

Moving On Up – Investing in Today's Rate Environment

Presented by PFM Asset Management LLC

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Today's Agenda

Challenge: Navigating the fixed income market can be difficult, and time consuming

Goal: Identifying and understanding the keys to addressing those challenges to create the optimal investment program for your public power utility

Factors that impact your portfolio's unique investment goals

- Current market environment and outlook
- 2. Liquidity Projections
- 3. Investment Guidelines and Objectives
- 4. Risks
 - Duration
 - Interest Rate
 - Credit



Funds Maintained by Public Power Utilities

- Operating
- Revenue
- Debt Service Reserve
- Bond Reserve
- Construction
- Debt Service

- Rate Stabilization
- Nuclear Decommissioning Trust
- Renewal & Replacement
- General Reserves



Different Investment Options for Different Funds/Strategies

Short-term:

- Local Government Investment Pool (LGIP)
- Bank deposits with daily liquidity
- Certificates of deposit
- U.S. Treasury bills, federal agency and supranational discount notes
- Commercial paper
- Repurchase Agreements

Long-term:

- U.S. Treasury notes
- Federal agency bonds/Federal agency mortgage backed securities
- Supranational bonds
- Municipal bonds
- Corporate notes

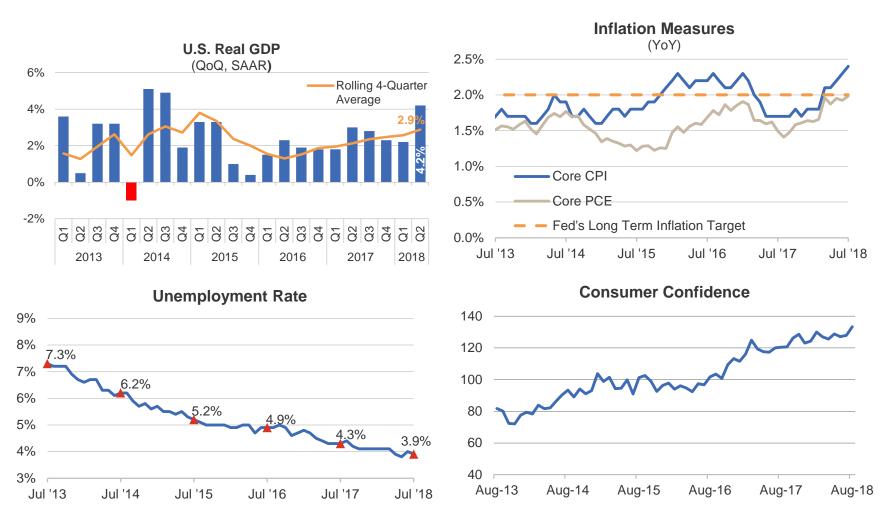


"It's the Economy, Stupid" ... and the Markets, Too

1. James Carville, 1992



Current U.S. Economic Conditions



Source: Bloomberg, latest data available as of 8/31/18. SAAR is seasonally adjusted annualized rate.

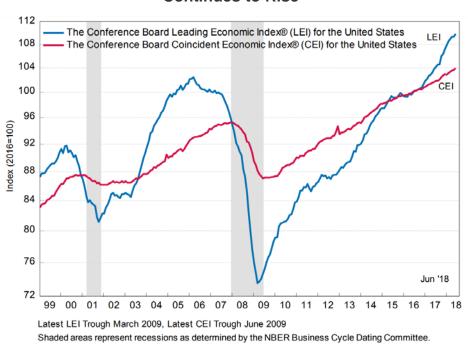


Where Are We in the Economic Cycle?

Different Indicators Give Differing Views

Duration	Length of cycle	Late
Slack	Labor market slack Output market slack	Late Late
Cost pressures	Wage growth Unit labor cost growth	Mid Early
Cyclical demand	Resi investment/GDP Housing starts Consumer durables/GDP Capital spending	Early Mid Early Mid
Confidence	Cyclically adj. confidence	Mid
Leverage	Household leverage Most levered companies	Early Mid
Credit	Bond default rates Loan delinquencies Bank lending standards	Mid Mid Mid
Profits	S&P 500 margins Earnings rel. to normalized	Late Mid

The Conference Board Leading Economic Index Continues to Rise

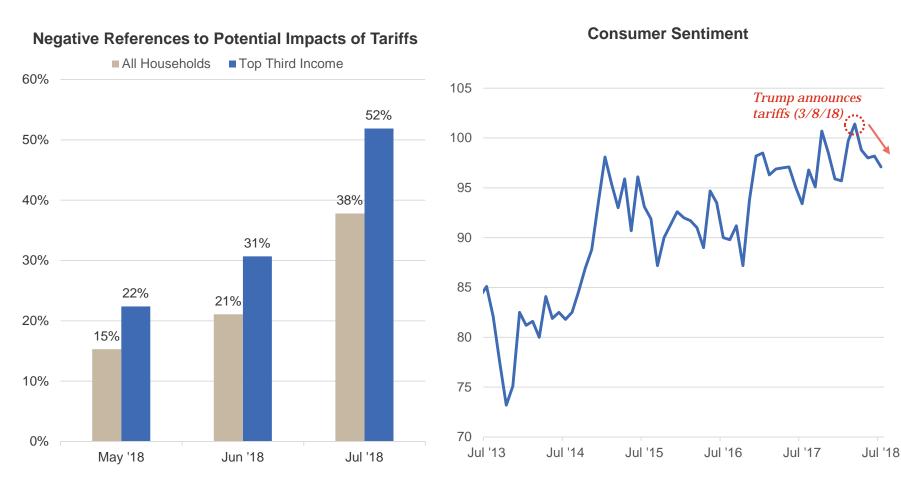


- Supports the continuing solid growth in the economy
- Suggests no recession in the near-term

Source (left): Wall Street Journal; Deutsche Bank. Source (right): Conference Board.



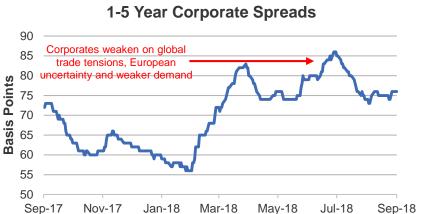
Trade War Begins to Infiltrate U.S. Consumer Sentiment

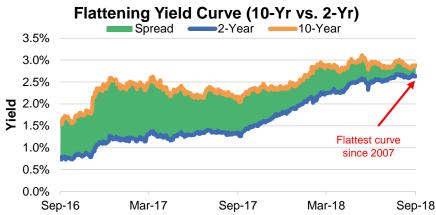


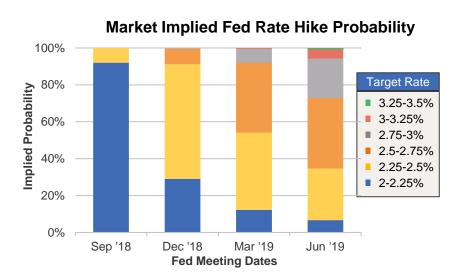
Sources: University of Michigan, FRED Economic Data.



What We're Watching... So You Should, Too





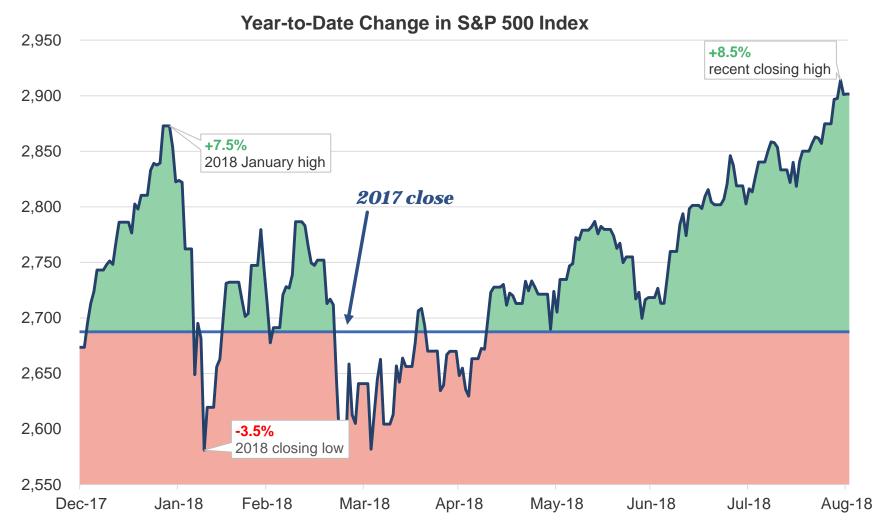


Economic Indicators are Strong

Metrics At or Near Multi-Year Bests							
U.S. GDP	Unemployment Rate						
Global Growth	Job Openings						
Consumer Confidence	Corporate Profits						
Home Prices	Inflation						



Domestic Equities March Higher after Difficult Q1



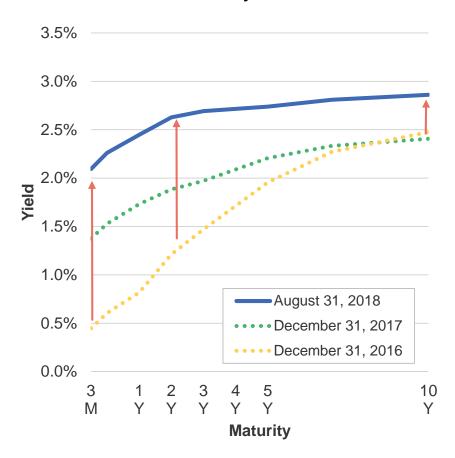
Source: Bloomberg, as of 8/31/18.



A Flattening U.S. Treasury Yield Curve

Tenor	Current 8/31/18	Year-End 12/31/2017	Year-End 12/31/16
3 month	2.09%	1.38%	0.45%
6 month	2.26%	1.53%	0.61%
1 year	2.45%	1.73%	0.82%
2 year	2.63%	1.88%	1.21%
3 year	2.69%	1.97%	1.47%
5 year	2.74%	2.21%	1.95%
10 year	2.86%	2.41%	2.48%

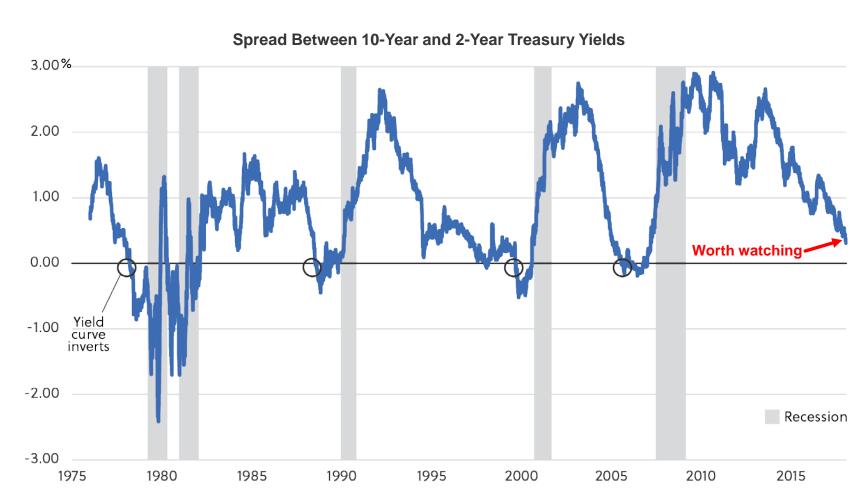
U.S. Treasury Yield Curve



Source: Bloomberg, as of 8/31/2018.



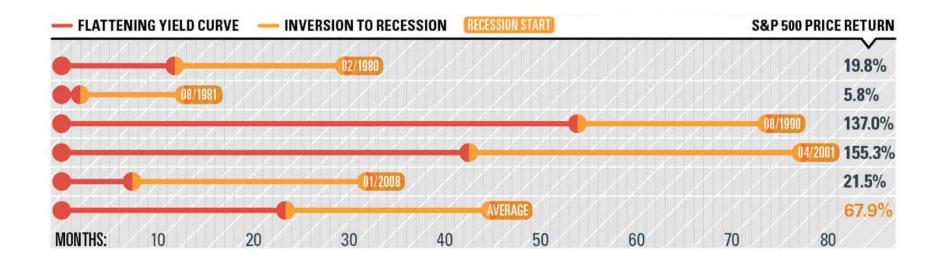
Yield Curve Inversions Precede Recessions: Deja Vu or Not?



Source: Federal Reserve Economic Data (FRED)



What Does the Flattening of the Yield Curve Mean?



Source (right): Wall Street Journal and Bloomberg. Source (bottom): LPL Research, FactSet.



Yield Environment as of August 31, 2018

Maturity	Treasury	Federal Agency	AA Corporate	A Corporate
3-Month	2.08%	2.09%	2.15%	2.26%
6-Month	2.24%	2.17%	2.38%	2.44%
1-Year	2.45%	2.46%	2.59%	2.79%
2-Year	2.61%	2.68%	2.89%	3.11%
3-Year	2.71%	2.75%	3.03%	3.26%
5-Year	2.80%	2.87%	3.24%	3.47%

Source: Bloomberg BVAL yield curves for Treasury and Corporate. TradeWeb for Federal Agency yields. 3 and 6 month corporate yields from commercial paper; A-1+ for AA and A-1 for A. Yields are for indicative purposes only; actual yields may vary by issue.

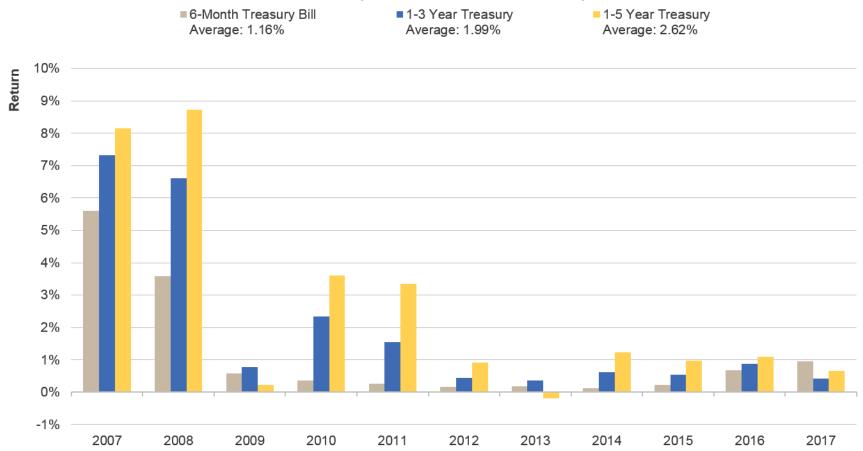


Keys to Portfolio Planning



Key #1: Liquidity Balance Overview

Total Return (as of December 31, 2017)



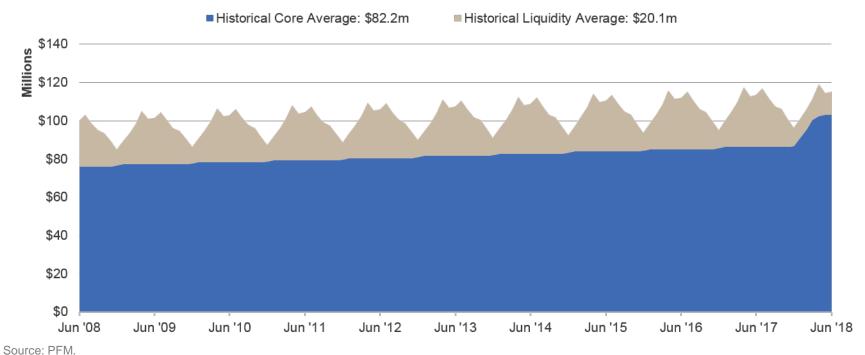
Source: ICE Bank of America Merrill Lynch indexes.



Key #1: Liquidity Balance – Sample Cash Flow

Portfolio Planning Presentation Historical Statistics From June 30, 2008 to June 30, 2018									
Total Core Liquidity									
Monthly Average	\$102,286,295	\$82,186,759	\$20,099,537						
Minimum \$84,978,485 \$76,055,478 \$8,497,848									
Maximum	\$118,977,085	\$102,959,807	\$31,105,821						

Portfolio Planning Presentation Portfolio Review



Source. Frivi



Key #1: Liquidity Balance – Sample Seasonal Analysis

Portfolio Seasonality								
Month	Average Balance	Historical Factor	Average Change					
January	\$95,019,028	92.93%	\$4,465,413					
February	\$99,532,990	97.35%	\$4,513,962					
March	\$104,660,456	102.36%	\$5,127,466					
April	\$111,831,183	109.38%	\$7,170,727					
May	\$107,528,801	105.17%	-\$4,302,382					
June	\$107,324,354	104.97%	\$527,988					
July	\$109,773,525	107.36%	\$3,212,888					
August	\$104,958,748	102.65%	-\$4,814,777					
September	\$101,054,772	98.84%	-\$3,903,976					
October	\$99,610,145	97.42%	-\$1,444,627					
November	\$95,084,122	93.00%	-\$4,526,023					
December	\$90,553,615	88.57%	-\$4,530,507					



Investment Objectives – Yield vs. Total Return

Yield is the income return at a point in time, expressed as an annualized rate of return based on cost, and is forward-looking. The calculation of yield assumes no changes in cash flow and reinvestment rates.

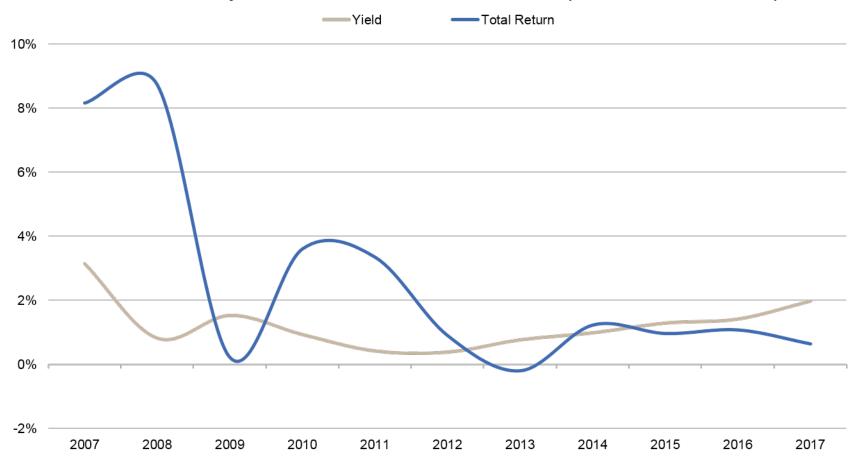
Total return is calculated based on interest and both realized and unrealized changes in market value, expressed as a rate of return over a specified period of time based on cost, and is backward-looking.

Earnings Target Approach	Total Return Approach
- Focused on income stability and useful for	- Focused on long-term performance and
budgeting purposes	growth
- Does not account for changes in market	- Affected by both yield and market value
value	fluctuations
- Not sufficient for assessing risk and	- Reflects "true value" of the portfolio
performance	- Recommended approach by the
Portfolio Management Style	Government Finance Officers Association
- Can limit active management strategies	Portfolio Management Style
- Focused on meeting earnings target	- Flexible active management
- May sacrifice higher earnings in the future	- More flexibility to capitalize on new
to avoid negatively affecting current year	opportunities from changes in interest rates
earnings	- Can be negative during rising interest rates



Key #2: Investment Objectives – Keep Your Eye on the Ball

1-5 Year Treasury Periodic Annual Yield and Total Return (as of December 31, 2017)

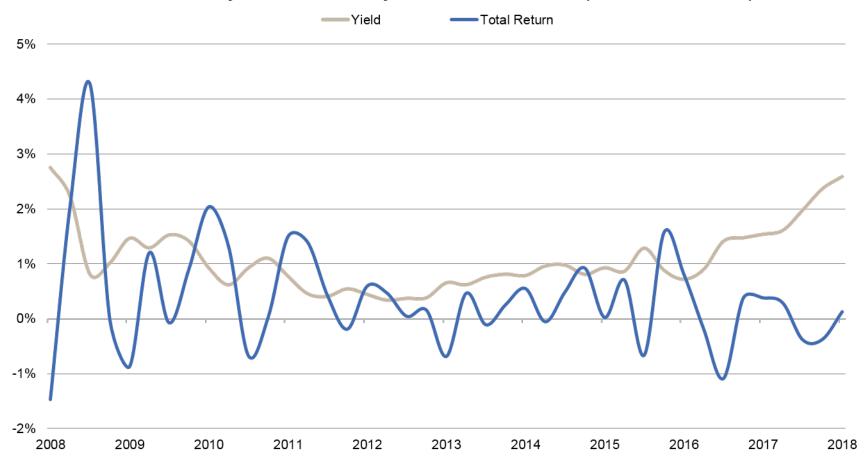


Source: ICE Bank of America Merrill Lynch indexes.



Key #2: Investment Objectives – Keep Your Eye on the Ball

1-5 Year Treasury Periodic Quarterly Yield and Total Return (as of June 30, 2018)

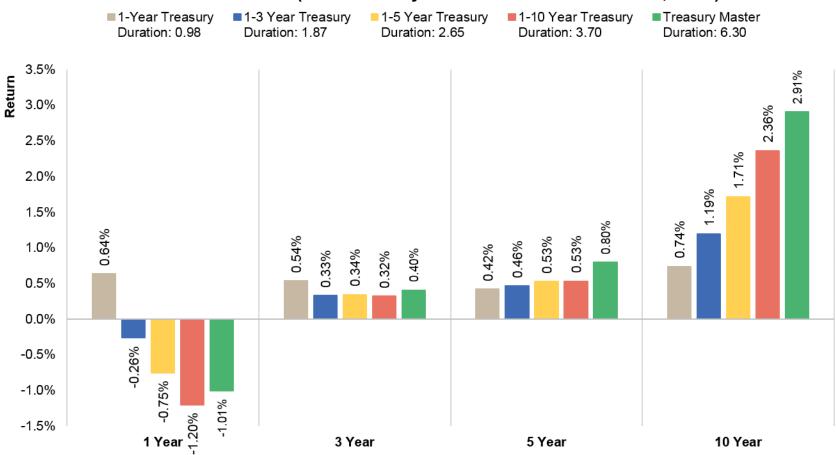


Source: ICE Bank of America Merrill Lynch indexes.



Key #3: Duration Selection

Total Returns % (U.S. Treasury Benchmarks as of June 30, 2018)

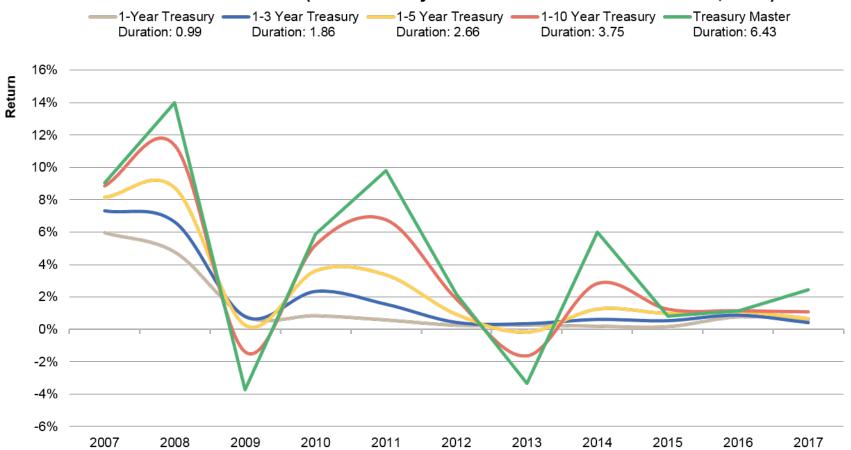


Source: ICE Bank of America Merrill Lynch indexes.



Key #3: Duration Selection Matters

Periodic Annual % (U.S. Treasury Benchmarks as of December 31, 2017)

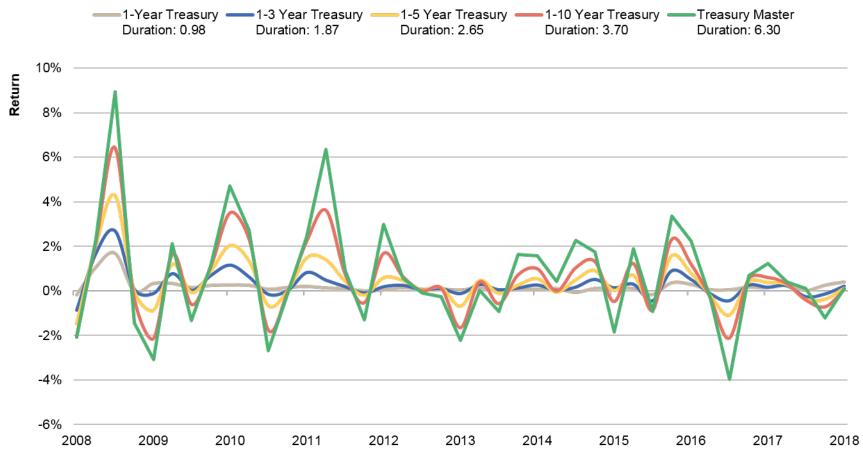


Source: ICE Bank of America Merrill Lynch indexes.



Key #3: Duration Selection Matters

Periodic Quarterly % (U.S. Treasury Benchmarks as of June 30, 2018)



Source: ICE Bank of America Merrill Lynch indexes.



Key #3: Duration Selection Impacts Market Value

\$100 Million Dollar Portfolio Current Interest Rate Sensitivity

(Market value change is expressed in millions of dollars, source: Bloomberg, PFM. Proxy Yields as of June 30, 2018)

12-Month Horizon										
Benchmark Duration Proxy Security Proxy Yield -0.50% -0.20% 0.00% 0.50% 1.00%										
1-Year Treasury	0.98	1-Year Treasury	2.31%	\$2.3	\$2.3	\$2.3	\$2.3	\$2.3		
1-3 Year Treasury	1.87	2-Year Treasury	2.53%	\$3.2	\$2.9	\$2.7	\$2.2	\$1.7		
1-5 Year Treasury	2.65	3-Year Treasury	2.62%	\$3.8	\$3.2	\$2.8	\$1.8	\$0.8		
1-10 Year Treasury	3.70	4-Year Treasury	2.68%	\$4.4	\$3.5	\$2.9	\$1.4	(\$0.1)		
Treasury Master	6.30	7-Year Treasury	2.82%	\$6.1	\$4.3	\$3.1	\$0.1	(\$2.9)		

12-Month Horizon

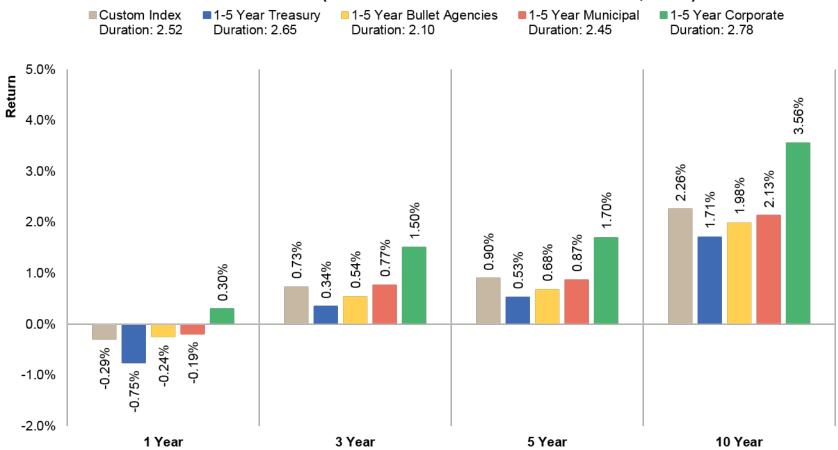


Source: Bloomberg, ICE Bank of America Merrill Lynch Indexes, and PFM.



Key #4: Sector Selection

Total Returns % (1-5 Year Benchmarks as of June 30, 2018)



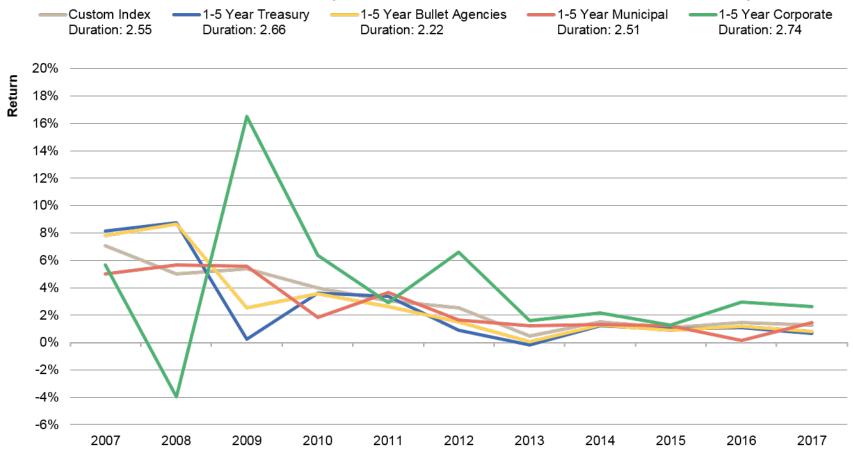
Source: ICE Bank of America Merrill Lynch indexes.

Custom Index is composed of ICE BAML 1-5 Year indexes allocated 40% to Treasury, 20% Bullet Agencies, 5% Callable Agencies, 10% Municipal, and 25% Corporate.



Key #4: Sector Selection Can Add Value

Periodic Annual % (1-5 Year Benchmarks as of December 31, 2017)



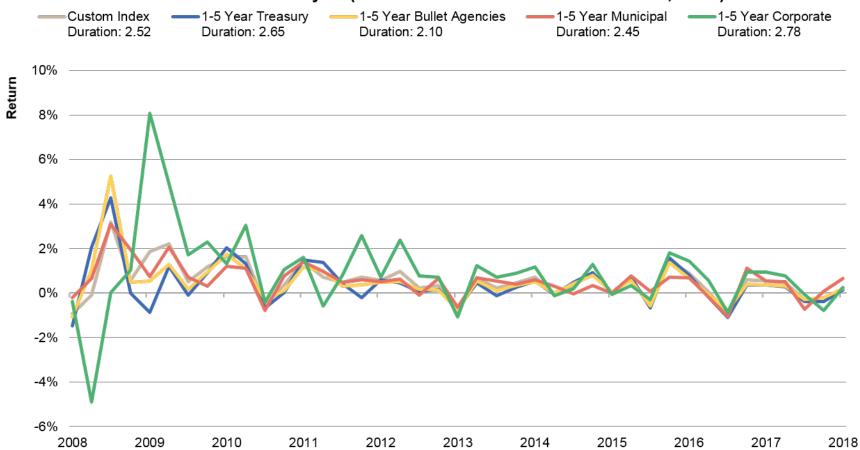
Source: ICE Bank of America Merrill Lynch indexes.

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Key #4: Sector Selection Can Add Value

Periodic Quarterly % (1-5 Year Benchmarks as of June 30, 2018)



Source: ICE Bank of America Merrill Lynch indexes.

Custom Index is composed of ICE BAML 1-5 Year indexes allocated 40% to Treasury, 20% Bullet Agencies, 5% Callable Agencies, 10% Municipal, and 25% Corporate.



Diversification Matters

Annual Index Returns	Duration	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Annualized Average
1-5 Year Treasury	2.66	8.16%	8.73%	16.50%	6.36%	3.66%	6.59%	1.78%	2.15%	1.28%	2.96%	2.64%	3.95%
1-5 Year Bullet Agencies	2.22	7.81%	8.63%	14.69%	4.86%	3.36%	4.49%	1.61%	1.38%	1.27%	2.39%	1.91%	3.29%
1-5 Year Callable Agencies	2.11	7.32%	7.78%	5.56%	3.61%	2.90%	1.63%	1.24%	1.30%	1.20%	1.19%	1.46%	2.77%
1-5 Year Municipal	2.51	7.12%	6.61%	4.21%	3.54%	2.62%	1.52%	1.07%	1.29%	1.01%	1.09%	1.00%	2.59%
1-5 Year Corporate	2.74	6.00%	5.65%	2.53%	2.67%	2.36%	1.03%	0.43%	1.24%	0.98%	0.99%	0.99%	2.57%
1-3 Year Treasury	1.86	5.77%	5.16%	2.23%	2.35%	1.76%	0.91%	0.40%	1.19%	0.92%	0.95%	0.86%	2.30%
1-3 Year Bullet Agencies	1.82	5.67%	4.84%	2.14%	1.85%	1.67%	0.89%	0.36%	0.73%	0.90%	0.89%	0.82%	2.04%
1-3 Year Callable Agencies	1.81	5.67%	4.68%	1.83%	1.29%	1.60%	0.85%	0.03%	0.72%	0.76%	0.81%	0.65%	1.96%
1-3 Year Municipal	1.83	5.00%	-2.68%	0.78%	1.24%	1.55%	0.69%	-0.01%	0.62%	0.64%	0.33%	0.59%	1.91%
1-3 Year Corporate	1.88	4.69%	-3.99%	0.23%	1.08%	1.21%	0.43%	-0.19%	0.58%	0.54%	0.16%	0.42%	1.71%

Source: ICE Bank of America Merrill Lynch indexes.



Components of a Strong Investment Policy

Objectives and Standards

- Safety, Liquidity, Yield
- Standard of Prudence
- Ethics and Conflicts of Interest
- Delegation of Authority

Constraints

- Authorized Investments
- Diversification by Asset Class
- Diversification by Issuer
- Maximum Maturity of Single Security
- Maximum Maturity of Fund
- Targeted Duration/Weighted Average Maturity
- Prohibited Investments

Operational Policies

- Security Downgrades
- Selection of Broker/Dealers
- Engagement of Investment Managers
- Competitive Selection of Investment Instruments
- Safekeeping and Custody
- Internal Controls
- Collateralization of Deposits

Reporting

- Performance Standards
- Required Monthly / Quarterly Reporting



Example: Defining Your Investment Parameters

Sector Type	Sector Max (%)	Issuer Max (%) Ratings Requirement ¹		Max Maturity
US Treasury	100%	N/A	N/A	10 Years
Federal Agency	75%	250/3	N/A	10 Years
Agency MBS	15%	35% ³	N/A	10 Years ²
Corporate Notes		5%	Top Three Ratings Categories	10 Years
Commercial Paper	25%	5%	Highest Ratings Category	270 Days
Negotiable CDs		5%	Top Three Ratings Categories	10 Years
Municipals	30%	5%	Top Three Ratings Categories	10 Years

¹By a Nationally Recognized Statistical Ratings Organization ("NRSRO")

²Agency MBS securities shall have a maximum weighted average life of 10 years

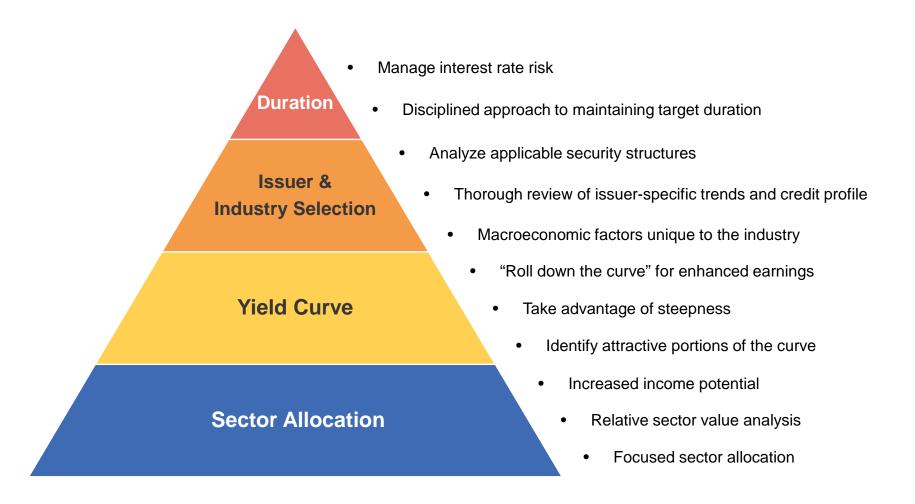
³Federal Agency and Agency MBS securities are limited to a combined 35% maximum issuer allocation



Building an Optimal Investment Program

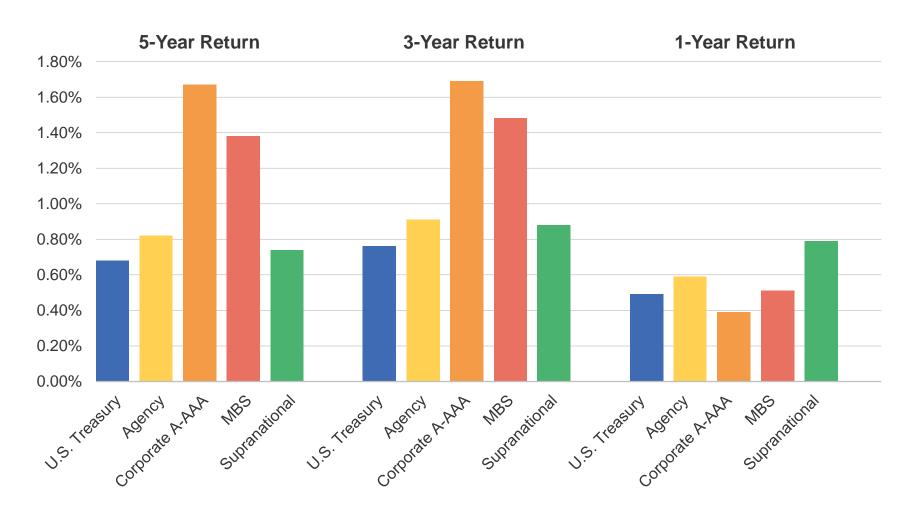


Building Blocks of Portfolio Management





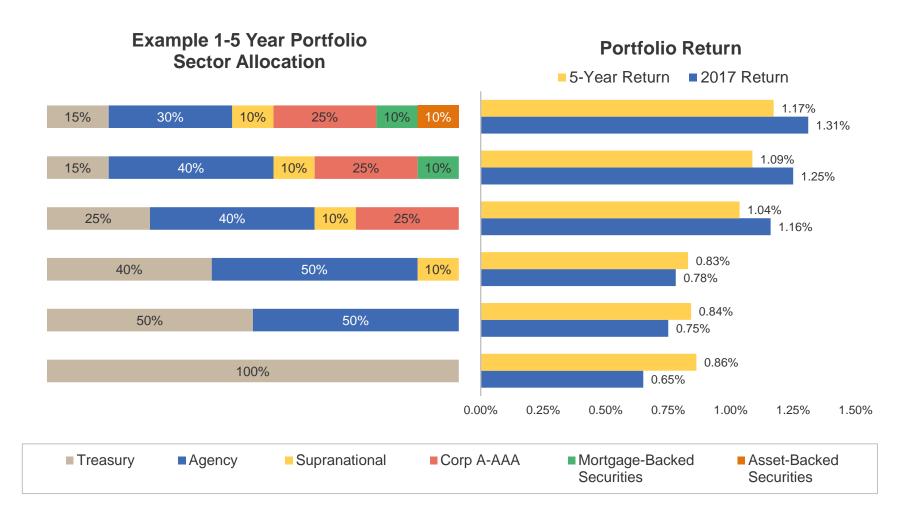
Sector Returns over Time



Source: ICE BofA Merrill Lynch Indices. MBS index is 0-5 year, based on weighted average life. As of 8/31/2018. Returns greater than 1-year are annualized.



Return Benefits of Diversification





Assessing and Finding Relative Value

Federal Agency Yield Spreads

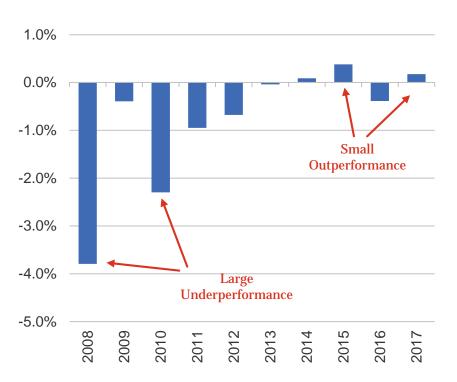




Callable Bonds Offer Asymmetric Returns

 The maximum benefit of a callable security is the initial yield spread, but non-callable securities can generate significantly higher returns in comparison, especially during periods of falling rates.

Callable vs. Bullet Agency Returns (1-5 Year)



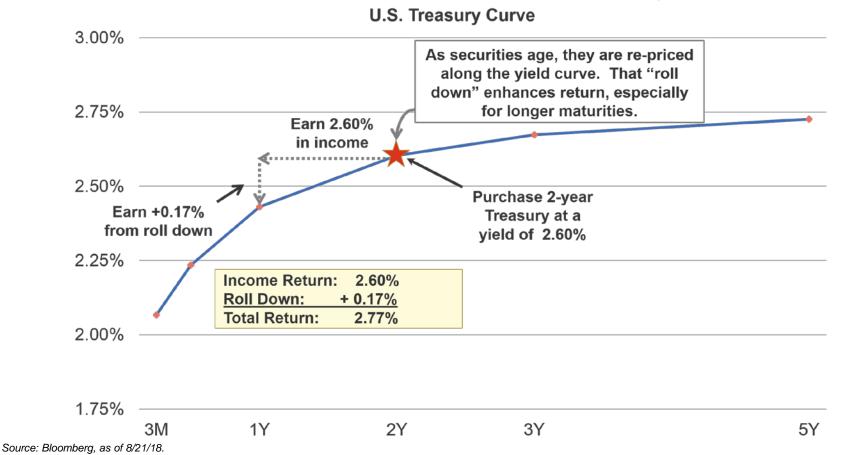
Annual Returns
Callable vs. Bullet Agencies (1-5 Year)

	31 11 (1 11)				
Year	Callable	Bullet	Difference		
2008	4.84%	8.63%	-3.79%		
2009	2.14%	2.53%	-0.39%		
2010	1.24%	1.24% 3.54%			
2011	1.67%	1.67% 2.62%			
2012	0.85%	1.52%	-0.68%		
2013	-0.01%	0.03%	-0.04%		
2014	1.38%	1.29%	+0.09%		
2015	1.28%	0.90%	+0.38%		
2016	0.81%	1.19%	-0.38%		
2017	0.99%	0.99% 0.82%			
10-Year Average	1.52%	2.31%	-0.79%		



Non-Callable Bonds Benefit From Roll Down

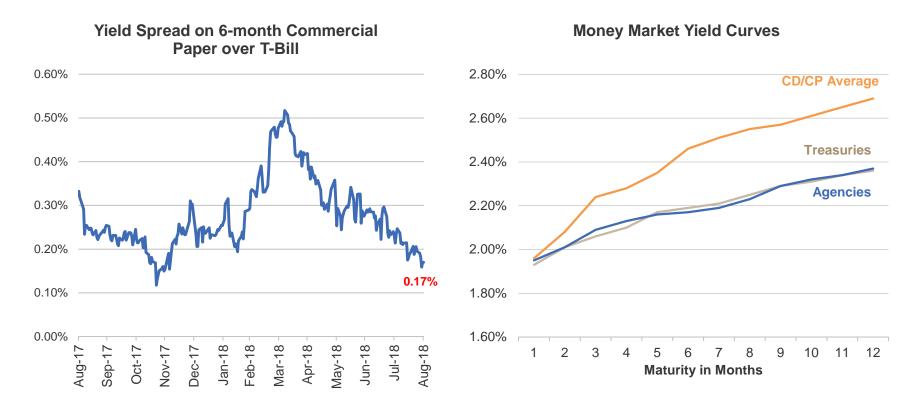
 Callable bonds have limited ability to appreciate in value because they are callable at par. Non-callable bonds have much more market appreciation capability, especially in a falling interest rate environment.





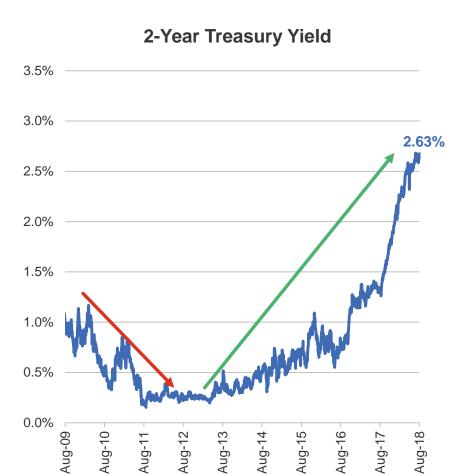
Current Short-Term Credit Environment

- Short-term credit spreads have tightened since Q1, but commercial paper and negotiable bank CDs remain attractive alternatives to Treasuries and federal agencies.
- While, current yields indicate CP/CDs are generally fairly valued, they offer value in several areas of the curve, particularly in the 3-6 month range, where they compensate for 1-2 more Fed rate hikes

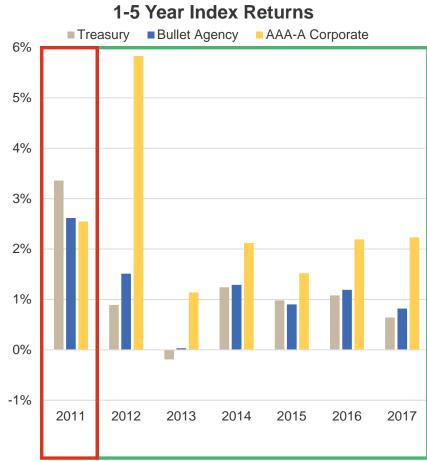




Safety: Sectors With Lower Correlations



Source: ICE BofA Merrill Lynch Indices from Bloomberg, as 8/31/18.

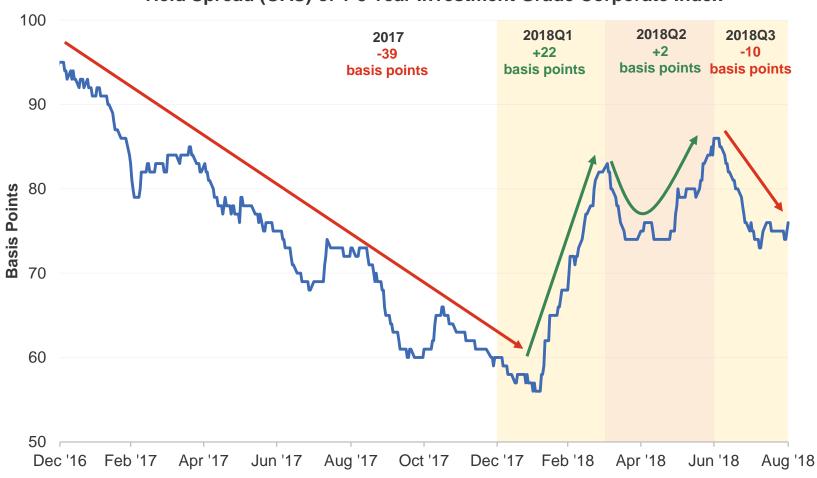


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Volatility in Corporate Securities

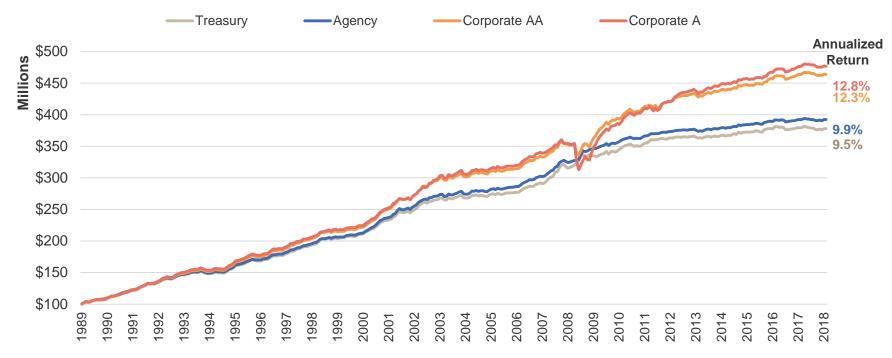
Yield Spread (OAS) of 1-5 Year Investment Grade Corporate Index



Source: Bloomberg, ICE BofA Merrill Lynch Indices, as of 8/31/2018.



Measuring Historical Corporate Note Outperformance (\$100MM)

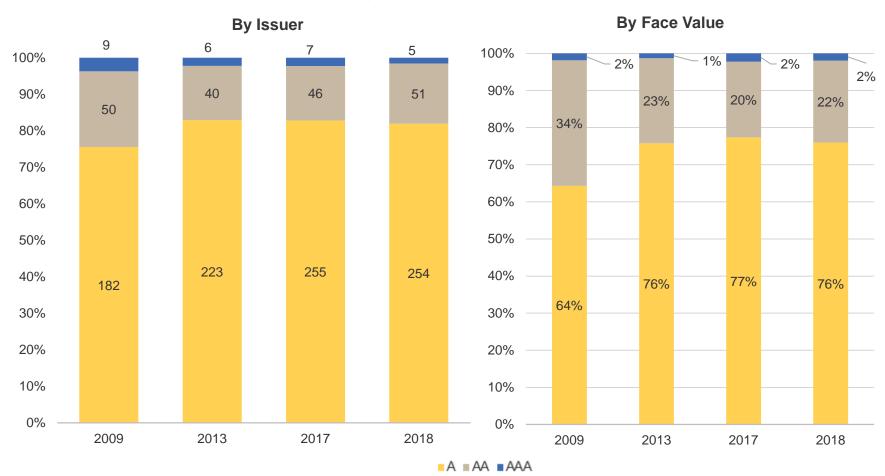


	Treasury	Agency	Corporate AA	Corporate A
Ending Value June 30, 2018	\$377,873,826	\$392,320,659	\$463,863,404	\$476,767,704
Incremental Earnings over Treasury	-	\$14,446,833	\$85,989,578	\$98,893,878



AA Corporates Have Decreasing Diversification Benefits

Composition of Merrill Lynch 1-5 Year AAA-A Corporate Index



Source: ICE BofA Merrill Lynch Indices composite ratings.



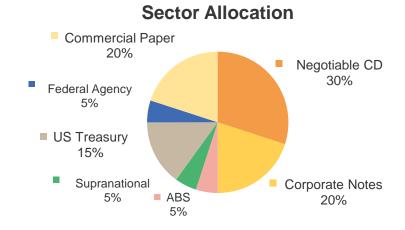
Short-Term Funds

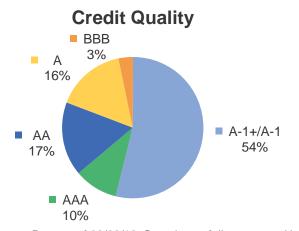


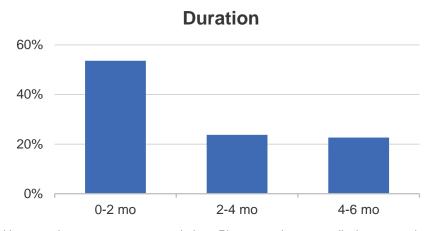
Sample Liquidity Portfolio: 0-6 Month

Portfolio Statistics

Gross Yield	2.31%
Average Duration	72 days







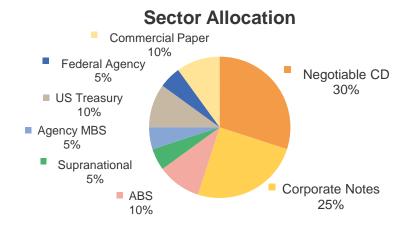
Source: Bloomberg. Data as of 09/06/18. Sample portfolio structured by PFM and is not an investment recommendation. Please see important disclosures at the end of this presentation.

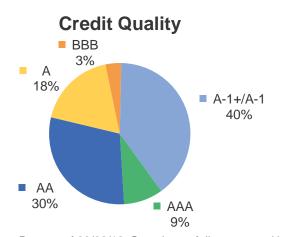


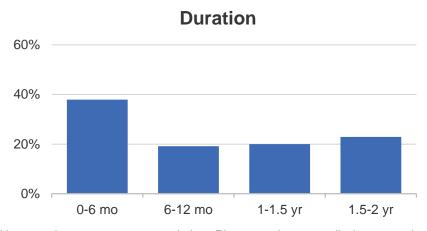
Sample Enhanced Cash: 0-2 Year

Portfolio Statistics

Gross Yield	2.62%
Average Duration	0.90 years







Source: Bloomberg. Data as of 09/06/18. Sample portfolio structured by PFM and is not an investment recommendation. Please see important disclosures at the end of this presentation.



Capital/Project Funds



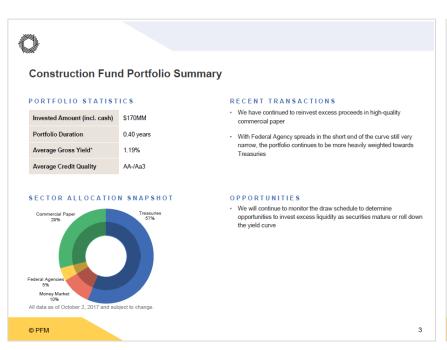
Asset-Liability Portfolio Structuring

Define Constraints & Objectives

- Draw schedule expectations
- Liquidity buffer

Portfolio Optimization

- Meet initial expected cash flow needs
- Horizon and relative value analyses







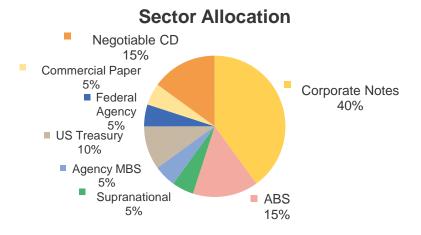
Longer-Term Funds



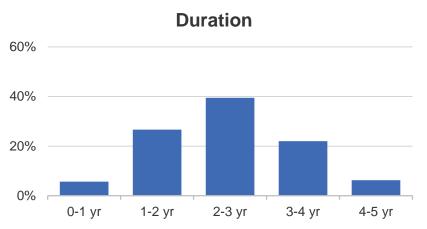
Sample Rate Stabilization: 1-5 Year

Portfolio Statistics

Gross Yield	3.00%
Average Duration	2.40 years



AAA 19% A-1+/A-1 5% BBB 10% AA 31%



Source: Bloomberg. Data as of 09/06/18. Sample portfolio structured by PFM and is not an investment recommendation. Please see important disclosures at the end of this presentation.



Sensitivity Analysis: Total Return Analysis

1-MONTH HORIZON							
MATURITY	CURRENT YTM	-0.25%	0.00%	+0.25%	+0.50%	+0.75%	+1.00%
3 month Treasury	2.11%	0.28%	0.24%	0.20%	0.16%	0.12%	0.09%
6 month Treasury	2.26%	0.45%	0.35%	0.25%	0.15%	0.05%	-0.05%
1 year Treasury	2.49%	0.67%	0.45%	0.23%	0.00%	-0.22%	-0.44%
2 year Treasury	2.65%	0.89%	0.43%	-0.03%	-0.49%	-0.95%	-1.41%
5 year Treasury	2.78%	1.38%	0.25%	-0.89%	-2.03%	-3.16%	-4.30%
		12-	монтн н	ORIZON			
MATURITY	CURRENT YTM	-0.25%	0.00%	+0.25%	+0.50%	+0.75%	+1.00%
3 month Treasury	2.11%	-	-	-	-	-	-
6 month Treasury	2.26%	-	-	-	-	-	-
1 year Treasury	2.49%	2.49%	2.49%	2.49%	2.49%	2.49%	2.49%
2 year Treasury	2.65%	3.16%	2.91%	2.67%	2.43%	2.19%	1.94%
5 year Treasury	2.78%	3.78%	2.84%	1.90%	0.97%	0.03%	-0.91%

^{*}As of September 4, 2018, and subject to change. Assumes hypothetical interest rate shocks.



Questions?





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