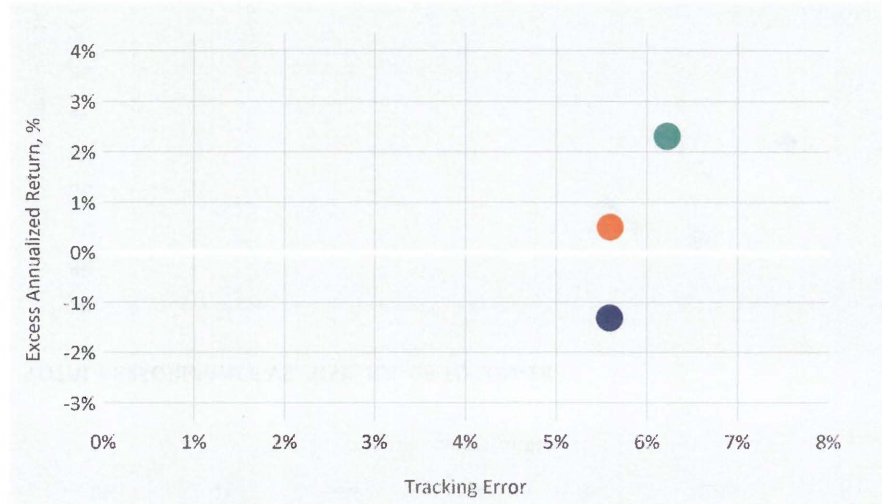
Index: 60-40 ACWI-Gbl Agg Returns: Gross of Fees
Data Source: eVestment Alliance Universe: eA All Global Balanced - TAA - Unhedged & Hedged

Performance efficiency

● AQR GRP-EL ● PanAgora ● 50/50 AQR GRP-EL/ Panagora ◆ Global 60/40

EXCESS PERFORMANCE VS. RISK, JUL-15 TO JUN-18

EXCESS PERFORMANCE VS. RISK, JUL-13 TO JUN-18



EXCESS PERFORMANCE VS. RISK, JUL-11 TO JUN-18

EXCESS PERFORMANCE VS. RISK, JUL-08 TO JUN-18

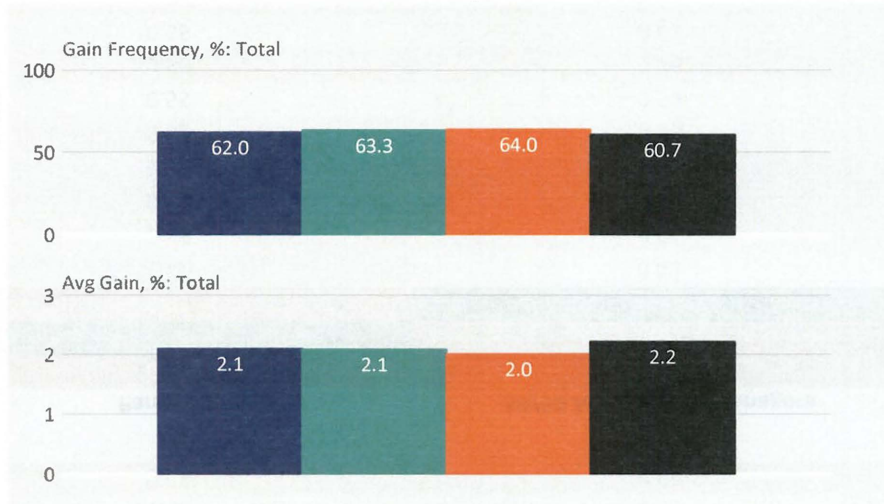
Index: 60-40 ACWI-Gbl Agg Returns: Gross of Fees
Data Source: eVestment Alliance Universe: eA All Global Balanced - TAA - Unhedged & Hedged

Up & down market analysis

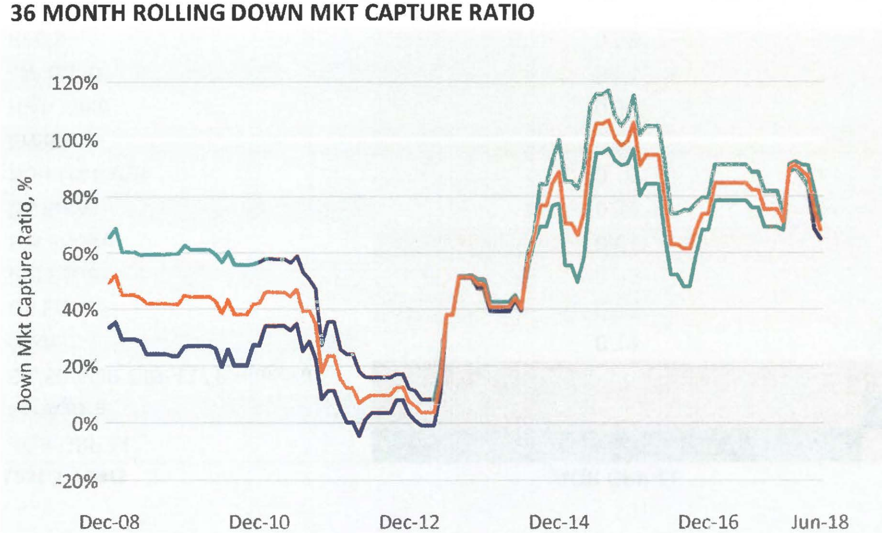
● AQR GRP-EL ● PanAgora ● 50/50 AQR GRP-EL/ Panagora ◆ Global 60/40

36 MONTH ROLLING UP MKT CAPTURE RATIO

% OF POSITIVE MONTHS AND SIZE OF GAIN, JAN-06 TO JUN-18



36 MONTH ROLLING DOWN MKT CAPTURE RATIO



% OF NEGATIVE MONTHS AND SIZE OF LOSS, JAN-06 TO JUN-18

Index: 60-40 ACWI-Gbl Agg Returns: Gross of Fees
Data Source: eVestment Alliance Universe: eA All Global Balanced - TAA - Unhedged & Hedged

Correlations - as of June 2017

Last 3 Years	AQR GRP-EL	PanAgora	50/50 AQR GRP-EL/ Panagora
AQR GRP-EL		0.85	0.96
PanAgora	0.85		0.97
50/50 AQR GRP-EL/ Panagora	0.96	0.97	
Cash	0.19	-0.01	0.09
US Equity	0.52	0. 7	0.51
Intl Equity	0. 3	0. 3	0. 5
EM Equity	0.61	0.55	0.60
US Rates	0.39	0.62	0.54
Non-US Rates	0. 0	0.56	0.51
Credit	0.65	0.79	0.75
High Yield	0.56	0.53	0.57
EM Bond	0.64	0.80	0.75
REITS	0.58	0.70	0.67
TIPS	0.65	0.79	0.75
Commodities	0.57	0.22	0. 0
Global 60/40	0.62	0.63	0.65

Last 5 Years	AQR GRP-EL	PanAgora	50/50 AQR GRP-EL/ Panagora
AQR GRP-EL		0.87	0.96
PanAgora	0.87		0.97
50/50 AQR GRP-EL/ Panagora	0.96	0.97	
Cash	0.09	-0.04	0.02
US Equity	0.51	0. 8	0.51
Intl Equity	0.53	0.50	0.53
EM Equity	0.63	0.55	0.61
US Rates	0. 2	0.63	0.55
Non-US Rates	0. 9	0.55	0.54
Credit	0.66	0.80	0.76
High Yield	0.64	0.55	0.61
EM Bond	0.70	0.77	0.76
REITS	0.62	0.75	0.71
TIPS	0.69	0.76	0.75
Commodities	0.52	0.19	0.36
Global 60/40	0.67	0.65	0.68

Index: 60-40 ACWI-Gbl Agg Returns: Gross of Fees
Data Source: eVestment Alliance Universe: eA All Global Balanced - TAA - Unhedged & Hedged

Correlations

Last 10 Years	AQR GRP-EL	PanAgora	50/50 AQR GRP-EL/ Panagora
AQR GRP-EL		0.90	0.97
PanAgora	0.90		0.98
50/50 AQR GRP-EL/ Panagora	0.97	0.98	
Cash	-0.20	-0.25	-0.23
US Equity	0.60	0.64	0.64
Intl Equity	0.64	0.67	0.67
EM Equity	0.67	0.69	0.70
US Rates	0.32	0.[illegible]1	0.38
Non-US Rates	0.59	0.62	0.62
Credit	0.69	0.73	0.73
High Yield	0.63	0.62	0.64
EM Bond	0.73	0.81	0.79
REITS	0.63	0.71	0.69
TIPS	0.70	0.7	0.7
Commodities	0.64	0.54	0.60
Global 60/40	0.72	0.75	0.76

Common Dates (Jan-06)	AQR GRP-EL	PanAgora	50/50 AQR GRP-EL/ Panagora
AQR GRP-EL		0.86	0.96
PanAgora	0.86		0.97
50/50 AQR GRP-EL/ Panagora	0.96	0.97	
Cash	0.01	-0.10	-0.05
US Equity	0.[illegible]8	0.60	0.57
Intl Equity	0.54	0.65	0.62
EM Equity	0.58	0.67	0.65
US Rates	0.39	0.36	0.39
Non-US Rates	0.62	0.58	0.62
Credit	0.66	0.71	0.71
High Yield	0.54	0.60	0.59
EM Bond	0.68	0.78	0.76
REITS	0.53	0.66	0.62
TIPS	0.70	0.67	0.71
Commodities	0.60	0.52	0.58
Global 60/40	0.64	0.74	0.72

Index: 60-40 ACWI-Gbl Agg Returns: Gross of Fees
Data Source: eVestment Alliance Universe: eA All Global Balanced - TAA - Unhedged & Hedged

Correlations of excess returns over 60/40

Last 3 Years	AQR GRP-EL	PanAgora	50/50 AQR GRP-EL/ Panagora
AQR GRP-EL		0.78	0.94
PanAgora	0.78		0.95
50/50 AQR GRP-EL/ Panagora	0.94	0.95	
Cash	0. 7	0.33	0. 2
US Equity	-0.24	-0.3	-0.31
Intl Equity	-0.61	-0.57	-0.62
EM Equity	-0.19	-0.22	-0.22
US Rates	0.61	0.62	0.65
Non-US Rates	0.37	0.50	0.46
Credit	0.62	0.62	0.66
High Yield	0.3	0.21	0.29
EM Bond	0.56	0.69	0.66
REITS	0.20	0. 2	0.33
TIPS	0.64	0.61	0.66
Commodities	0.59	0.16	0.39
Global 60/40	---	---	---

Last 5 Years	AQR GRP-EL	PanAgora	50/50 AQR GRP-EL/ Panagora
AQR GRP-EL		0.80	0.94
PanAgora	0.80		0.95
50/50 AQR GRP-EL/ Panagora	0.94	0.95	
Cash	0. 0	0.29	0.36
US Equity	-0.32	-0.31	-0.33
Intl Equity	-0.50	-0.46	-0.50
EM Equity	-0.11	-0.17	-0.15
US Rates	0.59	0.60	0.63
Non-US Rates	0. 0	0. 2	0. 3
Credit	0.62	0.64	0.66
High Yield	0.36	0.17	0.27
EM Bond	0.56	0.62	0.62
REITS	0.3	0.58	0. 9
TIPS	0.66	0.62	0.68
Commodities	0. 5	0.01	0.23
Global 60/40	---	---	---

Verus

Index: 60-40 ACWI-Gbl Agg Returns: Gross of Fees
Data Source: eVestment Alliance Universe: eA All Global Balanced - TAA - Unhedged & Hedged

Correlations of excess returns over 60/40

Last 10 Years	AQR GRP-EL	PanAgora	50/50 AQR GRP-EL/ Panagora
AQR GRP-EL		0.84	0.96
PanAgora	0.84		0.96
50/50 AQR GRP-EL/ Panagora	0.96	0.96	
Cash	0.68	0.51	0.62
US Equity	-0. 3	-0. 0	-0.44
Intl Equity	-0.71	-0.62	-0.70
EM Equity	-0. 8	-0.39	-0. 5
US Rates	0.78	0.70	0.77
Non-US Rates	0.64	0.57	0.63
Credit	0.77	0.70	0.77
High Yield	0.22	0.10	0.17
EM Bond	0.66	0.69	0.71
REITS	-0.26	-0.07	-0.17
TIPS	0.82	0.75	0.82
Commodities	0.16	-0.01	0.08
Global 60/40	---	---	---

Common Dates (Jan-06)	AQR GRP-EL	PanAgora	50/50 AQR GRP-EL/ Panagora
AQR GRP-EL		0.82	0.96
PanAgora	0.82		0.95
50/50 AQR GRP-EL/ Panagora	0.96	0.95	
Cash	0.63	0.51	0.60
US Equity	-0. 9	-0. 2	-0. 8
Intl Equity	-0.71	-0.63	-0.70
EM Equity	-0.46	-0.37	-0.44
US Rates	0.76	0.69	0.76
Non-US Rates	0.68	0.58	0.66
Credit	0.7	0.69	0.75
High Yield	0.20	0.12	0.17
EM Bond	0.64	0.67	0.68
REITS	-0.26	-0.11	-0.20
TIPS	0.81	0.7	0.81
Commodities	0.27	0.11	0.20
Global 60/40	---	---	---

Index: 60-40 ACWI-Gbl Agg Returns: Gross of Fees
Data Source: eVestment Alliance Universe: eA All Global Balanced - TAA - Unhedged & Hedged

Glossary

Glossary

Kurtosis *(excess returns)- Kurtosis describes whether the series distribution is peaked or flat and how thick the tails are as compared to a normal distribution. Positive kurtosis indicates a relatively peaked distribution near the mean and tends to decline rapidly and have fat tails. Negative kurtosis indicates a relatively flat distribution near the mean.*

Long Term Reversal Factor: *Risk premium associated with buying past losers and selling past winners (five year time horizon).*

Low Volatility*: Risk premium generated by picking low volatility stocks, measured by the MSCI USA Minimum Volatility Index.*

Momentum Factor: *Risk premium associated with buying past winners and selling past losers.*

Portfolio Turnover: *The percentage of a portfolio that is sold and replaced (turned over) during a given time period. Low portfolio turnover is indicative of a buy and hold strategy while high portfolio turnover implies a more active form of management.*

Predicted Style R-squared: *Measures how well the manager's predicted style fits the manager's return series. Adding many unnecessary indices will not improve the Predicted Style R-Squared. The methodology essentially predicts the manager's style at each point in time without the data at that point with the rationale being that if the style estimates obtained so far are good, then they can be used to predict the style at the estimation point.*

Price-to-Earnings Ratio: *Also called the earnings multiplier, it is calculated by dividing the price of a company's stock into earnings per share. Growth managers typically hold stocks with high price-to-earnings ratios whereas value managers hold stocks with low price-to-earnings ratios.*

Quality: *The quality factors measured the manager`s exposure to high quality stocks versus low quality stocks as defied by S&P. The factor is constructed by combining a long position in the S&P 500 High Quality index and short position S&P 500 Low Quality index.*

Regression Based Asset Loadings: *Represents the exposure period of an investment product (called a Manager, Fund, or Index in Stylus) to various explanatory variables. It is also referred to as Style Indices or Asset Classes. These Indices can be interpreted as the Manager Betas or risk factors at a given point in time.*

Risk Premium: *An expected return in excess of the risk-free rate. The premium provides compensation for the assumption of risk.*

Risk-Free Rate: *The rate of interest that one can earn on an investment with no default risk. It is generally assumed to be the interest rate on a 91 day T-Bill.*

R-Squared: *Also called the coefficient of determination, it measures the amount of variation in one variable explained by variations in another. In the case of investments, the term is used to explain the amount of variation in a security or portfolio explained by movements in the market or the portfolio's benchmark.*

Selection return: *The difference between the Manager and the Manager's Style Return.*

Sharpe Ratio: *A measure of portfolio efficiency. The Sharpe Ratio indicates excess portfolio return for each unit of risk associated with achieving the excess return. The higher the Sharpe Ratio, the more efficient the portfolio. Sharpe ratio is calculated as: Portfolio Excess Return / Portfolio Standard Deviation.*

Short Term Reversal Factor: *Risk premium associated with buying past losers and selling past winners (two month time horizon).*

Significance Level *(Excess Returns) - The Significance Level of a test is the probability that the test statistic will reject the null hypothesis when the hypothesis is true. Significance is a property of the distribution of a test statistic, not of any particular draw of the statistic.*

Glossary

Alpha (a): *The excess return of a portfolio after adjusting for market risk, usually attributable to the selection skill of the portfolio manager. Alpha = Excess Return – (Beta x Excess Market Return).*

Annualized Return: *Converts the Total Return to an annual basis for comparison purposes. Periods shorter than one year are not annualized.*

Benchmark: *Investment index used as a standard by which to measure the relative performance of an overall portfolio or an individual money manager. Appropriate benchmarks are selected based on their similarity to a portfolio or to the style of the individual money manager being measured.*

Benchmark R-squared: *Measures how well the Benchmark return series fits the manager's return series. The higher the Benchmark R-squared, the more appropriate the benchmark is for the manager.*

Beta (b): *A measure of systematic, or market risk; the part of risk in a portfolio or security that is attributable to general market movements. Beta is calculated by dividing the covariance of a security by the variance of the market.*

Book-to-Market: *The ratio of book value per share to market price per share. Growth managers typically have low book-to-market ratios while value managers typically have high book-to-market ratios.*

Calmar Ratio *- The Calmar Ratio is a risk/return ratio that calculates return on a downside risk adjusted basis. Similar to other efficiency ratios it balances return in the numerator per unit risk in the denominator. In this case risk is characterized by the Maximum Drawdown.*

Capture Ratio: *A statistical measure of an investment manager's overall performance in up or down markets. The capture ratio is used to evaluate how well an investment manager performed relative to an index during periods when that index has risen/fallen. The capture ratio is calculated by dividing the manager's returns by the returns of the index during the up/down market, and multiplying that factor by 100.*

Correlation Coefficient (r): *A measure of the relative movement of returns of one security or asset class relative to another over time. A correlation of 1 means the returns of two securities move in lock step, a correlation of –1 means the returns of two securities move in the exact opposite direction over time. Correlation is used as a measure to help maximize the benefits of diversification when constructing an investment portfolio.*

Hurst Exponent: *quantifies the relative tendency of a time series either to regress the mean. A value H in the range 0.5 < H < 1 indicates a time series with long-term positive autocorrelation, meaning a high value in the series will probably be followed by another high value . A value in the range 0 < H < 0.5 indicates a time series with long-term switching between high and low values in adjacent pairs, meaning that a single high value will probably be followed by a low value. A value of H=0.5 can indicate a completely uncorrelated series.*

Excess Correlation: *Correlation of the excess returns (above the benchmark).*

GARP: *Growth- t-A-Reasonable-Price. Equity strategy that combines tenets of both growth and value investing, looking for companies with above average earnings growth but excluding those with high valuations.*

Information Ratio: *A measure of a manager's ability to earn excess return without incurring additional risk. Information ratio is calculated as: alpha divided by tracking error.*

Glossary

Size Factor: *Risk premium associated with buying small companies.*

Skewness *(Excess Returns)- Skewness describes the degree of asymmetry of a distribution around its mean. A distribution is said to be symmetric if has the same shape to both the left and right of the mean. A perfectly symmetrical distribution has a Skewness of 0. A positively skewed distribution has larger gains than losses, while a negatively skewed distribution has a longer tail of losses.*

Standard Deviation (s): *A measure of volatility, or risk, inherent in a security or portfolio. The standard deviation of a series is a measure of the extent to which observations in the series differ from the arithmetic mean of the series. For example, if a security has an average annual rate of return of 10% and a standard deviation of 5%, then two-thirds of the time, one would expect to receive an annual rate of return between 5% and 15%.*

Style Analysis: *A return based analysis designed to identify combinations of passive investments to closely replicate the performance of funds.*

Style Map: *A specialized form or scatter plot chart typically used to show where a Manager lies in relation to a set of style indices on a two-dimensional plane. This is simply a way of viewing the asset loadings in a different context. The coordinates are calculated by rescaling the asset loadings to range from -1 to 1 on each axis and are dependent on the Style Indices comprising the Map.*

Style Returns: *The sum of the Return of each Style Asset multiplied by its weight for the time period.*

Style R-squared: *Measures how well the estimated Manager's style return series fits the manager's return series. The higher the Style R-squared, the better the fit between the manager's style and return series.*

Total Return: *Total Return geometrically compounds the Returns in the series from one period to the next.*

Tracking Error/Excess Standard Deviation: *The standard deviation of the difference between the rate of return of a portfolio and its benchmark.*

Treynor Ratio *- The Treynor Ratio is defined as the ratio of the manager's excess geometrically annualized return over the portfolio Beta. Excess returns are computed versus the cash index.*

Universe: *Also called a peer group, a universe is a large number of portfolios of a similar style. These portfolios can be divided into deciles or quartiles and then used for performance measurement and comparative purposes. Portfolios are ranked within the universe, which tells the investor how well a manager has done relative to his or her peers.*

Value: *Refers to the style of an equity manager. A value manager seeks to create returns by purchasing stocks selling at a discount to their true or intrinsic value. Typical portfolio characteristics of this strategy include a low price-to-earnings ratio, high book-to-market ratio, and high dividend yield.*

Valuation Factor: *Risk premium associated with buying companies trading at a low price/book multiple.*

VIX : *VIX is a trademark ticker symbol for the Chicago Board Options Exchange Market Volatility Index, a popular measure of the implied volatility of S&P 500 index options. Often referred to as the fear index or the fear gauge, it represents one measure of the market's expectation of stock market volatility over the next 30 day period.*

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Meeting Date
9/26/18
Agenda Item
#9

AQR Global Risk Premium (GRP-EL) Strategy

Prepared Exclusively for Contra Costa County Employees' Retirement Association

FOR INSTITUTIONAL INVESTOR USE ONLY

September 2018

AQR

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AQR Presenters

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Principal, Portfolio Management

Yao Hua is a Principal on AQR's Global Asset Allocation team, focusing on research and portfolio management of macro-related strategies that include commodities, risk parity and managed futures. His research has been published in the *Journal of Financial Economics* and the *Journal of Investment Management.* He was named the 2013 Alternatives Fund Manager of the Year by Morningstar for his work on managed futures, and shared the 2013 Whitebox Prize for his work on time series momentum. Yao Hua is an alumnus of the Jerome Fisher Program in Management and Technology at the University of Pennsylvania, where he earned a B.S. in economics and a B.S. in engineering, graduating *summa cum laude* in both.

Joey Lee

Managing Director, Client Strategies

Joey is a senior member of AQR's Business Development team, collaborating with institutional investors throughout the Western and Southwestern U.S. In this role, she is responsible for identifying and developing relationships with prospective investors and communicating AQR's investment philosophy and process across a range of traditional and alternative investment strategies. Prior to AQR, Joey worked in the White House as an aide in the Executive Office of the President, helping senior officials with communications and strategic planning. She earned a B.A., with distinction, in political science from Yale University, where she was a recipient of the Yale University–New Asia College Undergraduate Exchange fellowship and the Academic All-Ivy award, and was a four-year starter on the women's volleyball team; she earned an M.B.A. with concentrations in analytic finance and economics from the University of Chicago's Graduate School of Business, where she received the Lehman Brothers Fellowship.

AQR Overview

Risk Parity Strategy

Risk balancing offers more effective diversification

Build a risk-diversified portfolio

- Seeks better risk-adjusted returns
- Motivated by one of the strongest principles in finance — the power of diversification
- Less risk in stocks than in a traditional portfolio, more in everything else

Keep it that way

- Actively managed to target a risk balance across asset classes
- Seeks to keep total portfolio risk as steady as possible

Diversification does not eliminate the risk of experiencing investment losses. Please read important disclosures in the Appendix.

Our Firm

AQR is a global investment management firm built at the intersection of financial theory and practical application. We strive to deliver superior, long-term results for our clients by looking past market noise to identify and isolate what matters most, and by developing ideas that stand up to rigorous testing. Our focus on practical insights and analysis has made us leaders in alternative and traditional strategies since 1998.

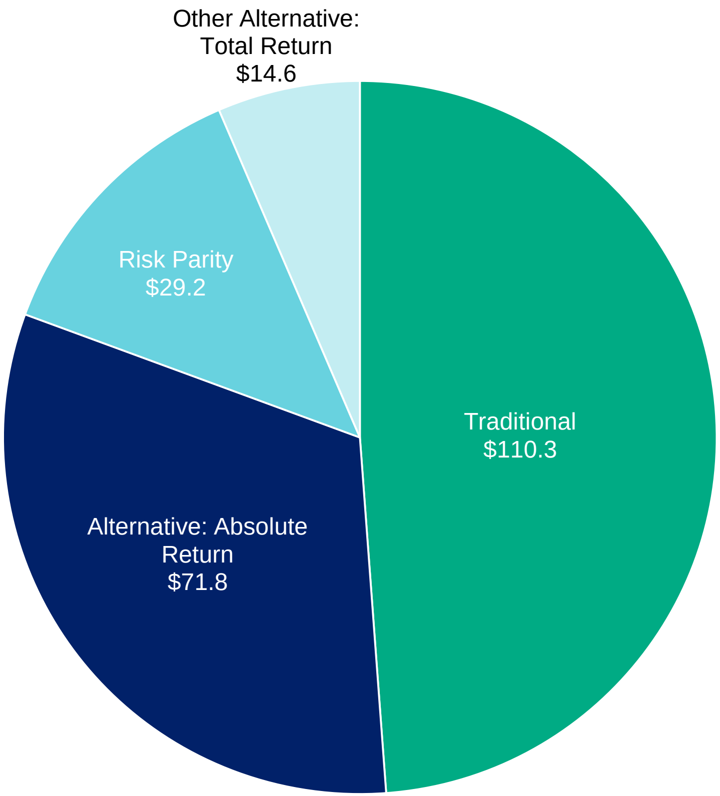
At a Glance

- AQR takes a systematic, research-driven approach to managing alternative and traditional strategies
- We apply quantitative tools to process fundamental information and manage risk
- Our clients include institutional investors, such as pension funds, defined contribution plans, insurance companies, endowments, foundations, family offices and sovereign wealth funds, as well as RIAs, private banks and financial advisors
- The firm has 35 principals and 932 employees; over half of employees hold advanced degrees
- AQR is based in Greenwich, Connecticut, with offices in Boston, Chicago, Hong Kong, London, Los Angeles, and Sydney
- Approximately $226 billion in assets under management as of June 30, 2018*

*Approximate as of 6/30/2018, includes assets managed by AQR and its advisory affiliates.

Assets Under Management

Total Assets
$226 Billion*



*Approximate as of 6/30/2018, includes assets managed by AQR and its advisory affiliates.

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Compliance

H.J. Willcox
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*Member of Executive Committee
Personnel as of 6/30/2018

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Neal Pawar
Principal

Personnel as of 7/9/2018

Investment Philosophy

Improving on Traditional Asset Allocation

Make everything matter but nothing matter too much

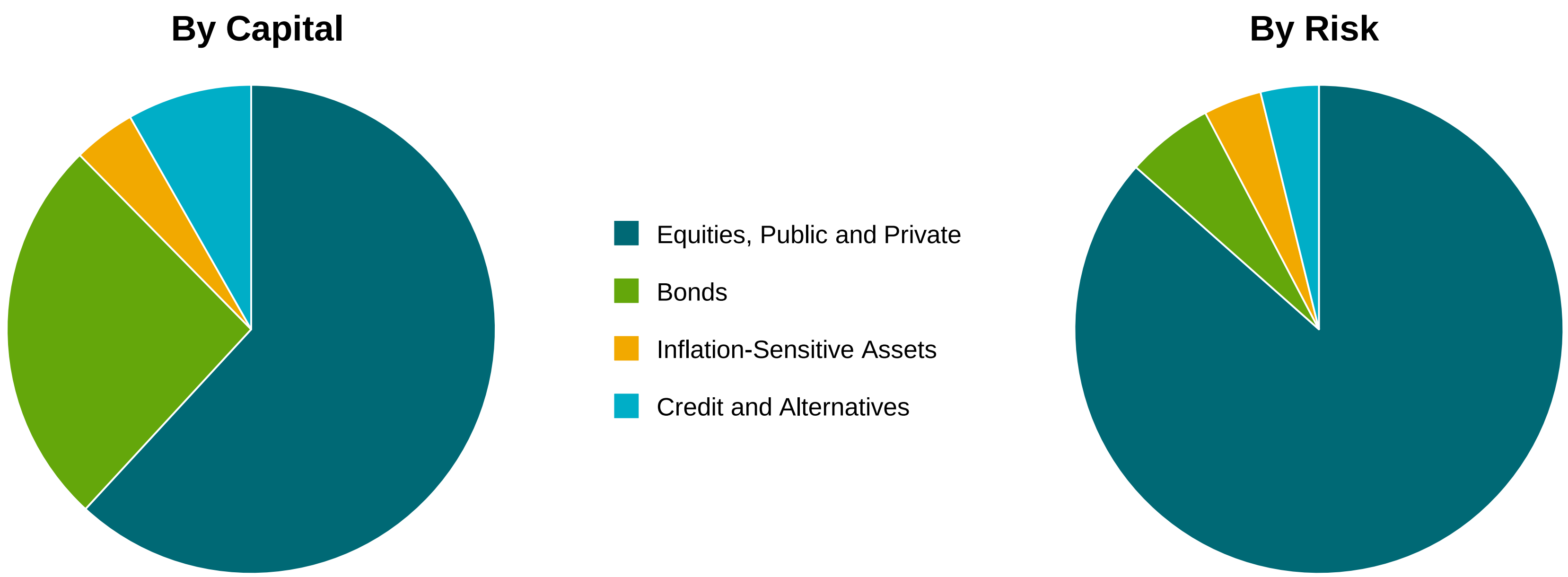
Investment goal	Realize a higher long-term, risk-adjusted return
Traditional approach	Diversify capital globally and across asset classes
Risk parity improvement	Diversify risk globally and across asset classes
Risk parity implementation	Keep it diversified and risk-targeted at all times

Diversification does not eliminate the risk of experiencing investment losses. Please read important disclosures in the Appendix.

Traditional Allocations Aren’t Risk Balanced

Equity concentration is a primary issue for many investors

Traditional Allocation



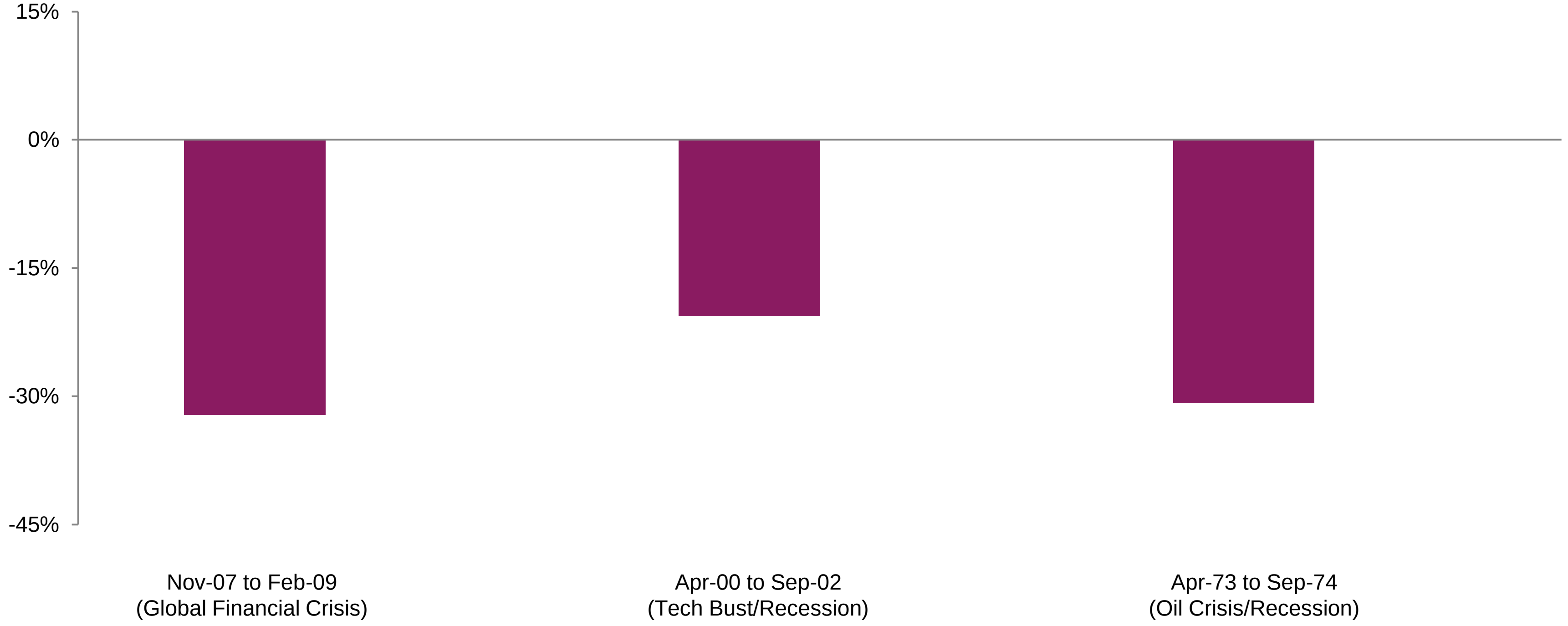
Source: AQR. “By Capital” and “By Risk” allocation charts are for illustrative purposes only and are intended to illustrate an asset class allocation and corresponding risk allocation/exposure of the typical multi-asset class, or “traditional” portfolio. The illustrative allocation above does not represent the actual or target allocation of any AQR client account, fund or strategy, or that of any other adviser.

…So Bad Times for the Economy and Strategy Can Coincide

When stocks fall, traditional portfolios tend to suffer

Global 60/40 during Worst 3 Drawdowns for Global Equities

January 1970 – June 2018



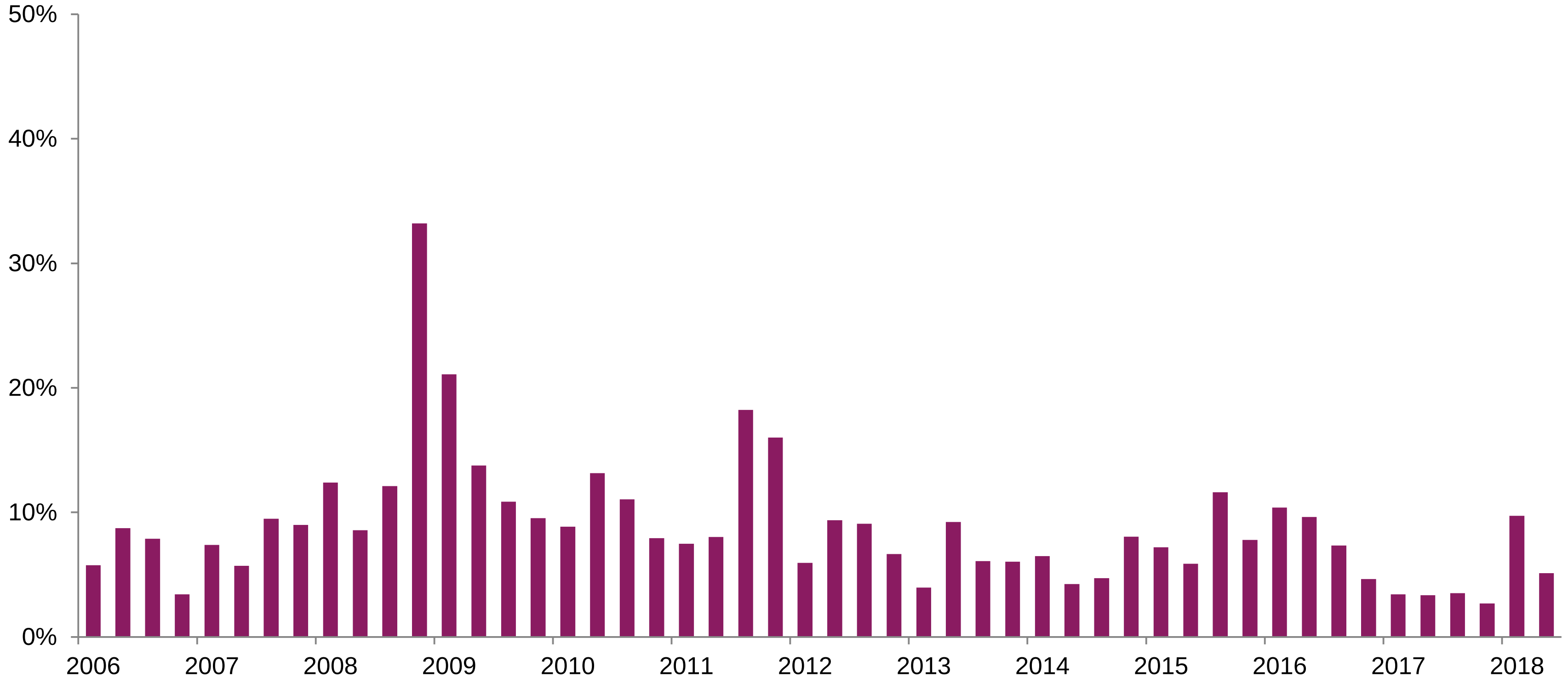
Source: AQR, Bloomberg. "Global Equities" here defined as the MSCI World Index. Global 60/40 Portfolio is based on 60% MSCI World Index and 40% Barclays Capital Global Aggregate Bond Index. Please read important disclosures in the Appendix.

Traditional Portfolios Are Not Risk Managed

Portfolio volatility levels and risk allocations can vary a lot

Global 60/40 Quarterly Realized Volatility

January 2006 – June 2018

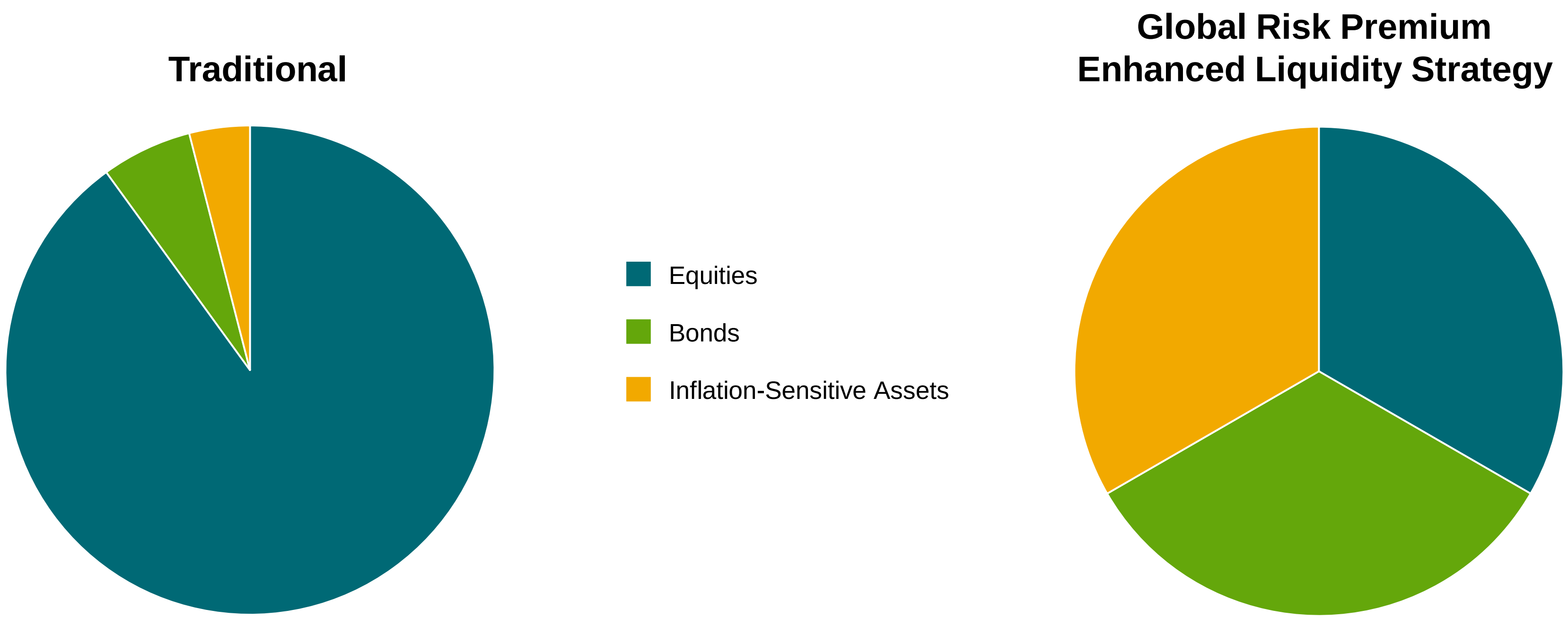


Source: AQR, Bloomberg. Data using 3-day returns. 60/40 Portfolio is based on 60% MSCI World Index and 40% Barclays Capital Global Aggregate Bond Index from January 1, 2006, through June 30, 2018. Past performance is not a guarantee of future performance. Please read important disclosures in the Appendix.

GRP-EL Is Risk Balanced

Targets equal risk across three broad asset classes

Risk Allocation



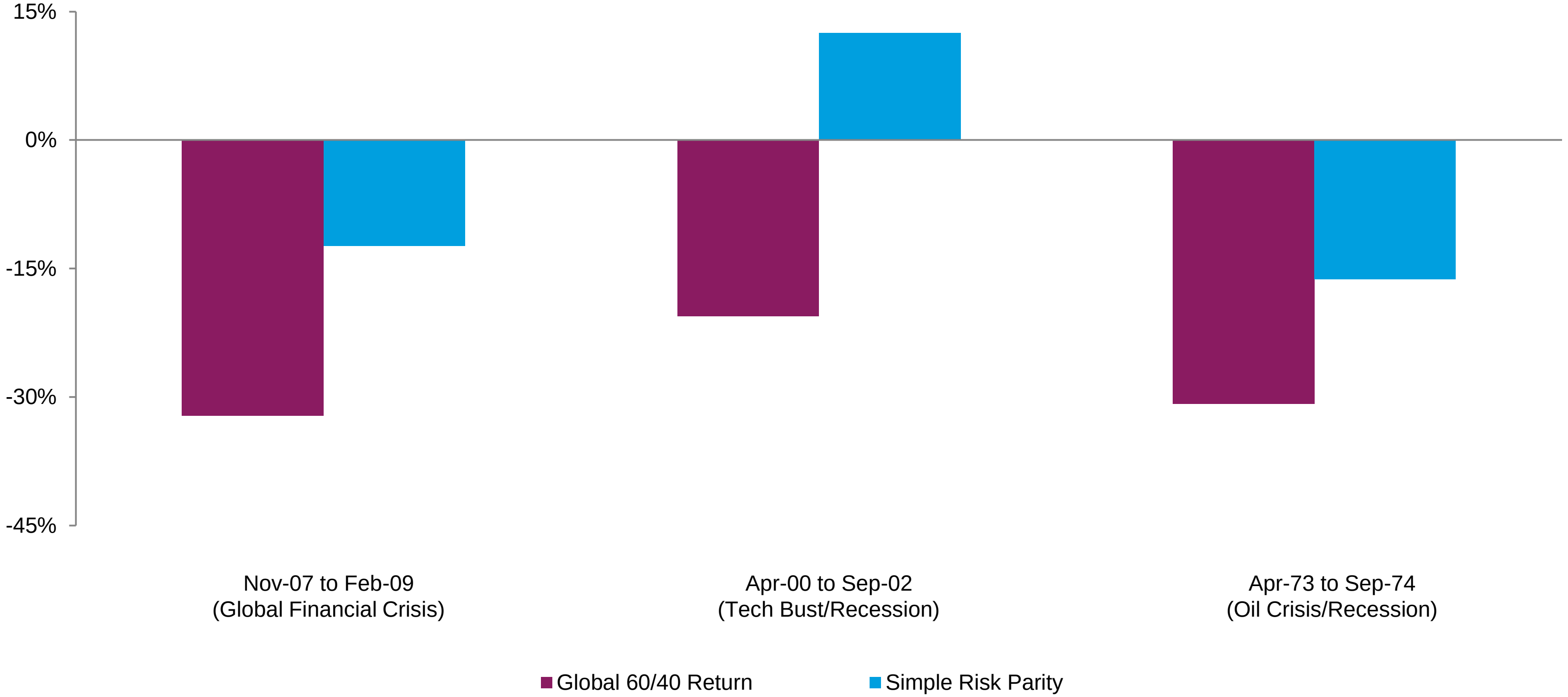
Source: AQR. Charts are for illustrative purposes only. The illustrative allocation above does not represent the actual allocation of any AQR client account, fund or strategy.

…So Risk Parity Returns Are Less Driven by Equity Markets

When stocks perform poorly, risk parity can be a diversifier

Global 60/40 and Simple Risk Parity Returns during Worst 3 Drawdowns for Global Equities

January 1970 – June 2018



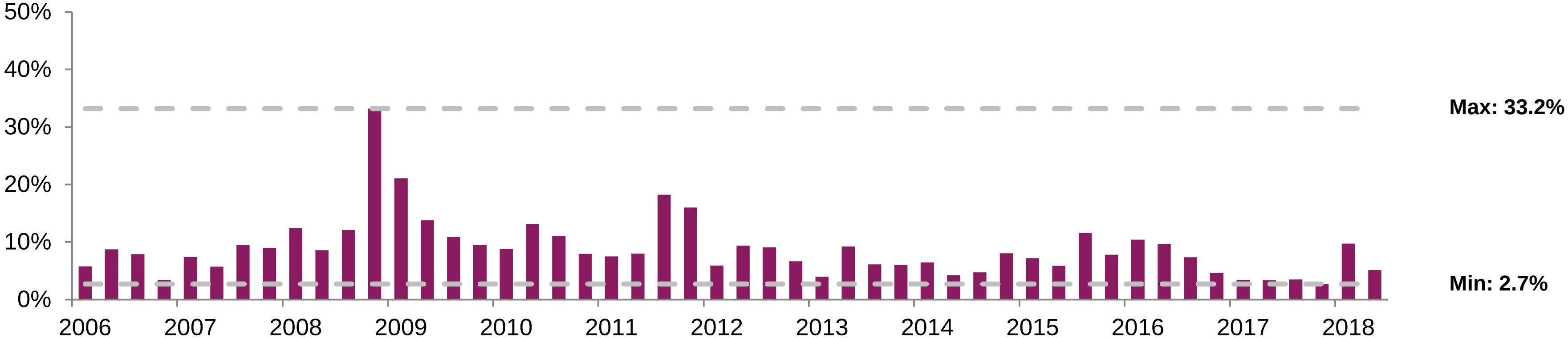
Source: AQR, Bloomberg. “Global Equities” here defined as the MSCI World Index. Global 60/40 Portfolio is based on 60% MSCI World Index and 40% Barclays Capital Global Aggregate Bond Index. Hypothetical Simple Risk Parity is constructed by AQR by allocating equal risk, rebalanced monthly, across three asset classes (equities, bonds and commodities) based on each asset class’ previous 12 month realized volatility to target a total annualized portfolio volatility of 10%. Please see Appendix for detailed construction methodology. Please read important disclosures in the Appendix. Hypothetical performance results have certain inherent limitations, some of which are disclosed in the Appendix.

GRP-EL Is Risk Managed

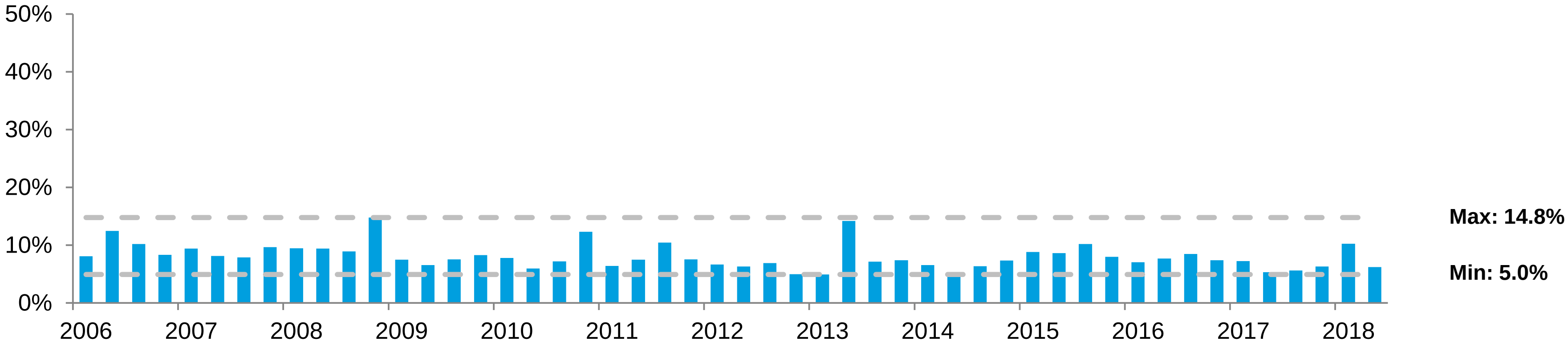
Risk targeting may provide more consistent realized portfolio volatility

Quarterly Realized Volatility

Global 60/40



Hypothetical GRP-EL 10% Volatility Carve-out



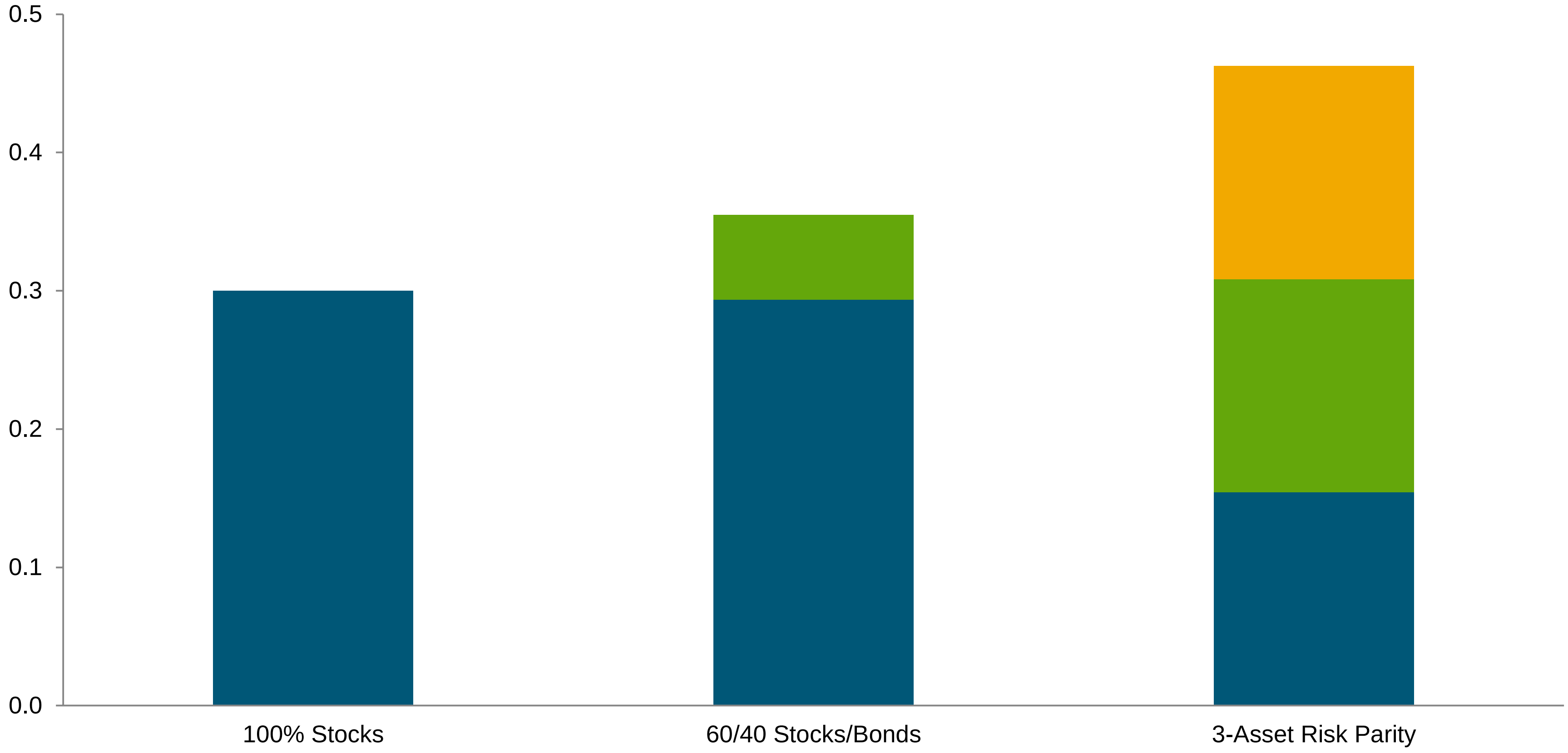
Source: AQR, Bloomberg. Data using 3-day returns, from January 1, 2006 to June 30, 2018. 60/40 Portfolio is based on 60% MSCI World Index and 40% Bloomberg Barclays Global Aggregate Bond Index. Static Risk Parity is a hypothetical model portfolio that allocates equal risk across three major categories (equities, nominal interest rates, inflation-sensitive assets). The strategy was constructed with a long-term risk model which means the exposures to the different asset classes will remain relatively constant through time. The strategy analyzes and trades more than 50 markets across the three major asset classes: global developed and emerging equity indices; developed bond futures and inflation-linked bonds, and commodities, including agriculturals, energies, and metals. The long-term volatility of the strategy will average 10%, but the volatility at any point in time may be either higher or lower. GRP-EL 10% Volatility Adjusted Carve-out returns are a subset of the GRP 25% volatility returns, taken by removing the credit bucket as well as the emerging bonds allocation. It is then scaled to match the 10% target volatility by multiplying the remaining asset class returns by the ratio of the risk targets resulting from switching to 3 asset classes. Please see the appendix for an explanation of the carve out construction. Carve-out performance results are based upon a segment of the strategy and were not managed separately but as part of a larger strategy. Volatility adjusted performance has been scaled to match a different volatility target and is not the actual performance of the respective portfolio(s). All volatility scaled performance are hypothetical and for illustrative purposes only. This information is supplemental to the GIPS® compliant presentation for the Global Risk Premium Composite incepted January 1, 2006 included in the Appendix. Past performance is not a guarantee of future performance. Hypothetical data has inherent limitations, some of which are disclosed in the Appendix. Please read important disclosures in the Appendix.

AQR

Expected Benefit of Diversification

Risk diversification may have a benefit over the long run

Hypothetical Sharpe Ratio Improvement from Diversification*



*Assumptions are consistent with our long-term static asset class correlations and volatilities, and assert equal risk adjusted returns of 0.3 for each asset class.
Source: AQR. Expected Sharpe ratio improvement from diversification results are based on a hypothetical equal risk contribution Risk Parity strategy consisting of equities, bonds, and inflation-sensitive assets. The traditional 60/40 portfolio consists of a hypothetical capital-weighted portfolio of 60% equities and 40% bonds. Diversification does not eliminate the risk of experiencing investment losses. Hypothetical data has inherent limitations, some of which are included in the Appendix.

Implementing Risk Parity

Investment Universe

GRP-EL is diversified across and within asset classes

Equity Risk

Developed

Australia
Canada
Eurostoxx
France
Germany
Hong Kong
Italy
Japan
Netherlands
Spain
Switzerland
United Kingdom
United States

Mid Cap

United States

Small Cap

United States

Emerging

Brazil
China
Chile
Hungary
India
Indonesia
Malaysia
Mexico
Peru
Philippines
Poland
South Africa
South Korea
Taiwan
Thailand
Turkey

Nominal Interest Rate Risk

Developed

Australia
Canada
Germany
Japan
United Kingdom
United States

Inflation Risk

Inflation-Linked Bonds

France
Germany
United Kingdom
United States

Commodities

Aluminum
Brent Oil
Cocoa
Coffee
Copper
Corn
Cotton
Crude Oil
Feeder Cattle
Gas Oil
Gold
Heating Oil
KC Wheat
Lead
Lean Hogs
Live Cattle
Natural Gas
Nickel
Silver
Soybeans
Soy Meal
Soy Oil
Sugar
Unleaded Gas
Wheat
Zinc

Instruments used: single stocks, futures, government bonds, swaps, and currency forwards

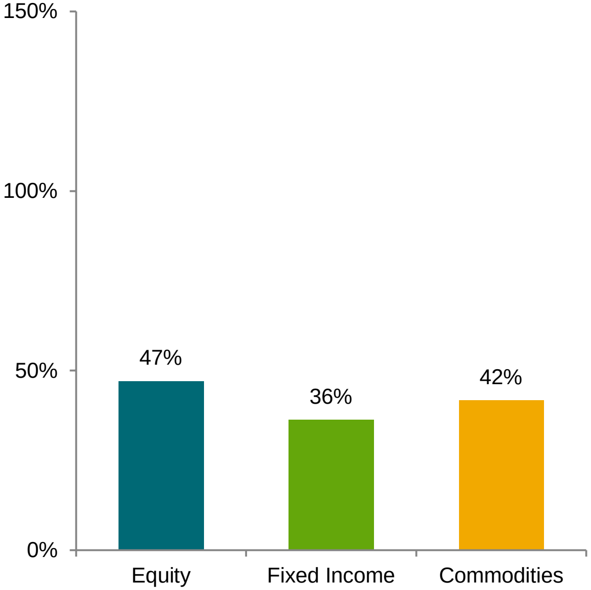
Diversification does not eliminate the risks of experiencing investment losses.

Rebalance Asset Exposures as Risk Forecasts Evolve

Positioning can differ markedly across market environments

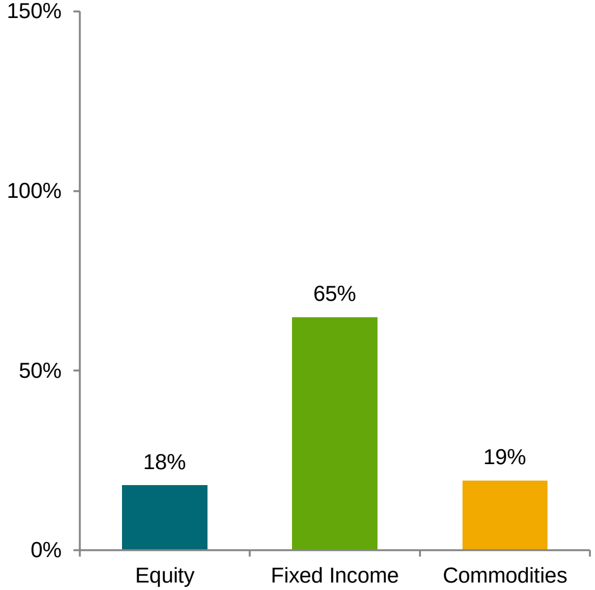
Hypothetical Exposures for 3 Asset Class Risk Parity Portfolio at 10% Volatility

Volcker Fed Fighting Inflation
October 31, 1980



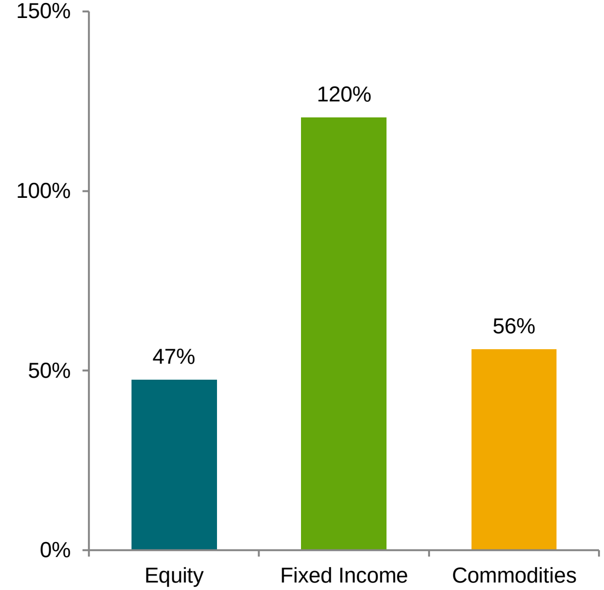
It's possible for bond volatility to be higher than equity volatility — and bond exposures to be relatively small

Financial Crisis
September 30, 2008



Risk spiked in the GFC, especially in equities and commodities, so all exposures were much smaller, but bonds relatively less so

Low Volatility Environment
June 30, 2014



In a period of below average volatility, like mid-2014, exposures were higher than average

Source: AQR. Morgan Markets, Bloomberg, MSCI, Barclays Live, Datastream, Reuters, Markit, Credit Suisse, Citi Velocity. The above exposure examples are based on a hypothetical 3-asset class risk parity strategy, which is not representative of an actual AQR strategy, and are for illustrative purposes only. The hypothetical asset class exposures shown are calculated using the volatility forecasts and volatility targets of three asset classes (developed equities, developed bonds and commodities). The volatility targets are sized using asset class correlation forecasts such that the risk contribution across asset classes is equal and the hypothetical strategy targets 10% annualized volatility, as asset class volatility forecasts evolve across the different periods, so do the exposures. The methodology used to calculate the asset class volatility and correlation forecasts are commensurate with those used in all AQR risk parity strategies, and the data reflects the historical data represented by the securities for the respective asset classes. Developed equities data includes the broad market-cap weighted indices which are sufficiently liquid to trade in each of the following countries/regions: Australia, Canada, France, Germany, Hong Kong, Italy, Japan, Netherlands, Spain, Switzerland, United Kingdom, United States, and continental Europe. Developed bonds data includes GDP-weighted government bonds from the following countries: Australia, Canada, Germany, Japan, United Kingdom, United States. Commodities data includes individual futures consistent with the weighting and composition of the Bloomberg Commodity Index. Hypothetical performance results have certain inherent limitations, some of which are disclosed in the Appendix.

Managing the Risk of Leverage

GRP-EL should be designed to make that risk manageable

Volatility target	Manage portfolio volatility to target a consistent level
Exposure limits	Employ sensible constraints to manage tail risk
Liquid holdings	Maintain a portfolio of liquid assets
Ample cash	Hold ample cash to maintain financing
Risk reduction process	Have a plan for reducing risk targets if returns are very poor

GRP-EL Results

January 2006 – June 2018

	GRP-EL Low Volatility Composite (Net)*	Hypothetical GRP-EL 10% Volatility Adjusted Carve-out (Net)	Cash
2006	--	3.0%	4.9%
2007	--	16.6%	5.0%
2008	--	-7.7%	2.1%
2009	--	13.5%	0.2%
2010	--	21.8%	0.1%
2011	3.9%*	12.4%	0.1%
2012	11.7%	11.4%	0.1%
2013	-2.7%	-4.0%	0.1%
2014	6.9%	6.6%	0.0%
2015	-9.4%	-9.5%	0.1%
2016	10.8%	10.9%	0.3%
2017	11.8%	13.6%	0.9%
2018 YTD	0.1%	-0.4%	0.8%
1 Year	8.8%	9.2%	1.4%
3 Year	3.6%	3.9%	0.7%
5 Year	4.6%	4.4%	0.4%
7 Year	--	4.5%	0.3%
10 Year	--	6.0%	0.4%
Annualized Return	**4.6%**	**6.6%**	**1.2%**
Realized Volatility	**7.3%**	**8.4%**	
Sharpe Ratio	**0.6**	**0.7**	

Source: AQR, Bloomberg. Net returns in USD from January 1, 2006 through June 30, 2018. Performance for the month ending June 30, 2018, is estimated and subject to change. Hypothetical GRP 10% Volatility Adjusted returns represent the 25% target volatility Global Risk Premium Full Volatility actual returns scaled to match the 10% target volatility. Hypothetical GRP-EL 10% Volatility Adjusted Carve-out returns are a subset of the GRP 10% volatility returns taken by removing the credit bucket as well as the emerging bonds allocation. It is scaled by multiplying the remaining returns by the ratio of the risk targets resulting from switching to 3 asset class buckets. Net performance is net of a 0.40% fee for GRP 10% Volatility Adjusted and net of a 0.38% fee for Global Risk Premium Enhanced Liquidity – Low Vol. Composite and GRP-EL 10% Volatility Adjusted Carve-out. Cash is the U.S. 3-month Treasury Bill, which is the risk free rate used to calculate Sharpe ratio. Please see the appendix for an explanation of the carve out construction. Carve-out performance results are based upon a segment of the strategy and were not managed separately but as part of a larger strategy. Volatility adjusted performance has been scaled to match a different volatility target and is not the actual performance of the respective portfolio(s). All carve-out and volatility scaled performance are hypothetical and for illustrative purposes only. This information is supplemental to the GIPS® compliant presentations for the Global Risk Premium Composite incepted January 1, 2006 and the Global Risk Premium Enhanced Liquidity - Low Vol. Composite incepted October 1, 2011 included in the Appendix. Past performance is not a guarantee of future performance. Hypothetical data has inherent limitations, some of which are disclosed in the Appendix. Please read important disclosures in the Appendix.
*Global Risk Premium Enhanced Liquidity – Low Vol. Composite returns and since inception performance beginning October 1, 2011.

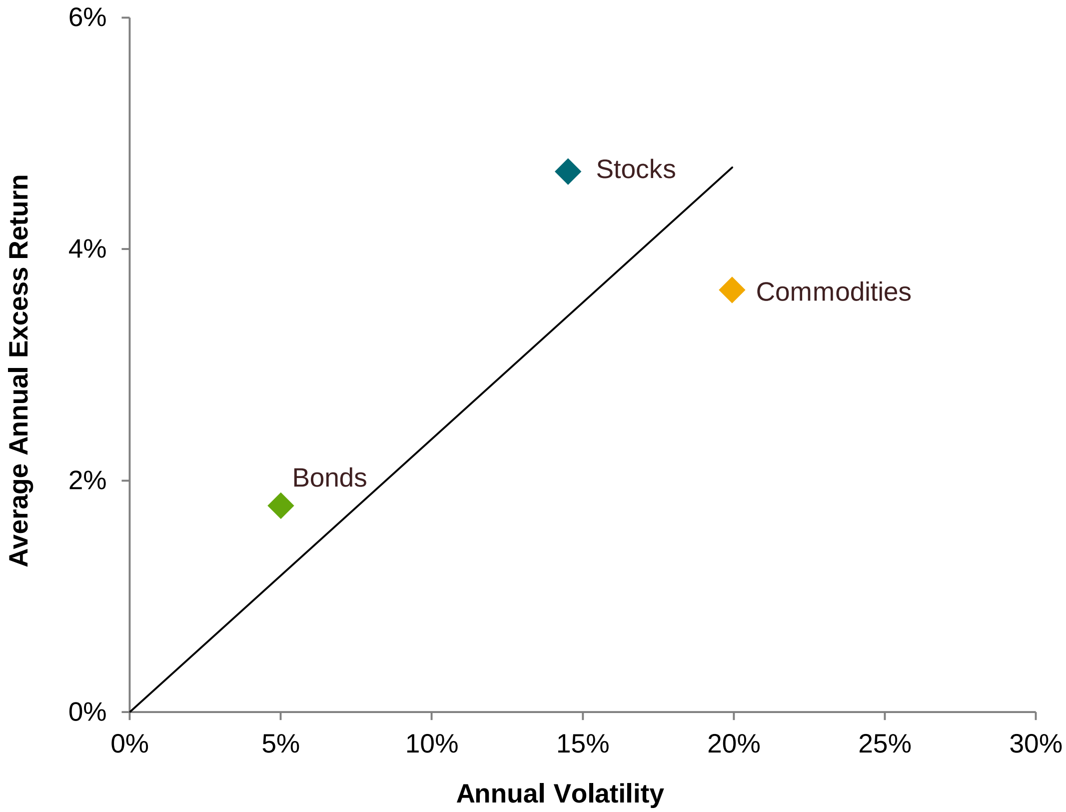
Appendix

The Premises Underlying Risk Parity

Risk-adjusted returns are similar, so risk allocations should be too

Historical Asset Class Risk and Return Scatter Plot

January 1971 – June 2018



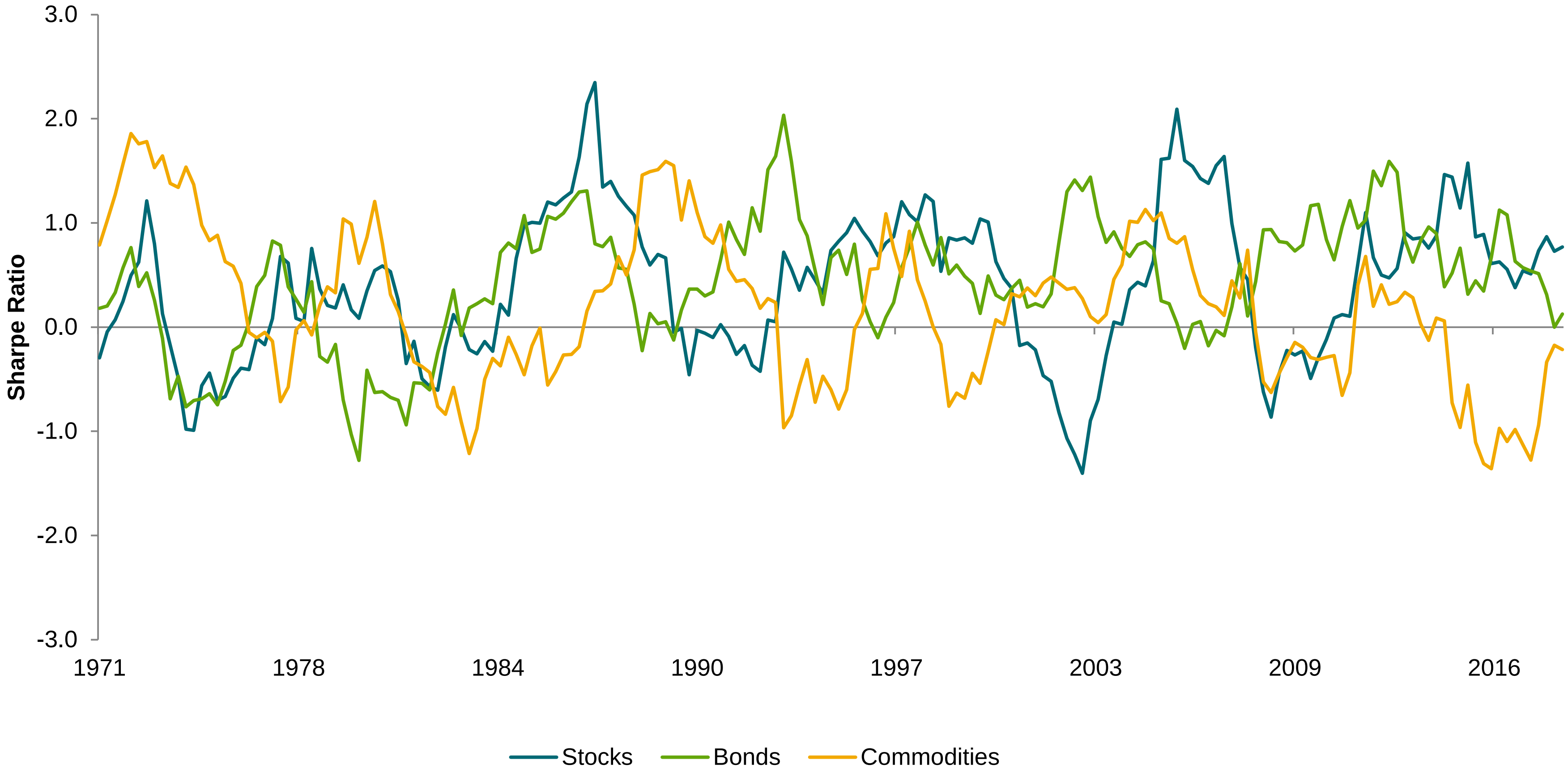
Source: AQR, Barclays Live, Bloomberg, Ibbotson Associates (Morningstar). Excess returns are in excess of cash proxied by the ICE BofAML U.S. 3-Month T-Bill Index. Stocks are defined as the MSCI World Index. Bonds are defined as the Bloomberg Barclays U.S. Government Bond Index and, prior to 1973, the Ibbotson U.S. Intermediate Government Bond Index. Commodities are defined as the S&P GSCI Total Return Index. Please read important disclosures in the Appendix.

The Premises Underlying Risk Parity

Assets pay off at different times, so diversification may have a benefit

Rolling 3-Year Asset Class Sharpe Ratios

December 1971 – June 2018



Source: AQR, Barclays Live, Bloomberg, Ibbotson Associates (Morningstar). Stocks are defined as the MSCI World Index. Bonds are defined as the Bloomberg Barclays U.S. Government Bond Index and, prior to 1973, the Ibbotson U.S. Intermediate Government Bond Index. Commodities are defined as the S&P GSCI Total Return Index. The risk free rate is assumed to be the U.S. 3-month Treasury Bill in Sharpe ratio calculations. Diversification does not eliminate the risk of experiencing investment losses. Please read important disclosures in the Appendix.

Benchmarking Risk Parity

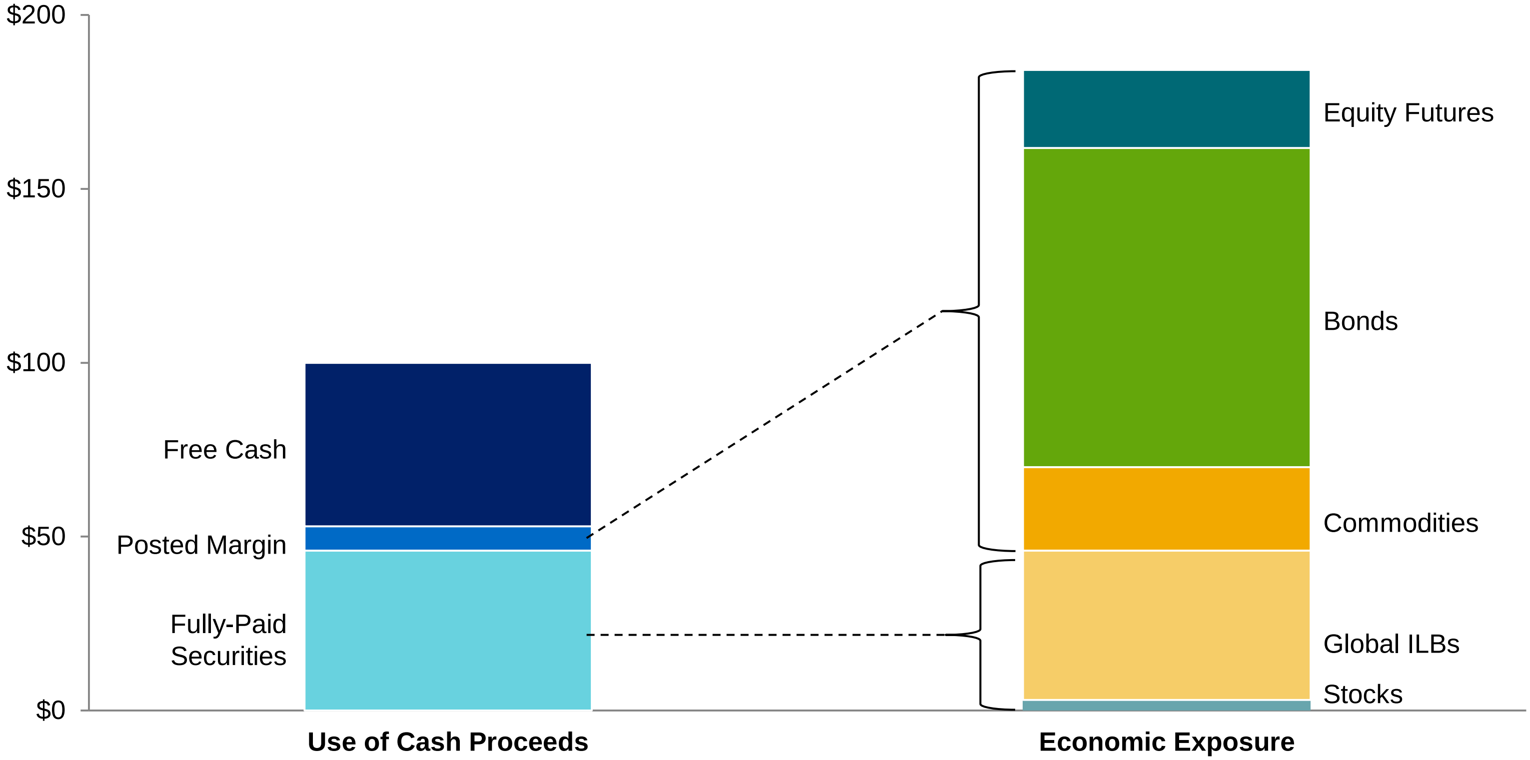
A few options for investors

	Traditional Allocation (e.g. 60/40)	Cash + 5%	Leveraged Risk-Balanced Index	Risk Parity Peer Index
Purpose	Opportunity cost	Absolute return	Comparison to a long-term risk-balanced portfolio	Peer comparison
Pros	Investible and well understood	Long-term comparison to return goals	Measures manager value added	Measures manager relative performance
Cons	Tracking error too high for useful comparisons	Not investible, unrealistic return without risk	Leveraged benchmark without an accepted standard for risk parity	Doesn't address most common investor questions
Expectations vs. Benchmark (10% volatility)	Approx. 0.15 Sharpe ratio improvement with 7%-9% tracking error	Expected returns similar, but with 10% tracking error	Similar expected returns with moderate tracking error	Similar expected returns with moderate tracking error

Source: AQR. The assumptions used to express these views are subject to change at any time without notice and there is no guarantee, express or implied, that long-term return and/or volatility expectations will be achieved. Realized returns and/or volatility may come in higher or lower than expected. Risk Parity Peer Index is the HFR Risk Parity Vol 10 Institutional Index, which is a non-investable index, and returns are net of underlying manager fees.

Managing the Risk of Leverage
Example of the uses of cash in a leveraged portfolio

Sample Risk Balanced Allocation Notional Exposures and Cash Usage



Source: AQR. Charts are for illustrative purposes only and are not based on an actual portfolio AQR manages. Strategies are subject to change based on market conditions and implementation practices at any time.

Disclosures

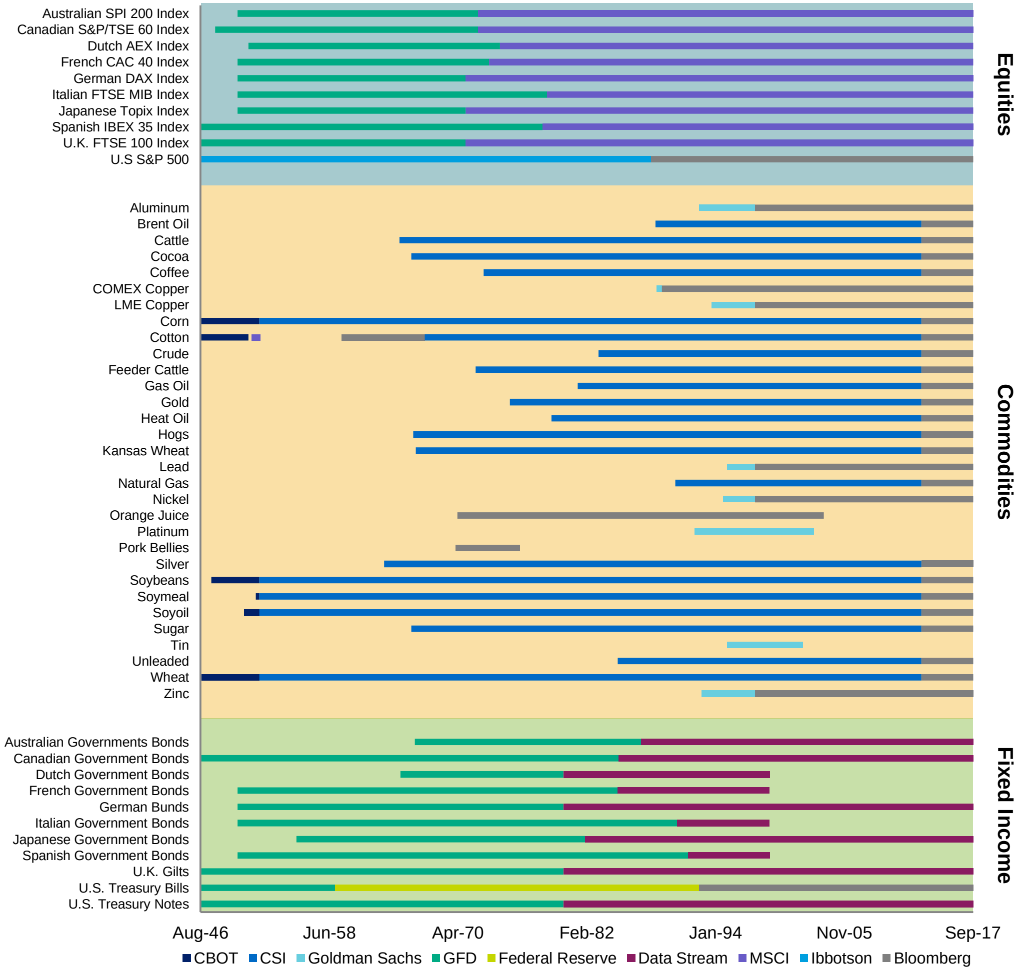
Simple Risk Parity

Description of Simple Risk Parity hypothetical portfolio

- Assumes equal volatility targets across global equities, global bonds and commodities
- The equal volatility targets are determined such that the volatility of overall portfolio averages 10% over the complete history
- Volatility estimates are calculated using rolling 12-month annualized standard deviation
- The exposure for each asset is adjusted as the volatility estimates evolve such that the portfolio targets 10% volatility over time
- There are no leverage constraints and the model makes no explicit assumptions about correlation between asset classes

Asset class weighting

- Global equities are GDP–weighted for the primary equity index for 10 developed countries
- Global bonds are GDP–weighted across government bonds for 10 developed countries
- Commodities are an equally weighted basket of futures which currently consists of 31 contracts



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All performance figures contained herein reflect the reinvestment of dividends and all other earnings and represent unaudited estimates of realized and unrealized gains and losses prepared by AQR Capital Management, LLC (AQR). There is no guarantee as to the above information's accuracy or completeness. There is no guarantee, express or implied, that long-term return and/or volatility targets will be achieved. Realized returns and/or volatility may come in higher or lower than expected. **PAST PERFORMANCE IS NOT A GUARANTEE OF FUTURE PERFORMANCE.** Diversification does not eliminate the risk of experiencing investment losses.

HYPOTHETICAL PERFORMANCE RESULTS HAVE MANY INHERENT LIMITATIONS, SOME OF WHICH, BUT NOT ALL, ARE DESCRIBED HEREIN. NO REPRESENTATION IS BEING MADE THAT ANY FUND OR ACCOUNT WILL OR IS LIKELY TO ACHIEVE PROFITS OR LOSSES SIMILAR TO THOSE SHOWN HEREIN. IN FACT, THERE ARE FREQUENTLY SHARP DIFFERENCES BETWEEN HYPOTHETICAL PERFORMANCE RESULTS AND THE ACTUAL RESULTS SUBSEQUENTLY REALIZED BY ANY PARTICULAR TRADING PROGRAM. ONE OF THE LIMITATIONS OF HYPOTHETICAL PERFORMANCE RESULTS IS THAT THEY ARE GENERALLY PREPARED WITH THE BENEFIT OF HINDSIGHT. IN ADDITION, HYPOTHETICAL TRADING DOES NOT INVOLVE FINANCIAL RISK, AND NO HYPOTHETICAL TRADING RECORD CAN COMPLETELY ACCOUNT FOR THE IMPACT OF FINANCIAL RISK IN ACTUAL TRADING. FOR EXAMPLE, THE ABILITY TO WITHSTAND LOSSES OR TO ADHERE TO A PARTICULAR TRADING PROGRAM IN SPITE OF TRADING LOSSES ARE MATERIAL POINTS THAT CAN ADVERSELY AFFECT ACTUAL TRADING RESULTS. THERE ARE NUMEROUS OTHER FACTORS RELATED TO THE MARKETS IN GENERAL OR TO THE IMPLEMENTATION OF ANY SPECIFIC TRADING PROGRAM WHICH CANNOT BE FULLY ACCOUNTED FOR IN THE PREPARATION OF HYPOTHETICAL PERFORMANCE RESULTS, ALL OF WHICH CAN ADVERSELY AFFECT ACTUAL TRADING RESULTS. The hypothetical performance results contained herein represent the application of the quantitative models as currently in effect on the date first written above and there can be no assurance that the models will remain the same in the future or that an application of the current models in the future will produce similar results because the relevant market and economic conditions that prevailed during the hypothetical performance period will not necessarily recur. Discounting factors may be applied to reduce suspected anomalies. This backtest's return, for this period, may vary depending on the date it is run. Hypothetical performance results are presented for illustrative purposes only. In addition, our transaction cost assumptions utilized in backtests, where noted, are based on AQR Capital Management, LLC's, ("AQR")'s historical realized transaction costs and market data. Certain of the assumptions have been made for modeling purposes and are unlikely to be realized. No representation or warranty is made as to the reasonableness of the assumptions made or that all assumptions used in achieving the returns have been stated or fully considered. Changes in the assumptions may have a material impact on the hypothetical returns presented. Actual advisory fees for products offering this strategy may vary.

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Broad-based securities indices are unmanaged and are not subject to fees and expenses typically associated with managed accounts or investment funds. Investments cannot be made directly in an index.

The Barclays Capital U.S. Aggregate Bond Index is a broad-based benchmark that measures the investment grade, U.S. dollar-denominated, fixed-rate taxable bond market, including Treasuries, government-related and corporate securities, MBS (agency fixed-rate and hybrid ARM passthroughs), ABS and CMBS.

The Barclays Capital U.S. Government Index is comprised of the U.S. Treasury and U.S. Agency Indices. The U.S. Government Index includes Treasuries (public obligations of the U.S. Treasury that have remaining maturities of more than one year) and U.S. agency debentures (publicly issued debt of U.S. Government agencies, quasi-federal corporations and corporate or foreign debt guaranteed by the U.S. Government). The U.S. Government Index is a component of the U.S. Government/Credit Index and the U.S. Aggregate Index.

The Ibbotson U.S. Intermediate Government Bond Index is a custom index designed to measure the performance of U.S. government bonds.

The MSCI World Index is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of developed markets.

The S&P GSCI™ Total Return index measures a fully collateralized commodity futures investment that is rolled forward from the fifth to the ninth business day of each month.
The S&P GSCI™ Total Return is significantly different than the return from buying physical commodities.

There is a risk of substantial loss associated with trading commodities, futures, options, derivatives and other financial instruments. Before trading, investors should carefully consider their financial position and risk tolerance to determine if the proposed trading style is appropriate. Investors should realize that when trading futures, commodities, options, derivatives and other financial instruments one could lose the full balance of their account. It is also possible to lose more than the initial deposit when trading derivatives or using leverage. All funds committed to such a trading strategy should be purely risk capital.

Performance Disclosures

AQR Capital Management, LLC
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Upon request, AQR will make available a complete list and description of all Firm composites, as well as additional information regarding the policies for valuing portfolios, calculating performance, and preparing compliant presentations.

GIPS Compliance: AQR claims compliance with the Global Investment Performance Standards (GIPS®) and has prepared and presented this report in compliance with the GIPS standards. AQR has been independently verified for the period August 1, 1998 through December 31, 2017. The verification reports are available upon request. Verification assesses whether (1) the Firm has complied with all composite construction requirements of the GIPS standards on a firm-wide basis and (2) the Firm's policies and procedures are designed to calculate and present performance in compliance with the GIPS standards. Verification does not ensure the accuracy of any specific composite presentation.

Composite Characteristics: New accounts that fit a composite definition are added at the start of the first full calendar month after the assets come under management, or after it is deemed that the investment decisions made by the investment advisor fully reflect the intended investment strategy of the portfolio. A composite will exclude terminated accounts after the last full calendar month performance measurement period that the assets were under management. The composite will continue to include the performance results for all periods prior to termination. For periods beginning July 1, 2010 through February 28, 2015, AQR defined a significant cash flow as an external cash flow within a portfolio of 50%. Additional information is available upon request.

Calculation Methodology: All portfolios are valued daily, weekly, intra-monthly or monthly as defined by Firm policy. The Modified Dietz calculation methodology is used when calculating monthly and intra-month returns. Mutual funds and UCITS are valued daily and performance is calculated on a daily basis. Gross of fees returns are calculated gross of management and performance fees, administrative and custodial costs, and net of transaction costs beginning January 1, 2010. Prior to January 1, 2010, gross of fees returns are gross of management and performance fees, and net of administrative, custodial, and transaction costs. Additional information regarding fees and the calculation of gross and net performance is available upon request.

The dispersion measure is the equal-weighted standard deviation of accounts in a composite for the entire year. Dispersion is not considered meaningful for periods shorter than one year or for periods during which a composite contains five or fewer accounts for the full period. The three-year annualized ex-post standard deviation measure is inapplicable when 36 monthly returns are not available.

Returns are calculated net of all withholding taxes on foreign dividends. Accruals for fixed income and equity securities are included in calculations. AQR's management or advisory fees are described in Part 2A of its Form ADV. In addition, AQR funds may have a redemption charge up to 2.00% based on gross redemption proceeds that may be charged upon early withdrawals. Consultants supplied with gross results are to use this data in accordance with SEC, CFTC and NFA guidelines.

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Past performance is not an indication of future performance.

Performance Disclosures

AQR Capital Management, LLC
Global Risk Premium Composite
1/1/2006 – 12/31/2017

Year	Gross Return %	Net Return %	Benchmark * Return %	Number of Portfolios	Composite 3-Yr StDev %	Benchmark * 3-Yr StDev %	Composite Assets ($M)	Total Firm Assets ($M)
2006	11.35	10.25	4.83	1	N/A	N/A	65.42	30,288.30
2007	10.06	8.97	5.03	1	N/A	N/A	557.15	34,495.05
2008	-37.63	-38.28	2.06	1	23.23	0.49	338.83	19,207.22
2009	48.79	47.35	0.21	1	24.68	0.63	511.63	23,571.55
2010	69.54	67.92	0.13	1	25.77	0.36	1,496.87	32,701.21
2011	15.42	14.28	0.10	1	21.92	0.04	2,455.78	43,540.99
2012	42.37	40.99	0.11	1	20.97	0.03	3,720.70	71,122.42
2013	-4.93	-5.88	0.07	1	21.44	0.03	4,610.04	98,302.69
2014	19.70	18.52	0.03	1	21.57	0.02	4,020.10	122,655.99
2015	-17.16	-18.00	0.05	1	21.89	0.02	4,260.01	142,173.39
2016	23.14	21.94	0.33	1	20.18	0.05	3,397.49	175,089.36
2017	42.71	41.33	0.86	1	16.77	0.11	846.69	223,432.52

*Bank of America ML US 3-Month Treasury Bill Index

Composite Description: The Global Risk Premium Composite (the "Composite") was created in January 2006. Accounts included invest in global developed and emerging market stocks, U.S. small- and mid-cap stocks, global developed and emerging market bonds and currencies, global inflation protected bonds, U.S. high yield and credit, U.S. mortgages, global swap spreads and commodities. The investment objective of these accounts is to deliver diversified exposure to a set of global risk premiums. The Composite's strategy targets the highest ex-ante volatility relative to all of the Firm's Global Risk Premium composites. Since inception, accounts included have at times adjusted their target volatility to accommodate changing market environments. The Composite is denominated in USD.

Benchmark: The Composite benchmark is the Bank of America ML US 3-Month Treasury Bill Index (the "Benchmark"). The index measures the rate of return an investor would realize when purchasing a single U.S. 3-month treasury bill, holding it for one month, selling it, and rolling it into a newly selected issue at the beginning of the next month. The investments in the Composite vary substantially from those in the Benchmark. The index has not been selected to represent an appropriate benchmark to compare an investor's performance, but rather is disclosed to allow for comparison of the investor's performance to that of a certain well-known and widely recognized index.

Fees: Composite net of fees returns are calculated by deducting the maximum model management or advisory fee AQR could charge from the composite monthly gross returns. AQR's asset-based fees for portfolios within the Composite may range up to 1.00% of assets under management and are generally billed monthly or quarterly at the commencement of the calendar month or quarter during which AQR will perform the services to which the fees relate. Composite assets may have been exposed to the impact of performance fees.

Past performance is not an indication of future performance.

Performance Disclosures

AQR Capital Management, LLC
Global Risk Premium Enhanced Liquidity - Low Vol. Composite
10/1/2011 – 12/31/2017

Year	Gross Return %	Net Return %	Benchmark * Return %	Number of Portfolios	Composite 3-Yr StDev %	Benchmark * 3-Yr StDev %	Composite Assets ($M)	Total Firm Assets ($M)	% Non-Fee Paying Portfolios
2011	3.95	3.85	0.00	1	N/A	N/A	5.17	43,540.99	100
2012	12.16	11.74	0.11	2	N/A	N/A	2,294.85	71,122.42	-
2013	-2.34	-2.71	0.07	3	N/A	N/A	5,224.58	98,302.69	-
2014	7.35	6.94	0.03	3	7.94	0.02	6,478.98	122,655.99	-
2015	-9.01	-9.36	0.05	3	8.49	0.02	5,992.85	142,173.39	-
2016	11.22	10.80	0.33	3	7.57	0.05	7,162.52	175,089.36	-
2017	12.25	11.83	0.86	3	6.74	0.11	7,595.16	223,432.52	-

*Bank of America ML US 3-Month Treasury Bill Index

Composite Description: The Global Risk Premium Enhanced Liquidity - Low Vol. Composite (the "Composite") was created in October 2011. Accounts included invest in global developed and emerging market stocks, U.S. small- and mid-cap stocks, global developed market bonds and currencies, global inflation protected bonds, and commodities. The investment objective of these accounts is to deliver diversified exposure to a set of global risk premiums with an enhanced level of liquidity relative to the Firm's Global Risk Premium Composite. The Composite's strategy targets a low ex-ante volatility relative to the Firm's Global Risk Premium Enhanced Liquidity - High Vol. Composite. Since inception, accounts included have at times adjusted their target volatility to accommodate changing market environments. The Composite is denominated in USD.

Benchmark: The Composite benchmark is the Bank of America ML US 3-Month Treasury Bill Index (the "Benchmark"). The index measures the rate of return an investor would realize when purchasing a single U.S. 3 month treasury bill, holding it for one month, selling it, and rolling it into a newly selected issue at the beginning of the next month. The investments in the Composite vary substantially from those in the Benchmark. The index has not been selected to represent an appropriate benchmark to compare an investor's performance, but rather is disclosed to allow for comparison of the investor's performance to that of a certain well-known and widely recognized index.

Fees: Composite net of fees returns are calculated by deducting the maximum model management or advisory fee AQR could charge from the composite monthly gross returns. AQR's asset-based fees for portfolios within the Composite may range up to 0.38% of assets under management and are generally billed monthly or quarterly at the commencement of the calendar month or quarter during which AQR will perform the services to which the fees relate. Composite assets may have been exposed to the impact of performance fees.

Past performance is not an indication of future performance.

AQR

PanAgora

Meeting Date
9/26/18
Agenda Item
#11

Contra Costa County Employees' Retirement Association

Risk Parity Multi Asset Strategy Overview

September 26, 2018

Contra Costa County Employees' Retirement Association

Risk Parity Multi Asset Strategy Overview

September 26, 2018

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BACKTESTED PERFORMANCE: The model and hypothetical performance included in the presentation does not represent the performance of actual client portfolios. The performance is shown for illustrative purposes only. Historical performance presented herein is purely theoretical and involves the application of PanAgora quantitative strategies to historical financial data to show what decisions would have been made if the strategy were employed. These backtested performance results are shown for illustrative purposes only and do not represent actual trading or the impact of material economic and market factors on PanAgora's decision-making process for an actual PanAgora client account. Backtested performance results were achieved by means of a retroactive application of a model designed with the benefit of hindsight.

HYPOTHETICAL PERFORMANCE RESULTS HAVE MANY INHERENT LIMITATIONS, SOME OF WHICH ARE DESCRIBED BELOW. NO REPRESENTATION IS BEING MADE THAT ANY ACCOUNT WILL OR IS LIKELY TO ACHIEVE PROFITS OR LOSSES SIMILAR TO THOSE SHOWN. IN FACT, THERE ARE FREQUENTLY SHARP DIFFERENCES BETWEEN HYPOTHETICAL PERFORMANCE RESULTS AND THE ACTUAL RESULTS SUBSEQUENTLY ACHIEVED BY ANY PARTICULAR INVESTMENT PROGRAM. ONE OF THE LIMITATIONS OF HYPOTHETICAL PERFORMANCE RESULTS IS THAT THEY ARE GENERALLY PREPARED WITH THE BENEFIT OF HINDSIGHT. IN ADDITION, HYPOTHETICAL TRADING DOES NOT INVOLVE FINANCIAL RISK, AND NO HYPOTHETICAL TRADING RECORD CAN COMPLETELY ACCOUNT FOR THE IMPACT OF FINANCIAL RISK IN ACTUAL TRADING. FOR EXAMPLE, THE ABILITY TO WITHSTAND LOSSES OR TO ADHERE TO A PARTICULAR INVESTMENT PROGRAM IN SPITE OF TRADING LOSSES ARE MATERIAL POINTS WHICH CAN ALSO ADVERSELY AFFECT ACTUAL TRADING RESULTS. THERE ARE NUMEROUS OTHER FACTORS RELATED TO THE MARKETS IN GENERAL OR TO THE IMPLEMENTATION OF ANY SPECIFIC INVESTMENT PROGRAM WHICH CANNOT BE FULLY ACCOUNTED FOR IN THE PREPARATION OF HYPOTHETICAL PERFORMANCE RESULTS AND ALL OF WHICH CAN ADVERSELY AFFECT ACTUAL TRADING RESULTS.

The Dynamic Risk Allocation (DRA) Model performance presented is shown for illustrative purposes only. Cumulative Value Added DRA reflects the impact of DRA as evidenced by the outperformance of the Risk Parity Multi Asset strategy attributable to DRA according to PanAgora's strategic risk targets. Model performance does not reflect actual returns experienced by any investor. Please see disclosures at the back of this presentation. Source: PanAgora.

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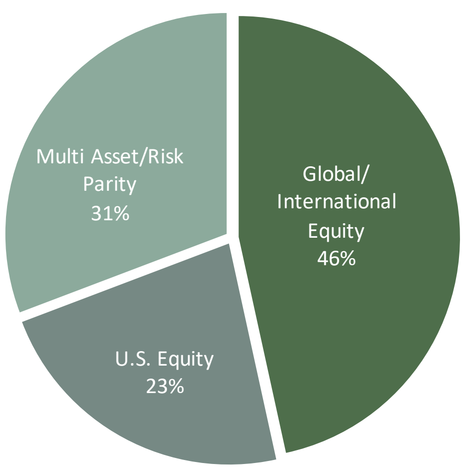
PanAgora Overview

PanAgora at a Glance

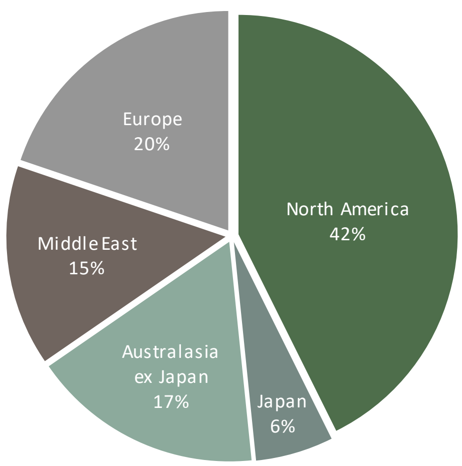
- » An experienced manager of quantitative investment strategies since 1989
- » Innovative research and intellectual capital
- » Over 150 institutional clients worldwide
- » Approximately $51 billion in assets under management

- » Strategies offered:
  - Alternatives
  - Risk Premia
  - Active Equity
- » Strong records since inception*

Asset Breakdown



Geographic Breakdown



AUM and asset breakdown as of June 30, 2018

**Past performance is not a guarantee of future results. See Performance Disclosures in the Appendix.*

Source: PanAgora

PanAgora Overview

PANAGORA

Ownership

» PanAgora Employees

- PanAgora employees own a portion of the company through restricted stock and options, under the provisions of the PanAgora Equity Plan.

» Power Financial Corporation

- Power Financial Corporation is a company with interests in companies that are active in the financial services sector in Canada, the United States, and Europe. Power Financial Corporation and its affiliates oversee more than $790 billion worldwide.

**Power Financial Corporation's legal interest is held through its subsidiaries Great-West Lifeco Inc./Putnam Investments*

PanAgora Overview

Why PanAgora? Our Clients' Interests Come First

- **Corporate Plans**
  - Boeing Corporation
  - PG&E Corporation
  - Southern California Edison Company
  - Marsh & McLennan Companies, Inc.
  - Eversource Energy Service Corporation
- **Public Plans**
  - Iowa Public Employees Retirement System
  - Ohio Public Employees Retirement System
  - NSW Treasury Corporation
  - Florida PrePaid College Board
  - Tennessee Consolidated Retirement System
  - Government Superannuation Fund Authority
  - Indiana Public Retirement System
  - Boston Retirement Board
  - New Mexico Educational Retirement Board
  - United Nations Food and Agriculture Organization
- **Endowments & Foundations**
  - Cornerstone Foundation of Northeastern Wisconsin
  - Statler Foundation
- **Sub-advisory**
  - Strategic Investment Group
  - SEI Investment Management Corporation
  - Investors Group
  - Northern Trust Global Advisors
  - Pear Tree Funds
- **Multi-Employer Plans**
  - IBEW Local 332
  - United Food and Commercial Workers

The list of clients presented above reflects both separate account investors and private fund investors and is based upon client type, domicile, account size, and diverse selection of investment management as of June 2018 and is provided for informational purposes only. It is not known whether the listed clients approve or disapprove of PanAgora or the advisory services provided.

PanAgora Overview

PANAGORA

Organizational structure

Eric H. Sorensen, Ph.D.
President and Chief Executive Officer

EQUITY	MULTI ASSET	BUSINESS DEVELOPMENT AND CLIENT SERVICE	ADMINISTRATION
George Mussalli, CFA *Chief Investment Officer & Head of Equity Research* **Jaime Lee, Ph.D.** *Director, Dynamic Equity* **Richard Tan, CFA** *Director, Stock Selector*	**Edward Qian, Ph.D.** *Chief Investment Officer & Head of Multi Asset Research* **Bryan Belton, CFA** *Director, Multi Asset*	**Michael Anderson** *Head of Global Sales* **Robert Job, CFA** *Head of Global Strategic Partnerships & Relations*	**Michael Turpin, CFA, CPA** *Chief Operating Officer*
Supported by 33 Employees	Supported by 22 Employees	Supported by 23 Employees	Supported by 66 Employees
Equity Group Strategies: Diversified Arbitrage Stock Selector Equity Dynamic Equity	**Multi Asset Group Strategies:** Risk Parity Factor Premia Defensive Equity Managed Futures	**Key Functions:** Relationship Management Business Development Client Service Marketing	**Key Functions:** Compliance Operations Information Technology

Source: PanAgora.

Risk Parity Multi Asset

PANAGORA

What is Risk Parity?

» **Multi Asset Investment Portfolio**

  » Long-only portfolio seeking to generate returns through persistent exposure to global equity, global fixed income and global inflation protected assets

» **Diversified**

  » Seeks balanced exposure for consistent performance across market environments

  » Global Equities (U.S., Int'l., EM) for upside participation in periods of strong growth

  » Global Fixed Income for downside protection in periods of weaker growth

  » Commodities and Global Inflation-Linked bonds to preserve real rates of return in inflationary periods

» **Alternative Weighting Scheme**

  » Traditional approach diversifies how dollars are invested (e.g. 60% equities and 40% fixed income)

  » Risk Parity weights investments so different asset all contribute similarly to the portfolio's total return

  » Less risky assets receive more weight than riskier assets (e.g. 50% equities and 150% fixed income) allowing the ***return contribution*** to be similar between equities and fixed income

Risk Parity Multi Asset

Investment objectives

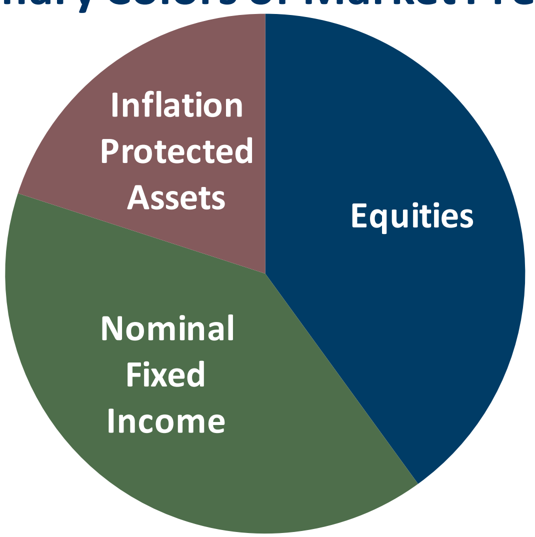
» Grow portfolio assets through investment returns

- Invest in assets with positive expected return

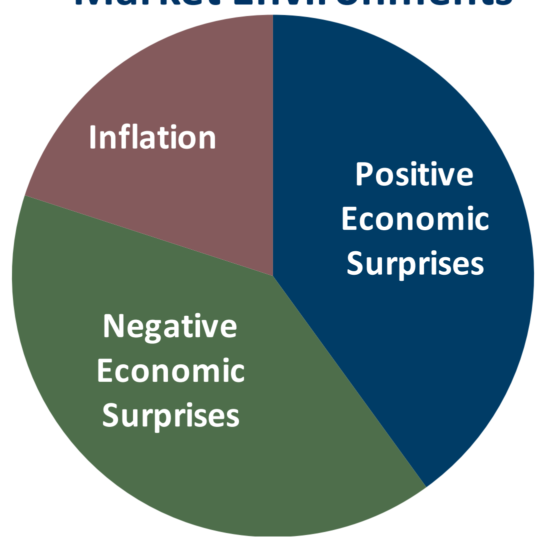
» Minimize impact of market volatility on the plan's wealth accumulation

- Diversify across assets that perform well during various macroeconomic and business cycles

Primary Colors of Market Premia



Market Environments



For illustrative purposes only. Source: PanAgora. PanAgora accounts may have exposure to some or all of the markets and asset classes discussed herein. Graphics are not representative of the strategy's exact exposure to each asset class.

Risk Parity Multi Asset

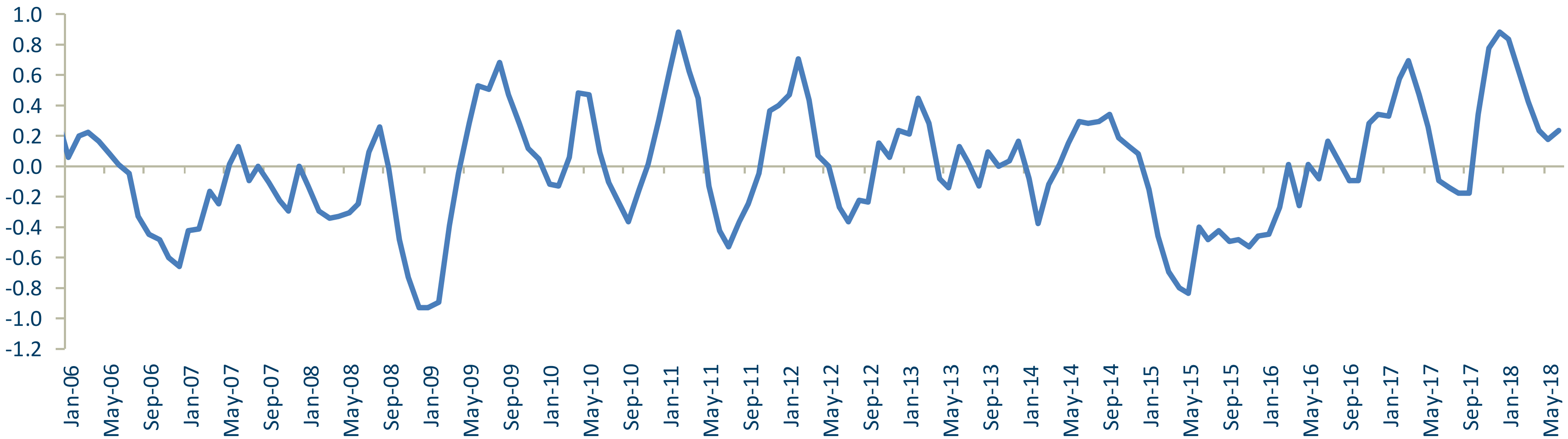
PanAgora

Promoting stability

» Every asset class will underperform in certain market environments

» Include assets that make money when others are losing money

Bloomberg U.S. Economic Surprise Index 2006-2018



Asset Class	Positive Surprise*	Negative Surprise*
MSCI USA	19.2%	-2.0%
BarCap U.S. Treasury	0.7%	6.4%

**Returns for the MSCI USA and BacCap U.S. Treasury indices are shown from Jan. 2006 – June 2018. For illustrative purposes only. Source: PanAgora.*

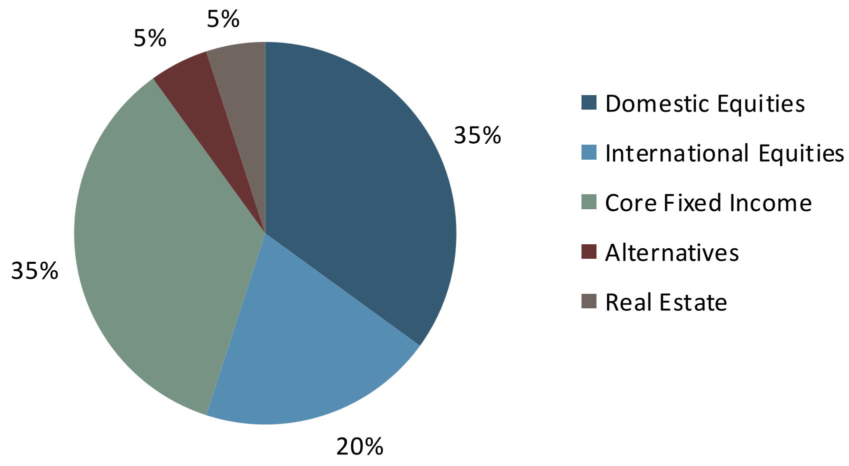
Risk Parity Multi Asset

PANAGORA

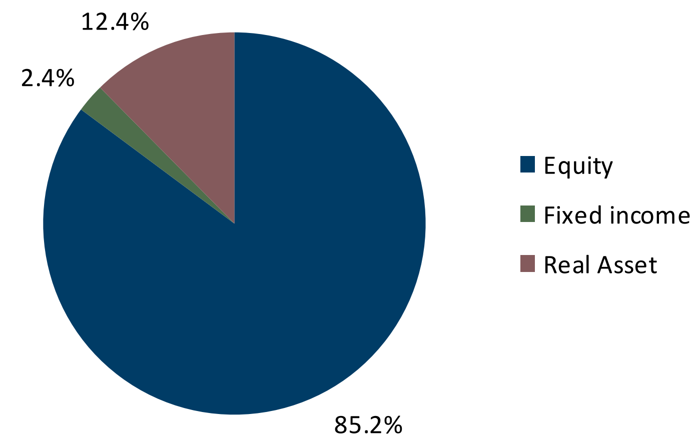
The traditional approach to asset allocation – diversify capital

» Traditional approach may result in the plan closely tracking the outcome of the equity market

Typical Plan's Capital Allocation



Typical Plan's Risk Allocation



For illustrative purposes only. Source: PanAgora.

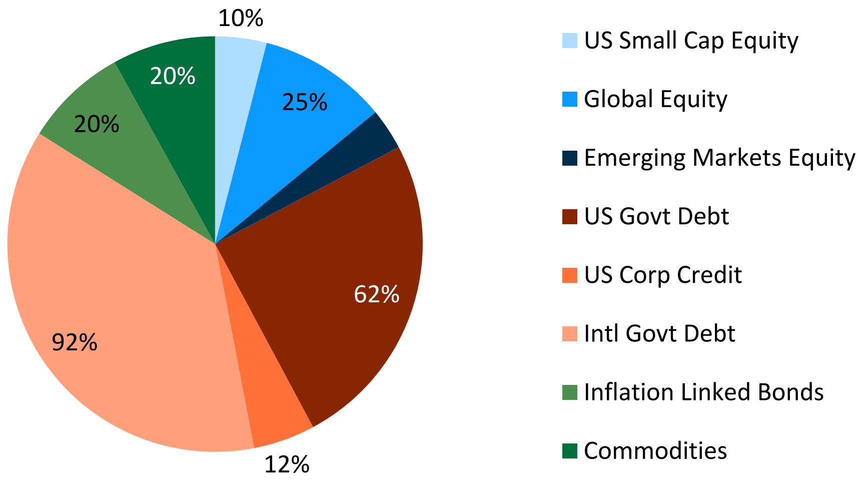
Risk Parity Multi Asset

PANAGORA

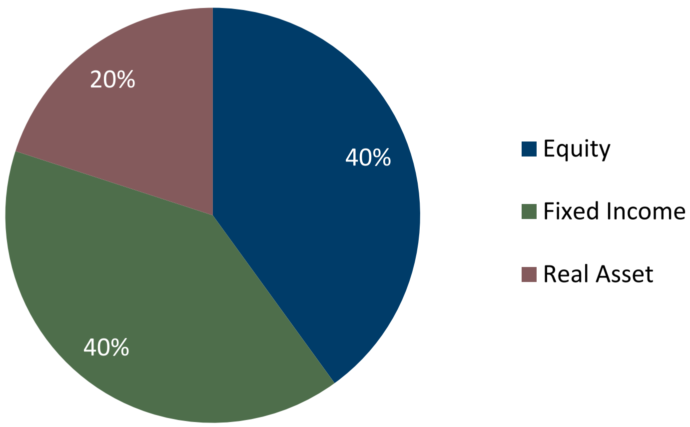
The Risk Parity approach to asset allocation – diversify risk

» Risk Parity approach weights assets so that all investments influence the portfolio similarly

Risk Parity Capital Allocation



Risk Parity Risk Allocation



For illustrative purposes only. Source: PanAgora.

Risk Parity Multi Asset

Global 60/40 Index Portfolio versus Risk Parity Multi Asset: Jan. 2006 – June 2018

» Allocation to PanAgora's Risk Parity Multi Asset strategy can improve consistency across economic surprises

Since Inception (1/1/2006)	60/40 Index Portfolio	Risk Parity Multi Asset Composite
Annualized Return	5.8%	7.0%
Annualized Risk	8.0%	9.1%
Sharpe Ratio	0.58	0.64

Since Inception (1/1/2006)	60/40 Index Portfolio	Risk Parity Multi Asset Composite
Annualized Return Positive Economic Surprise Months (75 months)	11.4%	8.9%
Annualized Return Negative Economic Surprise Months (75 months)	**0.4%**	**5.2%**

60/40 Index Portfolio consists of 60% MSCI World Hedged Index/40% Bloomberg Barclays Global Aggregate USD Hedged Index.

Composite performance is shown gross of fees and does not include the deduction of management fees and other expenses that may be incurred in managing an investment account. A portfolio's return will be reduced by advisory and other fees. Please see Appendix for full GIPS composite performance presentation. Data is historical. Past performance is not a guarantee of future results. As with any investment there is a potential for profit as well as the possibility of loss. Source: PanAgora. Periods are defined using Bloomberg index from prior page.

Risk Parity Multi Asset

PANAGORA

Differentiators

» Uses Strategic Risk Allocation which diversifies the portfolio across various economic environments with a strategic emphasis on growth shocks

» Deploys Bottom-up Risk Parity across and within asset classes with the goal of minimizing risk concentration across multiple dimensions

» Incorporates Dynamic Risk Allocation (DRA) an innovative approach which tactically adjusts risk exposures to capture changing market conditions

» Benefits from innovative research and continuous effort to enhance the investment process

Risk Parity Multi Asset

PanAgora

Investment process focused on diversification of risk

» Strategic emphasis on minimizing risk concentration in multiple dimensions to generate better long-term risk-adjusted returns

» Tactical emphasis on capitalizing intermediate-term investment opportunities to generate additional value-added

Step 1: Select appropriate asset classes

↓

Step 2: Build asset class exposures

↓

Step 3: Strategically weight long-term exposure to asset classes

↓

Step 4: Tactically re-weight exposures

Portfolio construction is subject to change. No assurance can be given that the investment objective or expected return will be achieved or that an investor will receive a return of all or part of his or her initial investment. As with any investment there is a potential for profit as well as the possibility of loss. Source: PanAgora.

Risk Parity Multi Asset

Step 1: Select appropriate asset classes

» Diversification can be achieved without introducing undue liquidity and tail risk

		Correlation to Capital Growth	Correlation to Capital Protection	Correlation to Inflation Protection	Liquidity Risk	Tail Risk	**Diversification Benefit**
PANAGORA DIVERSIFIED RISK ASSET CLASSES	Global Equity	High	Low	Medium	Low	Medium	High
	U.S. Small Cap Equity	High	Low	Medium	Low	Medium	High
	Emerging Markets Equity	High	Low	Medium	Medium	Medium	High
	Term Structure	Low	High	Low	Low	Low	High
	Sovereign Fixed Income	Low	High	Low	Low	Low	High
	Investment Grade Credit	Low	High	Low	Low	Low	High
	Inflation-linked Global	Low	High	High	Low	Low	High
	Commodities	Medium	Low	High	Low	Medium	High
OTHER ASSET CLASSES	High Yield Fixed Income	High	Low	Low	High	High	Low
	Emerging Markets Debt	High	Low	Low	High	High	Low
	Private Equity	High	Low	Medium	High	High	Low
	Real Estate	High	Low	Medium	High	High	Low

Marginal diversification benefit, but high liquidity and tail risk

For Illustrative purposes only. Source: PanAgora.

Risk Parity Multi Asset

PanAgora

Step 1: Select appropriate asset classes

» Risk Parity is applied across and within asset classes

Equities

- Diversified Risk Global Equity
- Diversified Risk U.S. Small Cap Equity
- Diversified Risk Emerging Markets Equity

Fixed Income

- Diversified Risk Term Structure
- Diversified Risk Investment Grade Credit
- Diversified Risk Non-U.S. Sovereign
- Diversified Risk Inflation-linked Global

Commodities

- Diversified Risk Commodities

Equities			Fixed Income	Commodities
Sectors	Countries		Credit	Energy
Consumer Discretionary	Australia	Brazil	AAA	Precious Metals
Consumer Staples	Austria	Chile	AA	Industrial Metals
Energy	Belgium	China	A	Agriculture
Financials	Canada	Colombia	BAA	Livestock
Healthcare	Denmark	Czech Republic		
Industrials	Finland	Egypt	Non-U.S.	
Materials	France	Greece	Sovereign	
Technology	Germany	Hungary	UK Gilts	
Telecomm	Hong Kong	India	German Bunds	
Utilities	Ireland	Indonesia	Canadian Gov't	
	Israel	Malaysia	Australia Gov't	
	Italy	Mexico	Japanese Gov't	
	Japan	Peru	Italian Gov't	
	Netherlands	Philippines	U.S. Term Structure	
	New Zealand	Poland	2 Year	
	Norway	Qatar	5 Year	
	Portugal	Russia	10 Year	
	Singapore	South Africa	30 Year	
	Spain	South Korea		
	Sweden	Taiwan	Inflation-linked	
	Switzerland	Thailand	Global	
	United Kingdom	Turkey	UK	
	United States	United Arab Emirates	US	
			Europe	

PanAgora accounts may have exposure to some or all of the markets and asset classes discussed herein.

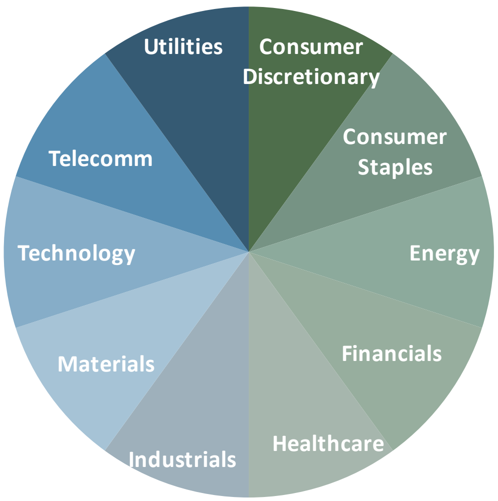
Risk Parity Multi Asset

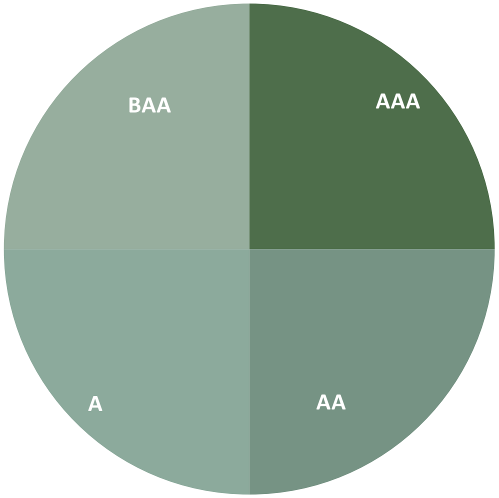
Step 2: Build asset class exposures

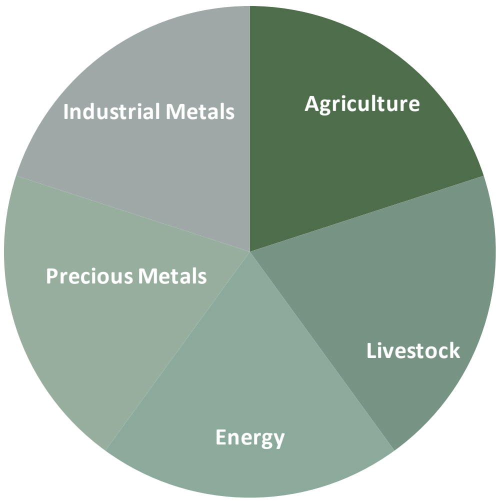
Diversified Risk Equity
- Sector concentration
- Country concentration
- Stock concentration

Diversified Risk Fixed Income
- Credit concentration
- Term structure concentration
- Sovereign concentration
- Real Interest rate concentration

Diversified Risk Commodities
- Sector concentration
- Security concentration





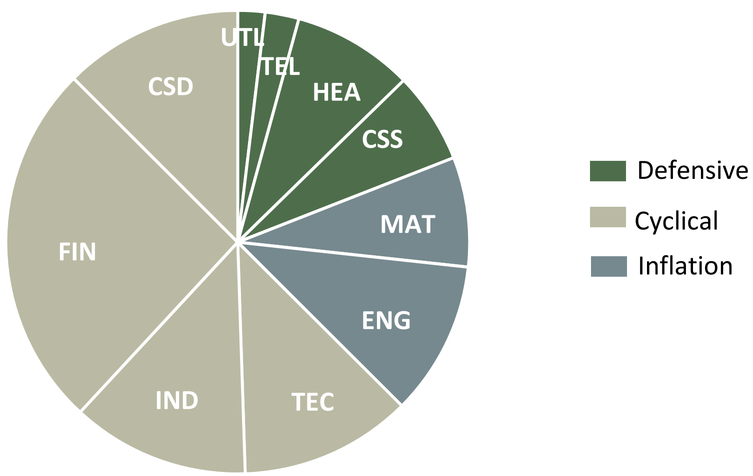


PanAgora accounts may have exposure to some or all of the markets and asset classes discussed herein.

Step 2: Build asset class exposures

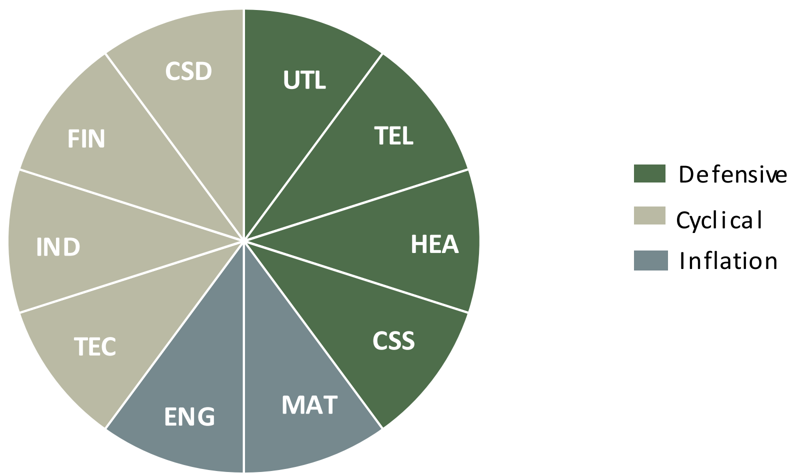
» We believe a deeper application of Risk Parity results in better portfolio building blocks

MSCI World Index Sector Contribution to Risk



» Risk concentration in Cyclical sectors

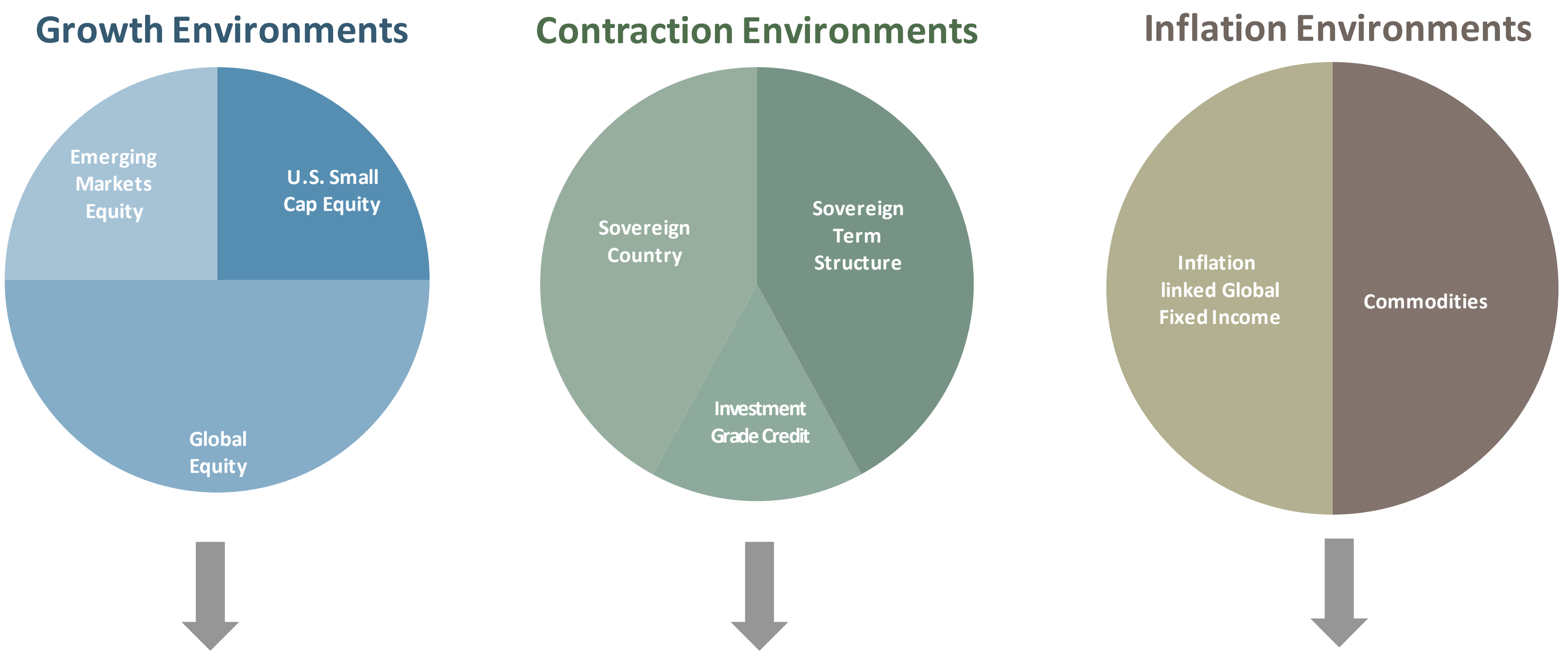
PanAgora Diversified Risk Global Equity Sector Contribution to Risk



» Balanced from the bottom-up

For illustrative purposes only. Source: PanAgora

Step 3: Strategically weight long-term exposure to asset classes



PanAgora Risk Parity Multi Asset Long-Term Exposure		
40%	40%	20%

Portfolio construction is subject to change. No assurance can be given that the investment objective or expected allocations will be achieved or that an investor will receive a return of all or part of his or her initial investment. As with any investment there is a potential for profit as well as the possibility of loss. PanAgora accounts may have exposure to some or all of the markets and asset classes discussed herein.

Source: PanAgora.

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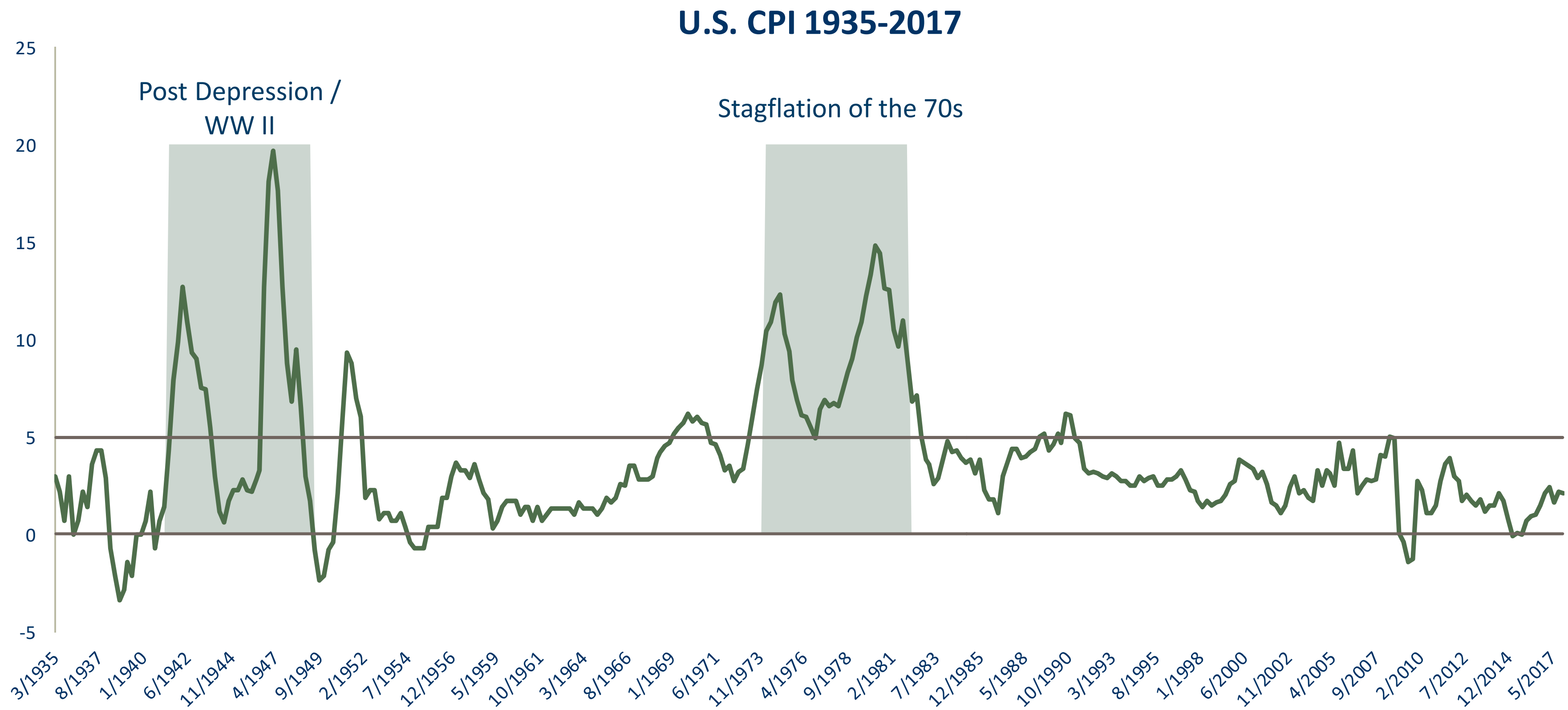
Step 3: Strategically weight long-term exposure to asset classes

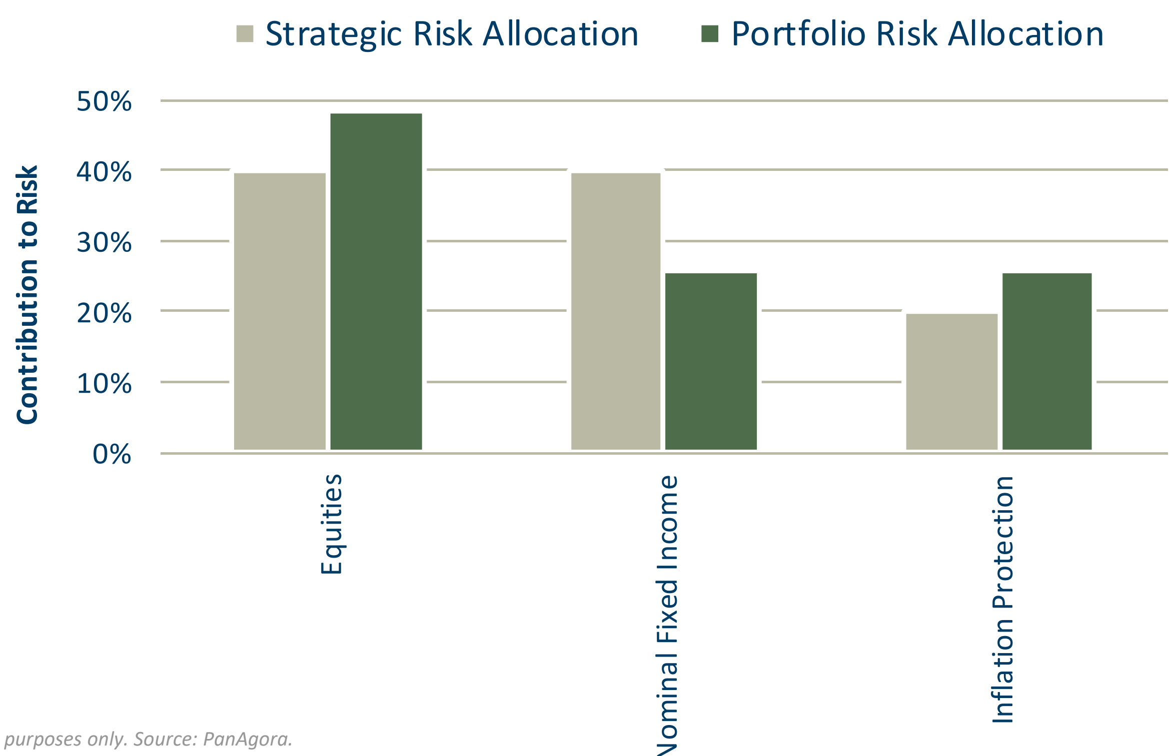
- Lower strategic allocation to inflation-protected assets
- Inflation is more of a risk that should be hedged than an asset that offers attractive risk-adjusted return
- Central Bank credibility has resulted in far fewer periods of heightened inflation



For illustrative purposes only. Source: Bureau of Labor Statistics

Step 4: Tactically re-weight exposures

- Dynamic Risk Allocation ("DRA") is designed to improve risk management and exploit changes in market conditions
- DRA also seeks to manage downside risk due to the changing market environments
- By tactically re-weighting risk exposures DRA seeks to further enhance portfolio returns



The risk allocation shown is for illustrative purposes only. Source: PanAgora.
Portfolio construction is subject to change. Please see the disclosures at the front of this presentation.

Risk Parity Multi Asset

Step 4: Tactically re-weight exposures

» DRA is applied across equities, fixed income, and commodities

» DRA is applied across sub-asset classes

» DRA is applied within certain asset classes

DRA across asset classes

DRA across sub-asset classes

Dynamic Risk Allocation

Equity	Fixed Income	Commodities
Global	Non-U.S. Sovereign	5 Commodity Sectors
Small Cap	Term Structure	Agriculture
Emerging Markets	Credit	Livestock
	Inflation Linked Bonds	Energy
		Precious Metals
		Industrial Metals

PanAgora accounts may have exposure to some or all of the markets and asset classes discussed herein. For illustrative purposes only. Source PanAgora.

Risk Parity Multi Asset

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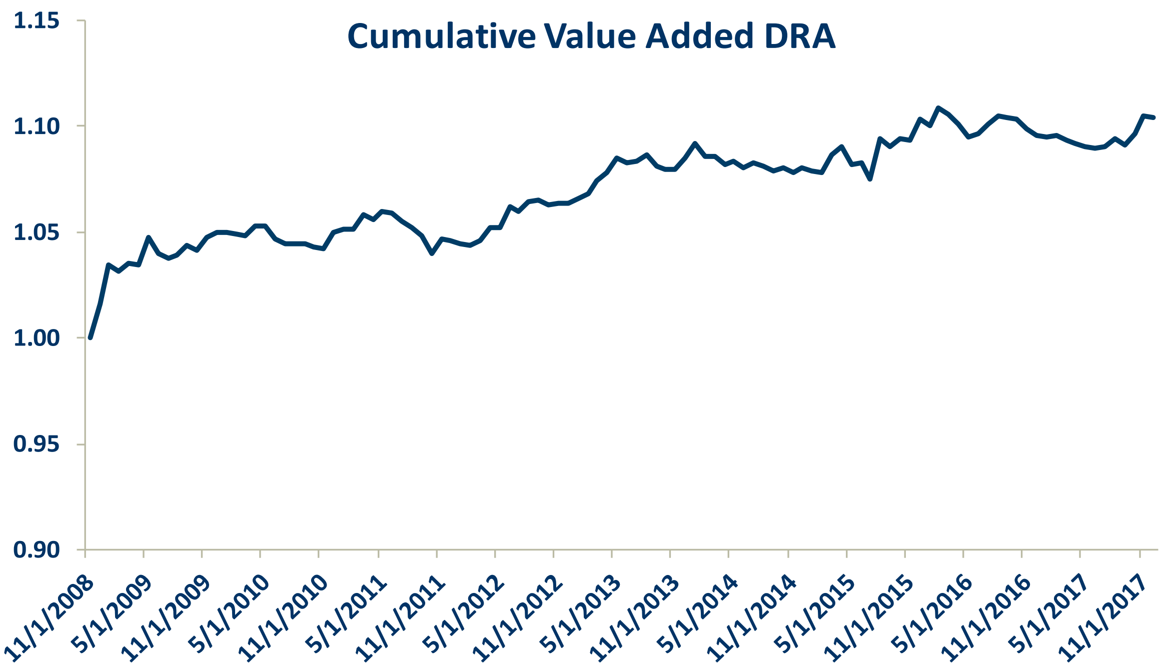
Dynamic Risk Allocation Model Performance (Gross)

» Tactical shifts have added moderate value on moderate active risk over time



	2009-2017	2009	2010	2011	2012	2013	2014	2015	2016	2017
Value Added	0.75%	1.47%	0.12%	-0.65%	2.09%	2.40%	-1.17%	1.97%	-0.48%	1.03%
Risk	1.48%	1.80%	1.14%	1.52%	1.18%	1.30%	0.84%	2.53%	1.30%	1.12%
Sharpe	0.50	0.82	0.10	-0.43	1.77	1.84	-1.39	0.78	-0.37	0.92

Shown for illustrative purposes only. Source: PanAgora. As with any investment, there is the possibility of profit as well as the risk of loss. Cumulative Value Added DRA reflects the impact of DRA as evidenced by the outperformance of the Risk Parity Multi Asset strategy attributable to DRA according to PanAgora's strategic risk targets. Model performance does not reflect actual returns experienced by any investor. Please see disclosures at the back of this presentation.

Risk Parity Multi Asset

Dynamic Risk Allocation Model Performance (Gross)

» Value-added from DRA is negatively correlated with the Risk Parity Multi Asset strategic portfolio over time

2008-2017	Risk Parity Multi Asset	MSCI World	Bloomberg BarCap Global Trsy	VA DRA
Risk Parity Multi Asset	1.00			
MSCI World	0.60	1.00		
Bloomberg BarCap Global Trsy	0.43	-0.26	1.00	
VA DRA	-0.28	-0.25	0.19	1.00

Shown for illustrative purposes only. Source: PanAgora. As with any investment, there is the possibility of profit as well as the risk of loss. Cumulative Value Added DRA reflects the impact of DRA as evidenced by the outperformance of the Risk Parity Multi Asset strategy attributable to DRA according to PanAgora's strategic risk targets. Model performance does not reflect actual returns experienced by any investor. Please see disclosures at the back of this presentation.

Risk Parity Multi Asset

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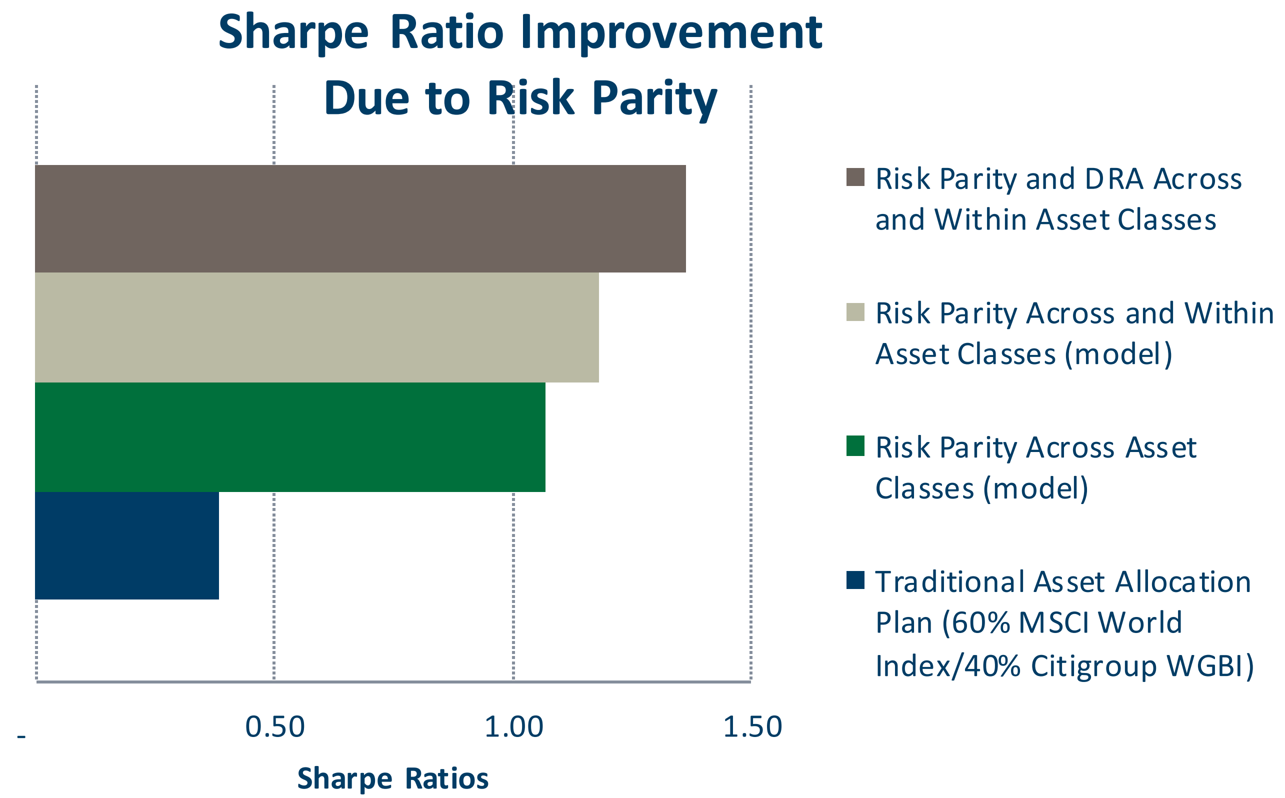
Improvements in Sharpe Ratios



Shown for illustrative purposes only. Source: PanAgora. Shown for illustrative purposes only. Source: PanAgora. As with any investment, there is the possibility of profit as well as the risk of loss. Model performance does not reflect actual returns experienced by any investor. Please see disclosures at the back of this presentation.

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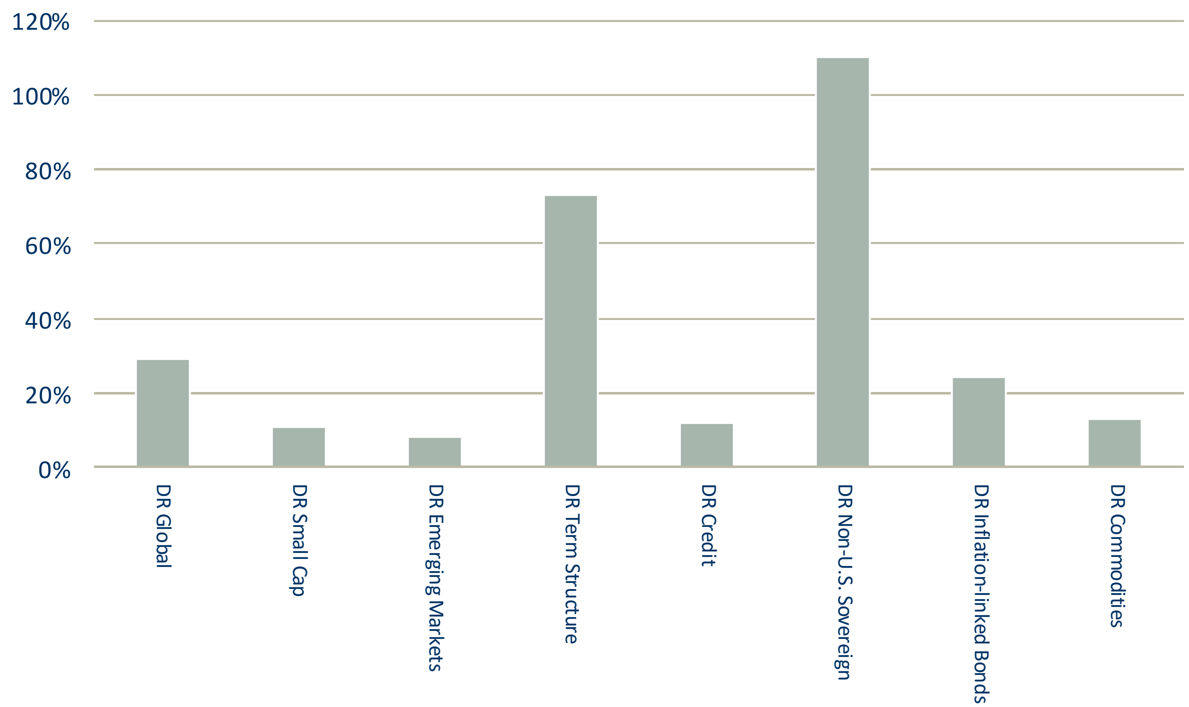
Risk Parity Multi Asset

PanAgora

Portfolio weights and exposures

	DR Global	DR Small Cap	DR Emerging Markets	DR Term Structure	DR Credit	DR Non-U.S. Sovereign	DR Inflation-linked Bonds	DR Commodities
Target Risk Weights	22%	11%	11%	16%	4%	16%	9%	11%
Notional Market Exposures	29%	11%	8%	73%	12%	110%	24%	13%
Instruments	Physicals/Futures	Physicals/Futures	Physicals/Futures	Futures	Physicals	Futures	Physicals	Futures

Notional Market Exposures



The portfolio allocation presented is shown for illustrative purposes only. PanAgora accounts may have exposure to some or all of the markets and asset classes discussed herein. Please see appendix for full GIPS compliant performance presentations. Source: PanAgora. Please see the disclosures in the back of this presentation.

Risk Parity Multi Asset

Composite performance summary (gross of fees)

	Annualized Performance (Gross of Fees, USD)						Sharpe Ratio	
As of 6/30/2018	Inception Date	Year to Date	One Year	Three Years	Five Years	Ten Years	Three Years	Five Years
Risk Parity Multi Asset	1/1/2006	-1.24	6.34	7.18	8.61	7.30	0.84	1.05

Calendar Year											
2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006
13.83	13.74	-3.45	14.86	3.58	14.68	11.30	18.80	7.16	-13.39	14.43	-1.22

Performance is shown gross of fees and does not include the deduction of management fees and other expenses that may be incurred in managing an investment account. A portfolio's return will be reduced by advisory and other fees. Please see Appendix for full GIPS composite performance presentation. Data is historical. Past performance is not a guarantee of future results. As with any investment there is a potential for profit as well as the possibility of loss. Source: PanAgora.

Summary

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An allocation to PanAgora Risk Parity can help CCCERA

» Risk Parity is designed to achieve a dual investment objective
  - Invests in "primary colors" of market premia to achieve returns
  - Employs alternative weighting scheme to generate a stable path to wealth creation across different environments

» Risk Parity will typically outperform a traditional allocation when a plan needs the most help
  - Provides downside protection in periods with negative economic surprises
  - Provides upside participation in periods with positive economic surprises, but will typically lag equity centric portfolios

» PanAgora employs an innovative approach to building portfolios
  - How we strategically weight asset classes
  - How we build exposures
  - How we shift exposures

APPENDIX

Leverage can help achieve both the return and stability objectives

» 60% equities, 40% fixed income
  - Achieves the expected return target by creating a portfolio with 10% risk
  - Introduces instability to plan’s funding status as return outcome is determined by the equity markets

» 20% equities, 80% fixed income
  - Fails to achieve the expected return target as portfolio risk is approximately 5%
  - Promotes stability by allowing fixed income returns to contribute as much as equity returns

» **Risk Parity Multi Asset**
  - Achieves the expected return target by levering a risk balanced portfolio to achieve a 10% risk target
  - Promotes stability by allowing fixed income returns to contribute as much as equity returns

Appendix

PanAgora

The modern economy is built on leverage

» Just like Risk Parity, most investments are levered

- Public and Private Equity, Real Estate, Infrastructure, Hedge Funds
- Securitization (or in the case of Risk Parity – commingled fund) allows it to be non-recourse leverage

» Risks of leverage can be controlled with good risk management

- Levering a diversified portfolio of liquid assets, not sub-prime mortgages
- Active rebalancing to target constant and balanced market risk
- Maintaining high levels of unencumbered cash
- Utilizing instrument leverage through exchange-traded and centrally cleared futures, not borrowed leverage

Appendix

PanAgora

Systematic flexibility to adapt to changes in market cycles of interest rates

» Risk Parity Multi Asset performance during periods of rising rates (Gross of fees)

		Annualized Returns		
Period	Change in US 10 year Treasury yield (bps)	MSCI World Hedged Index	Citigroup World Government Bond Hedged Index	PanAgora Risk Parity Multi Asset
January 2006 - June 2006	75	7.0%	-1.9%	-5.9%
December 2006 - June 2007	57	20.8%	-0.6%	1.0%
April 2008 - May 2008	65	56.1%	-12.8%	17.5%
January 2009 - December 2009	163	26.3%	1.0%	7.2%
September 2010 - March 2011	100	36.9%	-5.6%	19.2%
April 2013 - December 2013	134	23.7%	-0.8%	-1.0%
June 2016 - December 2016	96	15.0%	-0.8%	5.3%
Average:	**99**	**26.5%**	**-3.1%**	**6.2%**

For illustrative purposes only. Past performance is not indicative of future results. Source: PanAgora.

PanAgora

Multi Asset team research bibliography

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- PanAgora Investment Insight: Value of Stop-Loss Investment Policies. Research Notes (2013). Edward Qian, Ph.D.
- PanAgora Investment Insight: Risk Parity Equity With Flexible Risk Targets. Research Notes (2013). Nicholas Alonso, CFA & Edward Qian Ph.D.

Appendix

Multi Asset team research bibliography

» **Research Notes (continued)**

- PanAgora Investment Insight: Reaching for Yield: The Risk Parity Way. Research Notes (2013). Bryan Belton, CFA, Edward Qian, Ph.D.
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- PanAgora Investment Insight: Are Risk Parity Managers Risk Parity? Research Notes (2012). Edward Qian, Ph.D.
- PanAgora Investment Insight: Risk Parity and Global Macro Hedge Funds. Research Notes (2012). Edward Qian, Ph.D.
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- Risk Parity Fundamentals. (2016). Edward Qian, Ph.D.

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» **White Papers***

- Risk Parity: The Solution to Unbalanced Portfolios. White Paper (2010). Edward Qian, Ph.D.
- Risk Parity Still Makes Sense. White Paper (2010). Edward Qian, Ph.D., Bryan Belton, CFA
- Risk Parity Global Equity Strategy. White Paper (2010). Edward Qian, Ph.D.
- Risk Parity and Inflation. White Paper (2010). Edward Qian, Ph.D.
- Risk Parity Portfolios: The Next Generation. White Paper (2009). Edward Qian, Ph.D.
- Risk Parity Portfolios: Efficient Portfolios Through True Diversification. White Paper (2005). Edward Qian, Ph.D.

** Additional Published Articles and White Papers are available at www.panagora.com*

Experienced Multi Asset investment team

Name	Title	Area of Focus	Industry Experience	Years With Firm
Edward Qian, Ph.D.	CIO and Head of Research, Multi Asset	Architect of Risk Parity framework, oversight of Multi Asset group, research and implementation	22	20
Bryan Belton, CFA	Director, Multi Asset	Fixed income, currency and commodities research and implementation	20	13
David Liddell	Director, Multi Asset	Equity implementation	29	29
William G. Zink	Director, Multi Asset	Equity implementation	43	29
Kun Yang, Ph.D., CFA	Director, Multi Asset	Fixed income, commodities, currency and equity research and implementation	12	12
Nicholas Alonso, CFA	Director, Multi Asset	Equity research and implementation	11	8
Jonathan Beaulieu, CFA	Director, Multi Asset	Fixed income, currency and commodities research and implementation	22	7
Anthony Borthwick, CFA, CMT	Portfolio Manager, Multi Asset	Fixed income, currency and commodities research and implementation	30	26
Randall Yarlas	Portfolio Manager, Multi Asset	Equity implementation	25	18
Anne Ma, Ph.D.	Research Analyst, Multi Asset	Multi Asset research	4	4
Vic Malla	Research Analyst, Multi Asset	Fixed income, currency research and implementation	9	1
Timothy Doyle	Portfolio Analyst, Multi Asset	Portfolio implementation	14	12
James Alberto	Analyst, Multi Asset	Investment software application developer	28	10
Justin Neal	Analyst, Multi Asset	Investment software application developer	20	6

Biographies

Eric Sorensen, Ph.D.
President & Chief Executive Officer

Dr. Sorensen is the President and Chief Executive Officer of PanAgora, and a member of the firm's Investment, Operating, and Risk Committees. He is responsible for PanAgora's business and investment activities.

He took over leadership of PanAgora in 2004, and established a new research and investment direction for the firm. Prior to joining PanAgora, Dr. Sorensen was Director of Quantitative Research at Putnam Investments, overseeing the activities of several quantitative teams including equity, fixed income, asset allocation and financial engineering. He was also Chief Investment Officer of Structured Equity, which managed institutional portfolios using advanced quantitative approaches.

Between 1986 and 2000 Dr. Sorensen was the Global Head of Quantitative Research at Salomon Brothers (now Citigroup). At the end of his 14 years on Wall Street, he led a group of 55 quantitative analysts comprising teams in New York, London, Singapore, Tokyo and Australia. During that time he published extensively, and consulted with institutional investor clients around the world. His honors include many years on the Institutional Investor All American Research Team, and several Graham and Dodd awards for excellence in financial writing.

Prior to Wall Street, he was a professor with a productive academic career from 1974 to 1986. For a decade he was Professor of Finance and Department Head at the University of Arizona. He has published over 50 journal articles and served on the editorial boards of several academic Finance journals. He is also co-author of the recent book, Quantitative Equity Portfolio Management.

Between 1969 and 1974 he served the country as a United States Air Force Officer and jet pilot. His primary mission was instructor pilot in high-performance jet aircraft.

With over 40 years of quantitative research and investment experience, Dr. Sorensen is a leading expert in the industry. He continues to maintain affiliations in both the industry and academia.

Education:
University of Oregon, Ph.D.
Oklahoma City University, M.B.A.
University of Oregon, A.B.

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PanAgora

Biographies

Edward Qian, Ph.D.
Chief Investment Officer & Head of Research, Multi Asset

Dr. Qian is the Chief Investment Officer and Head of Research, Multi Asset for the firm. His primary responsibilities include investment research and portfolio management in PanAgora's Multi Asset group. He is also a member of the firm's Investment, Operating, and Directors Committees.

Dr. Qian has a distinguished career in investment management as well as academia. A renowned researcher, Dr. Qian's pioneering work, "On the Financial Interpretation of Risk Contribution: Risk Budgets Do Add up", became a cornerstone for what is commonly referred to as "Risk Parity" type investment strategies today. Dr. Qian's research has helped PanAgora become a leader in the area of risk budgeting strategies by launching the first Risk Parity Portfolios earlier this decade. He is the author of the recently published book, Risk Parity Fundamentals. Dr. Qian has authored many articles regarding quantitative equity investment techniques as well as co-author of the book, Quantitative Equity Portfolio Management: Modern Techniques and Applications.

Prior to joining PanAgora, Dr. Qian was a Portfolio Manager and part of the Asset Allocation team at 2100 Capital, an alternative investments firm. His prior experience includes a role as Senior Asset Allocation Analyst on Putnam Investments' Global Asset Allocation team. Before joining Putnam, he was a fixed-income Quantitative Analyst at Back Bay Advisors.

Dr. Qian was a National Science Foundation Research Fellow at MIT.

Education:
Florida State University, Ph.D.
The Chinese Science Academy, M.S.
Peking University, B.S.

Biographies

Bryan D. Belton, CFA
Director, Multi Asset

Mr. Belton is a Director within the Multi Asset group. Mr. Belton is responsible for research as well as the daily management of the firm's Risk Parity, global fixed income, currency, and commodity portfolios. Mr. Belton is a member of the firm's Directors and Operating Committees.

Prior to joining PanAgora, Mr. Belton was the Investment Portfolio Officer at the Federal Home Loan Bank of Boston. In that role, he was responsible for actively managing and hedging all of the Bank's long-term investment portfolios. Before joining the Federal Home Loan Bank of Boston, Mr. Belton was a Senior Manager at Investors Bank & Trust Company.

Mr. Belton is a CFA charterholder.

Education:
Northeastern University, M.S.F.
Boston College, A.B.

Lisa R. Mahoney
Director, Relationship Management

Ms. Mahoney is a Director and Relationship Manager responsible for working with investment consultants and managing existing client relationships. Previously, she was an Investment Product Manager at PanAgora, working with colleagues to provide solutions to institutional investor needs. Ms. Mahoney is also a member of the firm's Directors Committee.

Prior to joining PanAgora, Ms. Mahoney was a Client Relationship Manager for Putnam Investments' Institutional Defined Contribution clients and held several positions on the Putnam Consultant Relations Team.

Education:
Mason School of Business, College of William and Mary, M.B.A.
Allegheny College, B.S.

MSCI Disclosure

Certain information included herein is derived by PanAgora Asset Management, Inc in part from MSCI's Index (the "Index Data"). However, MSCI has not reviewed this product or report, and does not endorse or express any opinion regarding this product or report or any analysis or other information contained herein or the author or source of any such information or analysis. Neither MSCI nor any third party involved in or related to the computing or compiling of the Index Data makes any express or implied warranties, representations or guarantees concerning the Index Data or any information or data derived there from, and in no event will MSCI or any third party have any liability for any direct, indirect, special, punitive, consequential or any other damages (including lost profits) relating to any use of this information. Any use of MSCI data requires a license from MSCI. None of the Index Data is intended to constitute investment advice or a recommendation to make (or refrain from making) any kind of investment decision and may not be relied on as such.

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Disclosure

The performance shown is for the stated time period only; due to market volatility, each account's performance may be different. The returns shown assume the reinvestment of dividends and other income. The information in this presentation may contain projections or other forward-looking statements regarding future events, targets or expectations, and is only current as of the date indicated. No assurance can be given that the investment objective or target return will be achieved or that an investor will receive a return of all or part of his or her initial investment.

The securities presented are intended to demonstrate the application of the investment strategy and do not constitute a representative list of all securities bought or sold during any time period. These recommendations should not be considered to be a pattern of success or a guarantee of positive performance. Not all of PanAgora's recommendations have been or will be profitable.

PanAgora is exempt from the requirement to hold an Australian financial services license under the Corporations Act 2001 in respect of the financial services. PanAgora is regulated by the SEC under U.S. laws, which differ from Australian laws.

Performance is shown gross of fees and does not include the deduction of management fees and other expenses that may be incurred in managing an investment account. A portfolio's return will be reduced by advisory and other fees. To the extent required by Form ADV, actual fees are described in Part 2A of PanAgora's Form ADV and will vary depending on, among other things, the applicable fee schedule and account size. For example, if $100,000 were invested and experienced a 10% annual return compounded monthly for 10 years, its ending value, without giving effect to the deduction of advisory fees, would be $270,704 with annualized compounded return of 10.47%. If an advisory fee of 0.95% of the average market value of the account were deducted monthly for the 10-year period, the annualized compounded return would be 9.43% and the ending dollar value would be $246, 355. Past performance is no guarantee of future results.

The information in this presentation may contain projections or other forward-looking statements regarding future events, targets or expectations and is current only as of the date indicated. As used herein, "targeted" returns or characteristics refer to ex-ante objectives in the portfolio management process; whereas "expected" returns or characteristics refer to expectations based on the application of mathematical principles to portfolio attributes and/or historical data, and does not represent a guarantee. There is no guarantee that targeted or expected returns or other characteristics will be realized or achieved, or that an investment strategy will be successful. Forward-looking statements are subject to numerous assumptions, risks and uncertainties which change over time. Predictions, opinions and other information contained in this presentation are subject to change continually and without notice of any kind and may no longer be true after the date indicated. PanAgora assumes no duty to and does not undertake to update forward-looking statements.

PANAGORA

Risk Parity Multi-Asset Master Composite
Composite: Risk Parity Multi-Asset Master (As of 12/31/2017)
Benchmark: 60% MSCI World / 40% Citigroup World Government Bond Index

	One Year Performance			Internal Dispersion		External Dispersion			
Year	Composite Gross of Fees Return (%)	Composite Net of Fees Return (%)	Index Return (%)	High (%)	Low (%)	3 Yr. Composite Return (%)	3 Yr. Composite Standard Deviation	3 Yr. Index Return (%)	3 Yr. Index Standard Deviation
2017	13.83	13.48	16.24	15.76	12.95	7.72	8.10	6.36	6.64
2016	13.74	13.39	5.33	13.84	12.44	8.05	8.81	2.10	7.14
2015	-3.45	-3.80	-1.72	-2.64	-4.12	4.73	8.89	4.68	7.07
2014	14.86	14.51	2.80	16.31	13.78	10.91	7.83	8.74	6.92
2013	3.58	3.23	13.54	4.09	3.30	9.75	8.19	7.51	8.74
2012	14.68	14.33	10.15	14.11	13.99	14.89	7.09	6.22	10.96
2011	11.30	10.92	-0.63	11.72	10.17	12.32	8.68	8.91	13.85
2010	18.80	18.40	9.50	19.15	17.79	3.31	12.62	0.05	15.87
2009	7.16	6.79	18.72	7.27	7.23	2.03	12.33	0.19	14.22
2008	-13.39	-13.69	-22.97	-13.13	-14.38	-0.71	11.33	-1.04	10.80

	Assets Under Management				
Year	Composite Assets ($Millions)	Percentage of Firm Assets (%)	Number of Accounts	Firm Assets ($Millions)	Non-fee paying and/or Proprietary Assets (%)
2017	$7,038.46	13.05	6	$53,915	0.00
2016	$5,788.71	13.53	5	$42,798	0.00
2015	$4,015.91	10.47	5	$38,361	0.00
2014	$3,013.93	7.94	4	$37,953	0.00
2013	$1,520.33	3.85	3	$39,533	0.00
2012	$777.78	2.55	4	$30,524	0.00
2011	$249.36	1.11	2	$22,401	0.00
2010	$195.59	0.98	2	$19,914	0.00
2009	$134.30	0.83	2	$16,084	0.00
2008	$55.32	0.43	3	$12,778	4.46

Firm Overview

PanAgora Asset Management, Inc. (the “Firm”) claims compliance with the Global Investment Performance Standards (“GIPS®”) and has prepared and presented this report in compliance with the GIPS Standards. PanAgora Asset Management, Inc. has been independently verified for the periods 1993-2016. The verification reports are available upon request. Verification assesses whether (1) the firm has complied with all the composite construction requirements of the GIPS standards on a firm-wide basis and (2) the firm’s policies and procedures are designed to calculate and present performance in compliance with the GIPS standards. Verification does not ensure the accuracy of any specific composite presentation.

For the purposes of compliance with GIPS, the Firm is defined as a broad based investment management organization that provides investment services to institutions through separately managed accounts, pooled funds and mutual funds. The Firm is an independent investment advisor registered under the Investment Advisers Act of 1940 specializing in quantitative investment strategies and includes all assets under management.

Composition of Composite

The accounts within the Risk Parity Multi-Asset Master Composite (the "Composite") seek to generate attractive, absolute risk-adjusted returns utilizing a multi-asset investing approach through a combination of strategic asset allocation and tactical portfolio management. The strategy seeks to deliver true diversification through balanced risk budgeting between equities, bonds and commodities. The Composite consists of portfolios deploying a Risk Parity Multi-Asset approach to asset allocation that target an expected annualized volatility of 10%. The Composite is comprised of all discretionary institutional accounts managed by the Firm in this investment style. The inception date for the Composite is January 1, 2006. The creation date for the Composite was February 15, 2012. There is a minimum of $2 million in assets for inclusion in this composite.

The Risk Parity Multi-Asset strategy employs leverage in its risk efficient asset allocation portfolios in order to achieve the expected risk levels, predominantly through the use of exchange traded futures, forward contracts and swaps. In normal market conditions, the gross notional exposure of long and short positions has typically represented up to four times the market value of a client's account. The extent of leverage will vary by client.

New portfolios are included in a GIPS composite beginning with the first complete month of performance in the strategy. Terminated portfolios are included through the final full month of management. Composites may include portfolios with certain existing investment restrictions that the Company believes do not materially impact the investment strategy.

A list of composite descriptions is available upon request.

Calculation of Composite

A composite's monthly return is computed by asset weighting the portfolio returns within the composite, using the beginning of period market values. The quarterly return of a composite is computed by geometrically linking the returns of each month within the calendar quarter. The annual return of a composite is computed by geometrically linking the returns of each quarter within the calendar year.

Investments held by all portfolios are valued on a trade-date basis using accrual accounting. Individual portfolio returns are calculated using the daily time-weighted rate of return (TWRR) methodology. Performance is expressed in U.S. dollars. Policies for valuing portfolios, calculating performance, and preparing compliant presentations are available upon request.

Returns are net of foreign withholding taxes on dividends, interest, and capital gains. Equity benchmark returns assume dividends are reinvested monthly. MSCI benchmarks are presented net after withholding taxes by applying the maximum rate applicable to non-resident institutional investors who do not benefit from double taxation treaties. Returns from other benchmark providers are presented gross of any tax withholding.

Index Disclosure

The benchmark for this Composite is a fixed blend benchmark, comprised of 60% of the MSCI World Index and 40% of the Citigroup World Government Bond Index each month.

The MSCI World Index is a free float-adjusted market capitalization weighted index that captures large and mid-cap representation across 23 Developed Markets (DM) countries. The index covers approximately 85% of the free float-adjusted market capitalization in each country.

The Citigroup World Government Bond Index measures the performance of fixed-rate, local currency, investment-grade sovereign bonds. The WGBI is a widely used benchmark that currently comprises sovereign debt from over 20 countries, denominated in a variety of currencies, and has more than 30 years of history available. The WGBI is a broad benchmark providing exposure to the global sovereign fixed income market.

Benchmarks are generally taken from published sources and may have different calculation methodologies, pricing times, and foreign exchange sources from the Composite. The effect of those differences is deemed to be immaterial. The securities holdings of the composite may differ materially from those of the index used for comparative purposes. Indexes are unmanaged and do not incur expenses. You cannot invest directly in an index.

Gross and Net of Fees Disclosure

Gross of Fee returns are net of transaction costs but do not include the deduction of management fees and other expenses that may be incurred in managing an investment account. A portfolio's return will be reduced by management and other fees. The impact of management fees can be material. Investment returns are reduced by advisory fees as in the following example: Over a five year period, if a $100 portfolio had an annual return of 10% it would grow to $161.05. The net compounded effect of a 35 basis point annual investment management fee (without custody charges) would total $2.55 and result in a portfolio value of $158.51.

Net of Fee Return results are calculated as the Gross of Fee Returns minus a model fee equal to the highest standard Management Fee and includes a performance fee incentive, if applicable, that a client invested in this strategy would have paid during the performance period.

Fee Schedule

The below is the standard fee schedule based on the market value of assets under management and stated on an annual basis. Fees are for investment management services only. Custodial fees are not included in the Net of Fee Returns.

0.35 of 1% of assets under management.

This fee schedule has been prepared for informational purposes for the purpose of the Firm's global compliance with GIPS and should not be construed as an offer or solicitation. Actual fees may vary by client.

Past Performance is not a guarantee of future performance. No assurance can be given as to future performance.

Meeting Date
9/26/18
Agenda Item
#13

Fiduciary and Ethics Training
CCCERA Board of Retirement
September 26, 2018

Harvey L. Leiderman, Reed Smith, LLP

1. What are the fundamental fiduciary duties? **EXHIBIT A**

- Primary Loyalty Rule
- Exclusive Benefit Rule
- Prudent Expert Rule
- Duty to Diversify the Portfolio
- Duty to Follow the Law

2. What are the requirements of the CCCERA Code of Fiduciary Conduct and Ethics? **EXHIBIT B**

- Adhere to fundamental fiduciary duties
- Obey conflict of interest laws and CCCERA's Conflicts Code
- Avoid activities that improperly influence or impair your judgment, or are inconsistent with your duty to act in the best interest of the system
- Disclose conflicting interests; when in doubt, disclose
- Comply with all legal limitations on gifts and things of value
- Honor the "quiet period" during investment manager searches
- Avoid using your public position for private gain or influence
- Maintain the confidentiality of closed sessions
- Conduct yourself civilly and respectfully at board meetings
- Use care in communications with service providers, members and plan sponsors

3. When does a member of the Board or staff have a conflict because his/her outside interests are contrary to the interests of the system?

- Personal financial interests in contracts
- Personal financial interests in other board agenda items
- Litigation against the system or board
- Interests of your "constituency" clouding your independent judgment

4. **When should a member of the Board or staff recuse him/herself from considering a matter before the Board?** **<u>EXHIBIT C</u>**

- "Materiality" rule for government salaries under the Political Reform Act
- "Public generally" rule under the Political Reform Act
- Adverse litigant

5. **What and when should a member of the Board or staff disclose so that others are aware of their outside interests?** **<u>EXHIBIT D</u>**

- Annual Form 700, Statement of Economic Interests
- Content of disclosure for Board meetings
- Timing of disclosure for Board meetings
- Recording of disclosure at Board meetings

6. **What obligation does a member of the Board have to keep closed session discussions confidential?** **<u>EXHIBITS E, B</u>**

- Brown Act section 54963
- CCCERA Code of Fiduciary Conduct and Ethics, Part 7

EXHIBIT A

THE FUNDAMENTAL FIDUCIARY DUTIES OF TRUSTEES OF COUNTY EMPLOYEES' RETIREMENT SYSTEMS

CALIFORNIA CONSTITUTION, ART. XVI, § 17

1. Primary Loyalty Rule

The members of the retirement board of a public pension or retirement system shall discharge their duties with respect to the system solely in the interest of, and for the exclusive purposes of providing benefits to, participants and their beneficiaries, minimizing employer contributions thereto, and defraying reasonable expenses of administering the system. A retirement board's duty to its participants and their beneficiaries shall take precedence over any other duty.

2. Exclusive Benefit Rule

The assets of a public pension or retirement system are trust funds and shall be held for the exclusive purposes of providing benefits to participants in the pension or retirement system and their beneficiaries and defraying reasonable expenses of administering the system.

3. Prudent Person Rule/Duty to Diversify Investments

The members of the retirement board of a public pension or retirement system shall discharge their duties with respect to the system with the care, skill, prudence, and diligence under the circumstances then prevailing that a prudent person acting in a like capacity and familiar with these matters would use in the conduct of an enterprise of a like character and with like aims....[They] shall diversify the investments of the system so as to minimize the risk of loss and maximize the rate of return, unless under the circumstances it is clearly not prudent to do so.

THE COUNTY EMPLOYEES RETIREMENT LAW OF 1937, § 31595

The assets of a public pension or retirement system are trust funds and shall be held for the exclusive purposes of providing benefits to participants in the pension or retirement system and their beneficiaries and defraying reasonable expenses of administering the system....The board and its officers and employees shall discharge their duties with respect to the system:

(a) Solely in the interest of, and for the exclusive purposes of providing benefits to, participants and their beneficiaries, minimizing employer contributions thereto, and defraying reasonable expenses of administering the system.

(b) With the care, skill, prudence, and diligence under the circumstances then prevailing that a prudent person acting in a like capacity and familiar with these matters would use in the conduct of an enterprise of a like character and with like aims.

(c) Shall diversify the investments of the system so as to minimize the risk of loss and to maximize the rate of return, unless under the circumstances it is clearly prudent not to do so.

Reed Smith, LLP

EXHIBIT B

CONTRA COSTA COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Code of Fiduciary Conduct and Ethics
Adopted 7/23/03

WHEREAS, the National Conference on Public Employee Retirement Systems has published NCPERS' Model Code of Ethics, the Guiding Principles of which are as follows:

1. Service to the beneficiaries of public pension funds is the primary function of public pension fund trustees.

2. The beneficiaries of public pension funds are sovereign and the trustees of those funds are ultimately responsible to them.

3. In those situations where the law is not clear, the best interests of the fund beneficiaries must be served. Conscience is critical. Good ends never justify unethical means.

4. Efficient and effective administration and investment management is basic to public pension funds. Misuse of influence, fraud, waste or abuse is unacceptable conduct.

5. Safeguarding the trust of fund beneficiaries is paramount. Conflicts of interest, bribes, gifts or favors which subordinate fund trustees to private gains are unacceptable.

6. Service to public pension fund beneficiaries demands special sensitivity to the qualities of justice, courage, honesty, equity, competence and compassion.

7. Timely and energetic execution of fiduciary responsibilities is to be pursued at all times by pension fund trustees.

WHEREAS, the Political Reform Act of 1974 and Government Code section 1090 set forth specific circumstances which require public officials to disqualify themselves from making, participating in, or attempting to influence governmental decisions which may affect any of their financial interests.

NOW, THEREFORE, BE IT RESOLVED, that the Board of the Contra Costa County Employees' Retirement Association (the "Board") hereby adopts the following Code of Fiduciary Conduct and Ethics:

PREAMBLE

The Contra Costa County Employees' Retirement Association ("CCCERA") is a public pension plan organized under the County Employees Retirement Law of 1937. (California Government Code Section 31450, et seq.)

The management of CCCERA is vested in the Retirement Board.

Each member of CCCERA's Board shall discharge his or her duties with respect to the system solely in the interests of, and for the exclusive purposes of providing benefits to, participants and their beneficiaries, minimizing employer contributions thereto, and defraying reasonable expenses of administering the system, with the duty to the participants and beneficiaries taking precedence over any other duty. (California Constitution Article XVI, Section 17(b).)

The members of CCCERA's Board are mindful of the positions of trust and confidence held by them. They adopt this Code to ensure the proper administration of CCCERA, and to foster unquestioned public confidence in CCCERA's institutional integrity as a prudently managed and fiduciarily governed public pension system.

CCCERA's *Code of Fiduciary Conduct and Ethics* provides a fiduciary framework for the proper conduct of CCCERA's affairs.

1. Fiduciary Duties.

Each member of CCCERA's Board shall execute their duties as set forth in the County Employees' Retirement Law of 1937, as amended, with the care, skill, prudence, and diligence under the circumstances then prevailing that a prudent person acting in a like capacity and familiar with these matters would use in the conduct of an enterprise of a like character and with like aims.

Each member of CCCERA's Board shall diligently attend to the business of the Board and shall not leave to other Board members control over the administration of the affairs of the Board.

Each member of CCCERA's Board shall comply with CCCERA's *Code of Fiduciary Conduct and Ethics.*

2. Fiduciary Conflicts of Interest.

Each member of CCCERA's Board shall abide by the provisions of California Government Code Sections 1090 et seq., which prohibit Board Members from being financially interested, directly or indirectly, in any contract made by the Board.

Each member of CCCERA's Board shall abide by the provisions of the Political Reform Act, Government Code sections 81000, et seq, including section 87100 which prohibits Board Members from making, participating in making, or using their positions to influence Board and Association decisions in which they have a financial interest.

No member of CCCERA's Board shall engage in any employment, activity, or enterprise for compensation which is inconsistent, incompatible, or in conflict with, his or her duties as a member of CCCERA's Board, or with the duties, functions, or responsibilities of CCCERA's Board.

No member of CCCERA's Board shall perform any work, service, or counsel for compensation outside his or her Board responsibilities where any part of his or her efforts will be subject to approval by any other members of the Board on which he or she serves.

Each member of CCCERA's Board shall abide by the provisions of California Government Code Sections 87200 et seq., which require the public disclosure of economic interests as prescribed therein.

In keeping with the provisions of the Government Code, a member of CCCERA's Board shall not become an endorser, surety, or obligor on, or have any personal interest, direct or indirect, in the making of any investment for the Board, or in the gains or profits accruing therefrom. These people are prohibited from having any financial interest in any contract made by them in their official capacity and from making or influencing official decisions in which they have a financial interest.

Each member of CCCERA's Board shall strive to avoid activities which may impair the ability to exercise independent judgment in the discharge of official duties.

In order to maintain the highest standards of conduct and ethics above the minimum requirements of the California Government Code and to avoid even the appearance of a conflict of interest, each member of CCCERA's Board should conduct official and private affairs so as to avoid giving rise to a reasonable conclusion that he or she can be improperly influenced in the performance of his or her public duty.

Members of the CCCERA Board shall be accountable for recognizing a potential or actual conflict of interest and for disqualifying themselves from making, participating in, or attempting to influence Board decisions which may affect any of their financial interests. Immediately prior to the Board's consideration of the matter, a Member shall publicly disclose the actual or potential conflict in detail sufficient to be understood by the public, recuse himself or herself from acting on the matter, and, except in the case of consent agenda items, leave the room until the matter is concluded. Disclosure during Board meetings may be made 1) orally or 2) by handing a written statement to the Chair of the CCCERA Board, with a copy to all trustees and the Retirement Administrator. Such a disclosure shall be reflected in the official record of the meeting.

3. **Limitations on Gifts, Honoraria and Personal Loans; and Disclosure of Gifts on the Record.**

Each member of CCCERA's Board and designated staff shall comply with the gift limitation provisions and the prohibition on acceptance of honoraria under California Government Code Sections 89500 et seq.

Each member of CCCERA's Board and designated staff shall abide by the loan limitation provisions of California Government Code Sections 87460 et seq., which prohibits receiving personal loans from any officer, employee, member, consultant, or contractor with the CCCERA.

In addition to the minimum gift limitation requirements of California Government Code Sections 89500 et seq., CCCERA Board Members shall not accept or solicit gifts, favors, services or promises of future benefits which might compromise or impair the Board Member's exercise of independent judgment, or which the Board Member knows, or should know, are being offered with the intent to influence that Board Member's official conduct.

If a Board Member or designated staff has received gifts of $75.00 or more in the current calendar year from a person, firm or entity conducting business or seeking to conduct business with the CCCERA Board, immediately before the Board considers an item involving that donor, the Board Member or designated staff shall disclose on the record the receipt of the gift(s), the donor's name, and the nature and value of the gift(s).

If CCCERA has received a gift(s) (i.e., of travel, admission to seminars, tickets to events, use of sporting facilities, entertainment) of $75.00 or more in the current calendar year from a person, firm or entity, at the time the Board considers assignment to a particular Board Member or designated staff, the Retirement Administrator shall disclose on the record the original donor's name, and the nature and value of the gift(s).

4. **Contacts with Vendors, Consultants and Advisors.**

(a) **Prospective Vendors, Consultants and Advisors**. During the time when the CCCERA is in the process of selecting a vendor, consultant or advisor (a "service provider"), no member of the CCCERA Board or staff shall accept any gifts, favors, or services from any current or prospective service provider that the Board Member or staff knows has responded to a Request for Proposal, or is otherwise a candidate in a non-RFP selection process. During the time when CCCERA is in the process of selecting a vendor, consultant or advisor, no member of the CCCERA Board or staff shall accept any gift, benefit or service from CCCERA if it was donated to CCCERA by a current or prospective service provider that the Board or staff knows has responded to a Request for Proposal, or is otherwise a candidate in a non-RFP selection process. Furthermore, each member of the Board shall refrain from any discussions with any current or prospective service provider who is a finalist in the selection process regarding the Request for Proposal outside of an open public meeting, other than as part of a regularly scheduled interview during the selection process.

(b) **Existing Vendors, Consultants and Advisors**. Business meetings and discussions, including meetings which include meals, with current vendors, consultants and advisors ("service providers") may provide useful information of benefit to the Board member, and are not prohibited by this *Code of Fiduciary Conduct and Ethics.*

5. Use of CCCERA Resources and Facilities for Private Gain.

No member of the CCCERA Board shall use Board consultants or staff, or CCCERA facilities, equipment, materials or supplies for any purpose other than the discharge of his or her responsibilities to the retirement system.

6. Use of Official Position.

No CCCERA Board member shall use his or her Board position either to negotiate on behalf of the CCCERA Board outside of any process established for that purpose or to become involved in personnel matters. Furthermore, no Board member shall use his or her official position to secure a special privilege or exemption for himself or herself or on behalf of others.

7. Confidential Information.

No member of the CCCERA Board shall obtain or use for personal reasons or for private gain any confidential information acquired as a result of his or her position as a member of the Board.

Each Board Member shall abide by the provisions of Government Code section 54963, which prohibits the disclosure of confidential information acquired during authorized closed sessions.

8. Conduct at Retirement Board Meetings.

The CCCERA Board shall provide fair and equal treatment for all persons and matters coming before the Board or any Board committee.

Board members shall listen courteously to all discussions at meetings and avoid interrupting other speakers, including other Board members, staff or committee members, except as may be permitted by established Rules of Order.

Board members shall refrain from abusive or disruptive conduct, personal charges or verbal attacks upon the character, motives, ethics, or morals of others.

9. Communications with Service Providers and other Non-CCCERA Persons and Entities.

A Board member shall be respectful of the Board and its decisions in all external communications, even if he or she disagrees with such decision.

Board members shall indicate when they are speaking in a capacity as a member of the CCCERA Board or in another capacity in their external communications.

A Board member shall not correspond with a non-CCCERA person or entity using CCCERA letterhead or as a spokesperson on behalf of the Board unless the communication is authorized by the Board.

Copies of all written communications from a Board member to a current service provider (vendor, consultant or advisor), or person or entity related to a current service provider, relating to CCCERA's business (other than purely personal or social correspondence) shall be provided to the CCCERA Administrator for subsequent distribution to all members of the Board.

A copy of any written business related communication (other than routine announcements, generally distributed newsletters, and similar material) received by a Board member from a current CCCERA service provider, or person or entity related to a current service provider, and not received by any other Board Member, shall be forwarded to the CCCERA Administrator for subsequent distribution to all members of the Board.

10. Communications with Plan Members.

Board members shall be aware of the risk of communicating inaccurate information to plan members (both active members and retirees), and the potential exposure to liability and possible harm to a plan member that may result from such miscommunications.

Board members shall mitigate the risk of miscommunication with plan members and thereby avoid creating additional plan liability by refraining from providing specific advice or counsel with respect to the rights or benefits to which a plan member may be entitled under the CCCERA plan. **To that end, any Board member communication to three or more members of the public should include the following disclaimer: "The following statement has not been authorized by CCCERA or its Board. It reflects the personal views of the author and should not be construed as an official statement of CCCERA or its Board. Additionally, members of CCCERA should not rely on any factual information contained in the following statement when making retirement related decisions. All inquires relating to a member's retirement should be directed to the CCCERA staff."**

Where explicit advice or counsel, with respect to retirement plan provisions, policies or benefits is needed, Board members will refer inquiries to the CCCERA Administrator or appropriate designee.

11. Non-Compliance Sanctions.

Violation of this *Code of Fiduciary Conduct and Ethics* is grounds to remove the offender from the position of Chair or Vice-Chair of the CCCERA Board, or from any other assignment on behalf of the Board, and may also subject the offender to censure by the Board. The Board may also pursue all of its legal remedies against any Board member who violates the provisions of this *Code of Fiduciary Conduct and Ethics.*

EXHIBIT C

EXCERPTS FROM FPPC REGULATIONS UNDER THE POLITICAL REFORM ACT

CALIFORNIA CODE FO REGULATIONS, TITLE 2

§ 18702.5. Materiality Standard: Financial Interest in a Personal Financial Effect.

(a) A personal financial effect means the financial effect of a governmental decision on the personal finances of a public official or his or her immediate family. The financial effect is material if the official or the official's immediate family member will receive a measurable financial benefit or loss from the decision.

(b) Notwithstanding subdivision (a), a personal financial effect does not include:

(1) Any establishment of or change to benefits provided under an employment or retirement policy for employees or retirees if the financial effect of the decision applies equally to all employees in the same bargaining unit or other representative group.

(2) Payment of any travel expenses, to the extent allowed by law, incurred while attending meetings as an authorized representative of an agency.

(3) Stipends received for attendance at meetings of any group or body created by law or formed by the official's agency for a special purpose, so long as the selecting body posts on its website a form provided by the Commission that includes: a list of each appointed position eligible for a stipend, the amount of the stipend for each position, the name of the public official who has been appointed to the position, the name of the public official, if any, who has been appointed as an alternate, and the term of the position.

(4) The use of any government property, such as automobiles or other modes of transportation, mobile communication devices, or other agency provided equipment for carrying out the official duties of a position, including any nominal, incidental, negligible, or inconsequential personal use while on duty.

(5) Any personal reward received by the official when using a personal charge card or membership rewards program, so long as the reward is no different from the reward offered to the public and is limited to charges made solely for the official's approved travel expenses.

(6) A decision to fill a position on the body of which the official is a member.

(c) If the governmental decision affects a business entity or real property in which the official has a financial interest, this regulation does not apply and materiality is determined under Regulation 18702.1 or 18702.2.

§ 18703. Public Generally.

(a) General Rule. A governmental decision's financial effect on a public official's financial interest is indistinguishable from its effect on the public generally if the official establishes that a significant segment of the public is affected and the effect on his or her financial interest is not unique compared to the effect on the significant segment.

(b) A significant segment of the public is at least 25 percent of:

(1) All businesses or non-profit entities within the official's jurisdiction;

(2) All real property, commercial real property, or residential real property within the official's jurisdiction; or

(3) All individuals within the official's jurisdiction.

(c) A unique effect on a public official's financial interest includes a disproportionate effect on:

(1) The development potential or use of the official's real property or on the income producing potential of the official's real property or business entity.

(2) An official's business entity or real property resulting from the proximity of a project that is the subject of a decision.

(3) An official's interests in business entities or real properties resulting from the cumulative effect of the official's multiple interests in similar entities or properties that is substantially greater than the effect on a single interest.

(4) An official's interest in a business entity or real property resulting from the official's substantially greater business volume or larger real property size when a decision affects all interests by the same or similar rate or percentage.

(5) A person's income, investments, assets or liabilities, or real property if the person is a source of income or gifts to the official.

(6) An official's personal finances or those of his or her immediate family.

(d) "Jurisdiction" means the jurisdiction of the state or local government agency as defined in Section 82035, or the designated geographical area the official was elected to represent, or the area to which the official's authority and duties are limited if not elected.

(e) Specific Rules for Special Circumstances. The financial effect on a public official's financial interest is deemed indistinguishable from that of the public generally if the official establishes:

(1) Public Services and Utilities. The decision establishes or adjusts assessments, taxes, fees, or rates for water, utility, or other broadly provided public services or facilities that are applied equally, proportionally, or by the same percentage to the official's interest and other businesses, properties, or individuals subject to the assessment, tax, fee, or rate.

(2) General Use or Licensing Fees. The decision affects the official's personal finances as a result of an increase or decrease to a general fee or charge, such as parking rates, permits, license fees, application fees, or any general fee that applies to the entire jurisdiction.

(3) Limited Neighborhood Effects. The decision affects residential real property limited to a specific location, and the decision establishes, amends, or eliminates ordinances that restrict on-street parking, impose traffic controls, deter vagrancy, reduce nuisance or improve public safety, provided the body making the decision gathers sufficient evidence to support the need for the action at the specific location.

(4) Rental Properties. The decision affects all renters of residential property within the official's jurisdiction and only interests resulting from the official's leasehold interest in his or her residence are affected.

(5) Required Representative Interest. The decision is made by a board or commission and the law that establishes the board or commission requires certain appointees have a representative interest in a particular industry, trade, or profession or other identified interest, and the public official is an appointed member representing that interest. This provision applies only if the effect is on the industry, trade, or profession or other identified interest represented and there is no unique effect on the official's interest.

(6) State of Emergency. The decision is made pursuant to an official proclamation of a state of emergency when required to mitigate against the effects directly arising out of the emergency and there is no unique effect on the official's interest.

(7) Governmental Entities. The decision affects a federal, state, or local governmental entity in which the official has an interest and there is no unique effect on the official's interest.

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EXHIBIT D

CONTRA COSTA COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
BOARD OF RETIREMENT

CONFLICT OF INTEREST CODE

Adopted: 02/24/76
Amended: 11/06/02, 11/17/04, 4/8/09, 12/8/10, 09/10/14, 09/28/16

I. AUTHORITY

Pursuant to the provisions of Government Code Sections 87300, *et seq.*, the Board of Retirement of the Contra Costa County Employees' Retirement Association adopts this Conflict of Interest Code. This Conflict of Interest Code and any amendments thereto become effective upon approval by the Contra Costa County Board of Supervisors. (Government Code Sections 87303 and 82011(b).)

II. DESIGNATED POSITIONS AND EMPLOYEES

The positions listed in Appendix "A" attached hereto are "designated positions". Every person holding any designated position is deemed to make, or participate in the making of, decisions which could affect his or her personal economic interests. Designated positions are assigned the disclosure categories set forth in Appendix "A". Each person holding any designated position shall file an annual statement of economic interest disclosing that person's interest in investments, business positions, real property and income designated as reportable under the category to which the employee's position is assigned.

The positions listed in Appendix "B" attached hereto manage public investments for purposes of Section 87200 of the Government Code and are "Code filers." Each Code filer shall file an annual statement of economic interest.

III. INCORPORATION OF FPPC REGULATION 18730

The California Fair Political Practices Commission (FPPC) has adopted Regulation 18730, which contains the terms of a standard conflict of interest code. (2 Cal. Code of Regs. 18730.) Regulation 18730 may be amended from time to time. The terms of Regulation 18730, and any amendments to it duly adopted by the FPPC, are hereby incorporated by reference as Appendix "C".

IV. FPPC FORM 700 – STATEMENT OF ECONOMIC INTEREST

Disclosure statements shall be made on FPPC Form 700 – Statement of Economic Interest. The Form 700 is published annually by the FPPC, available on the FPPC website at fppc.ca.gov and supplied by the Contra Costa County Clerk of the Board of Supervisors. The place and time of filing shall be as follows:

(a) Every person holding any designated position listed in Appendix "A" shall file the original of his or her statement of financial interests with the Contra Costa County Clerk of the Board of Supervisors.

(b) Every person holding a position listed in Appendix "B" shall file the original of his or her statement of financial interests with the Contra Costa County Clerk - Elections Division.

(c) All Form 700 filers must file the Form 700 at the times prescribed by law. Failure to file statements on time may result in penalties including but not limited to late fines.

APPENDIX A

Designated Positions	Disclosure Category
Deputy Chief Executive Officer	General
Accounting Manager	1
Administrative/Human Resources Manager	2
General Counsel and Deputy General Counsel	1
Investment Analyst and Investment Officer	1
Outside fiduciary counsel	1
Outside investment consultant and other consultants	1

- Consultants shall be included in the list of designated positions and shall disclose pursuant to the broadest disclosure category in the code subject to the following limitation: The Chief Executive Officer may determine in writing that a particular consultant, although a "designated position", is hired to perform a range of duties that is limited in scope and thus is not required to fully comply with the disclosure requirements described in this code. Such written determination shall include a description of the consultant's duties and, based upon that description, a statement of the extent of disclosure requirements. The Chief Executive Officer's determination is a public record and shall be retained for public inspection in the same manner and location as this conflict of interest code.

Disclosure Categories

General:

Employees designated in Disclosure Category "General" above shall complete all schedules of Form 700. An investment, interest in real property, or income is reportable if the business entity in which the investment is held, the interest in real property, or the income or source of income may foreseeably be affected materially by any decision made or participated in by the designated employee by virtue of the employee's position.

Designated Employees in Category 1:

Employees designated in Disclosure Category 1 above shall complete all schedules of Form 700 unless there are no reportable interests for that schedule. A "reportable interest" shall be any business entity or source of income of a type in which the Board is authorized to invest.

Designated Employees in Category 2:

Employees designated in Disclosure Category 2 above shall complete all schedules of Form 700 except those relating to interests in real property (Form 700, Schedules B and C), unless there are no reportable interests for a schedule. A "reportable interest" shall be any business entity or source of income which, within the filing period has contracted, or in the foreseeable future may contract with the Board to provide products or services, to the Retirement System or the Retirement Office.

APPENDIX B

Agency Positions that Manage Public Investments
For Purposes of Section 87200 of the Government Code

Pursuant to Government Code Section 87314, the following is a list of each position with the Retirement Board and CCCERA for which an individual occupying the position is required to file a Form 700 - Statement of Economic Interests as a public official who manages public investments within the meaning of Government Code Section 87200:

Members of the Board of Retirement, including Alternate Members
Chief Executive Officer
Chief Investment Officer

EXHIBIT E

THE RALPH M. BROWN ACT ("OPEN MEETINGS LAW")
SECTION 54963

CONFIDENTIALITY OF CLOSED SESSIONS

(a) A person may not disclose confidential information that has been acquired by being present in a closed session authorized by Section 54956.7, 54956.8, 54956.86, 54956.87, 54956.9, 54957, 54957.6, 54957.8, or 54957.10 to a person not entitled to receive it, unless the legislative body authorizes disclosure of that confidential information.

(b) For purposes of this section, "confidential information" means a communication made in a closed session that is specifically related to the basis for the legislative body of a local agency to meet lawfully in closed session under this chapter.

(c) Violation of this section may be addressed by the use of such remedies as are currently available by law, including, but not limited to:

(1) Injunctive relief to prevent the disclosure of confidential information prohibited by this section.

(2) Disciplinary action against an employee who has willfully disclosed confidential information in violation of this section.

(3) Referral of a member of a legislative body who has willfully disclosed confidential information in violation of this section to the grand jury.

(d) Disciplinary action pursuant to paragraph (2) of subdivision (c) shall require that the employee in question has either received training as to the requirements of this section or otherwise has been given notice of the requirements of this section.

(e) A local agency may not take any action authorized by subdivision (c) against a person, nor shall it be deemed a violation of this section, for doing any of the following:

(1) Making a confidential inquiry or complaint to a district attorney or grand jury concerning a perceived violation of law, including disclosing facts to a district attorney or grand jury that are necessary to establish the illegality of an action taken by a legislative body of a local agency or the potential illegality of an action that has been the subject of deliberation at a closed session if that action were to be taken by a legislative body of a local agency.

(2) Expressing an opinion concerning the propriety or legality of actions taken by a legislative body of a local agency in closed session, including disclosure of the nature and extent of the illegal or potentially illegal action.

(3) Disclosing information acquired by being present in a closed session under this chapter that is not confidential information.

(f) Nothing in this section shall be construed to prohibit disclosures under the whistleblower statutes contained in Section 1102.5 of the Labor Code or Article 4.5 (commencing with Section 53296) of Chapter 2 of this code.

Reed Smith, LLP

CONTRA COSTA COUNTY CCCERA Employees' Retirement Association

Meeting Date
9/26/18
Agenda Item
#14

Ralph M. Brown Act
Open Meeting Laws: The Fundamentals

September 26, 2018

Karen Levy, Esq.
General Counsel

Ralph M. Brown Act

Open Meeting Laws for Local Legislative Bodies

- The Brown Act sets forth the rules regarding open meetings held by local legislative bodies.

- The CCCERA Board of Retirement is subject to the Brown Act.

Government Code §54950 *et seq.*

Purpose of the Brown Act

- To ensure that agency ***actions*** are taken openly

- To ensure that agency ***deliberations*** are conducted openly

Government Code §54950 *et seq*.

Key Concepts

- Retirement Board meetings must be open and accessible to the public
- A Board meeting agenda must be posted publicly
- During Board meetings, the public must be given an opportunity to comment

Retirement Board Meetings must be Open and Accessible to the Public

“Meeting” means any congregation of a majority of the Retirement Board (i.e. five Retirement Board members) at the same place and location (including teleconference locations) to hear, discuss, deliberate or take action on any item within the Retirement Board’s subject matter jurisdiction.

Government Code §54952.2(a)

Serial Meetings

- “Meeting” also means any serial use of communication, personal intermediaries, or technological devices through which a majority of the Board’s members discuss, deliberate, or take action on an item
- For example, an unlawful “serial” meeting would occur if Board member A emails Board member B about his or her position on a Retirement Board issue. B forwards A’s email to C, who then forwards to D, who then forwards to E. A mere series of emails or phone calls by a majority of the Board about one of its business items violates the Brown Act

Government Code §54952.2(b)

Attendance at Conferences

- A majority of the Retirement Board members may attend a conference or similar gathering open to the public that involves a discussion of issues of general interest to the public or to other public pension systems, so long as the majority of the board do not discuss among themselves business that is within the subject matter jurisdiction of the Retirement Board
- Examples of such conferences include the State Association of County Retirement Systems (SACRS) and the California Association of Public Retirement Systems (CALAPRS) conferences

Government Code §54952.2(c)(2)

Attendance at Purely Social Events

A majority of the Retirement Board members may attend a purely social or ceremonial occasion, provided that the majority of the Retirement Board members do not discuss among themselves business that is within the subject matter of the retirement board

Government Code §54952.2(c)(5)

Voting Report Requirement

Board must publicly report any action taken and the vote or abstention of each member present for the action

Government Code §54953(c)(2)

CONTRA COSTA COUNTY CCCERA Employees' Retirement Association

Agenda Requirement

- At least 72 hours before a regular meeting of the Retirement Board, an agenda containing a general description of each item of business to be transacted, including items to be discussed, and the time and location of the meeting must be posted in a public location and the CCCERA website
- <u>New</u> for Board meetings occurring on or after January 1, 2019: Agenda must be accessible through a prominent, direct link on the CCCERA website (AB 2257)

Government Code §54954.2(a)

Agenda Requirement

- If an item is not included on the agenda, the Retirement Board may not act on or discuss that item, or add that item to the meeting's agenda as an urgency item, subject to limited exceptions.
- As to items that are not included on the agenda, Retirement Board members and staff may ask a question for clarification, make a brief announcement, or make a brief report. Retirement Board members may provide a reference to staff or other resources for factual information, request staff to report back to the body at a subsequent meeting concerning any matter, or take action to direct staff to place a matter of business on a future agenda.

Government Code §54954.2

Public Comment

- During each meeting, the Retirement Board must allow public comment on each agenda item and on other matters within the jurisdiction of the Board.
- Board may limit time.
- If Board limits public comment time, the Board must provide at least twice as much of the allocated time to members of the public who utilize a translator.

Government Code §54954.3

Closed Session

- The Brown Act authorizes the Retirement Board to hold closed sessions to discuss or take action on items under certain enumerated circumstances.

- Examples:
  - The Retirement Board may meet in closed session to deliberate or take action on the purchase or sale of a particular, specific pension fund investment (Govt. Code §54956.81).
  - The Retirement Board may meet in closed session on personnel matters (Govt. Code §54957).
  - The Retirement Board may meet in closed session with CCCERA's designated representatives regarding employees' salaries, benefits but cannot take final action in closed session (Govt. Code §54957.6).
  - The Retirement Board may meet in closed session to confer with legal counsel regarding pending litigation that has been formally initiated, exposure to litigation against the retirement system or the board, and to decide whether to initiate litigation (Govt. Code §54956.9).

Closed Session Confidentiality

Board members may not disclose confidential information acquired by being present in a closed session to a person not entitled to receive the information (Govt. Code §54963(a)).

Consequence of Violating the Brown Act

- Criminal liability for individual Board members
- Civil remedies: Civil actions to stop, prevent or invalidate of the action of the Board
- Attorneys fees and costs awarded to plaintiff

Consequence of Violating the Brown Act

Individual criminal liability: Each Retirement Board member who attends a Retirement Board meeting where action is taken in violation of any provisions of the Brown Act, and where the member intends to deprive the public of information to which the member knows or has reason to know the public is entitled under the Brown Act, is guilty of a misdemeanor.

Government Code §54959

Consequence of Violating the Brown Act

Civil remedies: Any person may commence an action by mandamus, injunction, or declaratory relief for the purpose of stopping or preventing violations or threatened violations of the Brown Act.

Government Code §54960

Consequence of Violating the Brown Act

- Civil remedies: Any person may commence an action by mandamus or injunction for the purpose of obtaining a judicial determination that an action taken by a legislative body of a local agency is null and void. Recent Example: *Hernandez v. Town of Apple Valley*, 7 Cal.App.5th 194 (2017) (holding that a ballot initiative and MOU are null and void because the city council's agenda did not provide sufficient information).
- Prior to commencing the action, the person must make a demand of the Board to cure or correct the action.

Government Code §54960.1

Consequence of Violating the Brown Act

- A court may award attorney fees and costs to the prevailing plaintiff.
- A court may award attorney fees and cost to a defendant public agency if the court finds that the action against the agency for alleged Brown Act violation was frivolous and lacking in merit.

Government Code §54960.5

Questions?

Meeting Date
9/26/18
Agenda Item
#15

CONTRA COSTA COUNTY CCCERA
Employees' Retirement Association

California Public Records Act: The Fundamentals

September 26, 2018

Karen Levy, Esq.
General Counsel

The California Public Records Act (CPRA)

The legislature has declared that:

> *“access to information concerning the conduct of the people’s business is a fundamental and necessary right of every person in this state.”*

The purpose is to give the public access to information that enables them to monitor the functioning of their government.

Government Code §6250 *et seq.*

What are public records?

A public record includes *“any writing containing information relating to the conduct of the public’s business prepared, owned, used or retained by any state or local agency, regardless of physical form or characteristics.”*

Examples of a “writing”:

- Notes
- Handwriting
- Copies
- Faxes
- Voicemail
- Videos
- Pictures
- E-mail

Regardless of the manner in which they’re stored.

Does CCCERA have to comply with the CPRA?

- CCCERA Accessibility of Records Policy
- CCCERA Accessibility of Investment Records Policy

- ***Who*** can make a CPRA request?
- ***How*** are CPRA requests made?
  - Writing
  - Phone
  - Emails
- Can you charge ***fees*** for responding to a CPRA request?
  - *Can* charge for copies.
  - *Cannot* charge for staff time.

- Duty to respond within ten days from receipt of the request (with exceptions).

  This does not mean that the agency must produce the records within ten days.

- Duty to produce records within a reasonable time.

What types of records are *exempt* from CPRA disclosure?

- Pending litigation
- Attorney-client communications
- Personal member records
- Preliminary drafts and notes
    - *But only if they are not retained by the agency in the ordinary course of business, and if the public interest in withholding those records clearly outweighs the public interest in disclosure.*

What about E-mails?

What about text messages?

E-mails, text messages, and other electronic communication (and other records) that are kept in the ordinary course of business, may be public.

Board member personal email communications:

- Emails and text messages relating to local agency business on local agency and/or personal accounts and devices are public records.

  Government Code §6252(e); *City of San Jose v. Superior Court* (2017) 2 Cal. 5th 608.

- Agency may "reasonably rely" on employees to search their own personal files, accounts, and devices for responsive materials.

Pension system member records:

Name and pension amounts of public agency retirees are public. However, personal or individual records, including medical information, remain exempt from disclosure.

- Sacramento County Employees' Retirement System v. Superior Court (2011) 195 Cal. App. 4th 440.
- San Diego County Employees' Retirement Association v. Superior Court (2011) 196 Cal. App. 4th 1228.
- Sonoma County Employees' Retirement Association v. Superior Court (2011) 198 Cal. App. 4th 196.

Government Code §§ 6254(k) and 31532

Investment records:

CPRA definition of “alternative investments”:

“investment in private equity fund, venture fund, hedge fund, or absolute return fund,”

Government Code §6254.26 specifies what is and is not subject to public disclosure. As to alternative investments, the following is *exempt* from disclosure:

1. Due diligence materials that are proprietary to the public investment fund or the alternative investment vehicle.
2. Quarterly and annual financial statements of alternative investment vehicles.
3. Meeting materials of alternative investment vehicles.
4. Records pertaining to information regarding the portfolio positions in which alternative investment funds invest.
5. Capital call and distribution notices.
6. Alternative investment agreements and all related documents.

Government Code §6254.26(a)

As to alternative investments, the following are subject to disclosure and cannot be considered a trade secret exempt from disclosure:

1. The name, address, and vintage year of each alternative investment vehicle.

2. The dollar amount of the commitment made to each alternative investment vehicle by the public investment fund since inception.

3. The dollar amount of cash contributions made by the public investment fund to each alternative investment vehicle since inception.

4. The dollar amount, on a fiscal year-end basis, of cash distributions received by the public investment fund from each alternative investment vehicle.

Government Code §6254.26(b)

5. The dollar amount, on a fiscal year-end basis, of cash distributions received by the public investment fund plus remaining value of partnership assets attributable to the public investment fund's investment in each alternative investment vehicle.
6. The net internal rate of return of each alternative investment vehicle since inception.
7. The investment multiple of each alternative investment vehicle since inception.
8. The dollar amount of the total management fees and costs paid on an annual fiscal year-end basis, by the public investment fund to each alternative investment vehicle.
9. The collar amount of cash profit received by public investment funds from each alternative investment vehicle on a fiscal year-end basis.

Government Code §6254.26(b)

As to alternative investments, Government Code § 7514.7 requires CCCERA to disclose the following information at least once annually in a report presented at a meeting open to the public:

1. The fees and expenses that the public investment fund pays directly to the alternative investment vehicle, the fund manager, or related parties.

2. The public investment fund’s pro rata share of fees and expenses not included in paragraph (1) that are paid from the alternative investment vehicle to the fund manager or related parties.

3. The public investment fund’s pro rata share of carried interest distributed to the fund manager or related parties.

4. The public investment fund’s pro rata share of aggregate fees and expenses paid by all of the portfolio companies held within the alternative investment vehicle to the fund manager or related parties.

5. Any additional information described in subdivision (b) of §6254.26.

6. The gross and net rate of return of each alternative investment vehicle, since inception, in which CCCERA participates.

Government Code §7514.7

Questions?

CONTRA COSTA COUNTY CCCERA
Employees' Retirement Association

Meeting Date
9/26/18
Agenda Item
#16

MEMORANDUM

Date: September 26, 2018

To: Board of Retirement

From: Karen Levy, General Counsel

Subject: Consider and Take Possible Action to Amend CCCERA's Accessibility of Investment Records Policy

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I. *Background*

The Board of Retirement has adopted an Accessibility of Investment Records Policy. The Policy contains guidelines and procedures for handling requests for records pertaining to investments. As a public entity, CCCERA is subject to the California Public Records Act ("PRA"), which governs handling such requests. CCCERA's Policy covers investment records, whereas non-investment records are covered by a separate policy titled "Accessibility of Records Policy."

II. *Policy Amendments*

Enclosed, for the Board's consideration, is an amended Accessibility of Investment Records Policy that contains several updates. (See Attachment A.) The key suggested amendments are:

1. Adding the PRA provision regarding alternative investments, which lists those alternative investment records that must be provided if requested, and those alternative investment records that are exempt from disclosure. (Government Code Section 6254.26.)
2. Adding the PRA provision regarding annual disclosure pertaining to "alternative investments." (Government Code section 7514.7.)
3. Adding a provision that required this policy be reviewed by the Board every three years.

A redline reflecting all suggested changes is enclosed as Attachment B. For the Board's ease of reference, we have also included a copy of CCCERA's Policy and Guidelines for Accessibility of Records as Attachment C.

III. *Recommendation*

Consider and take possible action to amend CCCERA's Accessibility of Investment Records Policy.

Attachment A

CONTRA COSTA COUNTY EMPLOYEES' RETIREMENT ASSOCIATION

ACCESSIBILITY OF INVESTMENT RECORDS POLICY

I. PURPOSE

The Board of Retirement ("Board") of the Contra Costa County Employees' Retirement Association ("CCCERA") adopts this policy to establish guidelines and procedures for making determinations concerning the disclosure of investment records when responding to requests made under the Public Records Act ("PRA").

All staff should be familiar with these guidelines so that the process of responding to requests is efficient, consistent and compliant with the applicable laws. In many circumstances, these guidelines will enable staff to respond to requests without the need for substantial analysis or the assistance of legal counsel. However, given the complexities of the law, situations will likely arise where a simple application of the general guidelines will not provide a definitive answer. When such a situation arises, the Chief Executive Officer should refer any questions to legal counsel.

II. GUIDELINES

Records pertaining to CCCERA's investments that are in CCCERA's possession are generally accessible to the public, with the exception of records that are exempt from public disclosure pursuant to the California Public Records Act, Government Code section 6250, *et seq.*, as it may be amended from time to time. The following list of exemptions is not exhaustive.

A. Investment Records Exempt From Disclosure

The following records pertaining to investments are exempt from disclosure:

1. Records pertaining to pending litigation: This exemption extends only to pending litigation in which CCCERA is a named party or a real party in interest.

2. Records pertaining to communications by and between CCCERA staff or its Board and CCCERA's attorneys: This exemption extends to all records reflecting communications with in-house counsel or attorneys who have been retained to represent CCCERA.

3. Preliminary drafts, notes or CCCERA-related memoranda: This exemption extends to preliminary drafts, notes or CCCERA-related memoranda that are not retained by CCCERA in the ordinary course of business, so long as the public interest in withholding such records clearly outweighs the public interest in disclosure. (Government Code Section 6254(a).)

4. Real estate: The contents of real estate appraisals or engineering or feasibility estimates and evaluations made for or by the state or local agency relative to the acquisition of property, or

to prospective public supply and construction contracts, until all of the property has been acquired or all of the contract agreement obtained.

5. Confidential or privileged records. Records, the disclosure of which is exempted or prohibited pursuant to federal or state law, including but not limited to provisions of the Evidence Code relating to privilege.

6. Records of which the public interest served by not disclosing the record clearly outweighs the public interest served by disclosure of the record. (Sections 6254, *et seq.* and 6276.44 of the Government Code; Section 3426.1(d) of the Civil Code.)

7. Records pertaining to "alternative investments": "Alternative investments" are defined as "investment in private equity fund, venture fund, hedge fund, or absolute return fund," Government Code section 6254.26 specifies what is and is not subject to public disclosure. As to alternative investments, the following are exempt from disclosure:

(1) Due diligence materials that are proprietary to CCCERA or the alternative investment vehicle.
(2) Quarterly and annual financial statements of alternative investment vehicles.
(3) Meeting materials of alternative investment vehicles.
(4) Records pertaining to information regarding the portfolio positions in which alternative investment funds invest.
(5) Capital call and distribution notices.
(6) Alternative investment agreements and all related documents.

8. Trade secrets. This exemption extends to trade secrets, defined as information, including a formula, pattern, compilation, program, device, method, technique, or process, that:

(1) Derives independent economic value, actual or potential, from not being generally known to the public or to other persons who can obtain economic value from its disclosure or use; and
(2) Is the subject of efforts that are reasonable under the circumstances to maintain its secrecy.

B. Investment Records Subject to Disclosure

As to "alternative investments," the following information is subject to disclosure:

1. The name, address, and vintage year of each alternative investment vehicle.

2. The dollar amount of the commitment made to each alternative investment vehicle by the public investment fund since inception.

3. The dollar amount of cash contributions made by the public investment fund to each alternative investment vehicle since inception.

4. The dollar amount, on a fiscal yearend basis, of cash distributions received by the public investment fund from each alternative investment vehicle.

5. The dollar amount, on a fiscal yearend basis, of cash distributions received by the public investment fund plus remaining value of partnership assets attributable to the public investment fund's investment in each alternative investment vehicle.

6. The net internal rate of return of each alternative investment vehicle since inception.

7. The investment multiple of each alternative investment vehicle since inception.

8. The dollar amount of the total management fees and costs paid on an annual fiscal yearend basis, by the public investment fund to each alternative investment vehicle.

9. The dollar amount of cash profit received by public investment funds from each alternative investment vehicle on a fiscal year-end basis.

C. Annual Disclosure Of Alternative Investments Information

Annual disclosure pertaining to "alternative investments": Government Code section 7514.7 requires CCCERA to disclose the following information at least once annually in a report presented at a meeting open to the public:

1. The fees and expenses that CCCERA pays directly to the alternative investment vehicle, the fund manager, or related parties.

2. CCCERA's pro rata share of fees and expenses not included in paragraph (1) that are paid from the alternative investment vehicle to the fund manager or related parties. CCCERA may independently calculate this information based on information contractually required to be provided by the alternative investment vehicle to the public investment fund. If CCCERA independently calculates this information, then the alternative investment vehicle shall not be required to provide the information identified in this paragraph.

3. CCCERA's pro rata share of carried interest distributed to the fund manager or related parties.

4. CCCERA's pro rata share of aggregate fees and expenses paid by all of the portfolio companies held within the alternative investment vehicle to the fund manager or related parties.

5. Any additional information described in subdivision (b) of Section 6254.26.

6. The gross and net rate of return of each alternative investment vehicle, since inception, in which CCCERA participates.

III. REVIEW

This policy shall be reviewed by the Board at least every three (3) years and may be amended at any time.

IV. HISTORY

Adopted: May 19, 2004
Amended: ______, 2018

Attachment B

CONTRA COSTA COUNTY EMPLOYEES' RETIREMENT ASSOCIATION

ACCESSIBILITY OF INVESTMENT RECORDS POLICY

~~**Adopted 5/19/04**~~

~~Pursuant to Government Code section 6253, the following constitutes CCCERA's guidelines as to the accessibility of records pertaining to CCCERA's investments.~~

I. ~~Except as otherwise stated herein, all records~~ PURPOSE

The Board of Retirement ("Board") of the Contra Costa County Employees' Retirement Association ("CCCERA") adopts this policy to establish guidelines and procedures for making determinations concerning the disclosure of investment records when responding to requests made under the Public Records Act ("PRA").

All staff should be familiar with these guidelines so that the process of responding to requests is efficient, consistent and compliant with the applicable laws. In many circumstances, these guidelines will enable staff to respond to requests without the need for substantial analysis or the assistance of legal counsel. However, given the complexities of the law, situations will likely arise where a simple application of the general guidelines will not provide a definitive answer. When such a situation arises, the Chief Executive Officer should refer any questions to legal counsel.

II. GUIDELINES

Records pertaining to CCCERA's investments that are ~~made or kept by any employee of CCCERA for the purpose of discharging his or her official duties~~in CCCERA's possession are generally accessible to the public ~~according to CCCERA's general Accessibility~~, with the exception of ~~Records Policy.~~

~~The following~~ records that are exempt from public disclosure pursuant to the California Public Records ~~Acts (~~Act, Government Code section 6250, *et seq*~~.)~~~~:~~, as it may be amended from time to time. The following list of exemptions is not exhaustive.

A. Investment Records Exempt From Disclosure

The following ~~1. Records reflecting projections or opinions as to the future performance of any specific investment: These records include, but are not limited to, certain documents, or portions of documents, pertaining to Private Placement Offerings and Venture Capital, and reports prepared by CCCERA's contracting agents, to the extent that such documents and reports discuss opinions and/or projections. This exemption does not extend to any factual data that formed the basis of the opinions and/or projections, unless that factual data is provided to CCCERA with the specific written understanding by the supplier that the data will remain confidential. Additionally, this exemption extends only through the period in which CCCERA continues to hold the~~

~~specific investment, or for a shorter period of time such that disclosure will not affect the actual performance of the investment.~~

~~2. Records reflecting the leasing status, property budget, cash flow projections, and rent rolls for specific real estate assets: This exemption extends only through the period in which CCCERA continues to own an interest in the specific asset, or for a shorter period of time such that disclosure will not affect the ability of CCCERA to sell the asset in a competitive marketplace.~~
records pertaining to investments are exempt from disclosure:

1
~~3. Real Estate Proposals, until the acquisition is complete: All material concerning an individual real estate proposal is exempt from disclosure. This exemption terminates, however, upon the completed acquision of the subject real estate asset.~~

4. Records pertaining to pending litigation: This exemption extends only to pending litigation in which CCCERA is a named party or a real party in interest.

~~5. Records provided to CCCERA under an understanding that they will remain confidential: These records include broker research analyses, credit rating letters, and other sensitive financial or proprietary data, or data that includes trade secrets, that is provided to CCCERA with the specific written understanding by the supplier that the data will remain confidential. In regards to CCCERA's private equity portfolio, such sensitive financial or proprietary data includes portfolio company information and the identities of other limited partners. This exemption exists only if the information being supplied is necessary for a prudent investor to reach an investment decision or evaluate an investment, and the information would not have been supplied to CCCERA without the confidentiality understanding~~2~~.~~

~~6~~. Records pertaining to communications by and between CCCERA staff or its Board and CCCERA's attorneys: This exemption extends to all records reflecting communications with in-house counsel~~,~~ or attorneys who have been retained ~~under contract~~ to represent CCCERA~~, and attorneys employed on behalf of CCCERA through the Office of County Counsel of Contra Costa County~~.

3. Preliminary drafts, notes or CCCERA-related memoranda: This exemption extends to preliminary drafts, notes or CCCERA-related memoranda that are not retained by CCCERA in the ordinary course of business, so long as the public interest in withholding such records clearly outweighs the public interest in disclosure. (Government Code Section 6254(a).)

4. Real estate: The contents of real estate appraisals or engineering or feasibility estimates and evaluations made for or by the state or local agency relative to the acquisition of property, or to prospective public supply and construction contracts, until all of the property has been acquired or all of the contract agreement obtained.

5. Confidential or privileged records. Records, the disclosure of which is exempted or prohibited pursuant to federal or state law, including but not limited to provisions of the Evidence Code relating to privilege.

6
~~7. Other records determined by the Board to be necessarily confidential in the performance of its role as a fiduciary and prudent investor.~~

~~Notwithstanding the foregoing, if records relating to CCCERA's investments are requested under the Public Records Act, or other applicable law, and if CCCERA determines in its sole discretion that such records should be provided in response to such request, then a copy of the request and proposed response letter (identifying said records) should first be sent to any third party known to CCCERA who may reasonably claim a right to maintain the confidentiality of such records.~~ ***~~A cover letter to the proposed response letter should notify such third party that the records will be disclosed 10 calendar days after the date of the response letter unless the third party obtains a court order preventing such disclosure and provides such order~~***

~~*to CCCERA's Administrator.* In these cases, the records should not be made available until at least 10 calendar days after the date that the response letter is sent. This notice will allow the third party(ies) a fair opportunity to seek a court order preventing the production of the records.~~. Records of which the public interest served by not disclosing the record clearly outweighs the public interest served by disclosure of the record. (Sections 6254, *et seq.* and 6276.44 of the Government Code; Section 3426.1(d) of the Civil Code.)

7. Records pertaining to "alternative investments": "Alternative investments" are defined as "investment in private equity fund, venture fund, hedge fund, or absolute return fund," Government Code section 6254.26 specifies what is and is not subject to public disclosure. As to alternative investments, the following are exempt from disclosure:

(1) Due diligence materials that are proprietary to CCCERA or the alternative investment vehicle.
(2) Quarterly and annual financial statements of alternative investment vehicles.
(3) Meeting materials of alternative investment vehicles.
(4) Records pertaining to information regarding the portfolio positions in which alternative investment funds invest.
(5) Capital call and distribution notices.
(6) Alternative investment agreements and all related documents.

8. Trade secrets. This exemption extends to trade secrets, defined as information, including a formula, pattern, compilation, program, device, method, technique, or process, that:

(1) Derives independent economic value, actual or potential, from not being generally known to the public or to other persons who can obtain economic value from its disclosure or use; and
(2) Is the subject of efforts that are reasonable under the circumstances to maintain its secrecy.

B. Investment Records Subject to Disclosure

As to "alternative investments," the following information is subject to disclosure:

1. The name, address, and vintage year of each alternative investment vehicle.

2. The dollar amount of the commitment made to each alternative investment vehicle by the public investment fund since inception.

3. The dollar amount of cash contributions made by the public investment fund to each alternative investment vehicle since inception.

4. The dollar amount, on a fiscal yearend basis, of cash distributions received by the public investment fund from each alternative investment vehicle.

5. The dollar amount, on a fiscal yearend basis, of cash distributions received by the public investment fund plus remaining value of partnership assets attributable to the public investment fund's investment in each alternative investment vehicle.

6. The net internal rate of return of each alternative investment vehicle since inception.

7. The investment multiple of each alternative investment vehicle since inception.

8. The dollar amount of the total management fees and costs paid on an annual fiscal yearend basis, by the public investment fund to each alternative investment vehicle.

9. The dollar amount of cash profit received by public investment funds from each alternative investment vehicle on a fiscal year-end basis.

C. Annual Disclosure Of Alternative Investments Information

Annual disclosure pertaining to "alternative investments": Government Code section 7514.7 requires CCCERA to disclose the following information at least once annually in a report presented at a meeting open to the public:

1. The fees and expenses that CCCERA pays directly to the alternative investment vehicle, the fund manager, or related parties.

2. CCCERA's pro rata share of fees and expenses not included in paragraph (1) that are paid from the alternative investment vehicle to the fund manager or related parties. CCCERA may independently calculate this information based on information contractually required to be provided by the alternative investment vehicle to the public investment fund. If CCCERA independently calculates this information, then the alternative investment vehicle shall not be required to provide the information identified in this paragraph.

3. CCCERA's pro rata share of carried interest distributed to the fund manager or related parties.

4. CCCERA's pro rata share of aggregate fees and expenses paid by all of the portfolio companies held within the alternative investment vehicle to the fund manager or related parties.

5. Any additional information described in subdivision (b) of Section 6254.26.

6. The gross and net rate of return of each alternative investment vehicle, since inception, in which CCCERA participates.

III. REVIEW

This policy shall be reviewed by the Board at least every three (3) years and may be amended at any time.

IV. HISTORY

Adopted: May 19, 2004
Amended: _______, 2018

Attachment C

CONTRA COSTA COUNTY EMPLOYEES' RETIREMENT ASSOCIATION

ACCESSIBILITY OF RECORDS POLICY

(Adopted 5/19/04)

Amended December 12, 2007; November 24, 2009

I. PURPOSE

The Board of Retirement ("Board") of the Contra Costa County Employees' Retirement Association ("CCCERA") adopts this policy to establish guidelines and procedures for making determinations concerning the disclosure of information in CCCERA's files, records or other information when responding to requests made under the Public Records Act ("PRA").

The Board recognizes that it has an obligation to balance its members' right to privacy with the public's right to information regarding public business. There are no "bright line" standards available to the Board for knowing how that balance should tip in each instance. Nevertheless, the Board has determined that it would be useful to establish guidelines for CCCERA to follow when a request is made under the PRA, and to publish those guidelines for the benefit of its members and their beneficiaries, and the public at large.

All staff should be familiar with these guidelines so that the process of responding to requests is efficient, consistent and compliant with the applicable laws. In many circumstances, these guidelines will enable staff to respond to requests without the need for substantial analysis or the assistance of legal counsel. However, given the complexities of the law, situations will likely arise where a simple application of the general guidelines will not provide a definitive answer. When such a situation arises, the Administrator should refer any questions to legal counsel.

In addition, to the extent that any requests made to CCCERA under the PRA pertain to CCCERA's investment records, responses to such requests should follow the additional guidelines set forth in CCCERA's Policy and Guidelines for Accessibility of Investment Records.

II. GENERAL PRINCIPLES

A request to inspect CCCERA records may be made by a telephone call, an in- person oral request, a written request, a subpoena or a court order. The person making a request for records may be a member, a beneficiary, an employee organization, a government agency or member of the press or general public. Staff should always be aware that a request, no matter how informal it may appear, must be analyzed under the principles outlined in this Policy (or analyzed by legal counsel in more complicated situations). The general principles of the policy may be summarized as follows:

1. Confidentiality of an individual member's records must be protected unless those records relate to the conduct of the public's business, or unless the member has authorized the disclosure in writing.

2. An individual (member or beneficiary) generally must be permitted access to his or her own records.

3. The public – i.e., any person, for any reason - has a right to inspect records that relate to CCCERA's operation and that are neither confidential nor protected from disclosure by the applicable laws.

4. Generally, CCCERA must respond to any request for information within 10 calendar days of receipt of the request. The response need not contain the actual requested information or production of the sought records, but must (at a minimum) provide a response as to whether CCCERA will produce the requested records or provide a basis for rejecting the request. If CCCERA is unable to formulate a response within 10 calendar days, it may extend the time for a response by as much as 14 calendar days, but may only do so with good cause.

5. Subpoenas or court orders requiring the production of records and/or information should be referred to legal counsel immediately upon receipt.

6. Even if a request seeks disclosable records, under California case law, a request may be objectionable if it is unreasonably burdensome. Additionally, the PRA only requires CCCERA to disclose its existing records; it does not require CCCERA to conduct studies, reorganize information or summarize data for the requesting party. Thus, when confronted with a request that will substantially disrupt CCCERA's operations, the Administrator should consult legal counsel.[1]

7. When a request is made for information regarding an individual member that appears to be of a personal or private nature, CCCERA should seek the advice of legal counsel.

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[1] Although CCCERA does not have to conduct studies, reorganize information or summarize data, it may have to invest substantial energy sifting through existing data. The amount of time or energy spent sifting through CCCERA's existing data is not, alone, a valid ground for withholding records or information.

III. APPLICABLE LAW

A. Public Records Act (PRA)

The PRA generally requires CCCERA to disclose "public records" unless the particular information is exempt from disclosure. Under the PRA and interpreting case law, "public records" include information in virtually any format "relating to the conduct of the public's business prepared, owned, used or retained by any state or local agency." Although certain exemptions allow CCCERA to withhold some records, case law is clear that the policy in California generally favors disclosure.

The PRA sets forth an extensive list of records that are exempt from required disclosure.[2] Many of the statutory exemptions are inapplicable to CCCERA and others may be applicable only in rare instances. The following exemptions are the most important exemptions for CCCERA:

1. Preliminary drafts, notes, or interagency or intra-agency memoranda that are not retained by the public agency in the ordinary course of business, provided that the public interest in withholding those records clearly outweighs the public interest in disclosure.

2. Records pertaining to pending litigation to which the public agency is a party until the pending litigation or claim has been finally adjudicated or otherwise settled.

3. Personnel, medical, or similar files, the disclosure of which would constitute an unwarranted invasion of personal privacy.

4. Records, the disclosure of which is exempted or prohibited pursuant to federal or state law, including, but not limited to, provisions of the Evidence Code relating to privilege.

5. Additionally, Government Code Section 6255 provides a "catch all" provision whereby CCCERA can justify withholding any record by demonstrating that "on the facts of the particular case the public interest served by not disclosing the record clearly outweighs the public interest served by disclosure of the record."[3]

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2 According to California case law, the listed exemptions permit CCCERA to withhold records; they do not prohibit disclosure. In other words, these exemptions provide CCCERA with discretion to disclose certain records and information. However, due to (a) the possibly sensitive nature of the records covered by the exemptions and (b) the fact that disclosure may constitute a waiver of future rights to withhold information, CCCERA is encouraged to consult legal counsel before disclosing any records that fall under an exemption.

3 Generally, California law favors disclosure, and if a court disagrees with CCCERA's determination, CCCERA may be liable for the requesting parties' attorney fees and costs associated with obtaining disclosure. Thus, the "catch all" provision should be used sparingly, and only with the benefit of legal counsel.

B. Member Records

Government Code section 31532 provides as follows: "Sworn statements and individual records of members shall be confidential and shall not be disclosed to anyone except insofar as may be necessary for the administration of this chapter [the '37 Act] or upon order of a court of competent jurisdiction, or upon written authorization by the member."

Based upon section 31532 and applicable court rulings, the CCCERA Board hereby adopts the following interpretation of Government Code section 31532 as it pertains to the confidentiality of member records:

Subject to the provisions of this section, data filed by any member or beneficiary with CCCERA is confidential, and no individual record shall be divulged by any official or employee having access to it to any person other than the member to whom the information relates or his or her authorized representative or the county or participating agency by which he or she is employed. The information shall be used by CCCERA for the sole purpose of carrying into effect the provisions of this part. Any information that is requested for retirement purposes by any such public agency shall be treated as confidential by the agency.

Except as provided by this section, the following information is not public information and shall not be disclosed: a member's, beneficiary's or annuitant's social security number, date of birth, address, telephone and facsimile numbers, email addresses, age at entry into service, spouse's and/or beneficiary's names, disability application, medical records, or other personal information provided by the member or beneficiary (excluding the public information listed below).

The following information is public information and shall be released in response to a valid request: member's and benefit recipient's names, member's date of hire, category of service (e.g., general or safety), employment tier, date of hire, applicable benefit formula, date of retirement, election of retirement options, type of retirement allowance (e.g., service, service connected disability, non-service connected disability), years of credited service, age factor for calculation of benefit, final average compensation (including the elements of compensation earnable) and total retirement allowance.

IV. PROCEDURE FOR RESPONDING TO PUBLIC RECORDS REQUESTS

A. Initial Review

Upon receiving a request for records, CCCERA must first determine whether the request seeks disclosable "public records."[4] To make this determination, CCCERA should proceed as follows:

1. Determine if the records are prepared, owned, used, or retained by CCCERA.

2. If the records are prepared, owned, used, or retained by CCCERA, then determine if the requested records relate to the conduct of the public's business.

3. Determine if the requested records fit under one of the exemptions discussed above (e.g., preliminary drafts, records related to litigation or personnel files).

4. Always consider whether there is a good public policy reason to withhold the records. If so, the request should be referred to legal counsel for a case-by-case determination.

5. Determine whether the requested records will reveal information regarding a member that is of a personal or private nature. Generally, records or information that relate to a member's official responsibilities, his or her actions as a public employee, information that is within the public domain (e.g. formula used to calculate pension allowances) or information that is provided to the county auditor/controller (e.g., the member's salary, bonuses) or information provided by other similarly situated retirement systems (e.g., the gross amount of any benefit or any refund of a member contribution) is non-confidential, public information and should be disclosed. However, requests for more personal information (e.g., addresses, telephone numbers, social security numbers, disability and medical records and investigations, marital status, designated beneficiary, etc.) ordinarily should not be disclosed, unless the member has consented to disclosure, and the request should be referred to legal counsel for further handling.

6. Determine whether otherwise disclosable records need to be reorganized or redacted such that confidential information is not included in the disclosed material.

7. If, for any reason, CCCERA believes that certain records should not be disclosed, or questions whether certain records should be disclosed, legal counsel should be consulted.

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[4] It is important to remember that a request may be partially acceptable and partially objectionable. CCCERA should disclose all records that are properly sought, even if the person making the request has sought other records that need not be disclosed.

B. Preparing the Response Letter

Under normal circumstances, within 10 calendar days[5] after receipt of the request, CCCERA must notify - in writing -- the person making the request whether some or all of the records will be disclosed. The response letter should also contain the following:

1. If any records will not be disclosed, CCCERA must explain why those records are being withheld. If some of the requested records will be disclosed while others will not, it is important that CCCERA clearly delineate which records will be disclosed (and which will not) and explain the reasons for the distinctions.

2. If some or all of the requested records will be disclosed, CCCERA must state the estimated date and time when the records will be made available. In general, CCCERA should provide the relevant information or make the records available at the earliest practicable date. Unless special circumstances exist, CCCERA should endeavor to produce the information or records within 10 days after the response letter is sent (i.e., within 20 days after the original request).

3. If some or all of the requested records will not be disclosed, because "the public interest served by not disclosing the record clearly outweighs the public interest served by disclosure of the record," (pursuant to Govt. Code Section 6255) CCCERA must set forth the names and titles or positions of each person responsible for the denial.

C. Producing the Records

The logistics of providing the requested records should be worked out on a case- by-case basis in cooperation with the person making the request. If practicable, the information should be communicated by letter. If, however, the request seeks review of specific records, or if the requested information is too voluminous for inclusion in a letter, CCCERA should send copies of the relevant records to the person making the request. If the production requires substantial copying, CCCERA should not release the copies until the requesting party pays CCCERA for copying at the rate of $.10 per page. If the requested information is particularly voluminous (or the person requesting the information does not want to pay for copy charges) arrangements should be made so that he or she can view the records at CCCERA's offices.

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[5] Under "unusual circumstances," if CCCERA cannot reasonably make a determination within 10 days, the Administrator "or his or her designee" should, within the 10 days, send a letter to the person making the request explaining when a response is expected (but in no case more than 24 days after the initial request) and setting forth the reason(s) for the extension. Extensions should not be used simply to postpone the response, but rather should only be used when "unusual circumstances" exist. "Unusual circumstances" includes: (1) the need to search for and collect the requested records from other locations; (2) the need to search for, "sift through" and examine voluminous records; (3) the need for consultation with another agency or department; or (4) the need to compile data, to write programming language or a computer program, or to construct a computer report to extract more limited data that CCCERA seeks to provide in response to a PRA request.

V. MISCELLANEOUS

A. Availability Of This Policy

A copy of this policy statement shall be posted in a visible location of the CCCERA office, shall be made available to any member of the public upon request, and shall be made available on CCCERA's website.

B. Responsible Individual

For consistency and efficiency, the Administrator shall be the responsible individual for requests under the PRA. Staff shall promptly refer all requests to the Administrator, or his or her designee(s).

C. Record Keeping

A separate file shall be maintained for all documents relating to requests for records under the PRA. All communications relating to requests for records under the PRA shall either be in writing or memorialized by a writing that is appropriately filed.

CONTRA COSTA COUNTY CCCERA
Employees' Retirement Association

Meeting Date
9/26/18
Agenda Item
#17

MEMORANDUM

Date: September 26, 2018

To: CCCERA Board of Retirement

From: Christina Dunn, Deputy Chief Executive Officer

Subject: Consider and take possible action to issue a Request for Proposal for Actuarial Consulting and Actuarial Auditing Services

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Background

CCCERA engages both an actuarial consulting firm as well as an actuarial audit firm. In 2003, CCCERA engaged Segal Consulting to provide actuarial consulting services. In 2008, CCCERA engaged Milliman to provide actuarial audit services. Milliman has completed actuarial audits in 2008 and 2014 for actuarial valuation reports ending December 31, 2007 and December 31, 2012, respectively. Board policy mandates an actuarial audit be completed every five years, or as otherwise requested by the Board. (See CCCERA's Professional Consultant Evaluation Policy.)

In is timely for CCCERA to issue an RFP for both actuarial consulting and actuarial audit services. Upon Board approval, CCCERA intends on issuing one RFP for both services with one firm hired to perform actuarial consulting services and a separate firm hired to provide actuarial audit services.

Recommendation

Consider and take possible action to issue a Request for Proposal for Actuarial Consulting and Actuarial Auditing Services.

SACRS™

Providing insight. Fostering oversight.

Meeting Date
9/26/18
Agenda Item
#18

SACRS VOTING PROXY FORM

The following are authorized by the ____________________________ County Retirement Board to vote on behalf of the County Retirement System at the upcoming SACRS Conference

(if you have more than one alternate, please attach the list of alternates in priority order):

____ Voting Delegate

______________________________________ Alternate Voting Delegate

These delegates were approved by the Retirement Board on _____ / _____ / _____.

The person authorized to fill out this form on behalf of the Retirement Board:

Signature: __________________________________

Print Name: __________________________________

Position: __________________________________

Date: __________________________________

Please send your system's voting proxy by October 1, 2018 to Sulema H. Peterson, SACRS Administrator at Sulema@sacrs.org.

Meeting Date
9/26/18
Agenda Item
#20a.

Please Join Us for Nossaman's Annual Invitation-Only Fiduciaries' Forum!

Presented by Nossaman LLP's Public Pensions and Investments Practice Group

October 18-19, 2018 | Marriott Union Square | San Francisco, CA

Nossaman's 2018 Fiduciaries' Forum: *Risks and Responsibilities of Public Pension Funds Nationally*

We invite trustees (less than a quorum), executive staff, investment officers and in-house counsel of retirement system clients and colleagues to join us for this opportunity to learn, network and share best practices with their peers in a relaxed setting that encourages an open flow of communication and meaningful discussion.

This year's program will include the following:

Thursday, October 18

Marriott Union Square

2:30 - 3:00 p.m.	Registration
3:00 - 5:00 p.m.	Key Pension Litigation Nationally with a Focus on California, Texas, Washington and Kentucky

Jones Restaurant

5:30 - 6:30 p.m.	Welcome Reception
6:30 - 9:00 p.m.	Dinner + Keynote Presentation

Friday, October 19

Marriott Union Square

8:00 - 9:00 a.m.	Breakfast
9:00 - 10:00 a.m.	A Look at the Standard of Care in Private Fund Documentation and How This Plays Out in Litigation
10:15 - 10:45 a.m.	Key Intellectual Property Issues for Public Agencies
10:45 - 11:15 a.m.	Recent Market Trends in Private Fund Investment Transactions
11:15 - 11:35 a.m.	Tax Code Challenges as We Head Into 2019
11:45 a.m. - 12:45 p.m.	Defense and Indemnification Rights of Trustees and Staff: How Protected Are You?
1:00 - 2:00 p.m.	Lunch + How Technological Changes and Cyber Vulnerabilities Change the Risk Matrix for Investors **Guest Speaker**: Adam Cohen, *Managing Director at Berkeley Research Group*

We look forward to seeing you next month. **Remember to register before September 27 for an early bird rate on the program, as well as your hotel room.**

YES, I WILL ATTEND. REGISTER NOW!

Should you have any questions, concerns or suggestions, please contact Jessica Ku at jku@nossaman.com or 949.477.7667.

We look forward to seeing you in October!

NOSSAMAN HOSTS


Ashley Dunning
Partner


Yuliya Oryol
Partner


Peter Mixon
Partner


Katherine Jordan
Associate


Courtney Krause
Associate


Natasha Saggar Sheth
Associate

LOGISTICS

Location
Marriott Union Square
480 Sutter Street
San Francisco, CA 94108
MAP

Hotel Rooms
Nossaman has reserved a block of rooms at a reduced rate of $269 per night at the Marriott Union Square.

Please reserve your room by **5:00 p.m. on September 27, 2018**. After this date, the reduced rate cannot be guaranteed.

You will receive a link to book your hotel room in your registration confirmation email.