

EAST BAY MUNICIPAL UTILITY DISTRICT

DATE: July 20, 2017

MEMO TO: Members of the Retirement Board

THROUGH: Laura Brunson, Manager of Human Resources

FROM: Lisa Sorani, Manager of Employee Services

SUBJECT: Retirement Board Regular Meeting – July 20, 2017

A regular meeting of the Retirement Board will convene at 8:30 a.m. on Thursday, July 20, 2017 in the Training Resource Center (TRC1) of the Administration Building.

Enclosed are the agenda for the July 20, 2017 meeting and the minutes for the May 18, 2017 regular meeting. The package also includes the following: **(1) ACTION** items: Declaring the Results of the Election of the Employee Member of the Retirement Board, Select Proxy Service Provider, Declaring the Interest Rate on Member Contributions for the Period Ending June 30, 2017; **(2) INFORMATION** items: ERS Cash-Flow Projection, Application of Strategic Asset Classes, Asset-Liability Study Assumptions, Covered Calls 3-Year Review, Van Hulzen Presentation; **(3) REPORTS FROM THE RETIREMENT BOARD.**

LS:eg

Enclosures

AGENDA

EBMUD EMPLOYEES' RETIREMENT SYSTEM

July 20, 2017

Training Resource Center (TRC1) 8:30 a.m.

ROLL CALL:

PUBLIC COMMENT: The Retirement Board is limited by State Law to providing a brief response, asking questions for clarification, or referring a matter to staff when responding to items that are not listed on the agenda.

ANNOUNCEMENT OF CLOSED SESSION AGENDA:

1. Personnel matters pursuant to Government Code Section 54957:

a. Application for Disability Retirement of Phillip Reed (R.B. Resolution No. 6861)

REGULAR BUSINESS MEETING: Upon completion of Closed Session

CONSENT CALENDAR:

1. Approval of Minutes – Regular meeting of May 18, 2017
2. Ratifying and Approving Investment Transactions by Counselors for April 2017 and May 2017 (R.B. Resolution No. 6862)
3. Ratifying and Approving Short-Term Investment Transactions by Treasurer for April 2017 and May 2017 (R.B. Resolution No. 6863)
4. Approving Treasurer's Statement of Receipts and Disbursements for April 2017 and May 2017

ACTION:

5. Declaring the results of the election of the employee Member of the Retirement Board (Resolution No. 6864) – E. Grassetti
6. Select Proxy Service Provider – S. Skoda
7. Declaring the interest rate on Member contributions for the period ending June 30, 2017 (Resolution No. 6865) – E. Grassetti

INFORMATION:

8. ERS Cash-Flow Projection –S. Skoda
9. Application of Strategic Asset Classes– S. Skoda
10. Asset-Liability Study Assumptions– S. Skoda
11. Covered Calls 3-Year Review – S. Skoda
12. Van Hulzen Presentation – S. Skoda

REPORTS FROM THE RETIREMENT BOARD:

13. Brief report on any course, workshop, or conference attended since the last Retirement Board Meeting

ITEMS TO BE CALENDARED:

- Select Actuarial Auditor based on RFP responses
- Vulnerability of ERS to Market Performance

MEETING ADJOURNMENT:

The next regular meeting of the Retirement Board will be held at 8:30 a.m. on Thursday, September 21, 2017.

2017 Retirement Board Meetings

September 21, 2017

November 16, 2017

MINUTES OF THE RETIREMENT BOARD

May 18, 2017

A regular meeting of the Retirement Board convened on Thursday, May 18, 2017 at 8:39 a.m. in the Large Training Resource Center (TRC) Room. The meeting was called to order by President Doug Higashi.

Roll Call – The following Retirement Board Members were present: Alex Coate, Doug Higashi, Frank Mellon, Lisa Ricketts and Marguerite Young. Tim McGowan was absent.

The following staff members were present: Dari Barzel, Damien Charléty, Elizabeth Grassetti, Lourdes Matthew, Sophia Skoda, and Lisa Sorani.

PUBLIC COMMENT

Retiree Dick Ward asked why the Retirement Board Meetings were not on the EBMUD.com website calendar, and if there would be another “Destinations” brochure published this year. Staff let the Board know that there had been training on posting items to the EBMUD.com calendar and that future meetings would be listed. Staff also confirmed that another “Destinations” brochure was coming later this year.

CONSENT CALENDAR

1 - 4. **Consent Calendar** – A motion to move the consent calendar with two corrections was made by Frank Mellon and seconded by Doug Higashi. The motion carried (4-0) by the following voice vote: AYES (Coate, Higashi, Mellon, Young), NOES (none), ABSTAIN (none), ABSENT (McGowan).

ACTION

5. **Approval to Join SACRS as a Non-Profit Affiliate** – In response to a request from Board Members to attend SACRS Modern Investment Theory & Practice at UC Berkeley, staff researched the Organization and found that the retirement system can join the Organization as a non-profit affiliate member which will afford discounted rates and provide additional training opportunities for the Board and staff. Board Members suggested that the System join for one year. Alex Coate moved the motion and Frank Mellon seconded. The motion carried (4-0) by the following voice vote: AYES (Coate, Higashi, Mellon, Young), NOES (none), ABSTAIN (none), ABSENT (McGowan).

INFORMATION

6. **1st Quarter Performance Review as of March 31, 2017** – Neil Rue from PCA reviewed the 1st Quarter performance results. The fund is now at approximately \$1.5 billion dollars. The fund has shown strong results and was in the top decile of pension funds over \$1 billion dollars for the last five years. The plan was compensated for the risk it took. Much of the returns were due to equity exposure and the covered calls strategy which has done very well.

7. **Asset-Liability Review Schedule** – Sophia Skoda presented the Asset-Liability Study Schedule, reviewing the items to be discussed at the next three meetings in preparation for live modeling at the November 2017 meeting. The Asset-Liability Study is scheduled to be adopted at the November 2017 Retirement Board meeting.

8. **Capital Market Assumptions** – Neil Rue from PCA reviewed the capital markets assumptions, applying PCA's latest assumptions to EBMUD's current strategic investment allocation. PCA increased their volatility expectations across all classes and reduced the 10-year expected returns in the US equity class. Fixed-income yields remain low. Based on these assumptions, PCA expects EBMUD's investments to produce an annual return of 6.19%, and with alpha, perhaps as much as 6.50%, on average for the next ten years.

9. **Strategic vs. Traditional Asset Allocation** – Neil Rue from PCA provided background on this topic, explaining that institutional investors used to focus on relative return criteria. After the market down-turn in 2008, investors began to look at the risk in the portfolio's policy and began looking at diversifying risk rather than just asset class. Neil showed EBMUD's portfolio's allocation to risk, showing the lack of diversification and emphasis on growth. As part of the Asset Liability study, a Strategic Class Framework will be used with the goal of reducing the risk while still providing needed returns with a risk efficient portfolio

10. **Proxy Service Provider Update** - Sarah Bernstein from PCA reviewed the proposals received for the RFP for Proxy service provider. Five firms received the RFP and three chose to respond to it. There are two finalists, Glass Lewis & Co. and ISS. Staff will provide a recommendation at the July 20, 2017 meeting.

11. **Presentation from Center Square** – Eric Rothman and Katie Bergman from Center Square provided an update on EBMUD's REIT holding. Center Square's inception was in 2011 when it received \$25 million; current valuation is at approximately \$50 million. Mr. Rothman reviewed the types of holdings that Center Square has and also market trends. He highlighted the move away from malls and retail, and toward medical office buildings, senior housing, and data centers. He also discussed ESG considerations they consider when reviewing REIT's.

12. **Northern Trust Fee Changes** - Sophia Skoda reviewed the changes to several of the Northern Trust fees, resulting in an annual savings of approximately \$89,000 a year to the ERS. An RFP for custody services will be held next year.

REPORTS FROM THE RETIREMENT BOARD:

16. **Brief report on any course, workshop, or conference attended since the last Retirement Board meeting** – Marguerite Young and Frank Mellon both attended a CERES program. Frank Mellon was impressed that sustainability was good for the bottom line and was impressed by the diversity of the attendees.

Marguerite attended a pre-meeting of INCR where she participated in a breakout session on water.

ITEMS TO BE CALENDERED / UPCOMING ITEMS

- Actuarial Audit scheduling
- Report on proxy voting

ADJOURNMENT – Doug Higashi moved to adjourn the meeting at 11:10 a.m. and Marguerite Young seconded the motion; the motion carried (4-0) by the following voice vote: AYES (Coate, Higashi, Mellon, and Young), NOES (none), ABSTAIN (none), ABSENT (McGowan).

President

ATTEST: _____
Secretary

7/20/2017

EAST BAY MUNICIPAL UTILITY DISTRICT

DATE: June 22, 2017

MEMO TO: Members of the Retirement Board

FROM: Sophia D. Skoda, Director of Finance 

SUBJECT: Investment Transactions by Retirement Fund Managers for April 2017 and May 2017

The attached Investment Transactions by Retirement Fund Managers report for the months of April 2017 and May 2017 is hereby submitted for Retirement Board approval.

Attachment

SDS:DSK:MH

INVESTMENT TRANSACTIONS BY RETIREMENT FUND MANAGERS

April 2017

	PURCHASES	SALES	PORTFOLIO VALUE
FIXED INCOME			
Western Asset Management Co.-IG	\$719,124	\$44,794	\$66,471,895
Western Asset Management Co.-HI	\$0	\$37,293	\$33,751,718
Western Asset Management Co.-HY	\$0	\$29,889	\$30,996,972
C.S. McKee	\$9,654,080	\$8,943,364	\$139,214,242
TOTAL	\$10,373,203	\$9,055,340	\$270,434,828
DOMESTIC EQUITY			
Barrow Hanley	\$0	\$0	\$179,537,945
Opus Capital	\$0	\$0	\$36,952,278
Russell 1000 Growth Index Fund	\$0	\$37,707	\$275,160,597
Russell 2000 Growth Index Fund	\$0	\$10,556	\$28,841,778
INTECH	\$1,198,984	\$1,046,562	\$80,421,573
T. Rowe Price	\$3,646,143	\$3,271,149	\$81,372,715
Total Domestic Equity	\$4,845,127	\$4,365,975	\$682,286,884
COVERED CALLS			
Parametric (BXM)	\$893,735	\$1,156,307	\$111,923,245
Parametric (Delta-Shift)	\$381,669	\$337,588	\$116,261,303
Van Hulzen	\$5,958,848	\$5,603,270	\$103,757,757
Total Covered Calls	\$7,234,251	\$7,097,165	\$331,942,305
INTERNATIONAL EQUITY			
Franklin/Templeton	\$4,481,810	\$3,450,332	\$97,519,687
Fisher Investments	\$0	\$0	\$107,458,283
Total International Equity	\$4,481,810	\$3,450,332	\$204,977,969
REAL ESTATE EQUITY			
RREEF America II	\$269,246	\$0	\$34,674,374
CenterSquare	\$2,694,950	\$2,684,012	\$48,965,826
Total Real Estate	\$2,964,196	\$2,684,012	\$83,640,200
TOTAL ALL FUND MANAGERS	\$29,898,586	\$26,652,826	\$1,573,282,186

May 2017

	PURCHASES	SALES	PORTFOLIO VALUE
FIXED INCOME			
Western Asset Management Co.-IG	\$2,263,604	\$2,001	\$66,645,450
Western Asset Management Co.-HI	\$0	\$38,006	\$33,839,646
Western Asset Management Co.-HY	\$0	\$30,724	\$31,132,259
C.S. McKee	\$11,075,707	\$10,036,233	\$140,263,026
TOTAL	\$13,339,311	\$10,106,964	\$271,880,380
DOMESTIC EQUITY			
Barrow Hanley	\$3,983,412	\$3,116,365	\$180,355,047
Opus Capital	\$4,467,686	\$4,506,073	\$35,589,268
Russell 1000 Growth Index Fund	\$0	\$0	\$278,694,899
Russell 2000 Growth Index Fund	\$0	\$0	\$28,581,234
INTECH	\$9,949,395	\$9,925,387	\$83,554,433
T. Rowe Price	\$4,830,914	\$4,753,594	\$84,243,946
Total Domestic Equity	\$23,231,407	\$22,301,418	\$691,018,826
COVERED CALLS			
Parametric (BXM)	\$1,359,513	\$956,507	\$113,240,818
Parametric (Delta-Shift)	\$231,570	\$303,607	\$117,851,646
Van Hulzen	\$31,240,221	\$31,288,185	\$104,202,943
Total Covered Calls	\$32,831,304	\$32,548,299	\$335,295,407
INTERNATIONAL EQUITY			
Franklin/Templeton	\$4,904,919	\$3,907,639	\$101,176,725
Fisher Investments	\$2,040,813	\$1,264,009	\$112,452,865
Total International Equity	\$6,945,731	\$5,171,648	\$213,629,591
REAL ESTATE EQUITY			
RREEF America II	\$0	\$0	\$34,674,374
CenterSquare	\$1,899,134	\$1,445,411	\$48,622,316
Total Real Estate	\$1,899,134	\$1,445,411	\$83,296,690
TOTAL ALL FUND MANAGERS	\$78,248,887	\$71,573,740	\$1,595,120,894

Prepared By:

Matt Houck, Accounting Technician

Date:

6/20/2017

R.B. RESOLUTION NO. 6862

RATIFYING AND APPROVING INVESTMENT TRANSACTIONS BY THE COUNSELORS
FOR MONTHS OF APRIL, 2017 AND MAY, 2017

Introduced by: ; Seconded by:

WHEREAS, Retirement Board Rule No. B-5 provides for investment transactions without prior specific approval by the Retirement Board; and

WHEREAS, investment transactions have been consummated during April, 2017 and May, 2017, in accordance with the provisions of said rule and in securities designated as acceptable by Retirement Board Resolution No. 4975, as amended;

NOW, THEREFORE, BE IT RESOLVED that the investment transactions appearing on the following exhibits are hereby ratified and approved.

President

ATTEST:

Secretary

07/20/2017

EAST BAY MUNICIPAL UTILITY DISTRICT

DATE: June 5, 2017
MEMO TO: Members of the Retirement Board
THROUGH: Sophia D. Skoda, Director of Finance *SDS*
FROM: D. Scott Klein, Controller *D. Scott Klein*
SUBJECT: Short Term Investment Transactions for April 2017

The attached Short Term Investment Transactions report for the month of April 2017 is hereby submitted for Retirement Board approval.

Attachment


SDS:DSK:MH

**EBMUD EMPLOYEES' RETIREMENT SYSTEM
SHORT TERM INVESTMENT TRANSACTIONS
CONSUMMATED BY THE TREASURER
MONTH OF APRIL 2017**

<u>COST/ FACE VALUE</u>	<u>DESCRIPTION</u>	<u>DATE OF PURCHASE</u>	<u>DATE OF SALE/MATURITY</u>	<u>YIELD (%)</u>
\$ 3,563,000.00	Local Agency Investment Fund	5-Apr-17		0.884
16,208.27	Local Agency Investment Fund	13-Apr-17		0.884
3,545,000.00	Local Agency Investment Fund	20-Apr-17		0.884
<u>(8,297,000.00)</u>	Local Agency Investment Fund		25-Apr-17	0.884
<u>\$ (1,172,791.73)</u>	Net Activity for Month			

\$ 3,656,741.99	Beginning Balance
<u>(1,172,791.73)</u>	Net Activity for Month
<u>\$ 2,483,950.26</u>	Ending Balance

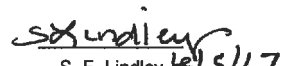
SUBMITTED BY


D. Scott Klein
Controller

DATE

6/5/17



Semadar Barzel
Treasury Manager



S. F. Lindley
Acctg. Systems Supvr.
prepared by MHouck

EAST BAY MUNICIPAL UTILITY DISTRICT

DATE: June 22, 2017

MEMO TO: Members of the Retirement Board

THROUGH: Sophia D. Skoda, Director of Finance 

FROM: D. Scott Klein, Controller 

SUBJECT: Short Term Investment Transactions for May 2017

The attached Short Term Investment Transactions report for the month of May 2017 is hereby submitted for Retirement Board approval.

Attachment

SDS:DSK:MH

**EBMUD EMPLOYEES' RETIREMENT SYSTEM
SHORT TERM INVESTMENT TRANSACTIONS
CONSUMMATED BY THE TREASURER
MONTH OF MAY 2017**

<u>COST/ FACE VALUE</u>	<u>DESCRIPTION</u>	<u>DATE OF PURCHASE</u>	<u>DATE OF SALE/MATURITY</u>	<u>YIELD (%)</u>
\$ 3,550,000.00	Local Agency Investment Fund	4-May-17		0.925
3,526,000.00	Local Agency Investment Fund	17-May-17		0.925
<u>(8,402,000.00)</u>	Local Agency Investment Fund		25-May-17	0.925
<u>\$ (1,326,000.00)</u>	Net Activity for Month			

\$ 2,483,950.26	Beginning Balance
<u>(1,326,000.00)</u>	Net Activity for Month
<u>\$ 1,157,950.26</u>	Ending Balance

SUBMITTED BY _____

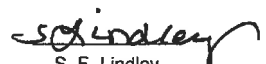


D. Scott Klein
Controller

DATE _____

6-22-17


Semadar Barzel
Treasury Manager


S. F. Lindley
Acctg. Systems Supvr.
prepared by MHouck

R.B. RESOLUTION NO. 6863

RATIFYING AND APPROVING INVESTMENT TRANSACTIONS BY THE TREASURER
FOR APRIL, 2017 AND MAY, 2017

Introduced by: ; Seconded by:

WHEREAS, Retirement Board Rule No. B-7 provides for the temporary investment of retirement system funds by the Treasurer or Assistant Treasurer in securities authorized by Sections 1350 through 1366 of the Financial Code or holding funds in inactive time deposits in accordance with Section 12364 of the Municipal Utility District Act; and

WHEREAS, investment transactions during April 2017, and May, 2017 have been made in accordance with the provisions of the said rule;

NOW, THEREFORE, BE IT RESOLVED that the investment transactions consummated by the Treasurer and included on the attached Exhibit A for April 2017, and May, 2017 are hereby ratified and approved.



President

ATTEST:

Secretary

07/20/2017

EAST BAY MUNICIPAL UTILITY DISTRICT

DATE: June 5, 2017
MEMO TO: Members of the Retirement Board
THROUGH: Sophia D. Skoda, Director of Finance 
FROM: D. Scott Klein, Controller 
SUBJECT: Statement of Receipts and Disbursements for April 2017

The attached Statement of Receipts and Disbursements report for the month of April 2017 is hereby submitted for Retirement Board approval.

Attachment

SDS:DSK:MH

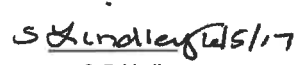
**STATEMENT OF RECEIPTS AND DISBURSEMENTS
EMPLOYEES' RETIREMENT FUND
MONTH OF APRIL 2017**

CASH BALANCE at March 31, 2017		\$ 2,784,522.85
<u>Receipts</u>		
Employees' Contributions	\$ 1,236,705.97	
District Contributions	5,911,516.06	
LAIF Redemptions	8,297,000.00	
Refunds and Commission Recapture	<u>22,663.85</u>	
TOTAL Receipts		15,467,885.88
<u>Disbursements</u>		
Checks/Wires Issued:		
Service Retirement Allowances	\$ 7,284,443.91	
Disability Retirement Allowances	141,597.91	
Health Insurance Benefit	860,444.37	
Payments to Retiree's Resigned/Deceased	79,374.03	
LAIF Deposits	7,108,000.00	
Administrative Cost	<u>101,439.59</u>	
TOTAL Disbursements		(15,575,299.81)
CASH BALANCE at April 30, 2017		\$ 2,677,108.92
LAIF		<u>2,483,950.26</u>
LAIF and Cash Balance at April 30, 2017		\$ 5,161,059.18
<u>Domestic Equity</u>		
Barrow Hanley	\$ 179,537,944.57	
Russell 1000 Index Fund	275,160,596.50	
Russell 2000 Growth Index Fund	28,841,777.81	
Opus	36,952,277.55	
Intech	80,421,572.50	
T. Rowe Price	<u>81,372,715.22</u>	
Subtotal Domestic Equity		682,286,884.15
<u>Covered Calls</u>		
Parametric (BXM)	\$ 111,923,244.90	
Parametric (Delta-Shift)	116,261,303.29	
Van Hulzen	<u>103,757,757.12</u>	
Subtotal Covered Calls		331,942,305.31
<u>International Equity</u>		
Franklin Templeton	\$ 97,519,686.56	
Fisher Investments	<u>107,458,282.56</u>	
Subtotal International Equity		204,977,969.12
<u>Real Estate</u>		
RREEF America REIT II	\$ 34,674,374.00	
Center Square	<u>48,965,825.56</u>	
Subtotal Real Estate		83,640,199.56
<u>Fixed Income</u>		
CS Mckee	\$ 139,214,242.38	
Western Asset Mgt Co-Short Term Inv Grade	66,471,895.28	
Western Asset Mgt Co-Short Term High Income	33,751,718.26	
Western Asset Mgt Co-Short Term High Yield	<u>30,996,971.95</u>	
Subtotal Fixed Income		270,434,827.87
Total for Domestic and International Equities		<u>1,573,282,186.01</u>
MARKET VALUE of ASSETS at April 30, 2017		\$ 1,578,443,245.19

Respectfully submitted,


D. Scott Klein
Controller



Semadar Barzel
Treasury Mgr.



S. F. Lindley
Acctg Sys Supvr.
prepared by mhouch

EAST BAY MUNICIPAL UTILITY DISTRICT

DATE: June 22, 2017

MEMO TO: Members of the Retirement Board

THROUGH: Sophia D. Skoda, Director of Finance 

FROM: D. Scott Klein, Controller 

SUBJECT: Statement of Receipts and Disbursements for May 2017

The attached Statement of Receipts and Disbursements report for the month of May 2017 is hereby submitted for Retirement Board approval.

Attachment

SDS:DSK:MH

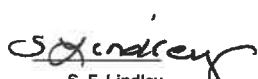
**STATEMENT OF RECEIPTS AND DISBURSEMENTS
EMPLOYEES' RETIREMENT FUND
MONTH OF MAY 2017**

CASH BALANCE at April 30, 2017		\$	2,677,108.92
<u>Receipts</u>			
Employees' Contributions	\$	1,232,605.41	
District Contributions		5,877,408.05	
LAIF Redemptions		8,402,000.00	
Refunds and Commission Recapture		<u>52,850.09</u>	
TOTAL Receipts			15,564,863.55
<u>Disbursements</u>			
Checks/Wires Issued:			
Service Retirement Allowances	\$	7,407,133.85	
Disability Retirement Allowances		141,597.91	
Health Insurance Benefit		856,929.07	
Payments to Retiree's Resigned/Deceased		114,748.73	
LAIF Deposits		7,076,000.00	
Administrative Cost		<u>193,373.60</u>	
TOTAL Disbursements			<u>(15,789,783.16)</u>
CASH BALANCE at May 31, 2017		\$	<u>2,452,189.31</u>
LAIF			<u>1,157,950.26</u>
LAIF and Cash Balance at May 31, 2017		\$	<u>3,610,139.57</u>
<u>Domestic Equity</u>			
Barrow Hanley	\$	180,355,047.15	
Russell 1000 Index Fund		278,694,899.12	
Russell 2000 Growth Index Fund		28,581,233.58	
Opus		35,589,268.24	
Intech		83,554,432.57	
T. Rowe Price		<u>84,243,945.79</u>	
Subtotal Domestic Equity			691,018,826.45
<u>Covered Calls</u>			
Parametric (BXM)	\$	113,240,817.65	
Parametric (Delta-Shift)		117,851,645.90	
Van Hulzen		<u>104,202,943.29</u>	
Subtotal Covered Calls			335,295,406.84
<u>International Equity</u>			
Franklin Templeton	\$	101,176,725.37	
Fisher Investments		<u>112,452,865.41</u>	
Subtotal International Equity			213,629,590.78
<u>Real Estate</u>			
RREEF America REIT II	\$	34,674,374.00	
Center Square		<u>48,622,315.84</u>	
Subtotal Real Estate			83,296,689.84
<u>Fixed Income</u>			
CS Mckee	\$	140,263,025.82	
Western Asset Mgt Co-Short Term Inv Grade		66,645,449.95	
Western Asset Mgt Co-Short Term High Income		33,839,646.05	
Western Asset Mgt Co-Short Term High Yield		<u>31,132,258.64</u>	
Subtotal Fixed Income			271,880,380.46
Total for Domestic and International Equities			<u>1,595,120,894.37</u>
MARKET VALUE of ASSETS at May 31, 2017		\$	<u>1,598,731,033.94</u>

Respectfully submitted,


D. Scott Klein
Controller



Semadar Barzel
Treasury Mgr.


S. F. Lindley
Acctg Sys Supvr.
prepared by mhouch

EAST BAY MUNICIPAL UTILITY DISTRICT

DATE: July 20, 2017

MEMO TO: Members of the Retirement Board

FROM: Elizabeth Grassetti, Sr. Human Resources Analyst 

SUBJECT: Declaring Results of the Election of an Employee Member of the Retirement Board

The election of an employee member to the District Retirement Board has been completed. The District Retirement System Election Committee has certified the following results:

A total of 630 ballots were cast in the 2017 election of an employee member to the Retirement Board. Valid ballots totaling 630 were tallied by the Election Committee.

The results of the tally are as follows:

Douglas Higashi	617
Others	13

I hereby certify that Douglas Higashi has been elected to the Retirement Board for a two-year term beginning June 24, 2017.

EG:eg

R.B. RESOLUTION NO. 6864

DECLARING THE RESULTS OF AN ELECTION OF AN EMPLOYEE MEMBER OF THE
RETIREMENT BOARD

Introduced by: ; Seconded by:

WHEREAS, Section 4(a) of the Retirement Ordinance provides for election by and from membership of the Retirement System to fill a vacancy on the Retirement Board created by the expiration of the term of an elected Retirement Board member, and the Secretary of the Retirement Board has certified that Douglas Higashi has been elected by the membership of the Retirement System as a member of the Retirement Board pursuant to an election conducted for said purpose;

NOW, THEREFORE, BE IT RESOLVED that Douglas Higashi is hereby declared a member of the Retirement Board and that said member shall serve a period of two years commencing June 24, 2017.

President

ATTEST:

Secretary

07/20/17



PENSION
CONSULTING
ALLIANCE

Date: July 20, 2017

To: East Bay Municipal Utility District Employees' Retirement Board
("EBMUDERS" or the "System")

From: Pension Consulting Alliance, LLC (PCA)

RE: Recommendations: Proxy Service Provider

Recommendations

- **PCA slightly prefers Glass Lewis as a proxy service provider for EBMUDERS** due to:
 - our view that Glass Lewis offers deeper research, including on ESG issues;
 - the Glass Lewis platform is somewhat more user friendly (perception of reference checks from clients using both Glass Lewis and ISS);
 - the annual fees quoted by each firm are in ballpark range of each other – a difference of approximately \$2,500 if EBMUDERS retains either firm for a specialty policy (Glass Lewis' \$19,786/year fee includes a 10% overage of ballots and annual meetings with no fee increase as compared to ISS' \$17,265/year fee with a 15% overage allowance);
 - Glass Lewis sells its products only to asset owners and managers as compared to ISS, which also provides services to companies.
 - Glass Lewis ownership is by like-minded public pension funds as compared to ISS, which is currently owned by a private equity fund.
- **Select Glass Lewis' Public Fund Specialty Policy, [or ISS' Public Fund Specialty Policy, should the Board select ISS] as best fit to EBMUDERS' proxy voting approach.** Glass Lewis has indicated that they will include the opportunity for slight adjustments to the policy should EBMUDERS wish to fine-tune the policy. The process includes an annual review of the policy.

Background

Glass Lewis & Co. LLC.: Founded in 2003, Glass Lewis is now 80% owned by the Ontario Teachers' Pension Plan and 20% owned by the Alberta Investment Management Co., which invests on behalf of 28 public pension plans. Glass Lewis provides clients with five guideline options, including their standard Glass Lewis, ESG, Taft-Hartley, Public Pension, and Catholic. For a higher fee, clients may develop custom proxy guidelines. Glass Lewis grew through internal development, acquisition, and strategic partnerships. Most recently, in 2016, the firm announced a strategy partnership with Sustainalytics (a leading provider of ESG research, ratings and analysis). In February 2017, Glass Lewis began integrating Sustainalytics' ESG research and ratings into Glass Lewis' Proxy Paper (research) and Viewpoint (Glass Lewis' vote management platform).

Glass Lewis Clients: Glass Lewis currently has approximately 50 U.S. public fund clients, which represents about half of their total global public pension fund client base. Forty of the 50 subscribe to vote execution services (the remainder subscribe to only research or another product such as Share Recall or ESG screening tools). Due to privacy constraints, Glass Lewis declined to publicly disclose details of some of its clients. Four of the five largest U.S. public

pension funds, seven of the 10 largest, and 13 of the 25 largest use Glass Lewis as their sole proxy voting agent. A representative list of U.S. public pension proxy voting clients has been provided below.

Los Angeles Water & Power
Los Angeles Fire and Police Pensions
Kern County Employees Retirement
CalPERS
CalSTRS
New York State, Office of the
Comptroller
New York State Teachers
North Carolina Retirement System
Ohio Public Employees

Washington State Investment Board
Oregon Public Employees
Michigan Department of Treasury
State University Retirement System of Michigan
Pennsylvania School Employees
Colorado Public Employees
Tennessee Consolidated Retirement System
Utah Retirement System
Illinois State Board
Florida State Board

Glass Lewis Specialty Policy use and differences

	Glass Lewis Policy	ESG Policy	Public Fund Policy	Taft-Hartley Policy
Policy Focus	The focus of Glass Lewis' standard proxy voting guidelines is to facilitate shareholder voting in favor of governance structures that will drive performance and create shareholder value.	Glass Lewis' ESG guidelines include an additional level of analysis on behalf of clients seeking to vote consistent with widely-accepted enhanced environmental, social and governance practices. Votes for reductions and disclosure.	The Public Pension guidelines are designed to ensure compliance with the special fiduciary responsibilities of public pension plan sponsors in voting proxies on behalf of public employees. Favors disclosure.	The Taft-Hartley guidelines are fully compliant with the fiduciary voting responsibilities of the Taft-Hartley Labor Act as well as the fiduciary requirements imposed by ERISA requiring a plan sponsor to protect a labor fund's assets.
Board Opposition	U.S.: 9% Global: 13%	U.S.: 20% Global: 20%	U.S.: 21% Global: 21%	U.S.: 13% Global: 45%
Say on Pay Opposition	U.S.: 23% Global: 28%	U.S.: 23% Global: 28%	U.S.: 22% Global: 28%	U.S.: 22% Global: 28%
Shareholder Proposal Support	U.S.: 37% Global: 30%	U.S.: 77% Global: 60%	U.S.: 73% Global: 52%	U.S.: 74% Global: 54%

Source: Glass Lewis (The results above are from 4/1/2016 -12/31/2016)

ISS, founded in 1985, is now owned by Vestar Capital Partners, a middle-market private equity firm specializing in management buyouts, recapitalizations and growth equity investment. ISS offers clients its general ISS guideline option or, for an additional fee, one of five specialty guidelines, including ISS Public Funds, Sustainability, Socially Responsible Investing, Labor Unions, Mission and Faith Based. For a higher fee, ISS provides the ability to develop custom proxy voting guidelines. ISS has grown through internal development and acquisition. Since its acquisition by Vestar in April 2014, ISS expanded its offerings to include a suite of socially responsible investing solutions and services through the acquisitions of Ethix SRI Advisors and IW Financial and has augmented its compensation-related offerings through the purchase of Incentive Lab.

ISS Clients: ISS serves more than 1,700 clients. As a matter of policy, ISS does not disclose client names. ISS serves more than 200 asset owner clients, of which approximately 150 are pension funds. Of those pension funds, 83 are in the U.S., including eight based in California. Approximately 15 U.S. public pension fund clients subscribe to ISS' off-the-shelf specialty policies. ISS included as references: Louisiana State Employees Retirement System, Fire and Police Pension Association of Colorado, and Los Angeles City Employee's Retirement System.

ISS Specialty Policy use and differences

	ISS Policy	Sustainability Policy	Public Policy	Fund	Taft-Hartley Policy
Policy Focus	Investment firms and large institutional investors. "Best Practice" standards that promote total shareholder value & risk mitigation.	UN PRI Signatories or similarly aligned investment managers & asset owners. UNPRI	Public pension fund managers & public plan sponsors/trustees. Long-term best interests of public plan participants & beneficiaries.		Taft-Hartley pension funds & investment managers (ERISA). Worker-owner view of long-term corporate value based on the AFL-CIO proxy voting guidelines.
Board Opposition	3%	3%	32%		40%
Say on Pay Opposition	8%	5%	18%		18%
Shareholder Proposal Support	Gov: 75% E&S: 62%	Gov: 75% E&S: 75%	Gov: 87% E&S: 94%		Gov: 87% E&S: 94%

*Recommendations for shareholder meetings in the S&P500 (2016).

Source: ISS

Appendix – Fee Quotes

Glass Lewis: 10% overage buffer included

Description	Quantities	Unit Cost	Cost
U.S. Meetings/Research/Reports	764+10%=840	\$13.40	
International Meetings/Research/Reports	157+10%=173	\$30.00	
Ballots Cast	1739+10%=1,913	\$2.00	
Policy Guidelines and Maintenance	N/A	Included	Included
Reporting on Voting	N/A	Included	Included
Staff Availability	N/A	Included	Included
Total: Provision of policy guidelines and maintenance, proxy voting, reports and staff availability			\$19,786

Source: Glass Lewis

ISS: 15% overage buffer included

Description	Quantities	Unit Cost	Cost
U.S. Meetings/Research/Reports	765[+15%=880]	\$12.00	\$9,168.00
International Meetings/Research/Reports	157[+15%=181]	\$15.00	\$2,355.00
U.S. Ballots cast	1,465[+15%=1,685]	\$1.25	\$1,831.25
International Ballots cast	274[+15%=315]	\$1.50	\$411.00
Policy Guidelines and Maintenance (ISS Specialty Policy: Choice of Sustainability, Public Fund, etc.) Please Note: If EBMUDERS would like to use the ISS Benchmark Policy, then this fee will be waived. If EBMUDERS would like a fully customized proxy voting policy, then an additional fee between \$1,500 and \$4,000 would be added.	1	\$3,500	\$3,500.00
Proxy Reporting: Standard reports listed in Question #5 included. Custom Reports available for additional fee. The great majority of clients find standard reports to be sufficient.	N/A	Included	Included
Staff Availability	N/A	Included	Included
Total			\$17,265.25

Source: ISS



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While PCA has reviewed the terms of the Fund referred to in this document and other accompanying financial information on predecessor partnerships, this document does not constitute a formal legal review of the partnership terms and other legal documents pertaining to the Fund. PCA recommends that its clients retain separate legal and tax counsel to review the legal and tax aspects and risks of investing in the Fund. Information presented in this report was gathered from documents provided by third party sources, including but not limited to, the private placement memorandum and related updates, due diligence responses, marketing presentations, limited partnership agreement and other supplemental materials. Analysis of information was performed by PCA.

An investment in the Fund is speculative and involves a degree of risk and no assurance can be provided that the investment objectives of the Fund will be achieved. Investment in the Fund is suitable only for sophisticated investors who are in a position to tolerate such risk and satisfy themselves that such investment is appropriate for them. The Fund may lack diversification, thereby increasing the risk of loss, and the Fund's performance may be volatile. As a result, an investor could lose all or a substantial amount of its investment. The Fund's governing documents will contain descriptions of certain of the risks associated with an investment in the Fund. In addition, the Fund's fees and expenses may offset its profits. It is unlikely that there will be a secondary market for the shares. There are restrictions on redeeming and transferring shares of the Fund. In making an investment decision, you must rely on your own examination of the Fund and the terms of the offering.

EAST BAY MUNICIPAL UTILITY DISTRICT

DATE: July 20, 2017

MEMO TO: Members of the Retirement Board

THROUGH: Lisa Sorani, HR Manager of Employee Services

FROM: Elizabeth Grassetti, Sr. Human Resources Analyst

SUBJECT: Crediting Interest Rate on Member Contributions

ACTION: Vote on Resolution No. 6865

RECOMMENDATION

Approve Resolution No. 6865

BACKGROUND

The Retirement Ordinance, Section 4(d), directs the Retirement Board to semi-annually declare the rate of interest to be credited to accumulated Member contributions.

In accordance with Retirement Board Rule B-9, the annual rate of interest credited to Member contributions will be the lesser of the actuarially assumed rate of interest or the five (5) year average rate of return on Retirement System investments for the period ending December 31, 2016. The actuarially assumed rate of interest is 7.25%, and the five-year average rate of return as of December 31, 2016 was 10.6%.

Therefore, Resolution No. 6865 declares that the interest credited to the balance of Member contributions effective June 30, 2017 will be at the annual rate of 7.25%. The rate credited to Members account will be prorated to a semi-annual rate of 3.625%.

R.B. RESOLUTION NO. 6865

DECLARING THE INTEREST RATE

Introduced by:

; Seconded by:

WHEREAS, section 4(d) of Ordinance, as amended, provides that the Retirement Board shall semi-annually declare the rate of interest for the preceding six (6) months to be credited on accumulated contributions of members, which rate shall be based upon criteria to be established by the Retirement Board; and

WHEREAS, the crediting rate be the lesser of the actuarial assumed rate of seven and one – quarter percent (7.25%) or the actual five (5) year earnings rate of the fund, determined to be ten and six-tenths percent (10.6%) for the period ending December 31, 2016;

NOW THEREFORE, BE IT RESOLVED that the Retirement Board does hereby declare a seven and one-quarter percent (7.25%) annual interest rate. The rate credited to members account will be three and six hundred twenty-five thousandths percent (3.625%) for the six (6) month period ending June 30, 2017, in accordance with Rule B-9 of Retirement Board.

President

ATTEST:

Secretary

07/20/17

EAST BAY MUNICIPAL UTILITY DISTRICT

DATE: July 12, 2017

MEMO TO: Members of the Retirement Board

FROM: Sophia D. Skoda, Director of Finance *SDS*

SUBJECT: Tipping Point Discussion

For many years the Retirement System's benefit payments have been paid from annual contributions made by and on behalf of current employees. As older employees retire, cash flow generated by annual contributions is no longer sufficient to cover the cost of benefits paid to retirees. Staff and Retirement System consultants have determined that, unlike the past five years when contributions and benefit amounts were approximately equal, projections show an emerging trend over the next ten years of benefit payments exceeding contributions. Staff has worked with the Retirement System's consultants to evaluate this "tipping point." Staff will present the projections and Pension Consulting Alliance (PCA) will discuss options for addressing them.

The Retirement System's Statement of Investment Policy and Procedures (the Policy) Section IV.A.7., requires the District to "maintain enough cash as working capital to effectively meet cash flow demands on the system. These funds are not considered investable System assets." Pursuant to the Policy, working capital is managed by District staff. In order to ensure compliance and meet the cash flow demands of the Retirement System, the District invests bi-weekly contributions in the State of California Local Agency Investment Fund (LAIF) and withdraws funds as needed to make monthly benefit payments.

Periodically over the past decade working capital grew sufficiently large that staff transferred funds out of the LAIF account into Retirement System assets held at Northern Trust. Approximately \$18 million was deposited into Retirement System assets over that time. In Fiscal Year 2017, for the first time staff needed to transfer \$8 million out of Retirement System assets and into LAIF. As a result, staff worked in concert with the Retirement System's Actuary (Segal) and General Investment Consultant (PCA) to determine whether this transfer was part of a short-term imbalance or signaled a new long-term trend.

Segal provided Retirement System data including contribution amounts and rates, participant mix, cash earnings, and cash flow of Retirement System assets, for the past five years and projected ten years into the future. The data showed that, while over the past five years contributions and benefit amounts generally equaled each other, a persistent need is projected over the next ten years for additional transfers into working capital.

The most significant reason is a change in the member mix, as older members retire and new members are hired. Members' contributions are based on their benefit levels. Older members' formula provides greater benefits than those offered newer members and contribution rates for newer employees, which are based on the new formula, are lower. Cash flow generated from

new member contributions fails to cover benefits provided current retirees under the old formula. Over the long term this imbalance will correct itself but in the interim the Retirement System is projected to experience a persistent cash flow shortfall.

While persistent, the shortfall is projected to be comparatively limited in amount. Conservative actuarial projections show that in the near term it is likely to approximate the daily fluctuations of the current portfolio, gradually increasing by 2027 to approximately two percent of 2016 assets. None of the projected shortfalls threaten the viability of the Retirement System as they are still below the overall projected growth of Retirement System assets over the same time period (i.e., assets will still grow, even if the amounts necessary to cover the shortfalls are withdrawn). Tools to manage this projected shortfall and the resulting cash-flow impact will be presented by PCA.

SDS:DB:DC



EAST BAY MUNICIPAL UTILITY DISTRICT

Tipping Point Discussion

**Retirement Board Meeting
July 20, 2017**

Agenda



- Tipping point basics
- The 3 types of tipping points
- Summary and perspective

Tipping Point Basics



- What is a tipping point?
 - An inflexion point
 - Imbalance between inflows and outflows
 - Can be positive or negative
- Why look at the Retirement System?
 - Changing dynamics of the Plan
 - Possible post-PEPRA effects

Tipping Point Basics (continued)



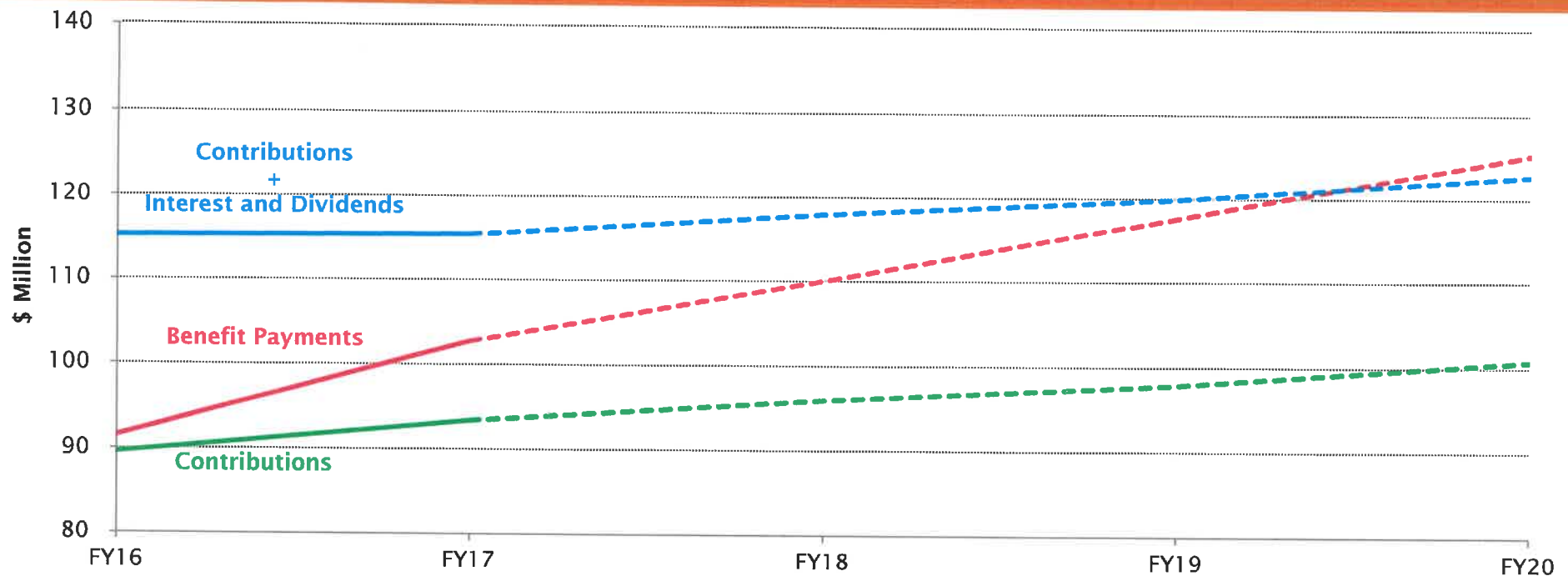
- What is driving our tipping point:
 - Plan members mix is changing
 - Large share of employees are retiring
 - Retirees receive benefits under older formula
 - Lower contributions for PEPRA employees
- What is not driving our tipping point:
 - Lack of contributions or lower returns
 - Contribution actuarially sized to fully fund system
 - District made all actuarially required contributions
 - Historical returns are close to actuarial ones

Tipping Point Type #1 FY12-FY16



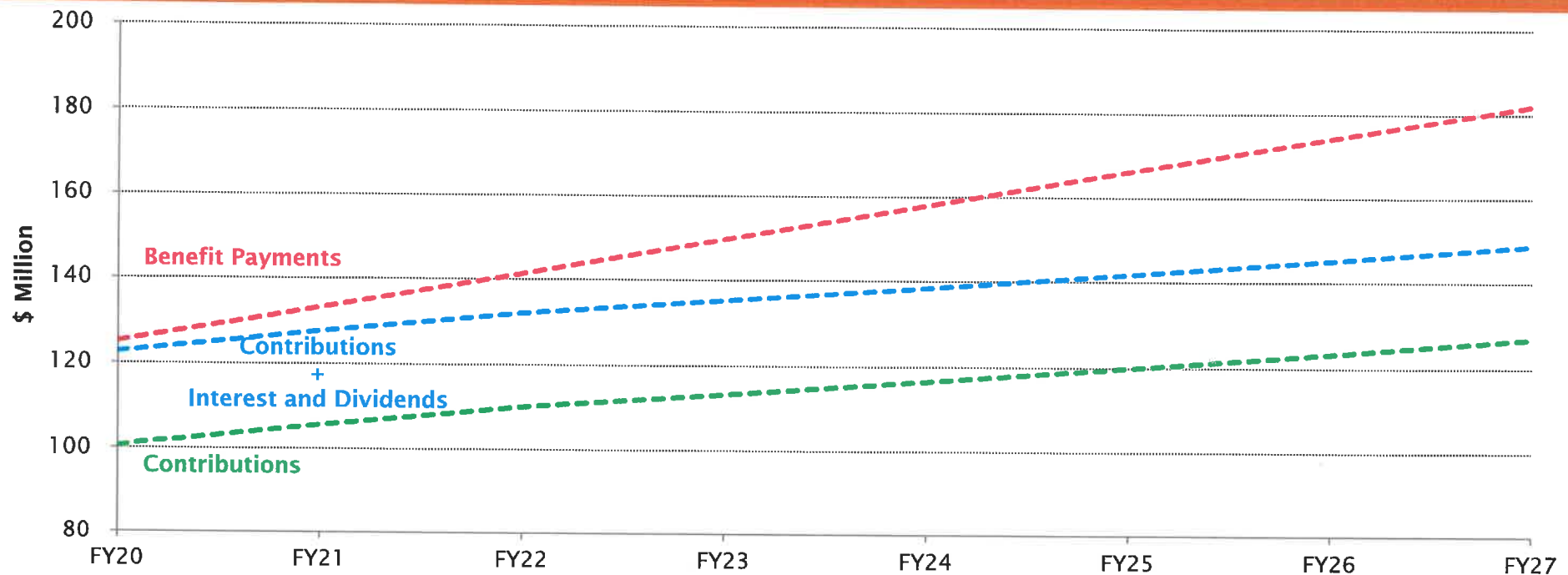
- Benefit payments roughly equal bi-weekly payroll contributions
 - May be slightly over or under in any given year
- Minor cash flow smoothing addressed by District staff
- ERS in this phase FY12-FY16

Tipping Point Type #2 FY16-FY20



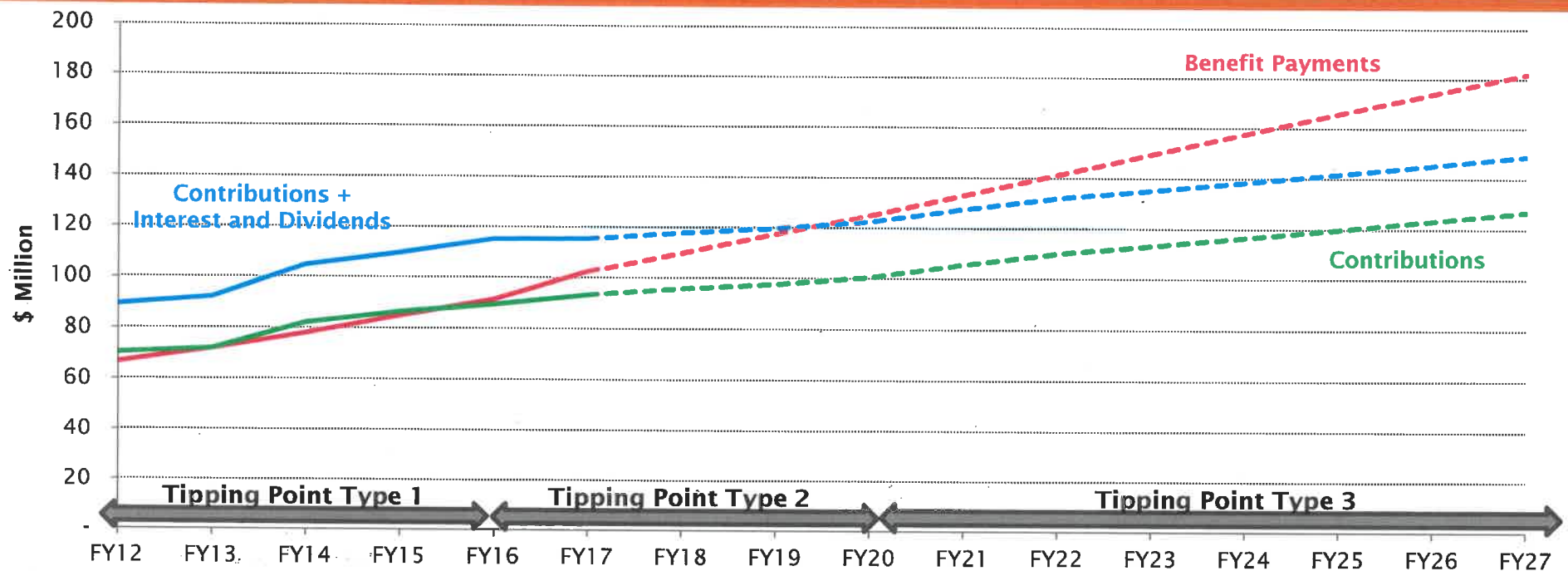
- Benefit payments are greater than contributions
 - Persistent shortfall from bi-weekly payroll contributions
- Bi-weekly contributions cash flow need to be supplemented by cash earnings from interest and dividends of the Plan
- ERS entered this phase in FY16, projected to extend until FY20

Tipping Point Type #3 FY20-FY27



- Benefit payments are greater than contributions+cash earnings
 - Continued shortfall from bi-weekly payroll contributions
 - Cash earnings insufficient to bridge gap to benefit payments
- Sale of Plan asset required to meet cash flow
- Projections for this phase to accelerate for ERS after FY20

Summary and Perspective FY12-FY27



- **Not a fiscal cliff** - cash flow needs grow slowly over time
- **Scale matters**
 - Projected FY27 shortfall less than 2% of FY16 assets
 - Plan assets still projected to continue growing, decreasing impact
- Actual experience will differ from projections

Conclusions



- Real world data matters
 - Actual investment results (from mix of assets and investment returns) will grow the fund
 - Projected cash flow needs are smaller than projected portfolio growth
 - Assumed rate of return affects contributions
- Timing matters
 - Retiree mix will change again
 - 1980 plan members will be retired
 - 2013 plan members will start retiring
 - Contributions/benefits relationship is affected

Conclusions (continued)



- A milestone for the portfolio
 - Entering a new era with new variables
 - Projected shortfall in FY20 similar in size to current daily changes in portfolio value
 - Projected draws to FY27 are smaller than projected growth of assets with current asset mix
 - Cash flow demands increase but plan assets continue to grow



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The background of the slide is a stylized illustration of a mountain range. The mountains are depicted in various shades of blue and grey, with some peaks appearing more prominent than others. The overall style is minimalist and modern, with clean lines and a soft color palette. The mountains are set against a light blue sky, and the foreground shows a dark, silhouetted mountain range.

Strategic Income Class Discussion

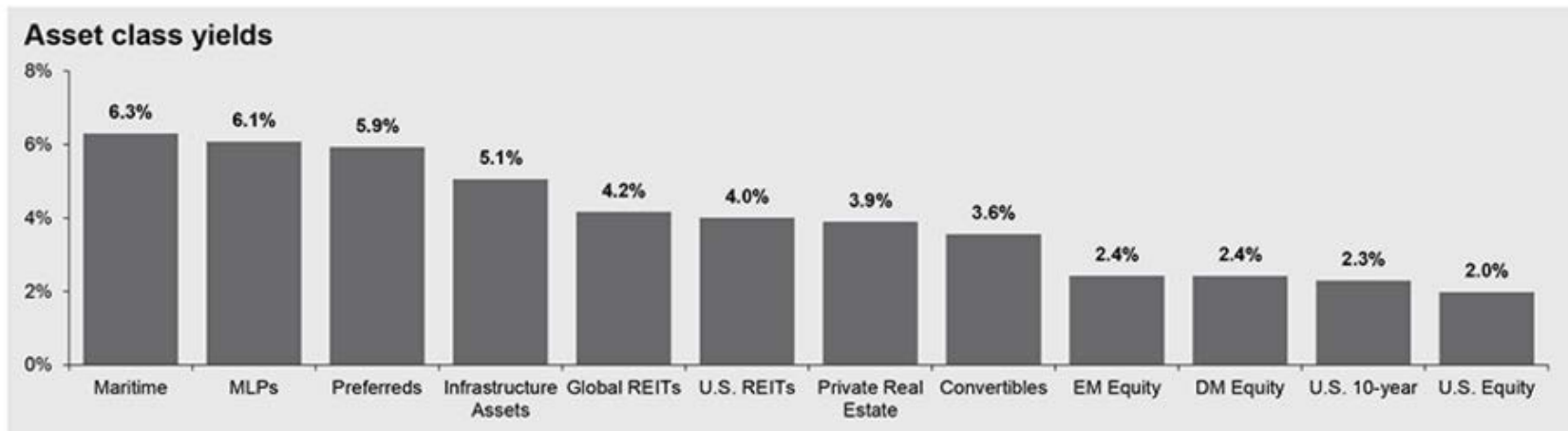
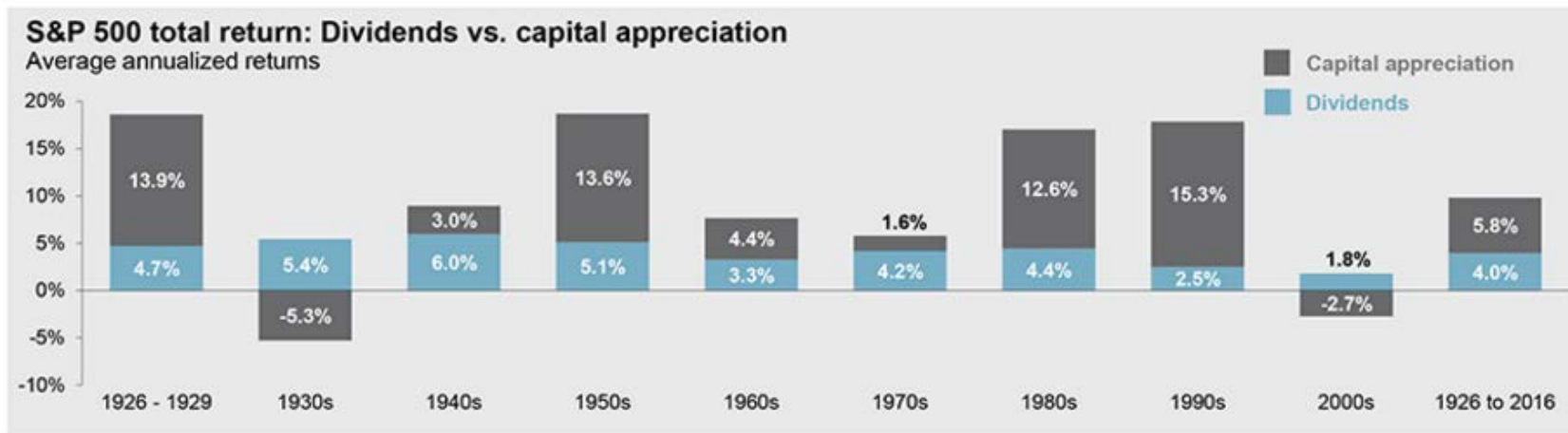
Eric White, CFA
July 2017

Income Class Portfolio: Why Income?

- EBMUDERS has a need for income to make monthly benefit payments
 - Plan has net negative external cash flow (benefits > contributions)
- There are two primary sources of investment return:
 1. Income/Yield (dividends or interest income)
 2. Price Appreciation/Depreciation
- Income (yield), all else equal, is a less risky source of return (i.e., more predictable)
 - Income is relatively stable and paid in the near future whereas appreciation is, by contrast, relatively uncertain and typically realized further in the future
- Potential for an Strategic Income Class to be part of upcoming asset / liability review
- An Income Class decreases pension payment management complexity
- Portfolio cash flows can forestall point at which Plan assets must be sold to meet benefit payments

Income Class Portfolio: Why Income?

- Almost all plan assets produce some form of positive cash flow
- Portfolio cash flows are an important component of total returns
 - Accounts for essentially all of Fixed Income's expected return while approximately 40% of equity's expected return



Income Class Portfolio: Basic Construct

A functional class designed to generate relatively high income

Investment Objectives:

- Yield of Core fixed income + spread (200-500 bps)
- Volatility lower than public equity but higher than core fixed income
 - Composition of Class dictates risk/return outcomes

Investment Characteristics:

- Income primary source of total return
- Composed of multiple sub-asset classes (high yielding fixed income, equity assets, etc)
- Public as well as potentially private assets

Risks:

- Economic Growth (i.e., equity risk)
- Credit Risk (i.e., risk of default)
- Interest Rate Risk
- Active Management Risk
- Liquidity Risk

Income Class Portfolio: Investable Universe

Deep and broad investable universe

1. Liquid, High Yielding Debt Strategies
 - Investment Grade Credit
 - High Yield Bonds / Bank Loans
 - Structured Credit / CLOs
2. Private Credit (not Growth portfolio)
 - i.e., middle market secured debt
 - Performing credits & immediately paying income (not deferred)
 - Fund final maturity <7 years
3. Equity Securities
 - Dividend focused strategies
 - REITs
 - MLPs
4. Other
 - Convertible Bonds

Income Class Portfolio: Important Considerations

Diversification

- The Income Class is not designed as a diversifier to total portfolio equity (growth) risk
- Diversification from the Income Class is not a primary objective
- The portfolio will be diversified across numerous sources of income (yield)

Other Considerations

- Income Class return will likely fall short of the Plan's assumed rate of return in current interest rate environment
- Siphoning off of cash flow will likely result in static portfolio allocation – little appreciation
- Credit appears to be relatively expensive relative to history – may benefit from opportunistic reallocations
- Portfolio structure will have a large impact on yield and risk profile
- Portfolio structure will determine if cash flows grow over time

Income Class Portfolio: Current Allocation

- The EBMUDERS' portfolio already has some of the building blocks for a Strategic Income Class
- The current Non-Core Fixed Income portfolio is already structured to be income oriented (2013 A/L: strategic decision to shift from interest rate risk to credit risk)
- Current portfolio is allocated 50% to short-term investment grade securities, 25% to short-dated High Yield, and 25% to bank loans
- Consider evolving short-term investment grade mandate into intermediate investment grade Credit allocation
 - Should materially increase portfolio yield
 - Evolves into an intermediate term allocation as interest rates continue to normalize
- A Strategic Income class should be large enough to “move-the-needle” in terms of income generation (likely larger than current Non-Core Fixed Income class)

Appendix

Income Class Portfolio: Terminology

- Arithmetic (average) Return
 - The return expected in any single given year
- Geometric/Compound (average) Return
 - The average/annualized return expected over a multi-year (e.g., 10) horizon
 - Geometric return = compound return
 - Due to volatility impacts, the geometric/compound average return is always less than the arithmetic average return
- Volatility/Standard Deviation
 - A measure that broadly describes how wide/narrow a distribution of returns is
 - Roughly 2/3 of all outcomes/observations fall within +/- one SD
- Annual Yield
 - The annual cash distribution
 - May be distributed monthly, quarterly, bi-annually, or annually



DEVELOPING EXPECTED RETURN AND RISK ASSUMPTIONS

March 2017

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PCA

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INTRODUCTION

A key tenet underpinning the strategic allocation decision-making process is that diversification across major strategic asset classes (asset classes with exposure to distinct compensated risk factors) can enhance a portfolio's risk-adjusted returns. As a result, within our modeling process, we develop expectations for investment returns, risks, and co-movements of and among strategic investment classes. The development of these expectations is the focus of this report.

This report will review our approach for developing expected average annual long-term returns, volatility, and correlations for and among several asset classes. While use of these expectations are consistent with the mean-variance approach to strategic allocation optimization that has been relied upon by the investment industry for several decades, the mean-variance approach is being critically examined by a wide spectrum of leading investment practitioners, including ourselves. One conclusion is that, since the mean-variance approach is a single-horizon model, it is limited in its applicability to measuring risk *within* an investment horizon, particularly if correlations between asset classes are non-constant (change during the period). Historically, asset class correlation relationships have not been constant. Therefore, such within-horizon risk analysis is critical for plan sponsors requiring an assessment of how asset allocation might potentially impact the interim funding risks of the overall plan. In spite of these issues, assumptions about investment class behavior are still required for the mean-variance framework, and the framework allows practitioners and users a familiar tool for analyzing portfolios.

Therefore, despite the issues identified above concerning the limitations of mean-variance optimization, the base metrics to be established from this analysis will be the traditional measures of expected return volatility (standard deviation) and co-movement (correlation). Nevertheless, we encourage investors to consider other types of portfolio-level and asset class-level risks for more complete analysis of portfolio risk including:

Portfolio level risks

1. Shortfall Risk (the risk of the plan being unable to pay out all future beneficiaries)
2. Drawdown Risk (the risk of many assets declining in tandem during a market panic)
3. Cash Flow Risk (the risk that cash will be unavailable to make interim payments to beneficiaries without borrowing money or a distressed sale of assets)

Asset class level risks

1. Valuation Risk (the risk that asset class cash flows decrease / or uncertainty of the cash flows increase, due to changes in the expected future level of the factor(s) driving the cash flows or uncertainty regarding the future level of such factor(s) themselves.)
2. Active risk (the risk that active management within an asset class will increase risk or decrease return relative to a passive alternative)
3. Illiquidity Risk (the risk that the market for the asset becomes less active or inactive)

As indicated above, return and risk expectations resulting from our analysis will assume normality and constant correlation relationships, though we are aware of the fact that these assumptions are not supported by historical evidence. Users of these assumptions are thus forewarned, and should use these assumptions as a starting place, and not the culmination of their analysis.

PROCESS FOR DEVELOPING EXPECTED RETURNS, RISKS, & CORRELATIONS

PCA's approach for developing mean-variance expectations of returns, risks, and correlations combines the use of investment class history, current investment class fundamentals, and factor drivers of investment class correlations. Before reviewing our approach to developing expectations, it is important to recognize that our objective is to establish expectations for investment classes that reflect a general *consensus view* of how such investments and their markets are expected to perform in the future. PCA's focus is not the development of shorter-term investment class expectations (less than 3 years) that might be used for tactical purposes. In addition, it is widely recognized that the entire expectation-setting exercise is highly subjective and may contain significant forecast error. That being said, PCA reviews a broad range of economic, fundamental, and investment industry data when examining and adjusting its forward-looking mean-variance assumptions.

Different procedures are utilized to develop expectations for real returns, risks, and correlations. PCA's approach to developing asset class return expectations is to utilize the well-known "building block" approach (see discussion below). This approach combines both fundamental and historical information and data. Developing expectations for risks and correlations relies more heavily on an analysis of historical data. However, PCA closely examines the trends of these latter measures across investment classes in order to understand their probable future drivers. In addition, given the volatility of the trends, PCA may use statistical procedures to smooth data and / or emphasize more recent data rather than utilizing simple computational techniques that treat all asset class history as equivalent in its influence on the future.

DEVELOPING EXPECTED RETURNS – THE BUILDING BLOCK APPROACH

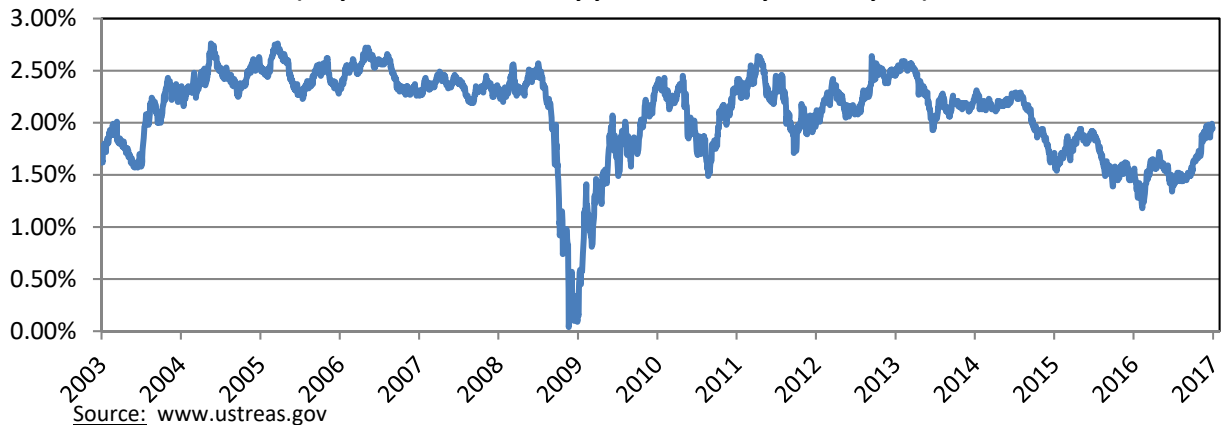
There are three general building blocks used to construct expected asset class returns: (i) an expected long-term rate of inflation, (ii) an expected return in excess of inflation that compensates an investor for making risk free investments (i.e., the "real risk free rate"), and (iii) an expected return premium for each investment class/market, depending on the amount and type of risk the typical investor is expected to bear when investing in such an investment class/market (i.e., the "risk premium"). As one might expect, the largest portion of most investment class returns comes from its respective risk premium exposures. Not surprisingly, the risk premiums are the most difficult to forecast.

DEVELOPING EXPECTATIONS FOR THE LONG-TERM RATE OF INFLATION

PCA uses both market-based fundamental measures and other sources of inflation expectations to determine an expected long-term rate of inflation. Market-based information includes differences in yield levels between the 10-year U.S. Treasury Note and the analogous yield of the 10-year Treasury Inflation Protected Security (or TIPS) Note. The difference between the 10-year U.S. Treasury Note yield and the 10-year TIPS yield is referred to as the "break even inflation rate." Since the 10-year TIPS Note yield is issued with a real yield (because the par value of the bond is reset quarterly based on the CPI-U), the breakeven inflation rate represents a market-based consensus view on inflation over the next 10-year horizon. As of 12/31/2016, the yield on the 10-year U.S. T-Note was approximately 2.45% while the real yield on the 10-years TIPS Note was approximately 0.50%. Thus, the breakeven inflation rate was 1.95%.¹ During the year, the measure ranged between 1.2% and 2.0%, above its level last year (see the following graph).

¹ The difference (2.25% - 0.75%), 1.50%, represents an initial baseline assumption for inflation.

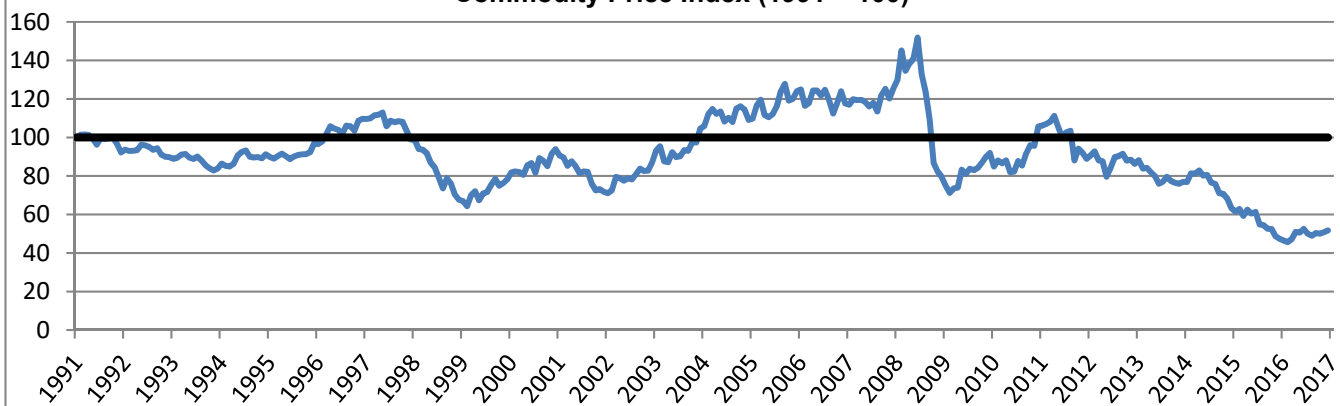
**FIGURE 1 - Implied Inflation Rate from 10-Year Breakeven Inflation
(10-year nominal Treasury yield minus 10-year TIPS yield)**



The TIPS market is a very large and liquid market, second only to the U.S. Nominal Treasury debt market and the developed world stock markets, suggesting that inflation expectations implied by trading in this market should be given serious consideration. However, several short-to-intermediate factors can impact breakeven inflation rates. Such factors include (i) the TIPS carry trade expectations (i.e., selling short TIPS and buying long TIPS), (ii) demand/supply differences between security types, and (iii) price volatility that is associated with headline inflation, but not the core CPI-U inflation (e.g., fluctuations in commodity prices). Therefore, inflation expectations indicated by this measure should be an average of readings over a period of time (not a point estimate), and the indication should be adjusted upward by approximately 0.30% to account for the liquidity differential between nominal Treasury bonds and TIPS.² The range of readings for the year (adjusted up by 30 basis points) is 1.5% to 2.3%.

Another harbinger of change in inflation expectations is movement in commodity prices. The price of oil rose in 2016, from a low near \$34 in January 2016 to a high of \$54 at the end of the year. Commodity prices more broadly followed suit, returning 11% as shown below.³

**FIGURE 2 - Inflation Adjusted Dow Jones UBS
Commodity Price Index (1991 = 100)**



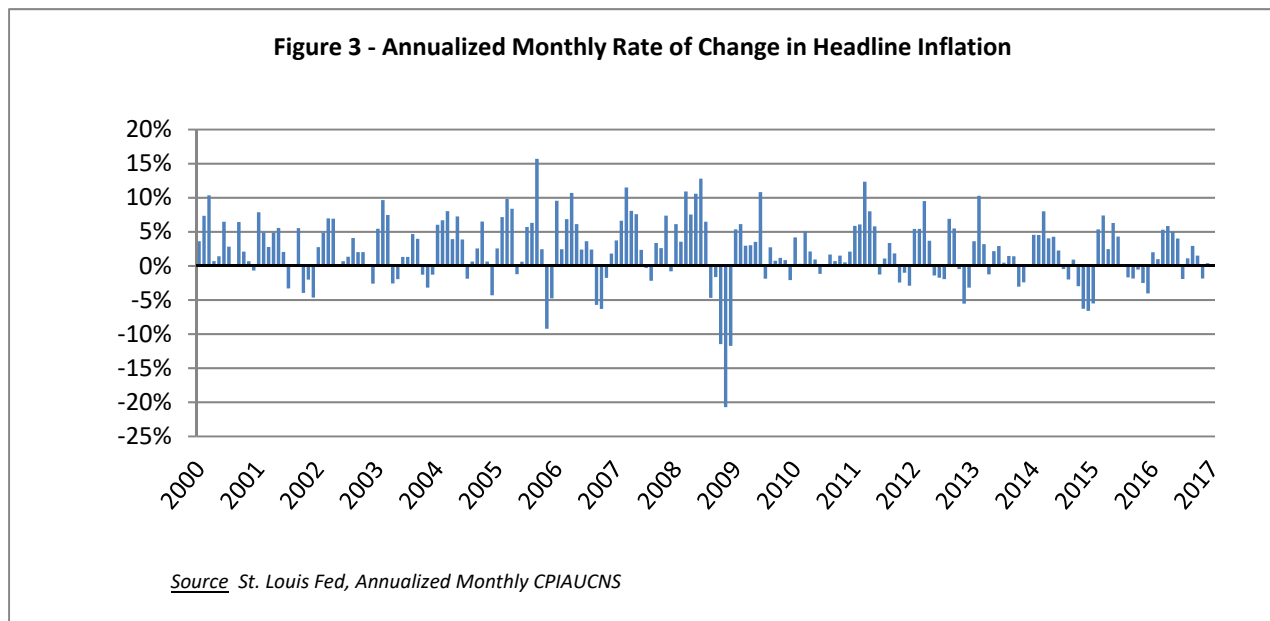
Source: Bloomberg DJUBS Index, St. Louis Fed for US CPI all

² Page 27: <http://www.frbsf.org/publications/economics/papers/2011/wp11-16bk.pdf>

³ Source: Bloomberg CL1 Comdty <GO>

2016 began with the interest rate on the benchmark 10-year Treasury at 2.2%. U.S. unemployment continued to decline from 4.9% at the beginning of 2016 to 4.7% at year end. Capacity utilization remained at 76%, and the 10-year Treasury yield rose increasing above 2% immediately after the 2016 presidential election.

For the year ended December 2016, inflation was 2.1% (CPI for all urban consumers, CPI-U). According to the Bureau of Labor Statistics January 20, 2016 release, *“The CPI rose 2.1 percent in 2016, a larger increase than the 0.8 percent rise in 2014 and the 0.7 percent advance in 2015. This also represented a larger increase than the 1.8 percent average annual increase over the past 10 years. The food index declined in 2016, falling 0.2 percent. This was its first yearly decline since 2009. The food at home index, which fell 0.4 percent in 2015, decreased 2.0 percent in 2016. This is the first time the food at home index declined in consecutive years since it declined four years in a row from 1952 through 1955.”*



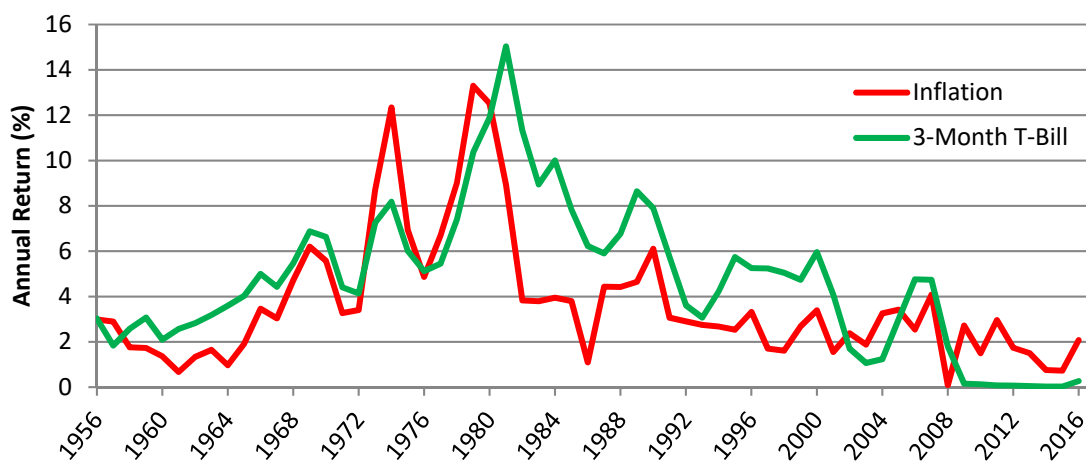
Given that market-based measures of inflation expectations provide a reasonable, but potentially volatile assessment, PCA also typically refers to other credible sources within the marketplace to gain a broader consensus view of inflation. Several of these sources include leading investment management firms and/or investment banks that are forecasting inflation in the range of 2.0% to 3.0%. However, PCA also considers other well-regarded sources such as the Survey of Professional Forecasters that estimated long-term average annual inflation over the next 10 years at 2.20%, and the University of Michigan Survey of 5-10 Year Ahead Inflation Expectations at 2.5%. In consideration of the aforementioned measures, trends and dynamics, PCA's long-term inflation assumption remains unchanged since last year at **2.25%**.

DEVELOPING EXPECTATIONS FOR THE REAL RISK-FREE RETURN

The real risk-free rate can take two forms: (i) a short-term rate of return based on default-free government debt and (ii) a real rate of return or real yield on a default-free zero-coupon bond whose duration closely matches the horizon of an investor's cash flow requirements. PCA examines the returns of 90-day Treasury Bills to address (i) and examines the yields on 10-year TIPS to address (ii).

Developing expectations for the short-term real risk-free return requires an examination of its history, as well as a qualitative assessment of the trend associated with the Fed's inclination to raise or lower its lending rates for the foreseeable future. Over recent history, linkage between inflation and Fed action has been loose at best (see chart below).

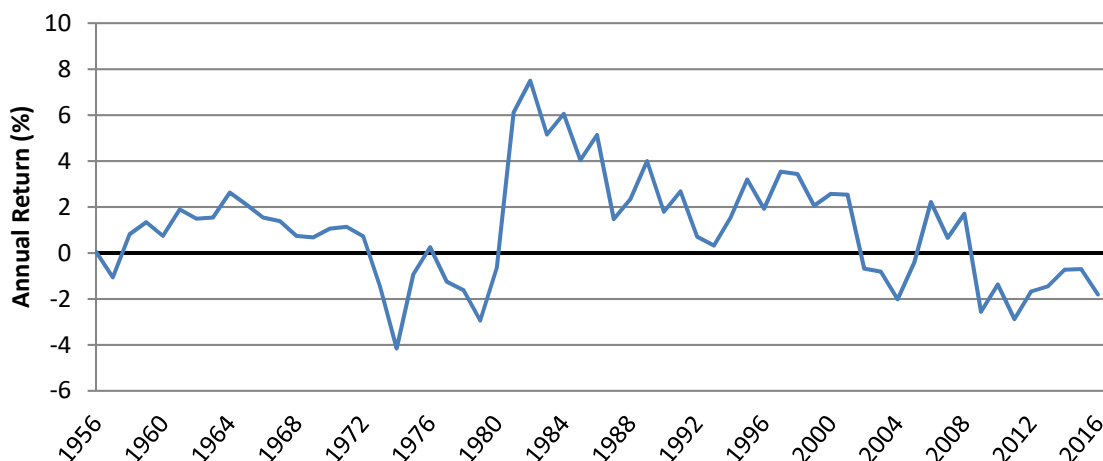
Figure 4 - History of T-Bills returns and Inflation



Source: Federal Reserve, BLS, Citigroup 3 month T-Bill Index

As indicated in the chart above, since the early 1990's, inflation in the U.S. has proven relatively benign, while short-term rates (as measured by the 3-month T-bill returns) have exhibited a wide range. As a result, the real risk-free rate (3-month T-bill minus inflation) has been quite volatile (see chart below).

Figure 5 - History of the Real Risk-Free Cash Rate of Return

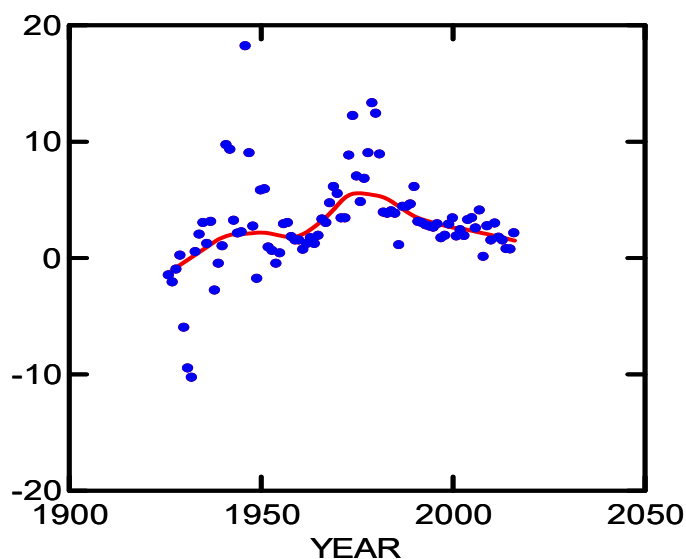


Source: PCA calculation of Citigroup 3 month T-Bill returns minus BLS annual CPI Data.

Furthermore, the real risk-free cash rate of return has averaged 0.5% since 1990, and -0.4% since 2000, with several episodes of significantly negative annual real returns to holding cash in the mid 2000's and most recently from 2009 through 2016. We expect negative real rates to continue in the near future.

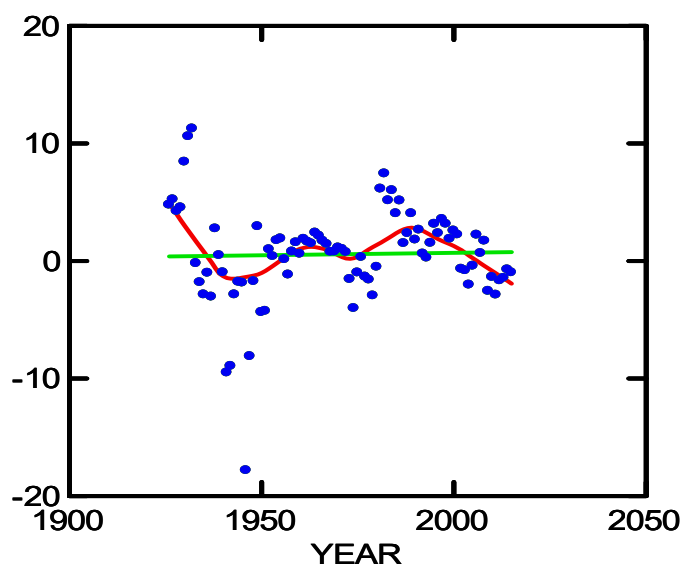
To further develop intuition about inflation and the real risk-free rate, we have examined the trends of their annual time series utilizing exponential smoothing techniques. Interestingly, both series have exhibited declining trends over recent history with no dramatic outliers (see charts below).

FIGURE 6 – Long-Term Trend of Inflation



Source: PCA

FIGURE 7 – Trend of the Real Risk Free Return



Source: PCA

At present, Federal Funds Rates, and hence T-Bill rates, are in the 0.50% to 0.75% range, after the Fed announced the second rate hike in a decade in December 2016. Per the language of the December 14, 2016 FOMC announcement:

“Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. The Committee expects that, with gradual adjustments in the stance of monetary policy, economic activity will expand at a moderate pace and labor market conditions will strengthen somewhat further. Inflation is expected to rise to 2 percent over the medium term as the transitory effects of past declines in energy and import prices dissipate and the labor market strengthens further. Near-term risks to the economic outlook appear roughly balanced. The Committee continues to closely monitor inflation indicators and global economic and financial developments.”

Given current market conditions, PCA's 10-year expectation for the annualized short-term real risk-free rate of return is 0.0%, implying a nominal return to cash of **2.25%**.

To determine a longer-term real, default-risk free rate (a default free, but volatile real rate estimate), we examine the yield of the 10-year TIPS Note. As discussed earlier, the TIPS' real yield was 0.50% as of 12/31/2016, falling from 0.75% as of 12/31/2015. Our expectation for the long-term real risk-free rate over the 10-year horizon is 0.50%.

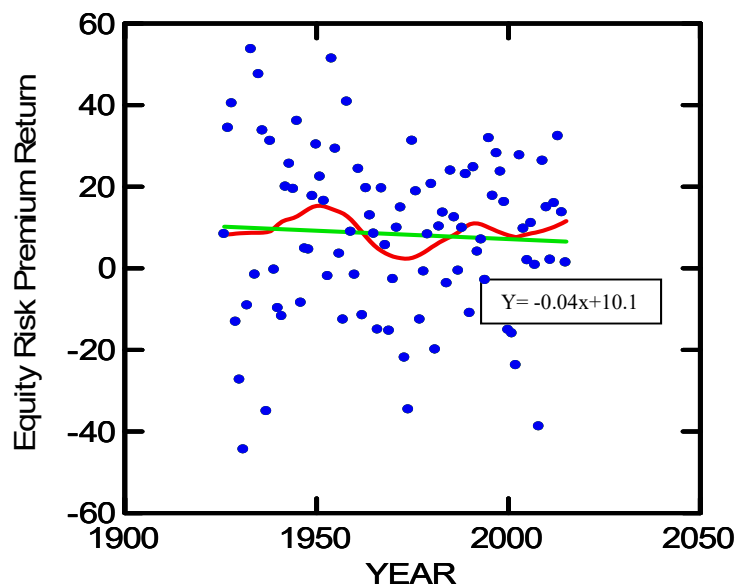
DEVELOPING EXPECTATIONS FOR THE U.S. EQUITY RISK PREMIUM

As highlighted earlier, the portion of an investment class's return associated with various risks above and beyond the risk-free return is often the largest and most volatile component of expected return, hence the most difficult to forecast. With these caveats in mind, PCA begins its analysis by examining the trends of various return risk premiums over time, not merely their averages. The behaviors of these trends provide two important signals about risk premiums: (i) whether there is any indication of cyclicity and (ii) whether long-term trends exhibit stability. From a long-term strategic perspective, outlying single-year returns and market events may prove to have only modest influence on long-term trends. Once such trends are confirmed, PCA extrapolates the trend to arrive at an initial estimate of an investment class's projected risk premium. Confidence in this trend estimate is also a function of investment class return history. The shorter the return history for a specific investment class, the less reliable the trend. For investment classes with less than 10 years of history, more qualitative approaches are used to develop risk premium estimates.

We compare these estimates derived from analysis of historical risk premiums and risk premium trend extrapolations to risk premium estimates derived via fundamental models. With estimates of the risk premium in hand, we compare those estimates with a spectrum of other practitioners, including investment advisors and other investment consulting organizations. To the extent that our estimates deviate significantly from these other sources, we will investigate, and if appropriate, make adjustments. Again, our effort here is to develop a set of reasonable consensus-based expectations.

As an example, the trend of the U.S. Equity risk premium return appears below.

FIGURE 8 – Trend of the U.S. Equity Risk Premium Return, Last 90 Years



Source: PCA

Figure 8 shows that the trend of the annual U.S. Equity premium has exhibited a cyclical behavior reaching respective peaks and troughs every 20 years or so. In addition, the linear trend line is nearly flat, but moving downward at a very modest slope likely attributable to decreasing volatility of economic growth during the course of the 20th century. After a strong year for U.S. equities in 2016, we moved our 10-year expectations slightly downward, and project the average level of the premium to be in the range of 5.75% to 6.75% per year over the next ten years.

We next examine how this finding reconciles with other analyses. Our first step is to compute estimates of long-term equity risk premium utilizing a basic dividend discount model:

$$RP_e = D/P + g - R_f \pm [\text{impact due to valuation changes}]$$

The last term is more subjective in nature and reflects an expected penalty/reward that is a function of where current price-earnings (P/Es) multiples are in relation to their historical averages. If P/Es on normalized earnings are relatively high, then one might argue that the future equity risk premium return will be penalized as the price level of equities is expected to revert towards historical averages over time. Conversely, if normalized P/Es are low, then one might expect the equity risk premium to be higher as the price level of equities rises over time.

To determine the inputs for the above model, we relied on several sources to estimate a rough consensus view of each variable (see figure 9).

FIGURE 9 – Dividend Discount Model Inputs & Estimated Equity Risk Premiums

Source	Benchmark	Real Earnings / Distributions Growth	Current Normalized Dividend Yield	Normalized Current P/E
		Long-Term (5+ Yrs.)	Dividend Yield	
JP Morgan	S&P 500	3.0%	2.0%	25.3x
BNY Mellon	Russell 1000	2.1%	2.0%	25.3x
Blackrock	S&P 500	3.3%	2.1%	25.3x
Averages		2.8%	2.0%	25.3x
Real Short-term Risk Free Rate		0.0%		
Dividend Yield		2.0%		
Valuation Adjustment		-0.75%		
Equity Risk Premium		4.05%		

Sources: JP Morgan, BNY Mellon, Blackrock, PCA

Notes:

Current normalized P/E's are based on normalized earnings estimate for the S&P 500 and prices as of 12/31/2016.

Risk-free rate estimates per PCA, discussed in the "Developing expectations for the real risk free return section.

Valuation adjustment is based on our judgment that the exit multiple will be lower than the current multiple.

Equity Risk Premium estimates = 2.8% + 2.0% - (-0.00%) -0.75% = 4.05%

$$RP_e = D/P + g - R_f \pm [\text{impact due to valuation changes}]$$

where:

RP_e is the estimated equity risk premium

D/P is the current dividend yield

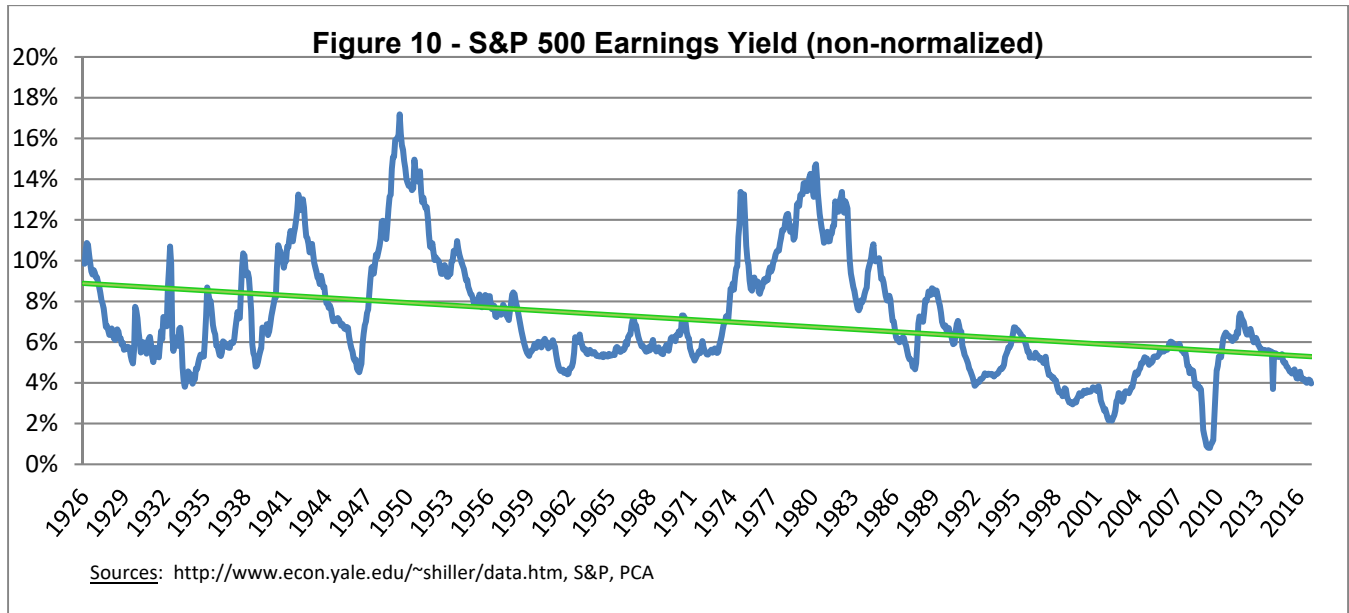
g is the long-term real dividend growth rate, and

R_f is the real risk-free rate.

JP Morgan, BNY Mellon and Blackrock are three highly regarded firms. BNY Mellon focuses on the Russell 1000 as a proxy for U.S. equities, while JP Morgan and BlackRock focus on the S&P 500. Given the risk premiums estimated using the dividend discount model above; U.S. equities are expected to produce approximately 6.30% (4.05 ERP + 2.25 Risk Free Rate) on a geometric basis over the next 10+ years. Translating this to an arithmetic average return results in an estimate of 8.10% on an arithmetic basis, or an annualized arithmetic equity risk premium of 5.85%.

Another equity valuation methodology is the normalized earnings yield method. Currently normalized earnings for the S&P 500 estimated using a Shiller 10-year real earnings estimation methodology are equal to \$89. Using the 12/31/2016 S&P 500 closing price, we estimate the earning yield on normalized earnings to be approximately $\$89/\$2,239 = 4.0\%$. If these normalized earnings are reasonably correct (a true reflection of the long-term earnings power of the companies underlying the S&P 500), then as long as the price paid for these earnings does not decline or rise over the investment horizon (today's P/E is approximately equal to the P/E at exit), and the shareholders actually receive the earnings, the real return to holding equities over the investment horizon will approximately equal the current normalized earnings yield. This implies a geometric risk premium (net of real return to cash) of $4.0 - (-0.0) = 4.0\%$, or a geometric return expectation of 6.25%. Translating this to an arithmetic average return results in an estimate of 8.00% on an annualized arithmetic basis, or an arithmetic equity risk premium of 5.75%.

Obviously, if the current normalized earnings yield is high relative to the normalized earnings yield in the future (at the end of the investment horizon), the investor's real return over the investment horizon will be higher than the current normalized earnings yield. If the current normalized earnings yield is low relative to the normalized earnings yield in the future (at the end of the investment horizon), real return will be lower than the current normalized earnings yield. Below, are non-normalized observations of historical earnings yield over the last 90 years. While there are huge fluctuations over the years, the trend line indicates that earnings yields have declined over the course of the century. Nevertheless, the earnings yield level has tended to mean-revert to this declining trend over time. According to this chart, at an estimated normalized earning yield level 4.0% (estimated above), equity market valuations look somewhat high, indicating a valuation adjustment to the fundamental dividend discount method is warranted at 0.75%.



Combining previously highlighted trends in the U.S. Equity risk premium return, as well as fundamental estimates of the current equity risk premium, and a simple earning yield analysis, PCA believes that an expected annual arithmetic risk premium over risk-free short-term assets of 5.75% is reasonable. As a result, utilizing the building block approach highlighted earlier, PCA projects that the average annual (arithmetic) return of U.S. equities will be 8.00% for the next 10-year horizon.

Other practitioners have taken similar views as PCA about the level of the equity risk premium as reflected in their expected total nominal returns for U.S. equities (see the following table). PCA's expectations for U.S. equities are towards the middle of the range that has a minimum expected return of 6.00% and a maximum expected return of 9.50%. At **8.00%**, PCA is at the 60th percentile of return estimates of the firms surveyed. This returns estimate is a single-annual-period, arithmetic average return estimate and does not take into account the impact of projected volatility. As a result, there may be further differences when computing expected returns on a compound-return basis.

FIGURE 11 – Expected Domestic Equity Returns, Various Organizations

Firm	Expected Nominal Avg. Annual U.S. Equity Returns
Robeco	9.50
AON Hewitt	8.80
Callan	8.40
PCA	8.00
JP Morgan Asset Mgmt.	7.30
State Street Global Adv.	7.30
Voya	6.30
BlackRock	6.00

Sources: Various Firms

DEVELOPING EXPECTATIONS FOR THE NON-U.S. EQUITY RISK PREMIUM

For strategic asset allocation purposes, PCA believes that it is difficult to predict whether one large public equity capital market (multi-trillion dollar market with thousands of publicly-held companies) will outperform another over an extended investment horizon. However, the valuation levels of both developed markets outside of the U.S. and emerging market, are currently considerably lower than that of the U.S. markets. Therefore, the equity risk premium for non-U.S. equities is set to be 1.50% higher than the U.S. equity premium, and the global equity risk premium is set to be 1.00% higher.

Beyond the U.S. non-U.S. bifurcation, regional, capitalization-size, and growth-value factors are not considered from a strategic allocation perspective. Such market segments are typically highly correlated to one another and, from a modeling perspective, may introduce multicollinearity error issues into the optimization process. From a more practical standpoint, the relative weightings of such underlying segments often reflect more tactical views, that should be viewed as being outside the scope of the strategic allocation process.

DEVELOPING EXPECTATIONS FOR THE FIXED INCOME RISK PREMIUM RETURN

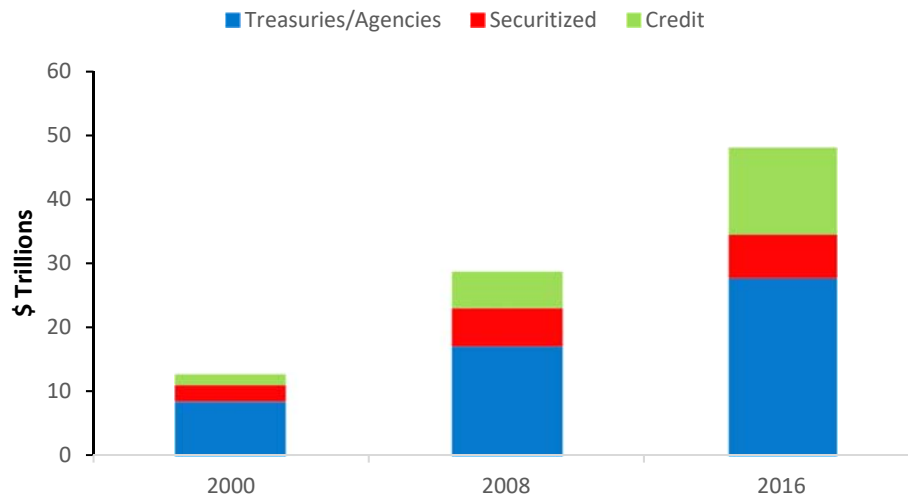
PCA applies the same general approach for estimating the expected fixed income risk premium return as that applied in establishing equity risk premium returns: (i) examine trends of the historical fixed income risk premium and (ii) assess market-based fundamentals. Within fixed income, cash flows and cash flow growth are less uncertain than in the equity markets and long-term appreciation of underlying principal does not occur under equilibrium conditions. As a result, current yields-to-maturity across the fixed income spectrum provide key baselines from which to begin projecting long-term return expectations. From this point, analyses of risk premium trends and the current interest rate environment are then used to adjust the yield-to-maturity to arrive at a final estimate for the Fixed Income risk premium return.

A Few Words About Market Structure

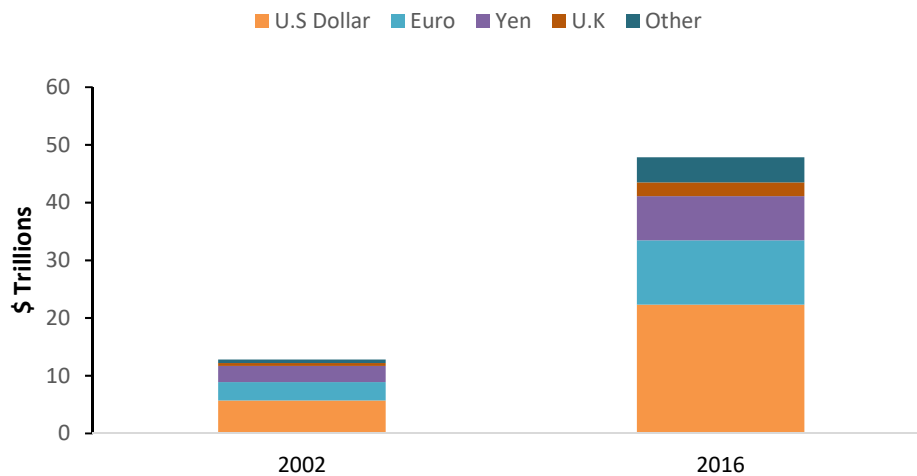
The global fixed income markets have evolved rapidly over the most recent decades. This evolution has occurred on three broad fronts: (i) the significant increase in global fixed income issuance, (ii) the increasing scale of the global credit markets, and (iii) the growth of Euro-based issues (see charts, next page). What these trends highlight is that the Euro-based fixed income markets are evolving toward a broad structure that is analogous to U.S. Dollar-based structure. While 2008 produced a significant crimp in fixed income issuance trends (with global issuance of corporate fixed income instruments virtually coming to a halt during the latter parts of 2008), 2009 through 2016 saw a resurgence in issuance. However, this issuance has been heavily concentrated in Treasury and traditional corporate credit market bonds. The issuance of securitized debt has lagged behind the large jumps in Treasury and traditional bond issuance. Furthermore, despite rolling banking crises in Europe, it looks like globalization trends in the fixed income markets are continuing despite the traumatic events of 2008.

FIGURE 12 – Global Fixed Income Trends

Panel A – By Security Type



Panel B – By Currency Type



Source: Barclays Capital

In light of developments discussed above, developing risk premium expectations first for the U.S. bond market and then using those assumptions as a baseline for other fixed income asset classes is a reasonable approach. Similar to developing assumptions for the equity asset classes, PCA focuses on developing expectations only for the broadest segments of the fixed income markets (U.S., non-U.S., global). For strategic asset allocation purposes, PCA considers other fixed income categories as components of these broader asset classes. Also, given the rapid convergence of global issuance, PCA believes that long-term global (hedged) bond risk premiums will be comparable across the major regions.

FIXED INCOME RISK PREMIUM RETURN EXPECTATION DEVELOPMENT PROCEDURE

As discussed above, PCA begins its development of the expected long-term fixed income risk premium by examining current yields-to-maturity of the investment-grade U.S. fixed income market. As of 12/31/2016, the yield on the Barclays Capital Universal Index and its key components were as follows:⁴

**FIGURE 13 – Yields to Maturity – Barclays Universal and its Components
(as of 12/31/2016)**

Barclays Universal	3.0	
<i>Major Segments</i>		
U.S. Treasuries	1.9	} Barclays Aggregate Yield = 2.61
Other Govt.-related	2.6	
Corporate Credits	3.4	
Securitized	2.8	
<i>Extended Segments</i>		
High Yield	6.5	
Eurodollar	3.2	
Emerging Market	5.1	
144A	3.4	

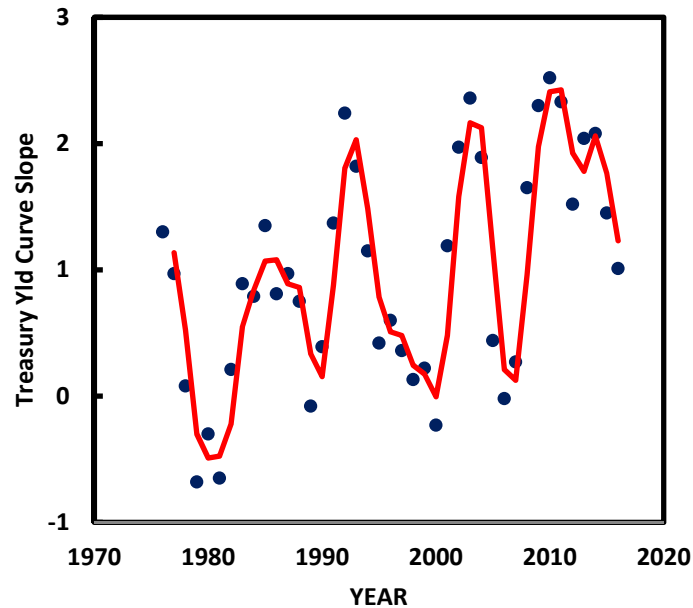
Source: Barclays Capital

Assuming interest rates remain constant, a core-oriented fixed income portfolio represented by the Barclays Capital Universal offers investors a projected yield of approximately 3.0%. The average maturity of bonds held in the Barclays Capital Universal is 8.0 years, making the 3.0 % yield a reasonable initial estimate of an expected return from fixed income over an appropriate investment horizon. At the end of December 2016, the yield for the Barclays Capital Aggregate Index was 2.6%, and the yield on the 10-year Treasury was 2.45%.

Longer-term fixed income returns will be influenced by the future slope of the yield curve, as well as the current level of yields. In addition, future credit spreads will also have an impact. To explore these impacts, PCA examines both (i) the trend in the slope of the Treasury yield curve and (ii) the trend in credit yield spreads utilizing the same statistical procedures used when assessing the long-term trend of the equity risk premium return (see the following charts).

⁴ The Barclays Universal index is a benchmark consisting of all U.S. Dollar-denominated bonds globally, subject to certain liquidity constraints.

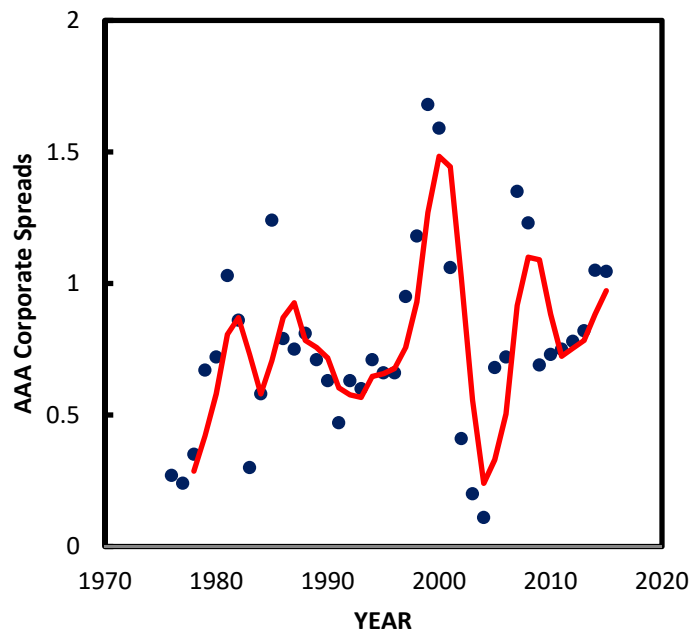
FIGURE 14 – Trend of Treasury Yield Curve Slope



Source: PCA, Federal Reserve

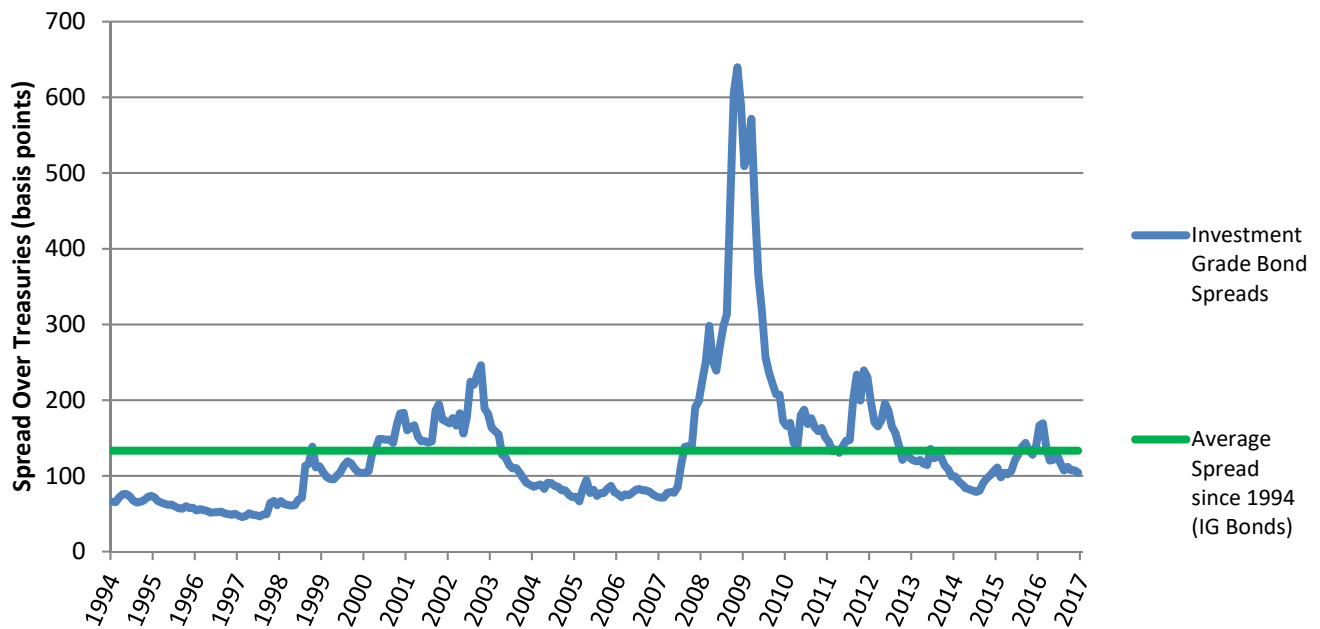
The yield curve remained upward sloping, with the difference between the 10-year Treasury and the 2-year Treasury averaging 100 basis points during the year, and ending the year at 101 basis points as of December 31, 2016. For comparison, the average slope since 1976 has been 97 basis points. Thus, the yield curve slope is positive (Figure 14), but has declined relative to last year, to a level that is consistent with the average over the past 40 years, suggesting equilibrium in the market term structure.

FIGURE 15 – Long-Term Trends of High-Grade (AAA) Corporate Spreads (30-year bonds)



Source: PCA, Federal Reserve

Figure 16 - Investment Grade Corporate Bond Spreads



Source: LehmanLive: Barclays Capital US Corporate Investment Grade Index Intermediate Component.

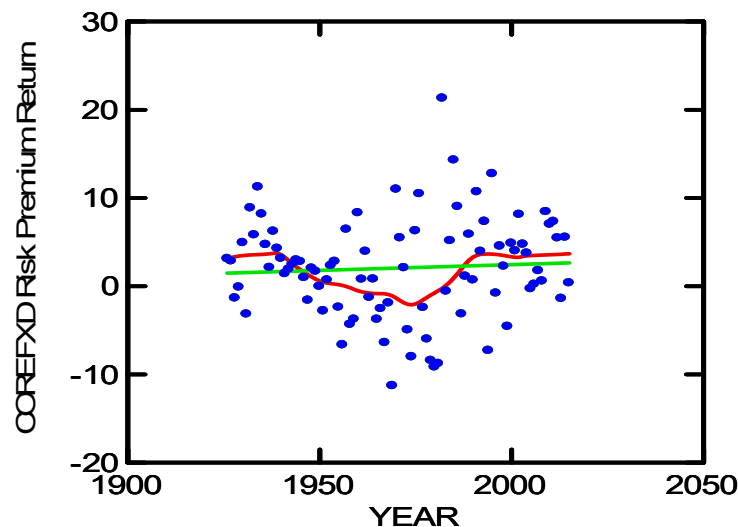
The corporate bond spreads, as highlighted in Figures 15 and 16, are cyclical. While spreads increased cyclically in the early-2000's, and more dramatically in 2008 - 2009, the longer term average spread appears to be relatively stable, and a reasonable indication of what might be expected in the future. The trend pattern for corporate spreads indicates that while there is room for some spread tightening, investors should not expect spreads to deliver much return from today's levels.

Changing yields impact long-term fixed income returns in two ways: (i) through changes in reinvestment rates of current coupon payments and (ii) through the values of future coupons due to changes in discount rates. Fixed income return expectations are lower compared to last year due to a decrease in yields across the fixed income markets.

In the absence of interest rates changes, the return expectation for bonds is approximated by the current yield to maturity of the bond index. Since PCA does not attempt to forecast the level of long-term interest rates, our estimates of expected returns are largely driven by currently observed yields. From 12/31/2015 to 12/31/2016, the 10-year TIPS' Real Yield decreased from 0.75% to 0.55%. Likewise, the Barclays Universal Yield decreased from 3.15% to 3.00 % during this period. For these reasons, PCA believes an expected annual return of 3.05% is warranted. Given the expected short-term risk free rate of 2.25%, PCA estimates the fixed income risk premium return to be 0.8% per year.

To verify the reasonableness of the above risk premium estimate PCA again examined the trend of the fixed income risk premium return (see Figure 17, following page).

FIGURE 17 – Trend of Core Fixed Income Risk Premium Return



Source: PCA

As Figure 17 highlights, the fixed income risk premium return was high during the mid 1980's, 1990's, and 2000's as the overall level of interest rates exhibited a long-standing declining trend. Since the absolute levels of inflation and interest rates today are at very low levels, the drivers of the return premium for investing in fixed income over the last 30 years are no longer available. The premium for investing in fixed income over the next 10 years is likely to be very low starting from today's levels, with probable periods of negative nominal returns and / or negative real returns in the interim.

Therefore, we expect that the trend of the risk premium return has peaked and will decline. We believe this expectation is consistent with the fundamentals cited earlier, relating to the fixed income market's current yield-to-maturity, yield curve structure, and spread trends. Therefore, it is our view that the core (investment grade) fixed income markets will offer a risk premium of 0.8% "over" the real risk free rate over the next 10 years or so, the Treasury-only risk premium will be 0.1%, and the return to investment grade credit premium will be 1.50%.

DEVELOPING EXPECTATIONS FOR OTHER MAJOR FIXED INCOME RISK PREMIUMS

As discussed earlier, PCA typically develops expectations for non-U.S. fixed income and therefore, by default, global fixed income. As we highlighted earlier, PCA believes the convergence of global fixed income markets is occurring rapidly and that institutional investors will continue to expand mandates to give practitioners broader global-oriented mandates in the future. Given this broad trend, similar-risk fixed income instruments across at least the developed markets should offer equivalent risk-adjusted returns, after taking potential currency fluctuations into account. Therefore, PCA sets the risk premium return expectations at the same level for all similar quality fixed income asset classes on a hedged basis.

Other practitioners have taken a similar view to that of PCA about the level of the fixed income risk premium as reflected in their expected total nominal returns for the fixed income asset class (see figure 18). PCA's expectations reside at the 50th percentile of a wide range that has a minimum expected return of 1.90% and a maximum expected return of 3.50%. As with the expected equity returns, these expectations are single-annual-period, arithmetic returns and do not take into account the impact of projected volatility. As a result, there may be further differences when computing expected returns on a compound-return basis.

FIGURE 18 – Expected Domestic Fixed Income Returns, Various Organizations

Firm	Expected Nominal Avg. Annual Fixed Income Returns
Robeco	3.50
State Street Global Adv.	3.20
Callan	3.10
JP Morgan Asset Mgmt.	3.10
PCA	3.05
Voya	2.80
AON Hewitt	2.60
BlackRock	1.90

Sources: Various Firms

DEVELOPING EXPECTATIONS FOR OTHER ASSET CLASS RISK PREMIUMS

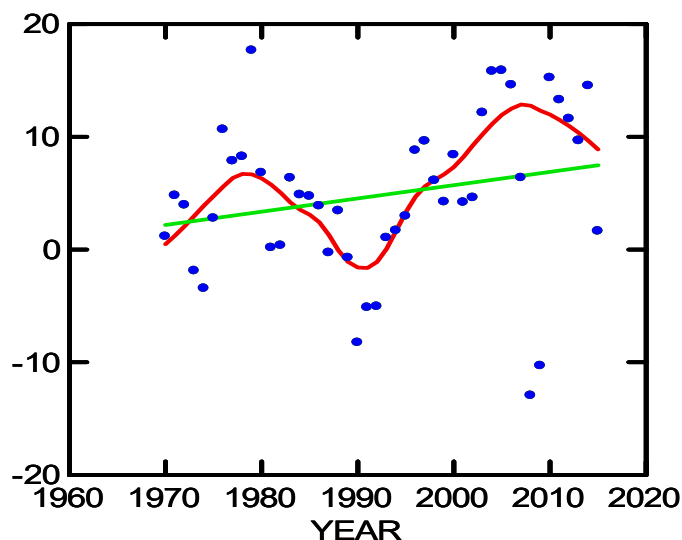
With expected risk premium returns developed for the publicly-traded equity and fixed income asset classes, we can now turn to developing expected risk premium returns for the other major asset classes, namely Real Estate and Private Equity.

Both of these asset classes do not lend themselves well to statistical procedures utilized by the Capital Asset Pricing Model. A key reason for this problem is that these asset classes are not marked-to-market on a near-continuous basis as is the case with the other publicly-traded asset classes. As a result, more reliance on qualitative and fundamentals-based procedures is necessary for developing return and risk expectations for these classes.

Real Estate Risk Premium Return Expectation Development Procedure

As with the other asset classes, PCA examines the trends in each of these asset classes' risk premium returns. The trend of the real estate risk premium return has been to exhibit highly cyclical characteristics, largely attributable to the trending behavior associated with real estate appraisals and capital discount rates that fluctuate only modestly over time compared to other market-based rates (see figure 19).

FIGURE 19 – Trend of Real Estate Risk Premium Return



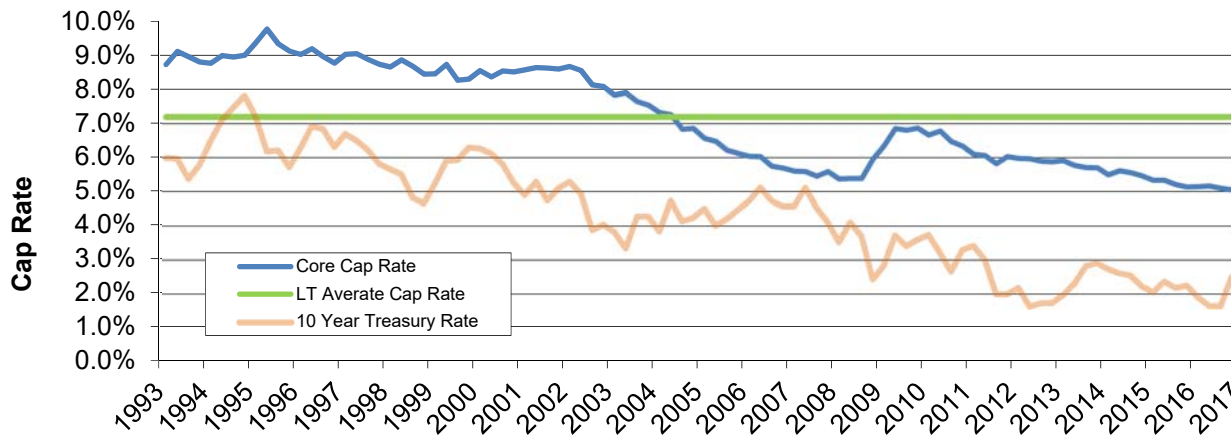
Source: PCA

Long-term core real estate (high occupancy, low leverage, high quality properties) returns exhibit long-term cyclical patterns. While 2008 and 2009 were the two worst years on record, 2010 to 2016 has seen positive returns to the real estate risk premium. Rising interest rates (should they materialize) may cause a moderation of price appreciation, and positive occupancy trends observed in all property types since the GFC could plateau as new supply (particularly in the multi-family and industrial sectors) comes on line, particularly if there is a slowdown in employment growth. However, current financing rates remain supportive of current valuations. Uncertainty regarding prospective tax policies and changing in banking regulations, each of which could drive increases in new supply for reasons other than identified tenant demand, are concerns for future performance.

Though returns for real estate in 2008 and 2009 were devastating, these price declines allowed cap rates to rise toward historical levels, allowing future returns to the real estate risk premium to be positive, much like after the cyclical trough of the late 1980's / early 1990's. However, price appreciation in real estate is tied to financing, which is inexorably linked to interest rates. Cheap financing has allowed a rapid rise in real estate prices, pricing that is vulnerable to rising interest rates, should this occur.

Finally, the returns to the real estate risk premium highlighted in figure 19, were driven by the securitization of commercial real estate from 1993 onward. From this point (1993 onward), real estate started to trade off of the Treasury curve to a greater extent than it had previously. This institutionalization of real estate markets provided for a one-time decline in the real estate cap rates that followed the decline in interest rates, generating asset valuation returns that are unlikely to be repeated. So, while the trend for real estate premium returns has been upward sloping historically, we believe this trend should not be extrapolated into the future. While we believe that the real estate premium will remain positive, we see no fundamental reason that future average returns of the premium should be expected to rise, as this one time drop in financing costs, leading to capital gains, was a one-time event.

Core Real Estate Current Value Cap Rates¹



Sources: NCREIF, www.ustreas.gov

¹A cap rate is the current annual income of the property divided by an estimate of the current value of the property. It is the current yield of the property. Low cap rates indicate high valuations.

For the core real estate asset class (which is typically assumed to be included as an investment class within a strategic allocation study), PCA models its risk premium return as falling between the risk premium returns of stocks and bonds. This approach reflects the common acceptance that real estate is a hybrid asset class offering both potentially high levels of current income (greater than fixed income), while also providing for potential long-term capital appreciation via income growth. One other attractive aspect of real estate is that since leases on commercial real estate are typically re-negotiated over time, lease cash flows should grow along with inflation. Thus, the analyses above indicate to PCA whether the future expected return of real estate should be above or below the midpoint between the equity and fixed income risk return premiums. Despite the above trends and findings with respect to real estate cap rates, PCA believes the expected risk premium return for real estate should be above this midpoint, owing to the inflation protected nature of long-term real estate cash flows, and their economic sensitivity. Given that publicly-traded equities are expected to produce an annual risk premium return of 5.75% and that fixed income is expected to generate an annual risk premium return of 0.80%, PCA believes an appropriate annual risk premium for real estate is 3.25%.

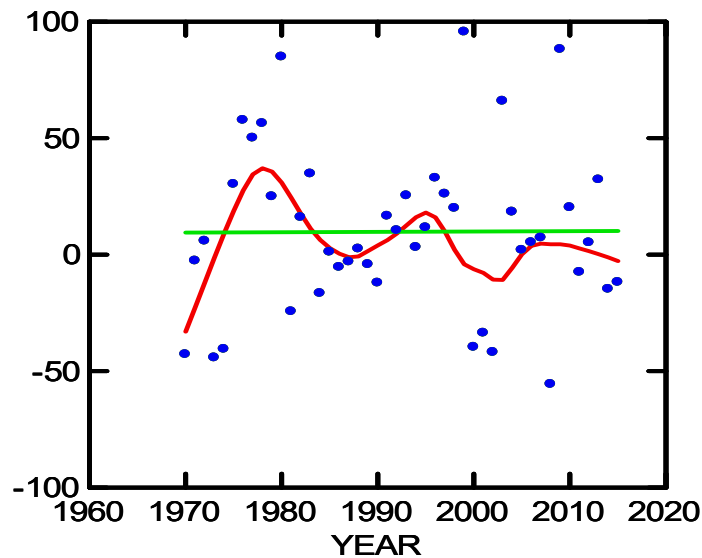
Private Equity Risk Premium Return Expectation Development Procedure

Like real estate, private equity is an appraised asset class, not amenable to capital asset pricing modeling processes. In addition, investors' primary motivation for entering the private equity asset class is to produce returns significantly above those for publicly-traded equities. The excess returns expected from private equity typically range from 3.0% to 5.0% annually over public equity counterparts. This premium is often associated with an "illiquidity premium" required by investors. Such premiums are often realized through establishing illiquidity discounts at the time of private purchase.⁵

As with the real estate asset class, PCA begins by assigning a "default position" for the private equity illiquidity premium. PCA then adjusts this illiquidity premium based on its current trend and any key fundamental factors impacting the asset class. The private equity illiquidity premium has varied cyclically over the last 40+ years (see figure 21).

⁵ See, for example, Pratt, Shannon, "Discount and Premia," *Valuation of Closely Held Companies and Inactively Traded Securities*, ICFA, December, 1989.

FIGURE 21 – Trend of Private Equity Illiquidity Premium

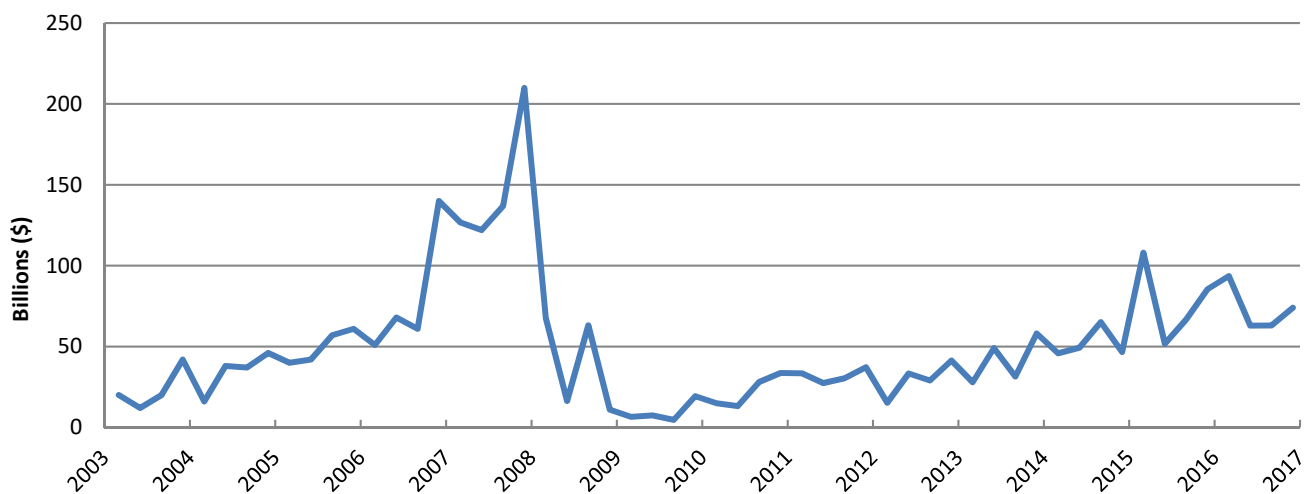


Source: PCA

The figure above indicates that private equity return premium has trended slightly upward over the last decade or so, driven largely by results after the equity bear market of the early 2000's, and a large return number in 2009.

Leveraged buyout deal volume - by far the biggest part of the private equity industry - which had slowed to a trickle in the wake of the credit crisis - has recovered significantly; however, it remains well below pre-crisis levels.

Figure 22 - Disclosed U.S. Quarterly Deal Volume*



Source: Thomson Reuters Buyouts

* quarterly total deal size (both equity and debt)

The previous figures suggest that private equity could continue to produce favorable risk premiums for the next several years. PCA estimates the long-term, arithmetic private equity return premium versus public equity at 2.75%. In addition, a growing number of M&A deals are closing globally, and this trend is likely to accelerate. This trend suggests a total annual risk premium return for private equity should be developed off of the *global equity* arithmetic return expectation of 9.00% implying a private equity return estimate of 11.75.

Similar to real estate, it is PCA's view that financing drove historical increases in risk premium returns to private equity, so that there is little reason to extrapolate this trend of rising premium returns in the future. Furthermore, given the higher level of information inefficiency associated with these asset classes, implementation and manager selection are highly critical factors that will impact an investor's long-term results. In other words, investors cannot hope to capture the risk premium returns associated with these assets through an indexing approach.

Other practitioners' expectations for the private asset classes vary around PCA's (see figure 23). PCA's expectations for real estate are in the lower end of a range that has a minimum expected return of 4.10% and a maximum expected return of 8.50%. It should be noted that PCA's core real estate expectations are for unlevered real estate investments, thus practitioners should account for their leverage utilization when applying PCA's estimates to their analyses. PCA's expectations for private equity are towards the upper end of the range that has a minimum of 8.60% and a high of 12.30%. As with the expected equity returns, these expectations are single-annual-period returns and do not take into account the impact of projected volatility. As a result, there may be further differences when computing expected returns on a compound-return basis.

FIGURE 23 – Expected Private Asset Class Returns, Various Organizations

Firm	Expected Nominal Avg. Annual Real Estate Returns
AON Hewitt	8.50
Voya	7.90
JP Morgan Asset Mgmt.	7.40
Callan	7.00
State Street Global Adv.	6.60
Robeco	6.50
PCA - Unlevered	5.50
BlackRock	4.10

Firm	Expected Nominal Avg. Annual Private Equity Returns
Callan	12.30
AON Hewitt	12.00
PCA	11.75
Robeco	10.90
State Street Global Adv.	10.30
JP Morgan Asset Mgmt.	9.90
BlackRock	8.60

Sources: Various Firms

In PCA's survey of other practitioners' forecasts, PCA found that the overwhelming majority simply use historical averages of risk (standard deviation) and correlations to arrive at their forward-looking estimates. The argument for not spending significant energy on utilizing more sophisticated approaches to developing expectations for these variables lies in the notion that risks and correlations are more stable than investment returns. As a result, simple averaging of history is an appropriate forecast for the future.

While we agree that these attributes are more stable than investment returns, they are not constants. Therefore, we believe that automatically defaulting to forecasts that are a simple linear extrapolation of history is inappropriate. At a minimum, for several asset classes and asset class relationships, we believe there are potential long-term trending patterns that should not be ignored, and instead, incorporated into the expectation setting process.

One challenge is that the investment markets have continued to evolve, allowing new, often broader, investment classes to become accepted. Several such classes have limited histories, which can leave one guessing how a specific class might perform relative to its own history and relative to other classes. In such instances, the average of history (assuming the history sample is reasonable) is *at least* an unbiased estimate of what might occur in the future.

However, where adequate history exists there is potential to improve upon using the historical average when assessing risk and correlations. This section reviews PCA's approach to examining the risk and correlation data (The approach used is analogous to our examination of risk premium return trends in prior sections.). As might be expected, for certain asset classes, there is enough evidence of trends and fluctuations in the risk and correlation data to consider making adjustments, rather than merely using historical averages as a proxy for the future.

DEVELOPING EXPECTATIONS FOR ASSET CLASS RISK

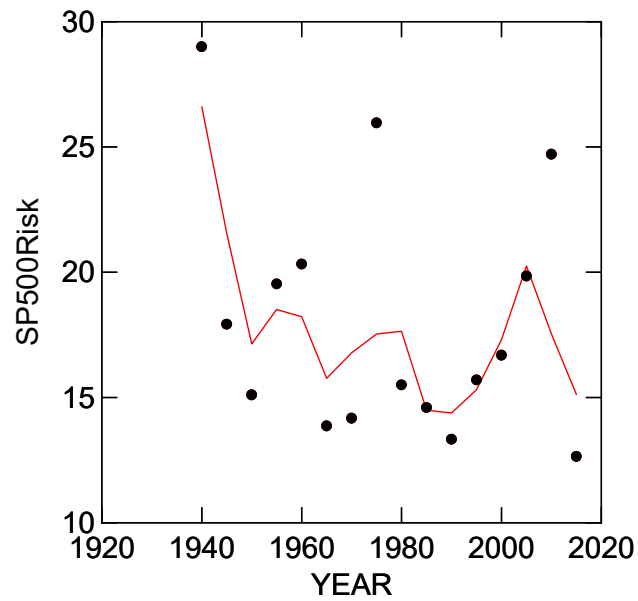
To begin analyzing risk patterns among various asset classes, PCA examines asset class volatility across discrete 5-year holding periods. PCA believes five years is a minimum horizon required to consider investing in an asset class. In addition, the 5-year horizon allows for a minimum amount of observations for a few of the key asset classes (e.g., 90 years of data provides 18 observations). For each 5-year period, PCA computes a standard deviation of returns for each asset class with an appropriate amount of history. Once PCA has computed a set of five-year data points, we map out the time series of 5-year risks to determine patterns and trends in the data. We then use information gathered from this process to adjust the historical standard deviation of an investment class's entire return history. The result is an expectation of an investment class's risk for the next investment horizon.

Examples: Risk of U.S. Equities and Core Fixed Income Classes

To begin our risk projection process, we first review asset classes' historical volatilities. For the 90 years ending 2016 (beginning with 1926), the standard deviation of annual returns for U.S. Equity and U.S. Core Fixed Income asset classes were 20.0% and 6.0%, respectively.

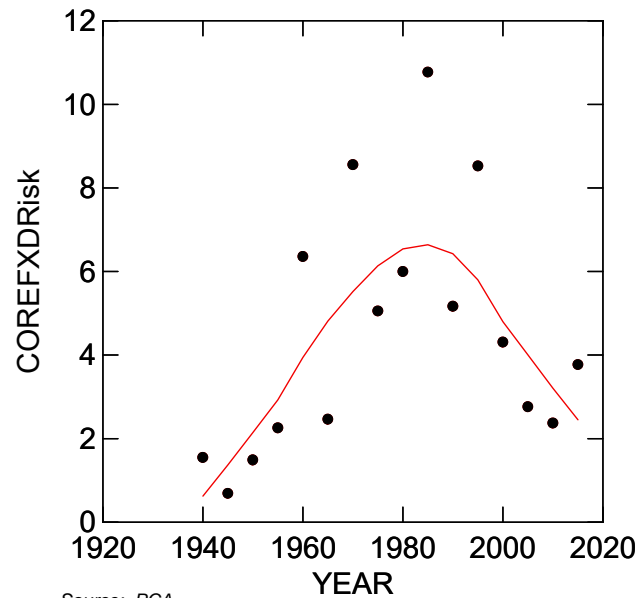
We then compute standard deviations for each discrete 5-year period ending with 2012-2016. Using statistical procedures, we then map out the trend of those discrete observations. Interestingly, the trends of risk behaviors of the two above asset classes exhibit unique patterns (see Figures on following page). While the secular trend for U.S. Equity risk appears to be downward, U.S. Core Fixed Income risk appears to be cyclical.

FIGURE 24 – Risk Trend of U.S. Equities



Source: PCA

FIGURE 25 – Risk Trend of U.S. Core Fixed Income

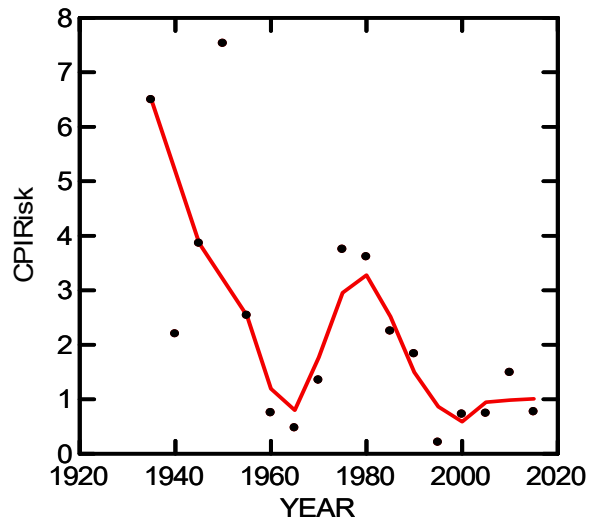


Source: PCA

As the above charts highlight, historical averages are likely biased by extended periods of dramatic volatility that may or may not have a direct influence on current forward-looking expectations. For U.S. equities, key periods were the late-1920's through the 1930's, the 1970's through the early 1980's, and the recent financial crisis years; for U.S. core fixed income, such a period was the late-1970's through the early-1980's. While we believe we should not exclude the distant historical data or outliers from the analysis, trend analysis at least provides a more appropriate indication of how these periods are, or are not, impacting the current environment.

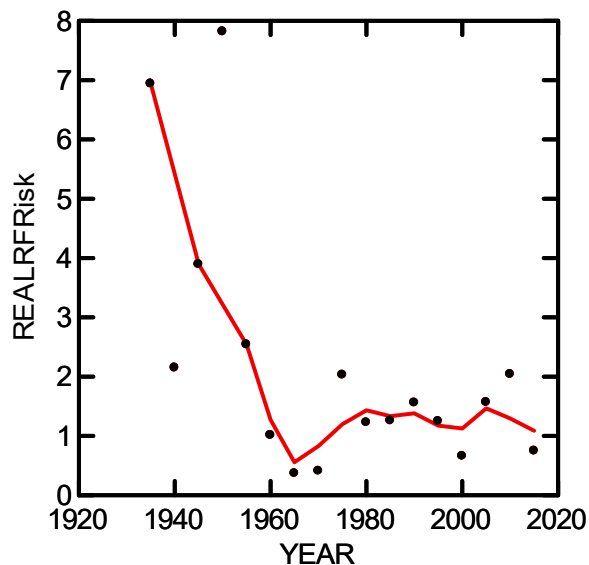
Periods of dramatic volatility were periods marked by price instability, deflation in the 1930's and inflation in the 1970's (figure 26), and variation in the level of the risk-free rate (figure 27).

FIGURE 26 - U.S Inflation Risk Trend



Source: PCA

FIGURE 27 – Real Risk Free Rate Risk Trend



Source: PCA

We expect the long-term secular trend of lower equity risk to continue as the volatility of global output continues to moderate. However, we believe the volatility of U.S. core fixed income has likely bottomed and could rise in response to a lower level of inflation, and thus a higher level of risk free rate volatility. Given these indications, PCA believes that both asset classes' average risks should be set to reflect forward-looking expectations. For U.S. Equities, PCA believes **19.5%** (versus its long-term average of 20.0%) is an appropriate level of risk. For U.S. core fixed Income, PCA believes a risk level of **5.50%** (higher than recent history of less than 3.5%, but lower than the long-term average of 6.0%) is appropriate.

Risk Estimates for Classes with Shorter Track Records

Admittedly, several asset class benchmarks have 40 years or less of history (e.g., international equities, non-U.S. and global bonds, private real estate, and private equity). As a result, the number of 5-year risk data points is too few to perform any meaningful statistical analysis. In these cases, PCA computes historical standard deviations, weighting the most recent periods heavier than prior decades, and combines these estimates with visual inspection of shorter trends to develop future expectations for risk of the strategic class. These procedures are applied to all other asset classes lacking ample history for further statistical trend analysis.

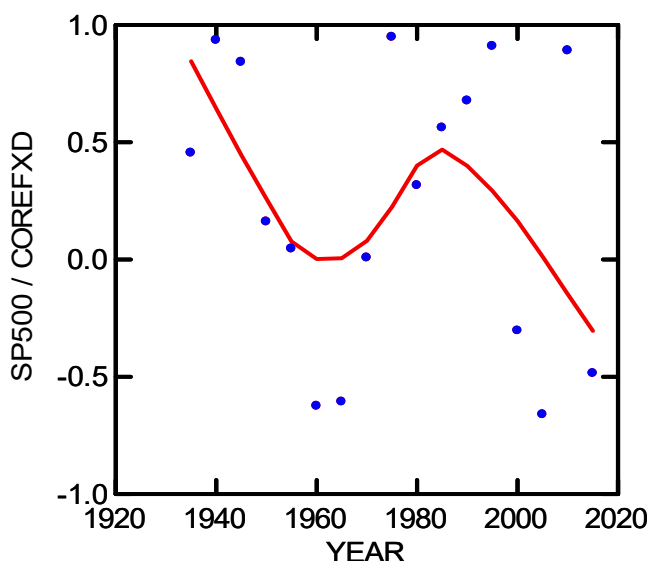
DEVELOPING EXPECTATIONS FOR ASSET CLASS CORRELATIONS

In developing expected correlations, PCA applies a process that is equivalent to that used to develop expected asset class risks. Again, most practitioners assume future correlations will be equivalent to their historical averages. This approach is counter to recent investment industry analysis that indicates that correlations fluctuate significantly over an investment cycle (e.g., the U.S. equity/non-U.S. equity correlation, the U.S. equity/U.S. core fixed income correlation). Given the potential of fluctuating correlations, PCA again (i) assesses the trends of discrete 5-year correlations, and (ii) adjusts historical correlations appropriately to account for evident trends and recent abnormalities which may unduly skew historical correlation relationships in a way that is unlikely to repeat in the future.

Example: Estimate for the U.S. Equities/U.S. Core Fixed Correlation

The historical correlation between U.S. Equities and U.S. Core Fixed Income, based on data going back to 1926, is 0.20 using annual return history. However, correlations have oscillated from over 0.8 to under -0.8 during this period.

FIGURE 28 – Trend of U.S. Equities/U.S. Core Fixed Income Correlation



Source: PCA

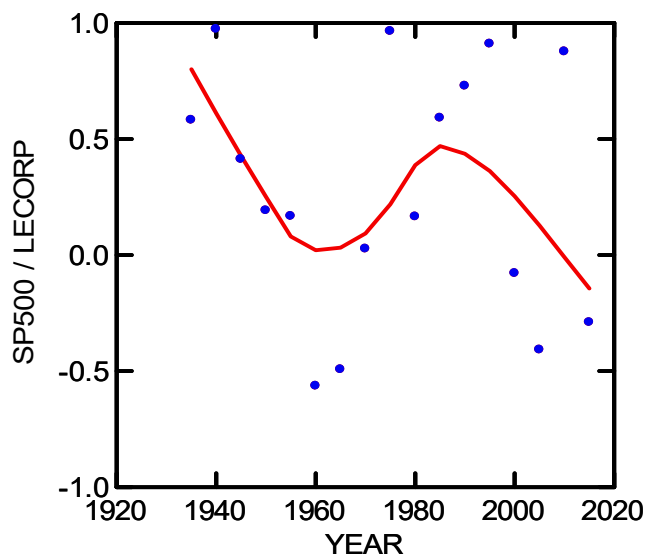
The historical correlation between U.S. Equities and U.S. Corporate Bonds (those with credit risk) is 0.26. As one might expect, on average equities have a significantly higher correlation to instruments that have corporate risk, than to those with interest rate risk alone.

Given these findings, PCA believes an estimated forward looking average correlation of 0.20 is appropriate. Such an estimate implies that returns of U.S. equities will typically be largely unrelated to returns of U.S. core fixed income. Nevertheless, the shortcomings of a framework that requires constant correlation relationships is apparent. The traditional mean-variance framework assumes constant correlations, and requires a static correlation matrix as an input. As the graph above indicates, this just doesn't comport with our historical experience.

While we know that the mean-variance framework is flawed, it is a reasonable starting point for analysis that is relatively simple to run, and is fairly well understood. That said, decision makers should keep in mind the framework's sensitivity to problematic assumptions as highlighted.

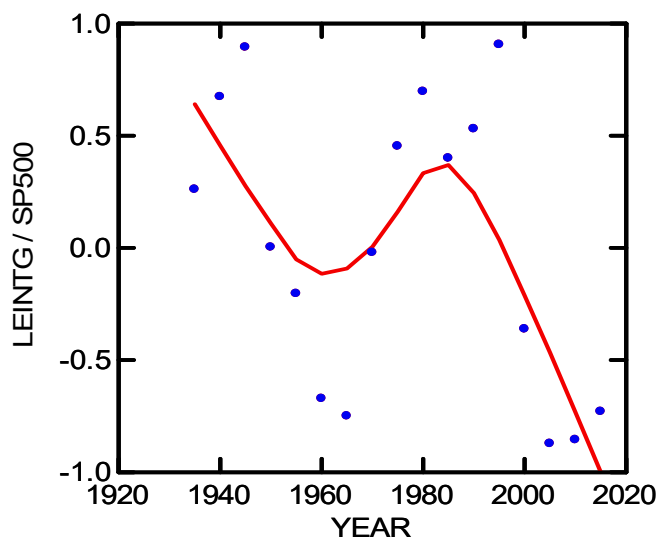
Finally, looking at this particular correlation relationship more closely is instructive. If the correlation between US fixed income and US equity is non-constant, then perhaps the dominant factors driving returns to these asset classes are different during different time periods. We postulate that the dominant common factor driving returns in the early 70's was the oil shock, during the late 1970's and early 1980's was rising U.S. inflation, during the 1980's and mid 1990's was declining inflation and declining real interest rates, and in the late 2000's was exposure to global growth. If we're right, then the correlation between U.S. equities and fixed income with credit exposure and without credit exposure should be very different in the most recent period, and it was (see the following charts).

FIGURE 29 – Trend of U.S. Equities/U.S. Corporate Bonds Correlation



Source: PCA

FIGURE 30 – Trend of U.S. Equities/ U.S. Government Fixed Income Correlation



Source: PCA

The important conclusion to take from this example is that fixed income with credit risk will be more correlated with equities during a crisis that impacts growth expectations, than with government bonds. While outside of a crisis most investment grade fixed income generally behaves similarly (Treasuries and corporate bonds behave similarly), if the dominant factor driving returns during a period is an exposure to growth (default risk), then performance and correlation relationships may be very different at these times.

ANNEX 1
PCA MEAN-VARIANCE EXPECTED ASSET CLASS RETURNS, RISKS, & CORRELATIONS
Average Annual Risk Premiums - %

Real Risk-Free Rates	
Shorter-term	0.00
Longer-term (10-year TIPS yield)	0.50
Risk Premiums over Short-term Real Risk-Free Rate	
US Treasuries Only Fixed Income	0.10
US Core Fixed Income	0.80
US Credit Fixed Income	1.50
Core Real Estate	3.25
Domestic Stocks	5.75
International Stocks	7.25
Global Stocks	6.75
Hedged International Stocks	7.10
Private Equity	9.50

Nominal Return and Risk Estimates (in %) – 2.25% Long-Term Inflation Assumption

	Expected Avg. Nominal Annual Return (Arithmetic)	Expected Risk of Nominal Returns (Annlzd. SD)
Cash	2.25	1.50
Treasury Inflation Protected Securities	3.00	7.00
US Treasuries Only Fixed Income	2.35	7.00
US Core Fixed Income	3.05	5.50
US Credit Fixed Income	3.75	7.00
Core Real Estate	5.50	10.00
Domestic Stocks	8.00	19.50
International Stocks	9.50	22.00
Global Stocks	9.00	20.00
Hedged International Stocks	9.35	20.05
Private Equity	11.75	27.00

Nominal Return Correlation Assumptions

	Cash	TIPS	TSY	CoreFxd	Credit	CoreRE	USStks	IntlStks	GblStks	HIntlStks	PrivateEq
TIPS	0.20										
TSY	0.30	0.50									
CoreFxd	0.25	0.60	0.40								
Credit	0.00	0.65	0.00	0.75							
CoreRE	0.30	0.00	0.00	0.00	0.00						
USStks	0.00	0.00	-0.25	0.20	0.40	0.40					
IntlStks	0.00	0.00	-0.35	0.10	0.20	0.30	0.80				
GblStks	0.00	0.00	-0.30	0.15	0.30	0.35	0.90	0.90			
HIntlStks	0.00	0.00	-0.30	0.10	0.30	0.35	0.85	0.90	0.90		
PrivateEq	0.00	0.00	-0.30	0.00	0.30	0.30	0.85	0.80	0.80	0.80	
CPI	0.50	0.45	-0.10	0.00	0.10	0.35	0.20	0.20	0.20	0.20	0.10

When establishing expectations for future asset class returns and risks, PCA utilizes numerous indices that cover a broad spectrum of investable asset classes (see table below).

Selected Asset Classes Utilized by PCA

Asset Class	Benchmarks Utilized
Cash	Citigroup 3 month US Treasury Bill Index
TIPS	Barclays Capital TIPS Index, simulated TIPS series per Bridgewater
US Treasuries Only Fixed Income	Barclays Capital Treasuries Index
US Core Fixed Income	Barclays Capital Intermediate Govt. Index Barclays Capital Corp/Credit Index Barclays Capital G/C Index Barclays Capital Aggregate Index Barclays Capital Universal
US Credit Fixed Income	Barclays Capital US Universal Spread 1-10 Index Barclays Capital Corp/Credit Index
Real Estate	NCREIF Property Index NAREIT Equity REIT Index Prior Indices
US Equities	Standard & Poors 500 Index Russell 3000 Index
Non-US Equities	MSCI EAFE Index MSCI EMF Index MSCI ACWI ex-US Index MSCI Hedged EAFE Index
Global Equities	MSCI/Barras ACWI Index
Private Equity	Prior Brinson Venture Capital Index (discontinued) VCJ Post-Venture Capital Index

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COVERED CALLS REVIEW

East Bay Municipal Utility District
Employees Retirement System

July 2017



Agenda Items

<u>Section</u>	<u>Tab</u>
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Rationale	2
EBMUDERS' Performance	3

Section 1: How Covered Calls Work

Covered Calls Review

A BRIEF REVIEW of OPTOINS

- Option contracts include a pre-established price (strike price) at which the contract owner could execute the contract to either purchase or sell a specific security (e.g., sell/purchase 100 shares of stock at the pre-set price)
- Options are standardized and are listed on an exchange
- Two options types:
 - *Calls* – a contract that provides the right, but not the obligation, to buy a security at a pre-specified price at a pre-specified time in the future
 - *Puts* – a contract that provides the right, but not the obligation, to sell a security at a pre-specified price at a pre-specified time in the future
- Buyers of options pay a premium and participate in security's gains beyond the strike price, downside loss is limited to loss of the premium
- Sellers of options receive a premium, but do not participate in security's gains beyond strike price; downside losses can be theoretically infinite (un-covered position)

Covered Calls Review

What is a covered call?

- **CALL** option gives the holder the right to buy shares at a certain price within certain time from seller of option
- **COVERED CALL** is an options strategy where an investor holds a long position in an asset and writes (sells) call options on that same asset in an attempt to generate increased income from the asset

EXAMPLE

- 1) Buy S&P 500 ETF (SPY) stock at \$242.77
- 2) Sell (write) an agreement to sell SPY in 1 months at \$245. Cost of agreement is \$1.46.
As seller of that agreement, you get \$1.46 option premium and own SPY.

What can happen:

- 3a) If SPY remains at \$242.77 at end of 1 month? – Call expires worthless
Result: Position value \$244.23 (SPY + call premium) compared to \$242.77 for long only (made \$1.46 extra, outperformed by 60 bps)
- 3b) If SPY goes to \$247.62 (2% increase) at end of 1 month? – Call is “called” must sell SPY at \$245.00:
Result: Position value \$246.46 compared to \$247.62 for long only (made \$1.16 less than market, 47 bps underperformance).
- 3c) If SPY goes to \$237.92 (2% decrease) at end of 1 month? – Call expires worthless
Result: Position value is \$239.38 compared to \$237.92 for long only (lost \$3.39 compared to \$4.85 for long only, outperformed by 61 bps)

 Refresh**SELL**

7/5/17 6:30:00 PM ET

ADJUSTED OPTIONS

[<](#)
[Jul 26 '17w](#)
[Jul 28 '17w](#)
[Aug 2 '17w](#)
[Aug 4 '17w](#)
[Aug 9 '17w](#)
[>](#)
[All Months](#)

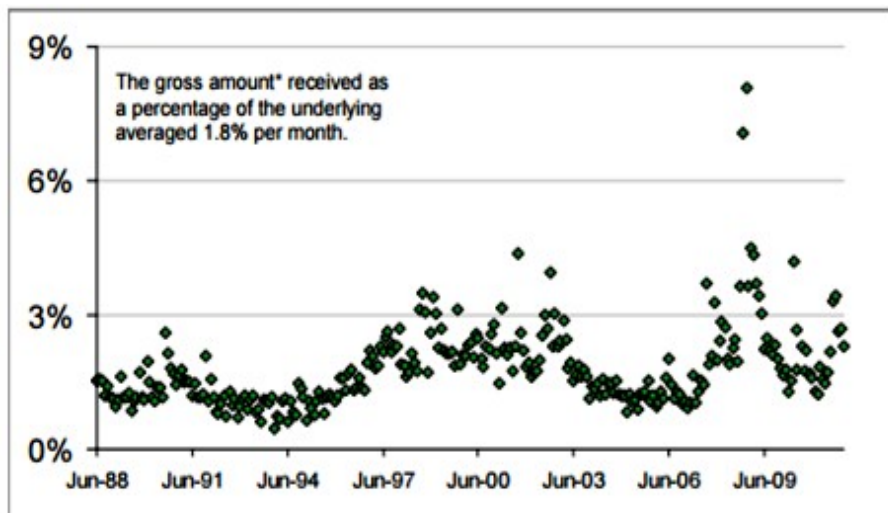
☐ In-the-money

Strike Price

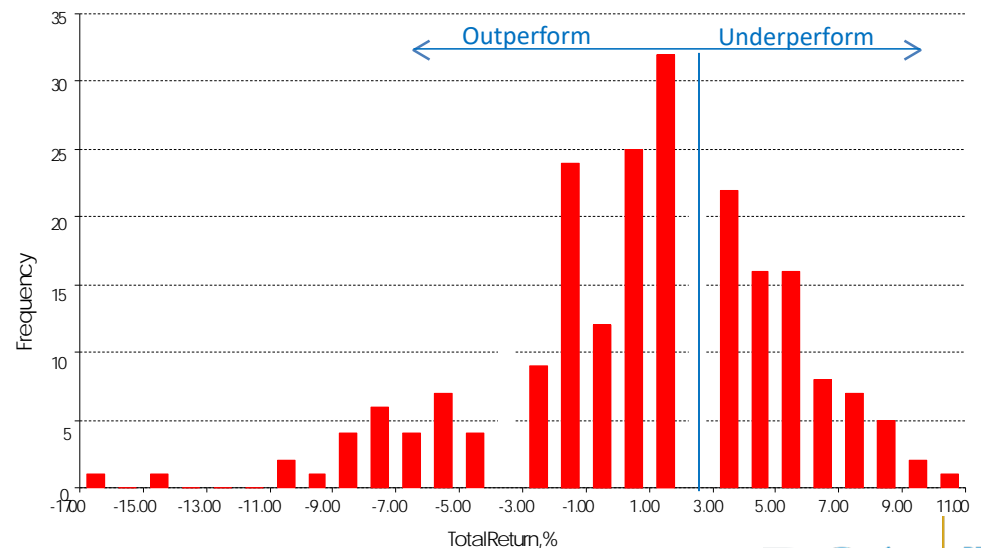
Covered Calls Review

- From the seller's perspective the attractiveness of a covered calls strategy depends on a large part on the size of the options premium – usually between 1-3%, 1.8% average
 - Currently 0.60%
- A simplistic way to think about it is that any time the market rises by less than the option premium a covered call strategy should outperform – Historically about 56% of the time
- An attractive feature of covered calls is that the option premium increases when market volatility increases

Monthly Call Premiums



Monthly S&P 500 Total Return

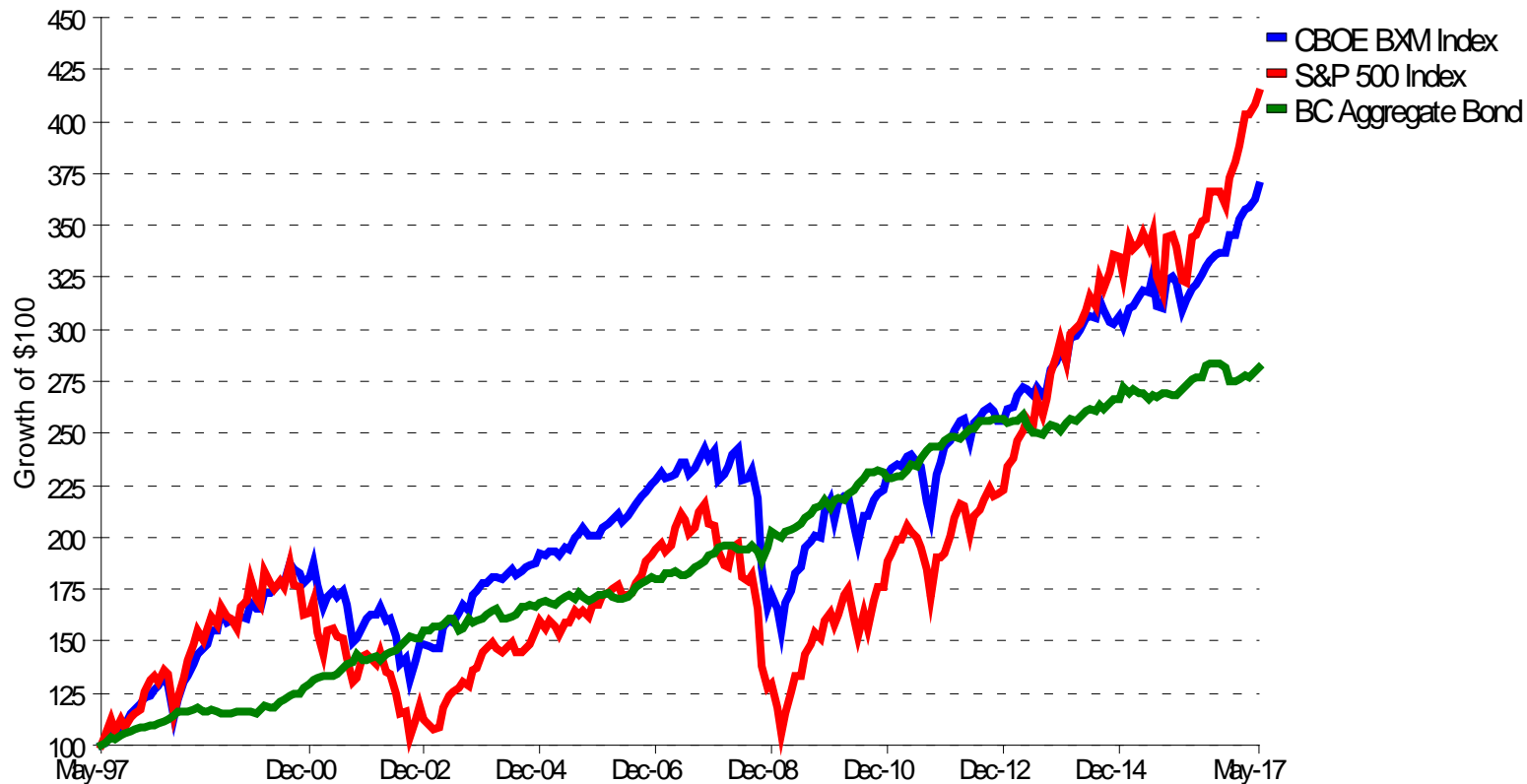


Section 2: Rationale

Covered Calls Review

RATIONALE

Comparison of Growth Patterns – Covered Calls vs. Other Major Classes



- The long-term return pattern is more stable than major equity classes
- Until recently, covered calls have produced similar levels of growth as public equities
- Covered calls lag in bull/recovery markets, but provide better downside protection in down markets
- Less stable than bonds, but higher level of growth

Covered Calls Review

COVERED CALLS IN DIFFERENT MARKET ENVIRONMENTS

- Over long time periods covered calls tend to produce returns in line with public equities with less volatility – 90% the return of equities with only 2/3rd the volatility
- Relative performance can differ meaningfully between a covered call strategy and public equities depending on the overall state of the market
- Covered calls lag in bull/recovery markets, but provide better downside protection in bear/down markets
- Covered calls should perform in line with equities in sideways markets and should slightly outperform in volatile sideways markets
- Covered calls can still lose considerable capital in sharply declining markets
- The degree of underperformance during advancing markets is directly related to the pace of advance

Covered Calls Review

COVERED CALLS & VOLATILITY

- Covered call strategies can provide some protection as volatility increases
- Volatility is a component of the options pricing formula which increases the value of the call options written, increasing the premium received
- The higher premium cushions performance during volatile market environments
- For example, during the credit crisis when volatility spiked, the BXM outperformed the S&P 500 with significantly less volatility
- Covered calls should perform well in sideways markets when there is meaningful volatility
- Key drawback: When the equity market is in a rapid recovery or bull market, covered calls will underperform their equity counterpart

Section 3: EBMUDERS' Performance

Covered Calls Review

SUMMARY

EBMUD Covered Calls – Periods ending March 31, 2017

Manager	Mkt Value (\$000)	Management	Quarter	1 YR	3 YR	Estimated Annual Fee (bps)
Parametric – BXM	110,679	Replication	4.0	13.3	8.9	24
Parametric – Delta Shift	115,090	Semi-Active	4.9	16.5	10.5	31
Van Hulzen	102,659	Fully Active	3.6	9.8	6.1	25
Total Covered Calls	328,428	Blend	4.2	13.3	8.5	
CBOE BXM	---	---	4.0	12.2	6.5	---

- Each mandate was funded with approximately \$86 million during the first quarter of 2014
- Allocation was split equally between management styles diversifying return stream
- The Covered Call allocation significantly outperformed its benchmark over the three years since inception
- Measurement period strongly favored Delta Shift strategy relative to other strategy
 - Difficult period for Van Hulzen strategy

Covered Calls Review

SUMMARY

EBMUD Covered Calls – Periods ending March 31, 2017

Manager	Annualized Return, %	Annualized StdDev, %	Information Ratio	Sharpe Ratio	Up Market Capture	Down Market Capture
Parametric – BXM	2.39	5.51	1.62	1.55	101.23	61.38
Parametric – Delta Shift	3.96	9.06	1.16	1.13	133.79	99.93
Van Hulzen	-0.42	5.78	1.05	1.03	82.94	72.46
CBOE BXM	0.00	6.25	1.04	1.02	100.00	100.00

- All managers outperformed on a risk-adjusted basis
- The Parametric mandates had strong absolute and risk-adjusted performance while the Van Hulzen mandate trailed on an absolute basis but outperformed on a risk-adjusted basis
- The overall portfolio appears well constructed with the different managers complimenting one another
- Expectations:
 - Delta Shift should do best in advancing markets
 - Van Hulzen should perform relatively well in down markets

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