MEETING MATERIALS

HOWARD COUNTY RETIREMENT PLANS

January 23, 2020

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TABLE OF CONTENTS

NOVEMBER FLASH REPORT

NEPC, LLC

CALENDAR YEAR INDEX PERFORMANCE

	2010	2011	2012	2013	2014	2015	2016	2017	2018	Nov	YTD
S&P 500	15.1%	2.1%	16.0%	32.4%	13.7%	1.4%	12.0%	21.8%	-4.4%	3.6%	27.6%
Russell 1000	16.1%	1.5%	16.4%	33.1%	13.2%	0.9%	12.1%	21.7%	-4.8%	3.8%	27.7%
Russell 2000	26.9%	-4.2%	16.3%	38.8%	4.9%	-4.4%	21.3%	14.6%	-11.0%	4.1%	22.0%
Russell 2500	26.7%	-2.5%	17.9%	36.8%	7.1%	-2.9%	17.6%	16.8%	-10.0%	4.3%	25.1%
MSCI EAFE	7.8%	-12.1%	17.3%	22.8%	-4.9%	-0.8%	1.0%	25.0%	-13.8%	1.1%	18.2%
MSCI EM	18.9%	-18.4%	18.2%	-2.6%	-2.2%	-14.9%	11.2%	37.3%	-14.6%	-0.1%	10.2%
MSCI ACWI	12.7%	-7.3%	16.1%	22.8%	4.2%	-2.4%	7.9%	24.0%	-9.4%	2.4%	22.3%
Private Equity	19.8%	9.5%	12.6%	22.3%	14.6%	10.4%	10.3%	21.0%	13.1%	-	9.9%
BC TIPS	6.3%	13.6%	7.0%	-8.6%	3.6%	-1.4%	4.7%	3.0%	-1.3%	0.2%	8.0%
BC Municipal	2.4%	10.7%	6.8%	-2.6%	9.1%	3.3%	0.2%	5.4%	1.3%	0.3%	7.2%
BC Muni High Yield	7.8%	9.2%	18.1%	-5.5%	13.8%	1.8%	3.0%	9.7%	4.8%	0.4%	10.3%
BC US Corporate HY	15.1%	5.0%	15.8%	7.4%	2.5%	-4.5%	17.1%	7.5%	-2.1%	0.3%	12.1%
BC US Agg Bond	6.5%	7.8%	4.2%	-2.0%	6.0%	0.5%	2.6%	3.5%	0.0%	-0.1%	8.8%
BC Global Agg	5.5%	5.6%	4.3%	-2.6%	0.6%	-3.2%	2.1%	7.4%	-1.2%	-0.8%	6.2%
BC Long Treasuries	9.4%	29.9%	3.6%	-12.7%	25.1%	-1.2%	1.3%	8.5%	-1.8%	-0.5%	18.1%
BC US Long Credit	10.7%	17.1%	12.7%	-6.6%	16.4%	-4.6%	10.2%	12.2%	-6.8%	0.5%	23.2%
BC US STRIPS 20+ Yr	10.9%	58.5%	3.0%	-21.0%	46.4%	-3.7%	1.4%	13.7%	-4.1%	-0.3%	26.2%
JPM GBI-EM Global Div	15.7%	-1.8%	16.8%	-9.0%	-5.7%	-14.9%	9.9%	15.2%	-6.2%	-1.8%	9.0%
JPM EMBI Glob Div	12.2%	7.3%	17.4%	-5.3%	7.4%	1.2%	10.2%	10.3%	-4.3%	-0.5%	12.8%
CS Hedge Fund	10.9%	-2.5%	7.7%	9.7%	4.1%	-0.7%	1.2%	7.1%	-3.2%	-	7.1%
BBG Commodity	16.8%	-13.3%	-1.1%	-9.5%	-17.0%	-24.7%	11.8%	1.7%	-11.2%	-2.6%	2.5%
Alerian MLP	35.9%	13.9%	4.8%	27.6%	4.8%	-32.6%	18.3%	-6.5%	-12.4%	-5.8%	-1.8%
FTSE NAREIT Equity REITs	28.0%	8.3%	18.1%	2.5%	30.1%	3.2%	8.5%	5.2%	-4.6%	-1.5%	26.8%

Source: FactSet, Barclays, Thomson One
*Private Equity return represents calendar year pooled IRR and is subject to a one quarter lag

TRAILING ANNUAL INDEX PERFORMANCE

Equity						
	Nov-19	YTD	1 YR	3 YR	5 YR	10 YR
MSCI ACWI	2.4%	22.3%	13.7%	11.9%	7.2%	8.6%
S&P 500	3.6%	27.6%	16.1%	14.8%	10.9%	13.4%
Russell 1000	3.8%	27.7%	16.1%	14.6%	10.8%	13.4%
Russell 2000	4.1%	22.0%	7.5%	8.5%	8.2%	12.3%
Russell 2500	4.3%	25.1%	11.4%	10.2%	8.7%	13.1%
MSCI EAFE	1.1%	18.2%	12.4%	9.6%	4.2%	5.3%
MSCI EM	-0.1%	10.2%	7.3%	9.0%	3.1%	3.3%

Credit						
	Nov-19	YTD	1 YR	3 YR	5 YR	10 YR
BC Global Agg	-0.8%	6.2%	8.4%	3.9%	2.0%	2.0%
BC US Agg	-0.1%	8.8%	10.8%	4.1%	3.1%	3.6%
BC Credit	0.2%	13.5%	15.2%	5.9%	4.3%	5.2%
BC US HY	0.3%	12.1%	9.7%	6.3%	5.4%	7.7%
BC Muni	0.3%	7.2%	8.5%	5.0%	3.6%	4.3%
BC Muni HY	0.4%	10.3%	11.3%	8.7%	6.0%	7.2%
BC TIPS	0.2%	8.0%	8.6%	3.1%	2.3%	3.1%
BC 20+ STRIPS	-0.3%	26.2%	36.0%	10.9%	7.2%	9.9%
BC Long Treasuries	-0.5%	18.1%	24.6%	7.8%	5.3%	6.7%
BC Long Credit	0.5%	23.2%	26.3%	9.4%	6.5%	7.8%
BC Govt/Credit 1-3 Yr	0.0%	3.8%	4.6%	2.1%	1.6%	1.5%
JPM EMBI Glob Div	-0.5%	12.8%	14.3%	6.4%	5.3%	6.7%
JPM GBI-EM Glob Div	-1.8%	9.0%	10.4%	6.2%	0.7%	2.2%

Real Assets						
	Nov-19	YTD	1 YR	3 YR	5 YR	10 YR
BBG Commodity	-2.6%	2.5%	-4.5%	-2.0%	-6.3%	-5.0%
Alerian MLP	-5.8%	-1.8%	-11.0%	-5.7%	-9.5%	4.0%
FTSE NAREIT Equity REITs	-1.5%	26.8%	16.3%	10.0%	7.7%	12.7%

Source: S&P, MSCI, Russell, Barclays, JPM, Alerian, FTSE, FactSet

Howard County Retirement Plans

TOTAL FUND PERFORMANCE SUMMARY (GROSS)

	Market Value ($)	% of Portfolio	Policy %	1 Mo (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
				Ending November 30, 2019							
Total Fund Composite	**1,128,297,121**	**100.0**	**100.0**	**1.2**	**14.4**	**11.2**	**9.8**	**7.2**	**8.3**	**7.4**	**Apr-97**
Policy Index				*0.9*	*13.4*	*11.0*	*8.7*	*6.4*	*7.7*	*7.3*	*Apr-97*
Allocation Index				*1.1*	*--*	*--*	*--*	*--*	*--*	*--*	*Apr-97*
Total US Equity Composite	**281,462,844**	**24.9**	**20.0**	**4.5**	**27.7**	**15.0**	**14.9**	**11.3**	**14.3**	**8.7**	**Jul-97**
Russell 3000				*3.8*	*27.3*	*15.5*	*14.2*	*10.6*	*13.4*	*8.0*	*Jul-97*
US Equity Allocation Index				*4.0*	*27.1*	*14.9*	*13.7*	*10.4*	*13.7*	*--*	*Jul-97*
Total International Equity	**201,735,327**	**17.9**	**20.0**	**0.8**	**17.6**	**13.3**	**10.3**	**4.8**	**5.2**	**4.8**	**Jul-97**
MSCI ACWI ex USA				*0.9*	*16.5*	*11.2*	*9.2*	*3.8*	*4.7*	*4.6*	*Jul-97*
Total Fixed Income Composite	**327,785,833**	**29.1**	**30.0**	**-0.3**	**8.8**	**10.1**	**5.0**	**4.0**	**4.9**	**5.5**	**Jul-97**
Fixed Income Policy Index				*-0.1*	*8.8*	*10.8*	*4.1*	*3.1*	*3.6*	*5.3*	*Jul-97*
Total Real Assets Composite	**40,211,132**	**3.6**	**7.5**	**0.0**	**-0.4**	**-0.1**	**8.6**	**8.6**	**4.9**	**7.2**	**Jul-03**
NCREIF Property Index 1 Qtr. Lag				*0.0*	*4.8*	*6.5*	*6.9*	*8.8*	*9.2*	*8.7*	*Jul-03*
Cash Composite	**8,059,458**	**0.7**		**0.1**	**1.7**	**1.9**	**1.3**	**0.8**	**0.4**	**1.4**	**Dec-03**
91 Day T-Bills				*0.1*	*1.9*	*2.1*	*1.6*	*1.0*	*0.5*	*1.3*	*Dec-03*
Hedge Fund Composite	**123,026,681**	**10.9**	**12.5**	**0.7**	**6.7**	**5.4**	**4.8**	**4.3**	**--**	**4.7**	**Jan-11**
HFRI FOF: Conservative Index				*0.5*	*5.3*	*4.3*	*3.1*	*2.2*	*2.7*	*2.4*	*Jan-11*
Private Equity Composite	**146,015,846**	**12.9**	**10.0**	**0.0**	**11.4**	**12.7**	**17.1**	**15.6**	**13.7**	**12.9**	**Jul-08**
Cambridge Associates Global All PE (Qtr Lag)				*0.0*	*7.3*	*10.8*	*14.5*	*11.0*	*13.7*	*9.3*	*Jul-08*

Fiscal year end 6/30.

All history prior to 3/1/2019 was provided by AndCo.

TOTAL FUND PERFORMANCE DETAIL (GROSS)

Ending November 30, 2019

	Market Value ($)	% of Portfolio	Policy %	1 Mo (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Total Fund Composite	**1,128,297,121**	**100.0**	**100.0**	**1.2**	**14.4**	**11.2**	**9.8**	**7.2**	**8.3**	**7.4**	**Apr-97**
Policy Index				*0.9*	*13.4*	*11.0*	*8.7*	*6.4*	*7.7*	*7.3*	*Apr-97*
Allocation Index				*1.1*	*--*	*--*	*--*	*--*	*--*	*--*	*Apr-97*
Total US Equity Composite	**281,462,844**	**24.9**	**20.0**	**4.5**	**27.7**	**15.0**	**14.9**	**11.3**	**14.3**	**8.7**	**Jul-97**
Russell 3000				*3.8*	*27.3*	*15.5*	*14.2*	*10.6*	*13.4*	*8.0*	*Jul-97*
US Equity Allocation Index				*4.0*	*27.1*	*14.9*	*13.7*	*10.4*	*13.7*	*--*	*Jul-97*
Large Cap Composite	**217,402,528**	**19.3**	**15.0**	**4.3**	**27.1**	**15.0**	**14.8**	**10.5**	**13.6**	**8.7**	**Apr-01**
Russell 1000				*3.8*	*27.7*	*16.1*	*14.7*	*10.8*	*13.5*	*7.8*	*Apr-01*
Invesco IQS – US Enhanced 1% Risk SMA	129,087	0.0		4.6	25.4	14.2	14.1	10.1	13.2	8.0	Apr-01
S&P 500				*3.6*	*27.6*	*16.1*	*14.9*	*11.0*	*13.4*	*7.6*	*Apr-01*
LSV Asset Management SMA	67,450,232	6.0		3.5	22.9	9.7	10.2	8.6	12.9	9.9	May-00
Russell 1000 Value				*3.1*	*23.2*	*11.3*	*9.6*	*7.8*	*11.7*	*7.1*	*May-00*
Westfield Capital Management SMA	81,723,958	7.2		5.7	33.6	21.6	20.2	12.9	--	16.3	Jul-10
Russell 1000 Growth				*4.4*	*32.4*	*21.0*	*19.8*	*13.7*	*15.2*	*16.9*	*Jul-10*
BlackRock Equity Index Non-Lendable Fund	68,099,252	6.0		--	--	--	--	--	--	--	Dec-19
S&P 500				*3.6*	*27.6*	*16.1*	*14.9*	*11.0*	*13.4*	*--*	*Dec-19*
Small/Mid Cap Composite	**64,060,316**	**5.7**	**5.0**	**5.1**	**29.9**	**14.9**	**15.3**	**13.6**	**15.5**	**12.3**	**Apr-93**
Russell 2500				*4.3*	*25.1*	*11.4*	*10.3*	*8.8*	*13.1*	*10.4*	*Apr-93*
William Blair SMA	21,270,616	1.9		4.5	32.1	16.7	19.8	14.5	16.9	12.4	Jun-06
Russell 2500 Growth				*6.8*	*31.4*	*17.2*	*15.2*	*10.9*	*14.8*	*9.9*	*Jun-06*
ICM Small Company - ICSCX	24,074,312	2.1		3.0	24.9	9.1	8.6	10.5	13.2	11.9	Apr-93
Russell 2000 Value				*2.3*	*18.3*	*4.0*	*5.0*	*6.8*	*11.0*	*9.8*	*Apr-93*
Brown Capital Small Company Strategy SMA	18,715,387	1.7		8.6	34.2	21.2	20.4	17.1	--	18.7	Aug-11
Russell 2000 Growth				*5.9*	*25.6*	*10.9*	*12.2*	*9.5*	*13.7*	*11.4*	*Aug-11*

TOTAL FUND PERFORMANCE DETAIL (GROSS)

Ending November 30, 2019

	Market Value ($)	% of Portfolio	Policy %	1 Mo (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Total International Equity	**201,735,327**	**17.9**	**20.0**	**0.8**	**17.6**	**13.3**	**10.3**	**4.8**	**5.2**	**4.8**	**Jul-97**
MSCI ACWI ex USA				*0.9*	*16.5*	*11.2*	*9.2*	*3.8*	*4.7*	*4.6*	*Jul-97*
International Developed Markets Composite	**133,631,285**	**11.8**	**13.0**	**1.5**	**21.1**	**15.0**	**10.3**	**4.8**	**6.0**	**3.4**	**Mar-08**
MSCI EAFE				*1.1*	*18.2*	*12.4*	*9.6*	*4.3*	*5.3*	*2.5*	*Mar-08*
Mondrian International Equity Fund, L.P.	62,700,002	5.6		0.9	15.1	10.1	9.2	4.0	5.4	2.1	Dec-07
MSCI EAFE				*1.1*	*18.2*	*12.4*	*9.6*	*4.3*	*5.3*	*1.6*	*Dec-07*
Baillie Gifford EAFE Pure K - BGPKX	70,931,283	6.3		2.0	27.0	19.8	--	--	--	5.0	May-18
MSCI EAFE				*1.1*	*18.2*	*12.4*	*9.6*	*4.3*	*5.3*	*0.7*	*May-18*
International Emerging Markets Composite	**68,104,043**	**6.0**	**7.0**	**-0.4**	**11.3**	**10.1**	**10.4**	**4.7**	**3.6**	**5.8**	**Feb-06**
MSCI Emerging Markets				*-0.1*	*10.2*	*7.3*	*9.0*	*3.1*	*3.3*	*4.5*	*Feb-06*
DFA Emerging Markets Value Portfolio Institutional - DFEVX	26,802,013	2.4		-0.1	3.8	1.7	7.1	2.8	2.6	5.3	Feb-06
MSCI Emerging Markets				*-0.1*	*10.2*	*7.3*	*9.0*	*3.1*	*3.3*	*4.5*	*Feb-06*
GQG Partners Emerging Markets Equity Fund	41,302,030	3.7		-0.6	16.7	16.5	--	--	--	16.5	Dec-18
MSCI Emerging Markets				*-0.1*	*10.2*	*7.3*	*9.0*	*3.1*	*3.3*	*7.3*	*Dec-18*
Total Fixed Income Composite	**327,785,833**	**29.1**	**30.0**	**-0.3**	**8.8**	**10.1**	**5.0**	**4.0**	**4.9**	**5.5**	**Jul-97**
BBgBarc US Aggregate TR				*-0.1*	*8.8*	*10.8*	*4.1*	*3.1*	*3.6*	*5.1*	*Jul-97*
Core Fixed Income Composite	**282,310,683**	**25.0**	**25.0**	**0.0**	**--**	**--**	**--**	**--**	**--**	**7.1**	**Mar-19**
BBgBarc US Aggregate TR				*-0.1*	*8.8*	*10.8*	*4.1*	*3.1*	*3.6*	*7.7*	*Mar-19*
Dodge & Cox SMA	139,719,832	12.4		0.0	9.4	10.7	4.9	4.0	--	4.7	May-10
BBgBarc US Aggregate TR				*-0.1*	*8.8*	*10.8*	*4.1*	*3.1*	*3.6*	*3.6*	*May-10*
PIMCO Total Return	119,661,604	10.6		-0.2	8.5	9.7	4.5	3.3	--	4.1	May-10
BBgBarc US Aggregate TR				*-0.1*	*8.8*	*10.8*	*4.1*	*3.1*	*3.6*	*3.6*	*May-10*
State Street Global Advisors TIPS	22,929,248	2.0		0.1	8.0	8.6	3.1	2.3	3.1	3.3	Nov-09
BBgBarc US TIPS TR				*0.2*	*8.0*	*8.6*	*3.2*	*2.3*	*3.1*	*3.3*	*Nov-09*
Emerging Markets Debt Composite	**45,475,150**	**4.0**	**5.0**	**-1.9**	**--**	**--**	**--**	**--**	**--**	**4.3**	**Mar-19**
JP Morgan GBI EM Global Diversified TR USD				*-1.8*	*9.0*	*10.4*	*6.3*	*0.7*	*2.2*	*4.5*	*Mar-19*
Colchester Local Markets Debt Fund	45,475,150	4.0		-1.9	8.8	10.5	7.7	--	--	8.4	Oct-15
JP Morgan GBI EM Global Diversified TR USD				*-1.8*	*9.0*	*10.4*	*6.3*	*0.7*	*2.2*	*6.4*	*Oct-15*

TOTAL FUND PERFORMANCE DETAIL (GROSS)

	Market Value ($)	% of Portfolio	Policy %	1 Mo (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
										Ending November 30, 2019	
Total Real Assets Composite	**40,211,132**	**3.6**	**7.5**	**0.0**	**-0.4**	**-0.1**	**8.6**	**8.6**	**4.9**	**7.2**	**Jul-03**
NCREIF Property Index 1 Qtr. Lag				*0.0*	*4.8*	*6.5*	*6.9*	*8.8*	*9.2*	*8.7*	*Jul-03*
Real Estate Composite	**27,287,493**	**2.4**		**0.0**	**--**	**--**	**--**	**--**	**--**	**0.0**	**Mar-19**
NCREIF Property Index 1 Qtr. Lag				*0.0*	*4.8*	*6.5*	*6.9*	*8.8*	*9.2*	*4.8*	*Mar-19*
Realty Associates Fund VIII L.P.	6,414	0.0		0.0	-42.2	-42.2	-10.9	-2.5	-1.5	-2.0	Jul-07
Partners Group Global RE 2011	4,719,740	0.4		0.0	-16.7	-19.0	-1.8	1.4	--	2.9	Mar-12
Partners Group Global RE 2014	18,068,761	1.6		0.0	5.5	7.5	11.1	9.3	--	9.3	Dec-14
Partners Group Global RE 2017	4,492,578	0.4		0.0	4.2	4.2	--	--	--	4.2	Dec-18
NCREIF Property Index 1 Qtr. Lag				*0.0*	*4.8*	*6.5*	*6.9*	*8.8*	*9.2*	*6.5*	*Dec-18*
Real Assets Composite	**12,923,639**	**1.1**		**0.0**	**--**	**--**	**--**	**--**	**--**	**-4.4**	**Mar-19**
Cambridge Associates Global Natural Resources (1 Qtr Lag)				*0.0*	*-7.4*	*-5.4*	*5.9*	*-2.4*	*5.1*	*-7.4*	*Mar-19*
Commonfund Natural Resources X	5,047,260	0.4		0.0	4.5	4.5	40.1	--	--	18.0	Apr-16
Commonfund Natural Resources XI	794,870	0.1		0.0	-41.7	-41.7	--	--	--	-37.0	Oct-18
Aether Real Assets IV	6,176,873	0.5		0.0	2.0	2.0	5.6	--	--	4.8	Jun-16
Aether Real Assets V	904,636	0.1		0.0	-70.0	-46.2	--	--	--	-37.2	Aug-18
Cambridge Associates Global Natural Resources (1 Qtr Lag)				*0.0*	*-7.4*	*-5.4*	*5.9*	*-2.4*	*5.1*	*-1.5*	*Aug-18*
Cash Composite	**8,059,458**	**0.7**	**0.0**	**0.1**	**1.7**	**1.9**	**1.3**	**0.8**	**0.4**	**1.4**	**Dec-03**
91 Day T-Bills				*0.1*	*1.9*	*2.1*	*1.6*	*1.0*	*0.5*	*1.3*	*Dec-03*
Hedge Fund Composite	**123,026,681**	**10.9**	**12.5**	**0.7**	**6.7**	**5.4**	**4.8**	**4.3**	**--**	**4.7**	**Jan-11**
HFRI FOF: Conservative Index				*0.5*	*5.3*	*4.3*	*3.1*	*2.2*	*2.7*	*2.4*	*Jan-11*
Magnitude International Class A Eligible	60,675,519	5.4		0.6	6.3	4.6	4.2	4.1	--	4.6	Jan-11
HFRI FOF: Conservative Index				*0.5*	*5.3*	*4.3*	*3.1*	*2.2*	*2.7*	*2.4*	*Jan-11*
Blackstone Partners Offshore Fund LTD	62,351,162	5.5		0.8	7.0	6.2	5.5	4.5	--	4.8	Mar-11
HFRI FOF: Conservative Index				*0.5*	*5.3*	*4.3*	*3.1*	*2.2*	*2.7*	*2.3*	*Mar-11*
Private Equity Composite	**146,015,846**	**12.9**	**10.0**	**0.0**	**11.4**	**12.7**	**17.1**	**15.6**	**13.7**	**12.9**	**Jul-08**
Cambridge Associates Global All PE (Qtr Lag)				*0.0*	*7.3*	*10.8*	*14.5*	*11.0*	*13.7*	*9.3*	*Jul-08*

TOTAL FUND PERFORMANCE DETAIL FOOTNOTES

Fiscal year ends 6/30.

Policy index consists of: 15% S&P 500 / 5% Russell 2500 / 13% MSCI EAFE / 7% MSCI Emerging Markets / 25% BBgBarc US Aggregate TR / 5% JP Morgan GBI EM Global Diversified TR USD / 7.5% NCREIF Property Index 1 Qtr. Lag / 12.5% HFRI FOF: Conservative Index / 10% Private Equity Composite.

Allocation index consists of: Weighted index of underlying managers to their respective benchmark.

Fixed Income Policy index consists of: 100% BBgBarc US Aggregate TR.

Real Estate, Real Assets and Private Equity investments are valued as of 06/30/2019 and adjusted for capital calls and distributions through 10/30/2019.

All history prior to 3/1/2019 was provided by AndCo.

2020 ASSET ALLOCATION UPDATE

NEPC, LLC

2020 ASSET CLASS OVERVIEW

2019 was a year of robust returns across most asset classes

Investors were rewarded with lucrative returns as global equities and bonds rallied

Falling global yields were a powerful tailwind

Fixed income benefitted as prices rose with falling yields

The discounting of future cash flows with lower rates, supports higher equity valuations

The economic backdrop weakened globally, but remains net positive

Accommodative monetary policy in the developed world was a positive for risk assets

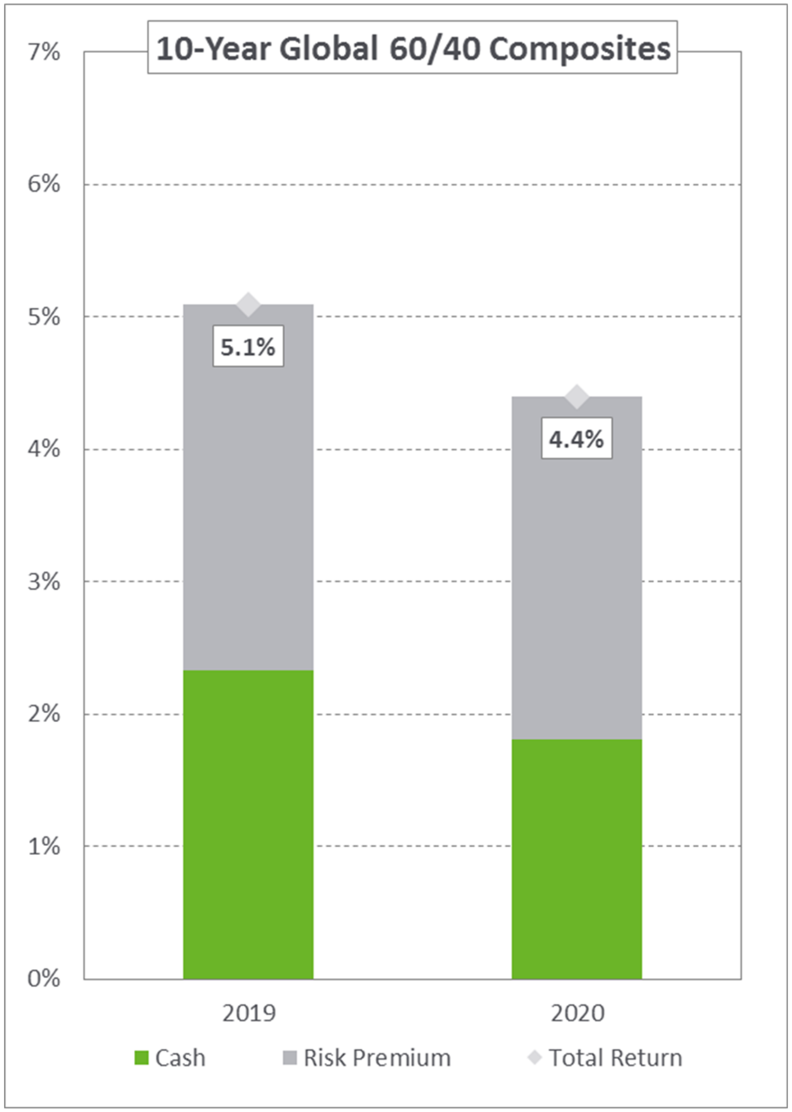
Market-based inflation expectations have declined considerably and reflect a lower expected inflation path over the long-term

The "lower for longer" period has extended out a decade due to central bank intervention

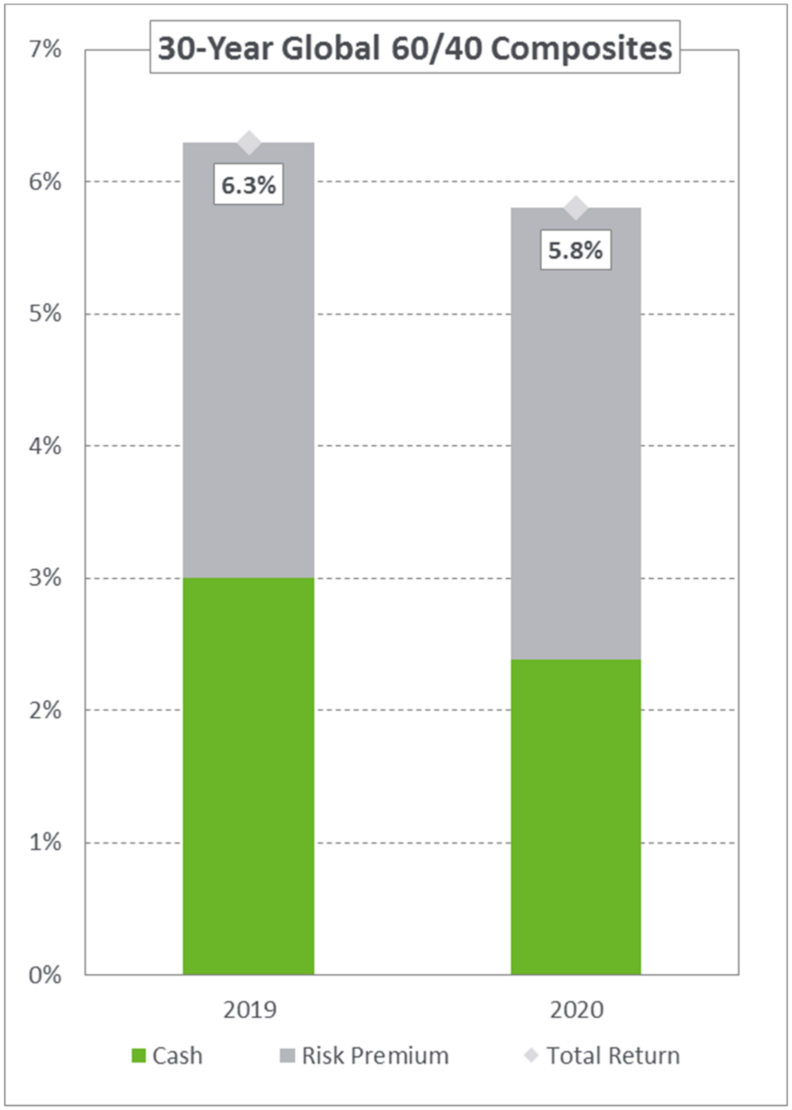
The combination of falling interest rates, robust returns in the prior year, and lower growth and inflation expectations generate declining return expectations for nearly all asset classes

These significant market movements resulted in a secular decline in NEPC's outlook – impacting both the 10-year and 30-year assumptions

THE IMPACT OF LOWER CASH RATES



Source: NEPC



Source: NEPC

HOWARD COUNTY 2020 ASSET ALLOCATION REVIEW

NEPC, LLC

HOWARD COUNTY TOTAL PORTFOLIO – CURRENT POLICY

Asset Class	Target Allocation (2019 Assumptions)	Target Allocation (2020 Assumptions)	Δ (+/-)
Large Cap Equity	19.0%	19.0%	--
Small/Mid Cap Equity	4.0%	4.0%	--
Int'l Equities	12.0%	12.0%	--
Emerging Markets Equity	5.0%	5.0%	--
Private Equity	10.0%	10.0%	--
Total Equities	**50.0%**	**50.0%**	--
TIPS	2.0%	2.0%	--
Core Bonds	20.0%	20.0%	--
Emerging Market Debt (Local)	4.0%	4.0%	--
Absolute Return Fixed Income	4.0%	4.0%	--
Private Debt	5.0%	5.0%	--
Total Fixed Income	**35.0%**	**35.0%**	--
Core/Non-Core Real Estate[1]	5.0%	5.0%	--
Private Real Assets – Energy/Metals	2.0%	2.0%	--
Total Real Assets	**7.0%**	**7.0%**	--
Hedge Funds	8.0%	8.0%	--
Total Multi Asset	**8.0%**	**8.0%**	--
Total Portfolio	**100.0%**	**100.0%**	--
Expected Return (5-7 / 10 years)	***6.57%***	***5.91%***	***-0.66%***
Expected Return (30 years)	***7.66%***	***6.98%***	***-0.68%***
Standard Deviation	***11.51%***	***11.70%***	***0.19%***
Sharpe Ratio (5-7 / 10 Years)	***0.35***	***0.35***	***0.00***
Sharpe Ratio (30 Years)	***0.41***	***0.39***	***-0.02***

(1) Real Estate was modeled using a 60/40 split between NEPC's assumptions for Core Real Estate and Non-Core Real Estate.

APPENDIX

NEPC, LLC

ASSUMPTION DEVELOPMENT

Capital market assumptions are published for over 65 asset classes

Assumptions include 10-year and 30-year return forecasts, volatility expectations, and correlations

NEPC publishes both 10- and 30-year return forecasts

10-year forecasts are appropriate for strategic asset allocation analysis and are influenced by global forecasts/pricing of growth, inflation, and yields, while valuations and spreads converge to NEPC-defined terminal values

30-year forecasts are appropriate for actuarial inputs and long-term planning

Based on data as of November 30

Assumptions are developed by the Asset Allocation Committee and approved by the Partners Research Committee (PRC)

Assumptions are developed with proprietary valuation models and rely on a core building block methodology

Asset Allocation Committee	
September	Asset Allocation Committee Assumptions Kickoff Finalize List of New Asset Class Assumptions
October	Review Draft of Asset Class Return Assumptions Discuss Outlook with NEPC Research Beta Groups
November	Finalize Volatility and Correlation Assumptions Final Update of Asset Class Models (As of 11/30)
December	Review Model Output and Create Return Assumptions Present Draft to the PRC Publish Assumptions on December 16th

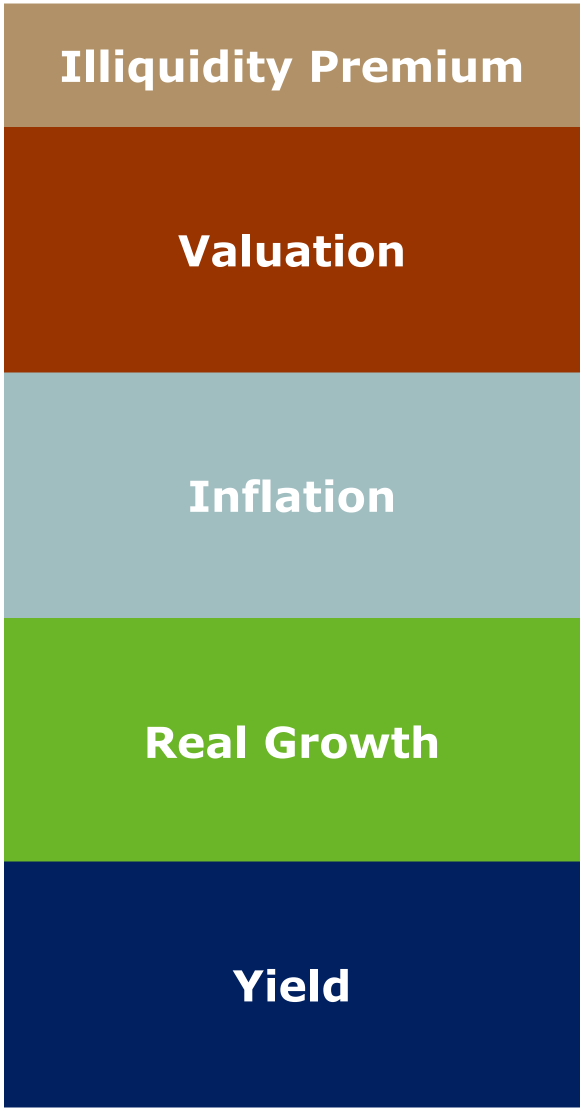
BUILDING BLOCKS METHODOLOGY

Forward-looking asset class models incorporate current and forecasted market and economic data to inform expected returns

Quantitative inputs combined with a conversion to long-term terminal values drive the 10-year outlook

Asset components are aggregated to capture core drivers of return across asset classes – forming the foundation of our building blocks framework

Building block components will differ for equity, fixed income, and real assets



CORE GEOMETRIC RETURN ASSUMPTIONS

	Asset Class	10-Year Return	30-Year Return	Volatility
	Cash	1.8%	2.4%	1.00%
	US Inflation	2.3%	2.5%	-
Equity	Large Cap Equities	5.0%	6.7%	16.50%
Equity	International Equities (Unhedged)	6.0%	7.0%	20.50%
Equity	Emerging International Equities	9.0%	9.2%	28.00%
Equity	*Global Equity**	6.2%	7.5%	17.79%
Equity	*Private Equity**	*9.4%*	*10.7%*	*24.58%*
Fixed Income	Treasuries	1.9%	2.7%	5.50%
Fixed Income	*Core Bonds**	*2.5%*	*3.4%*	*6.01%*
Fixed Income	TIPS	2.2%	2.7%	6.50%
Fixed Income	High Yield Bonds	4.1%	5.6%	12.50%
Fixed Income	*Private Debt**	*6.7%*	*7.8%*	*11.54%*
Real Assets	Commodities	4.0%	4.8%	19.00%
Real Assets	REITs	5.4%	6.5%	20.00%
Real Assets	Core Real Estate	5.2%	6.0%	13.00%
Real Assets	Private Real Assets: Infrastructure/Land	5.9%	6.7%	12.00%
Multi-Asset	*US 60/40**	*4.3%*	5.7%	*10.37%*
Multi-Asset	*Global 60/40**	*4.4%*	5.8%	*11.53%*
Multi-Asset	*Hedge Funds**	*5.0%*	5.9%	*8.18%*

*Calculated as a blend of other asset classes

MACRO ASSUMPTIONS

NEPC, LLC

INFLATION OVERVIEW

Inflation is an integral component of our asset allocation assumptions

Represents an essential building block for developing asset class returns

Inflation building blocks are model-driven and informed by multiple sources for both the US and global asset classes

Includes forecasts from international organizations (e.g. IMF), local consumer and producer price indices, break-even inflation expectations, and global interest rate curves

NEPC's US inflation expectation has declined relative to last year

This decline reflects market data including US CPI and IMF forecasts

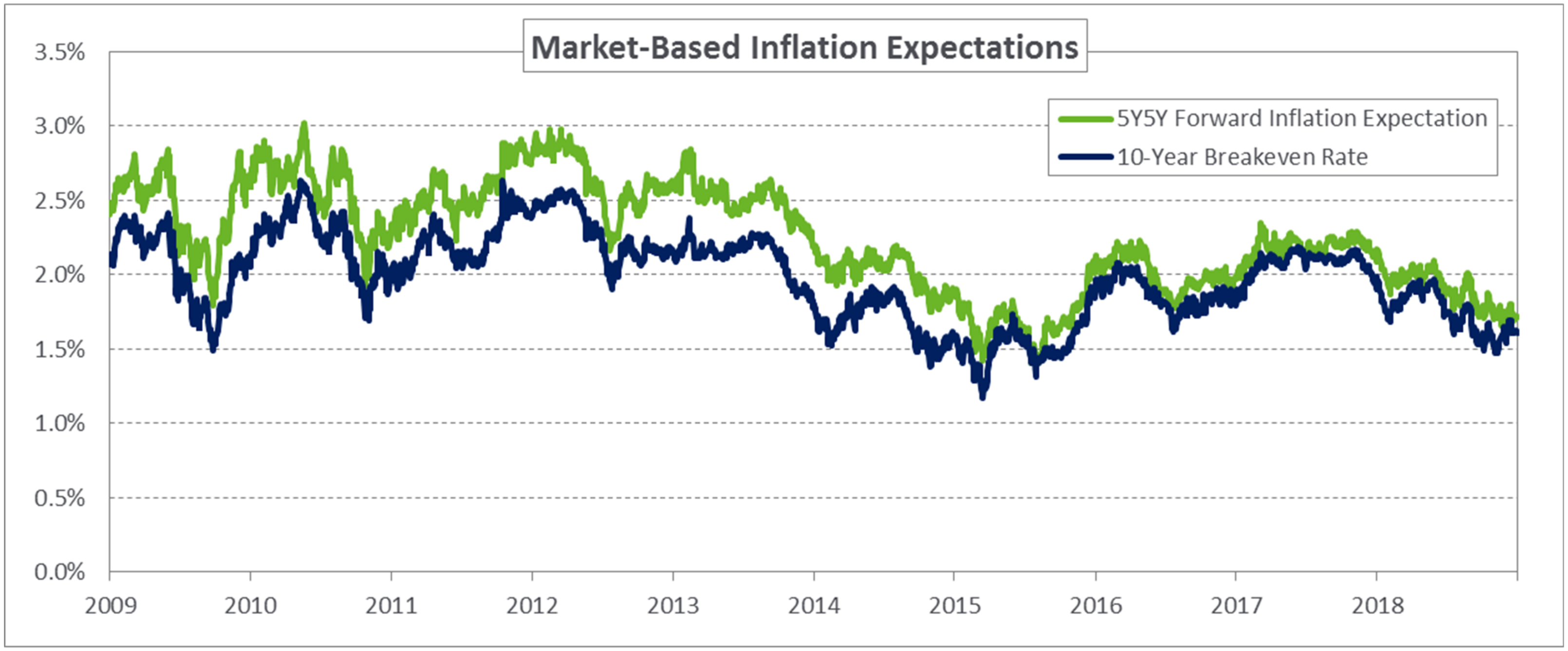
Market-based inflation expectations reflect little to no inflation pressure

Inflation break-evens (difference between Treasury and TIPS yields) suggest inflation will be near current levels for the next twenty years

NEPC return assumptions incorporate higher inflation expectations than break-evens, but are in line with IMF forecasts and well below long-term averages

Region	10-Year Inflation Assumption	30-Year Inflation Assumption
United States	2.3%	2.5%

US INFLATION



Source: FactSet, NEPC

US inflation has slowly trended higher, but has yet to accelerate despite resilient economic growth and a tight labor market

Underlying inflation has risen with modest wage increases amidst strong employment

Market-based inflation expectations have declined considerably

Suppressed energy prices have minimized overall inflation price pressures

Energy is historically the most volatile component of CPI and a sustained decline in prices can cause inflation to remain muted

GLOBAL INFLATION

In most developed economies, core inflation is below central bank targets

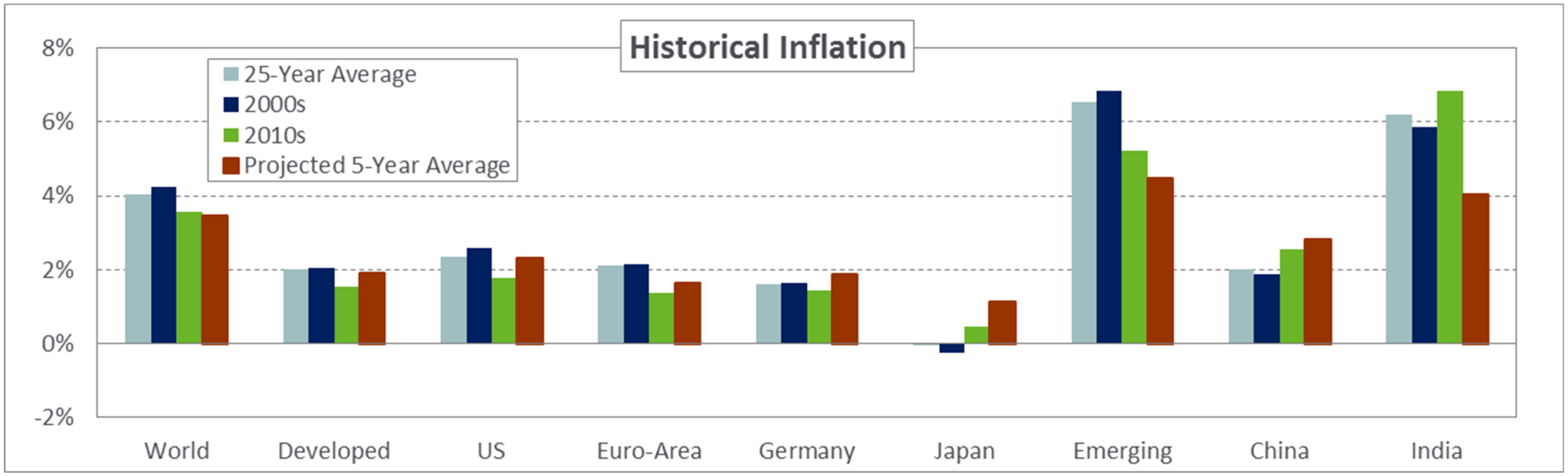
Globalization, deflationary technology, aging demographics and a decade of deleveraging are all deflationary headwinds

This trend will likely continue as global central banks rely on exhausted monetary policy programs following years of stimulus

A shift toward fiscal over monetary policy may be a source for potential inflation, but would require significant coordination and agreement across political spectrums

This may be an especially difficult prospect in the European Union given stark differences in opinion among member countries

Emerging market inflation remains well above the developed world, but is significantly lower than long-term averages



Source: IMF, FactSet, NEPC

US CASH EXPECTATIONS

Cash is a foundation for all asset classes

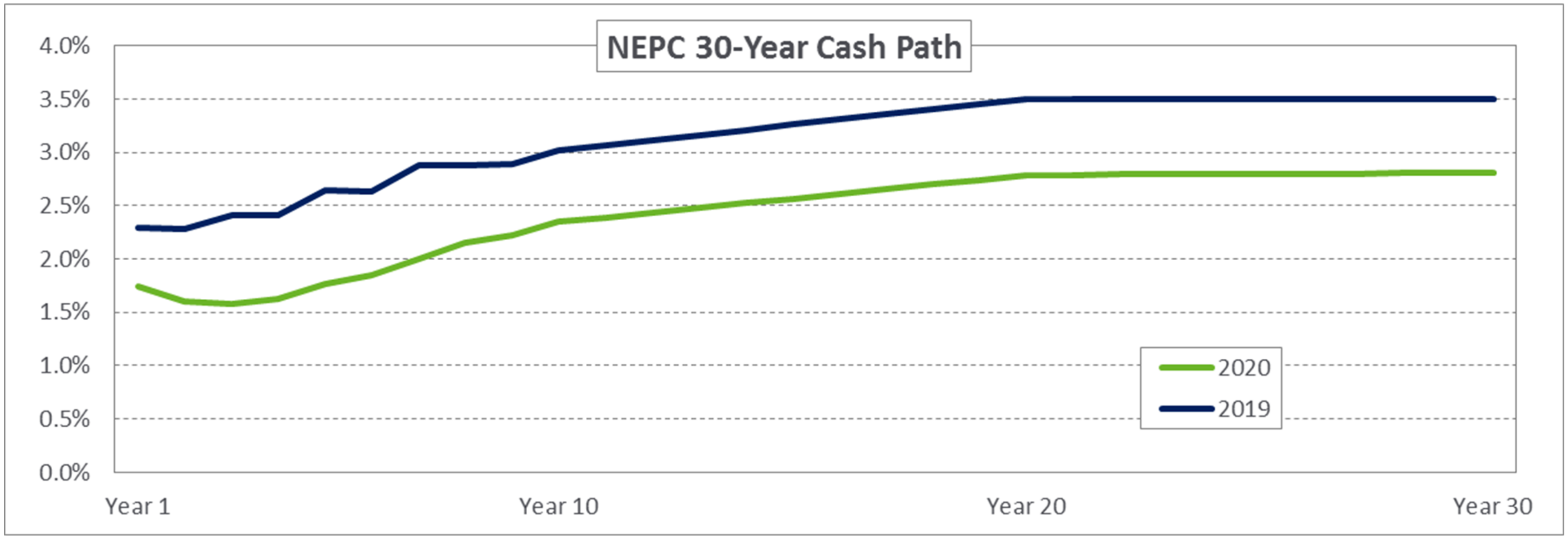
The assumption flows through as a direct building block component and as a relative value adjustment (cash + risk premia) in long-term return projections

Long-term cash assumption is a result of forecasted inflation plus a real interest rate path

US nominal rates are at a historically low point for NEPC's forecasts

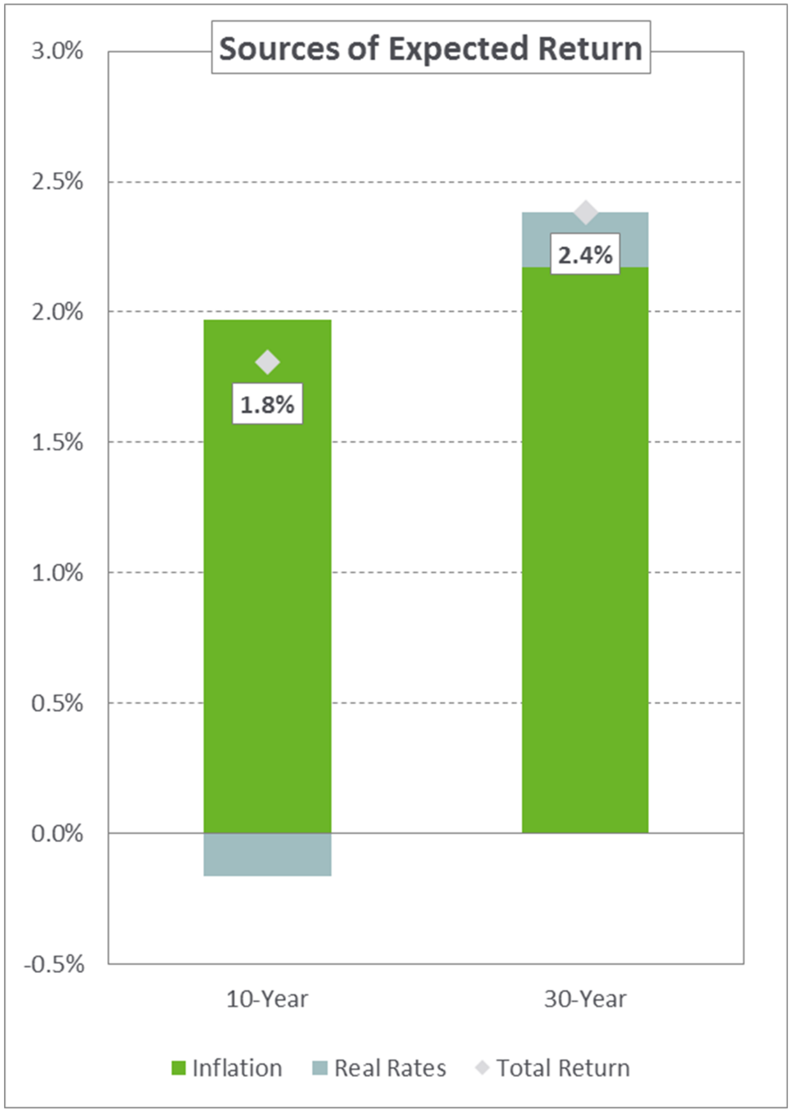
This level reflects recent rate cuts by the Federal Reserve and muted inflation pressures

Market expectations for a relatively flat curve and negligible inflation expectations create a low and flat expected path for cash



Source: Bloomberg, FactSet, NEPC

MACRO FOCUS: CASH



Source: NEPC

Rate cuts by the Fed and gravity of low global rates across developed world have depressed real yields across the curve

Rates outlook is lower for longer with little policy normalization priced into long-term yields

Market interest rate pricing in US (and across the world) reflects an expectation that key monetary authorities will keep rates low

- Reflects flexibility due to limited inflation pressure
- Acknowledges policymaker caution of having enough available firepower to navigate a downturn

US INTEREST RATE EXPECTATIONS

Real yields moved materially lower relative to last year with Fed rate cuts

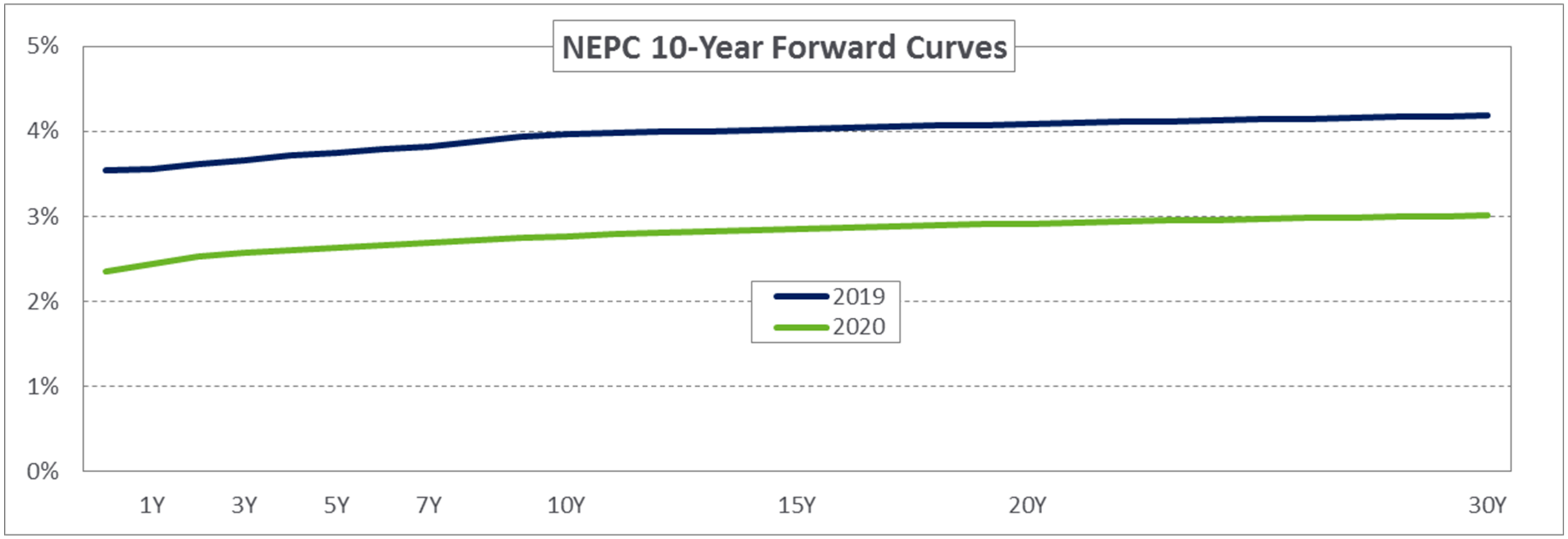
The real yield curve shifted down about 60 bps across the curve and continued to flatten over the past year

Slumping real yields reflect lower growth expectations

Long-term yields have been revised down considerably from last year

Low real rates depress the return outlook for risk assets over the long-term

Fed's shift to a prolonged easing environment and lower inflation expectations have suppressed yield forecasts



Source: FactSet, NEPC

GLOBAL INTEREST RATE EXPECTATIONS

Government bond yields remain low across much of the world

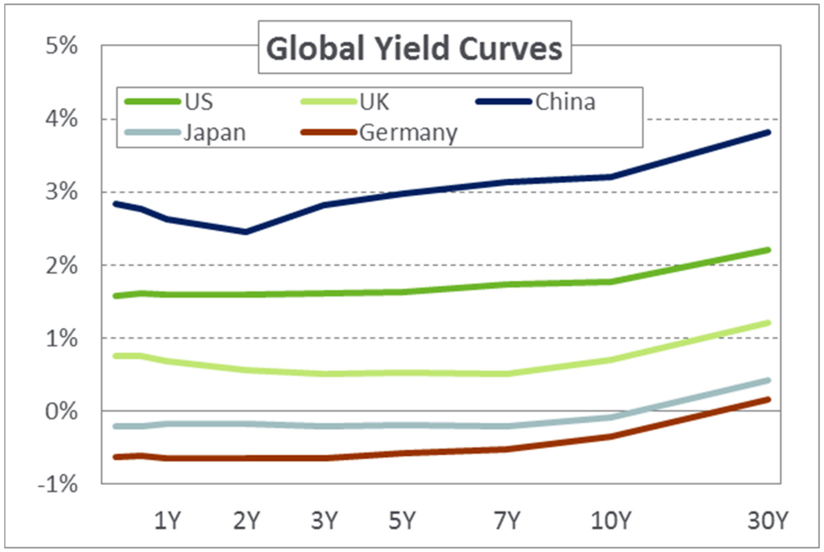
Several developed country yield curves outside the US are in negative territory with weak growth, continued monetary stimulus and muted inflation

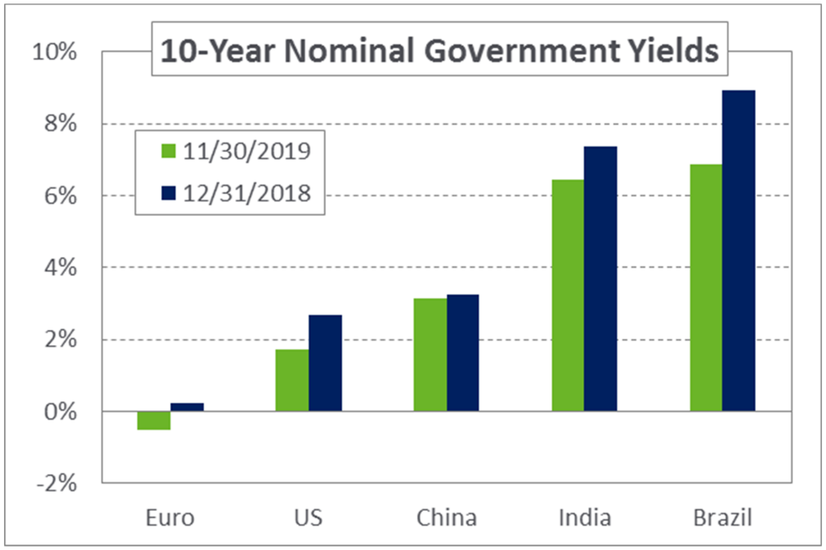
The US curve remains low, but positive

The outlook for non-US developed fixed income is poor given negative real and nominal yields

Emerging market local interest rates are attractive relative to negative real yields in much of the developed world

While real rates have declined, positive real rates provide a cushion for EM central banks to cut interest rates and ease monetary conditions as needed





Source: (Top) FactSet, NEPC
Source: (Bottom) FactSet, NEPC

EQUITY ASSUMPTIONS

EQUITY: ASSUMPTIONS

Equity Building Blocks	
Illiquidity Premium	The additional return expected for investments carrying liquidity risk
Valuation	An input representing P/E multiple contraction or expansion relative to long-term trend
Inflation	Represents market-specific inflation derived from index country revenue contribution and region-specific forecasted inflation
Real Earnings Growth	Reflects market-specific real growth for each equity asset class as a weighted-average derived from index country revenue contribution and forecasted GDP growth
Dividend Yield	Informed by current income distributed to shareholders with adjustments made to reflect market conditions and trends

Asset Class	2020 10-Year Return	2019 10-Year Return
US Large Cap	5.0%	6.2%
US Small/Mid-Cap	5.5%	6.4%
US Micro Cap	7.0%	7.1%
International (Unhedged)	6.0%	7.3%
International Small Cap	6.4%	7.6%
Emerging Markets	9.0%	9.2%
Emerging Markets Small Cap	9.2%	9.6%
China Equity	8.8%	7.9%
Hedge Funds – Long/Short	4.8%	5.7%
Global Equity	*6.2%*	*7.3%*
Private Equity	*9.4%*	*10.1%*

Source: NEPC
2019 return number reflects NEPC’s implied 10-year assumption

EQUITY: REAL EARNINGS GROWTH

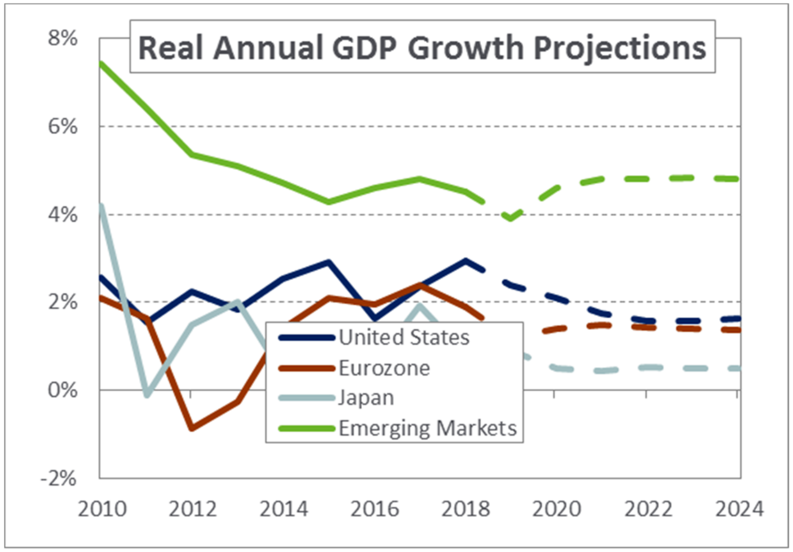
Global growth rates are subdued reflecting a cyclical slowdown, less favorable demographics, and US-China trade tensions

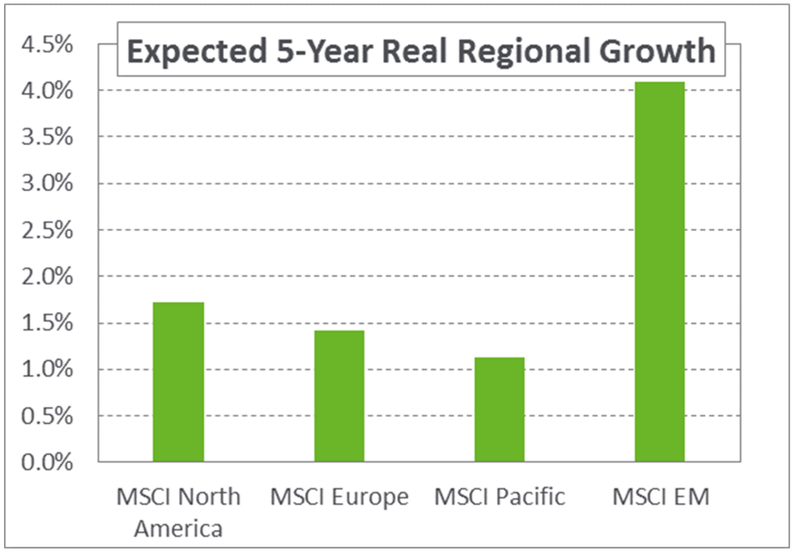
Regions more reliant on emerging markets for revenue generation are forecasted to enjoy higher expected real earnings growth

- International and emerging markets benefit from generating a much larger portion of revenues from this region than the US

Small caps have higher terminal values for real earnings growth relative to large caps

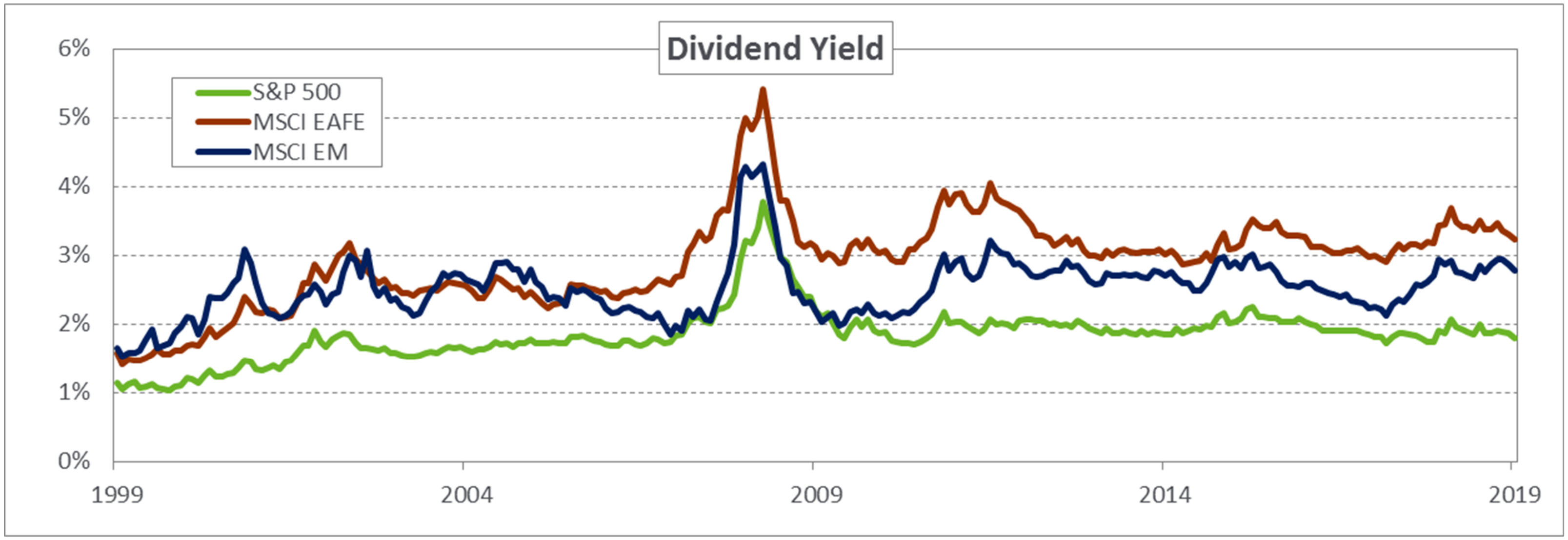
- This premium reflects a risk premium for small over large cap, which has existed historically
- In US markets, this represents a 50 basis point premium over large cap





Source: (Top) FactSet, NEPC
Source: (Bottom) IMF, MSCI, FactSet, NEPC

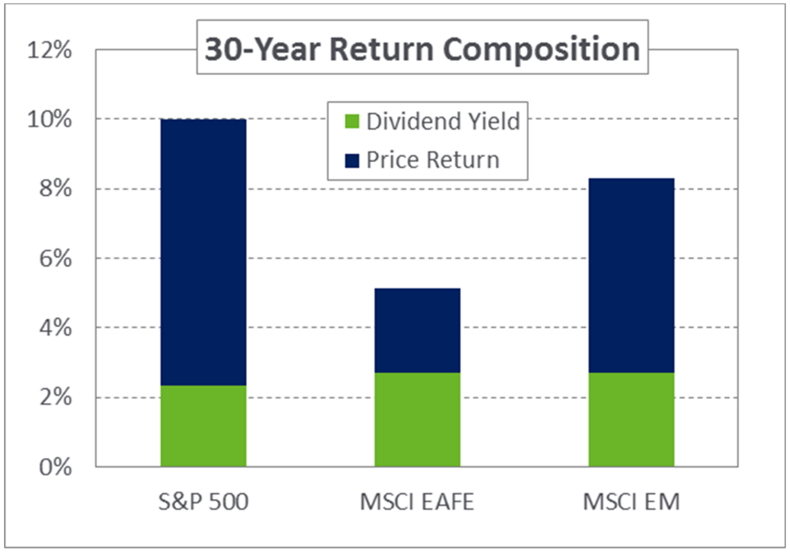
EQUITY: DIVIDEND YIELD



NEPC's long-term terminal value assumption for the S&P 500 dividend yield is 2.50%

EAFE and emerging markets offer structurally higher dividend yields relative to the US equity market

Long-term terminal value assumptions for the MSCI EAFE and MSCI Emerging Market dividend yields are 3.00% and 2.50%



Source: (Top) S&P, MSCI, FactSet, NEPC
Source: (Bottom) S&P, MSCI, FactSet, NEPC

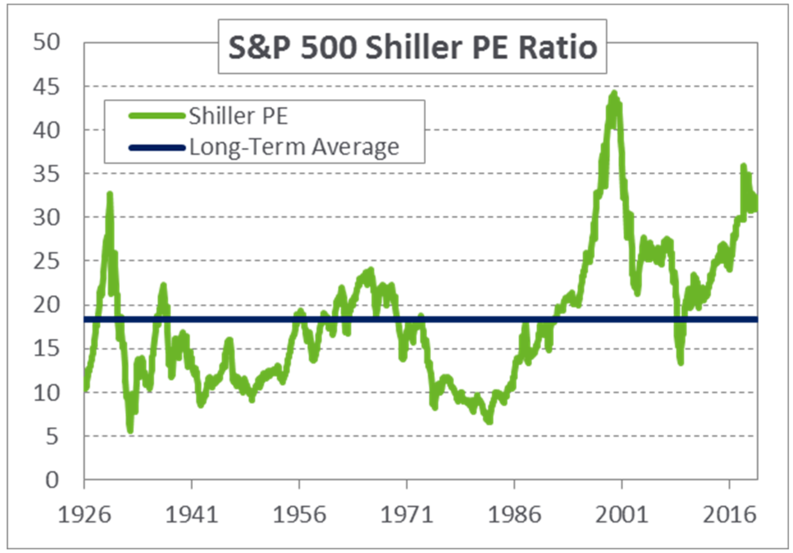
EQUITY: VALUATION

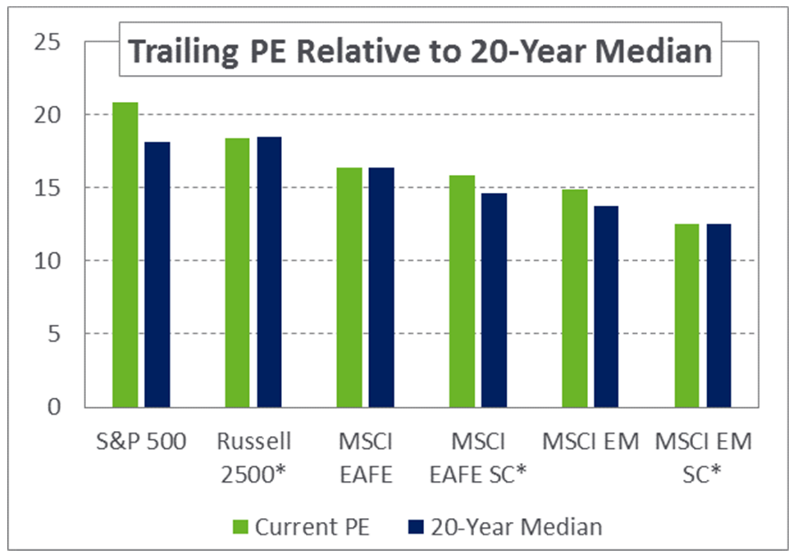
US equities have enjoyed multiple expansion as the extended US economic cycle supports earnings and profit margins

Terminal P/E values for the US are higher than historical averages to reflect expected low interest rates and higher discounting of future cashflows

Terminal values for EAFE are below current levels reflecting a less constructive market environment for investing in these regions

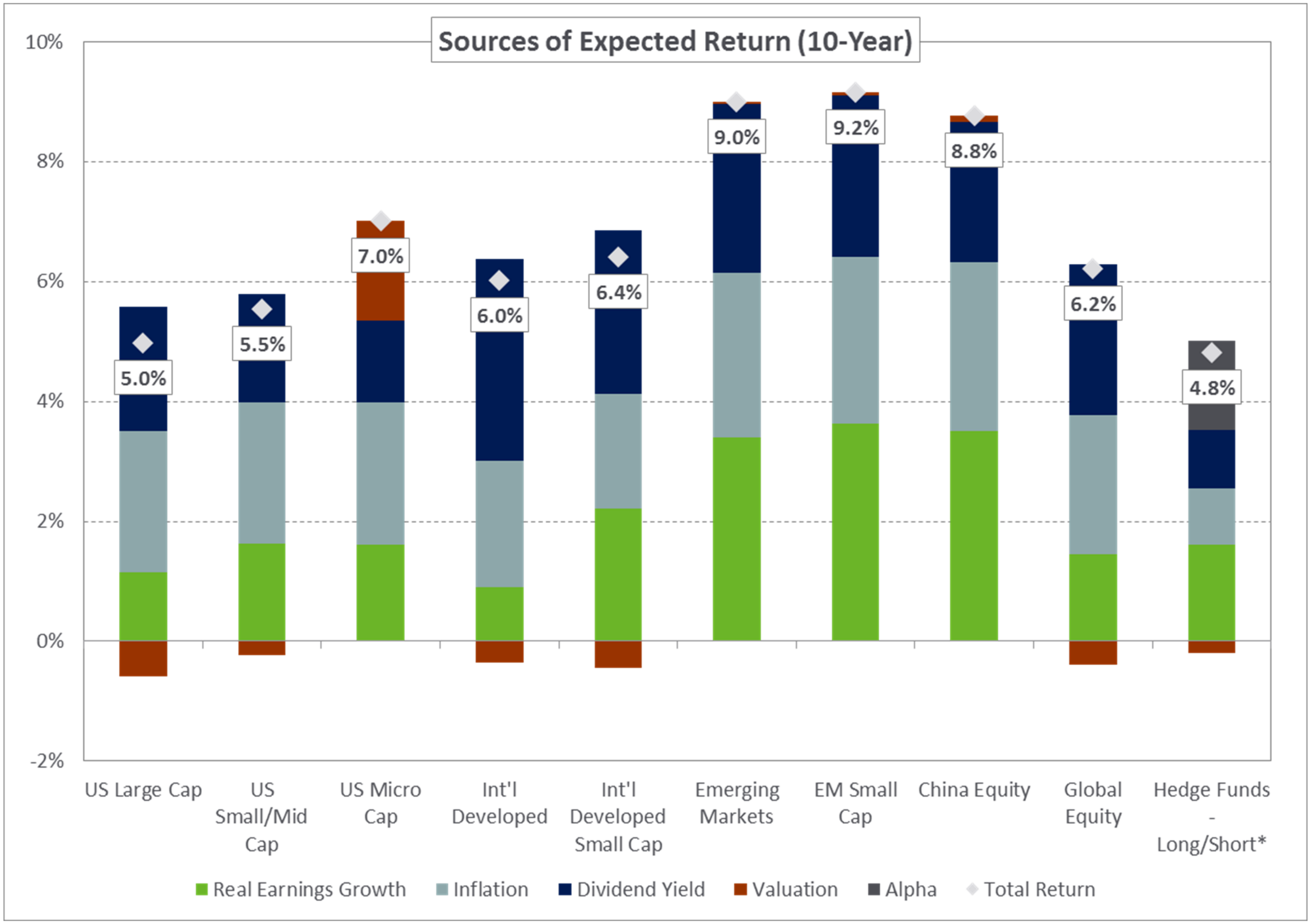
In emerging markets, equity and currency valuations remain near long-term averages, suggesting an attractive total return opportunity





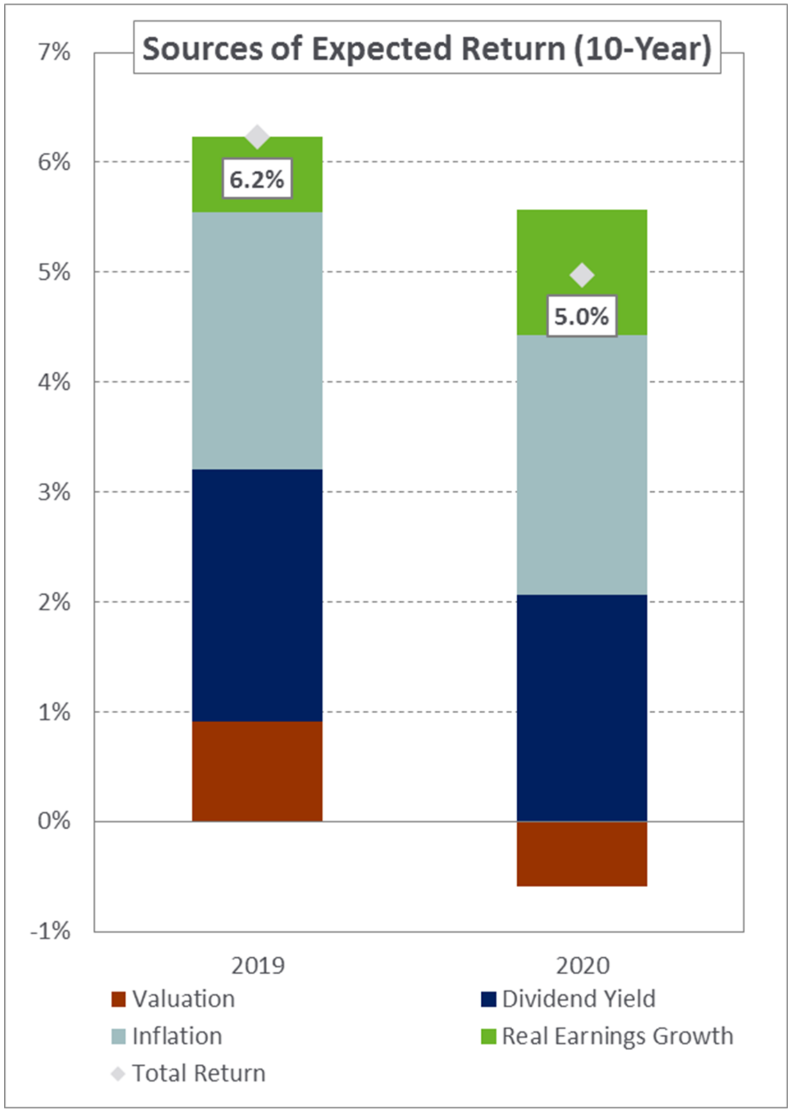
Source: (Top) S&P, Shiller, NEPC; long-term average beginning in 1926
Source: (Bottom) S&P, Russell, MSCI, FactSet, NEPC; *Small cap indices use index positive-adjusted earnings; MSCI EM Small Cap median calculated since 12/31/2008

EQUITY: BUILDING BLOCKS



Source: NEPC

EQUITY FOCUS: US LARGE CAP EQUITY



Source: NEPC

2019 return number reflects NEPC's implied 10-year assumption

The US large cap equity assumption is based on the S&P 500 Index, which derives 64% of revenues from North America, 16% from international developed markets, and 20% from emerging markets

This revenue contribution is applied to IMF regional estimates and drives changes in real earnings growth and inflation blocks

Lower IMF estimates for global real growth and inflation result in smaller contributions to expected returns than previously forecasted

Profit margin assumptions remain elevated over the long-term, though slowly trend downward toward historical averages

A higher terminal value for valuations relative to previous years was incorporated to reflect the 'Permanent Interventions' Key Market Theme

STRATEGIC EQUITY VIEW

Academic research suggests a return premium exists for small cap over large cap equities

- This notion is based on higher expected growth, less efficient analyst coverage, and an embedded risk premium for higher expected volatility

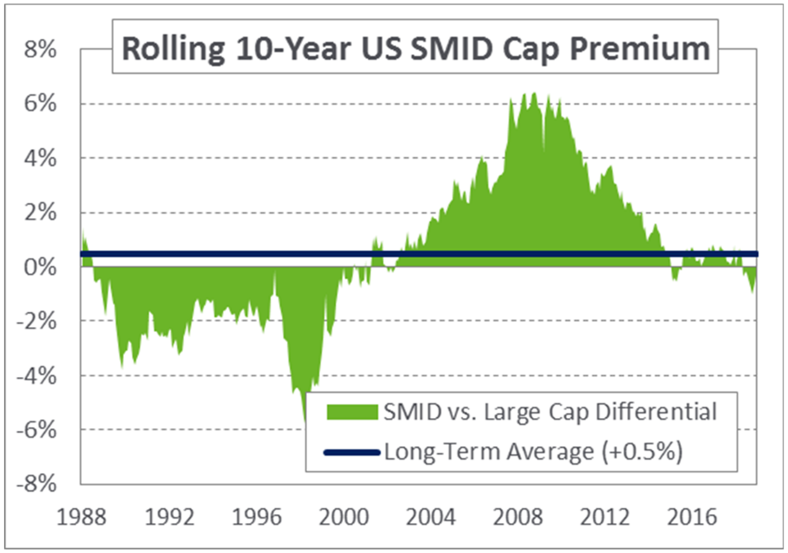
This premium has existed in the US and non-US developed markets

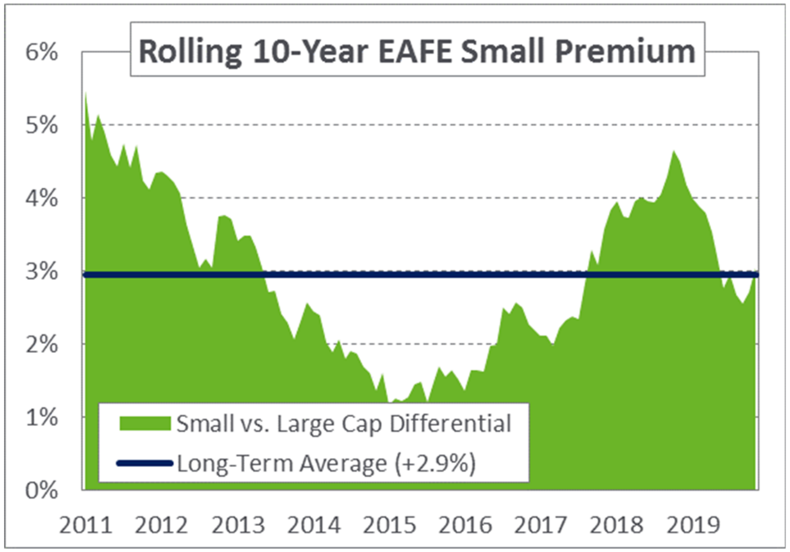
- The premium in US markets exhibits cyclicality, while international developed markets demonstrate more consistent outperformance

NEPC encourages a strategic bias to US and international small cap relative to the MSCI ACWI

This recommended target should be considered in the context of total equity beta exposure

- For example, investors with greater allocations to private equity might adopt an index weight to small caps





Source: (Top) S&P, Russell, FactSet, NEPC; relative to the S&P 500 Index
Source: (Bottom): MSCI, FactSet, NEPC; relative to the MSCI EAFE Index

FIXED INCOME ASSUMPTIONS

FIXED INCOME: ASSUMPTIONS

Fixed Income Building Blocks	
Illiquidity Premium	The additional return expected for investments carrying liquidity risk
Government Rates Price Change	The valuation change resulting from a change in the current yield curve to forecasted rates
Credit Deterioration	The average loss for credit securities associated with an expected default cycle and recovery rates
Spread Price Change	The valuation change resulting from a change in credit spreads over the duration of the investment and highly sensitive to economic cycles
Credit Spread	Additional yield premium provided by securities with credit risk
Government Rates	The yield attributed to sovereign bonds that do not have credit risk associated with their valuation

Asset Class	2020 10-Year Return	2019 10- Year Return
TIPS	2.2%	3.2%
Treasuries	1.9%	2.5%
Investment-Grade Corporate Credit	3.4%	4.4%
MBS	2.5%	1.9%
High-Yield Bonds	4.1%	5.5%
Bank Loans	4.8%	5.5%
EMD (External)	4.1%	5.3%
EMD (Local Currency)	5.4%	6.8%
Non-US Bonds (Unhedged)	0.2%	0.9%
Municipal Bonds (1-10 Year)	1.9%	1.0%
High-Yield Municipal Bonds	3.2%	2.6%
Hedge Funds – Credit	4.8%	5.9%
Core Bonds	*2.5%*	*2.9%*
Private Debt	*6.7%*	*7.6%*

Source: NEPC
2019 return number reflects NEPC's implied 10-year assumption

FIXED INCOME: CREDIT SPREAD

In most areas of credit, spreads are at or below long-term median spread levels

Expected returns are lower – reflecting the anticipated lower spread yield and losses as spreads converge upward to long-term medians

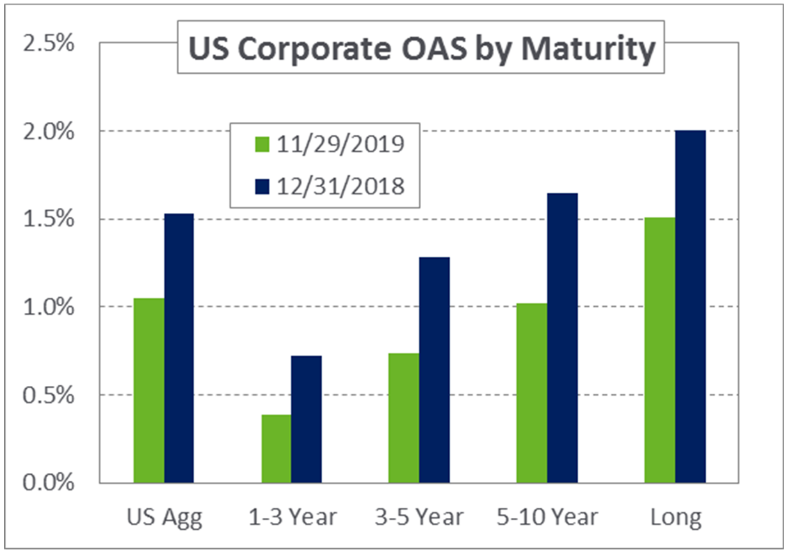
Spreads on CCC-rated bonds are above long-term medians given ongoing stress in the energy sector

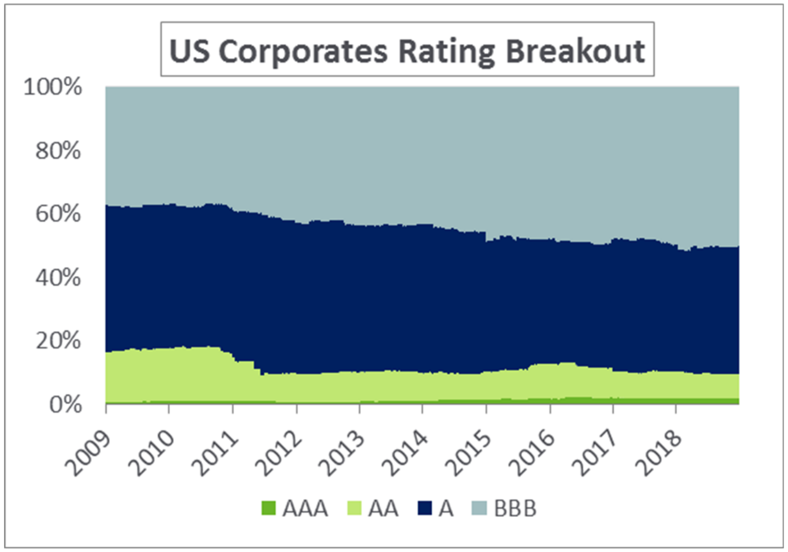
As a result, the return assumption increased as higher yields are captured throughout the forecast time horizon

Credit assumptions reflect a higher heightened risk environment

There are a record number of BBB-rated corporates – suggesting a greater risk of fallen angel downgrades

Corporate debt issuance has expanded rapidly in recent years with the majority of new debt rated BBB





Source: (Top) Barclays, FactSet, NEPC
Source: (Bottom) Barclays, FactSet, NEPC

FIXED INCOME: RATES PRICE CHANGE

Government Rates Price Change: The change in the level of interest rates, shape of the curve, and roll down that impact the price of a bond

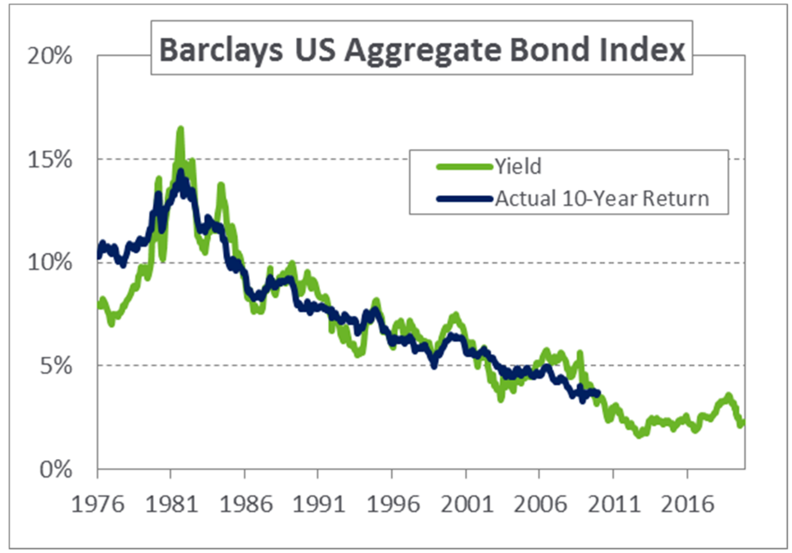
Roll down refers to the price change due to the aging of a bond along the yield curve

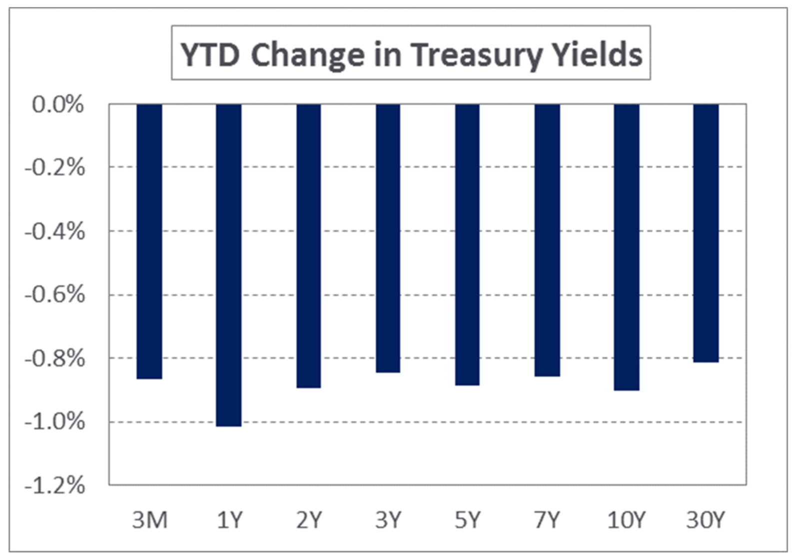
The rate price change is a significant component of total return and expectations of future rate increases can drag on future year returns

The path of interest rates for each market is tied to both central bank actions and inflation expectations

Roll down offers some relief to rising rates when yield curves are steep, but the flatness of the current curve suggests this benefit is muted

This dynamic often pushes investors to shorter duration bonds





Source: (Top) Barclays, FactSet, NEPC
Source: (Bottom) FactSet, NEPC

FIXED INCOME: SPREAD PRICE CHANGE

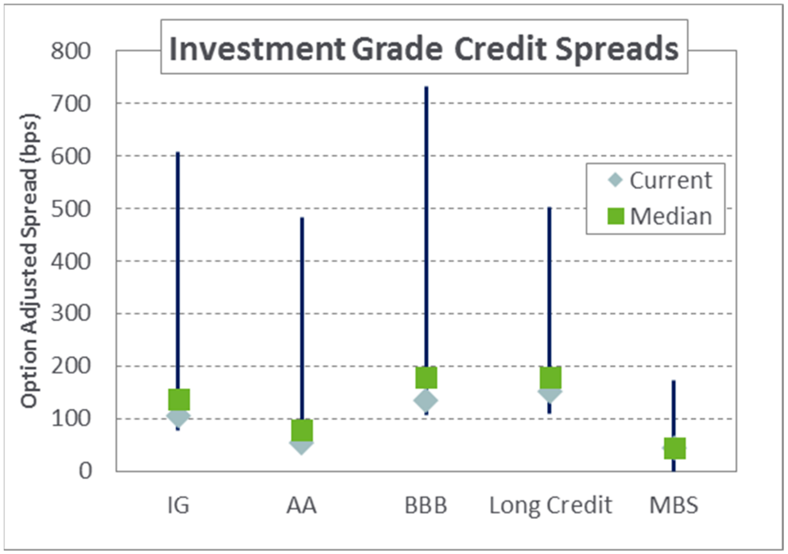
Credit spreads well below history imply a drag on expected returns as they converge toward long-term medians

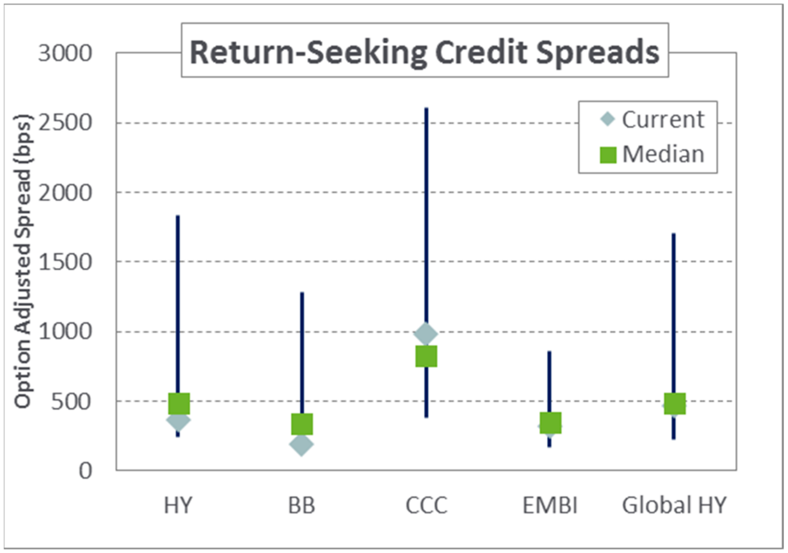
Low spreads temper excitement about lower-quality credit, where investors are not provided adequate compensation for risk relative to safer alternatives

Default and recovery rates across the credit complex are modeled using historical averages

Modestly higher expected default rates were incorporated in lower-quality credit, particularly in the BBB space, to reflect the increase as a percentage of the investment grade universe

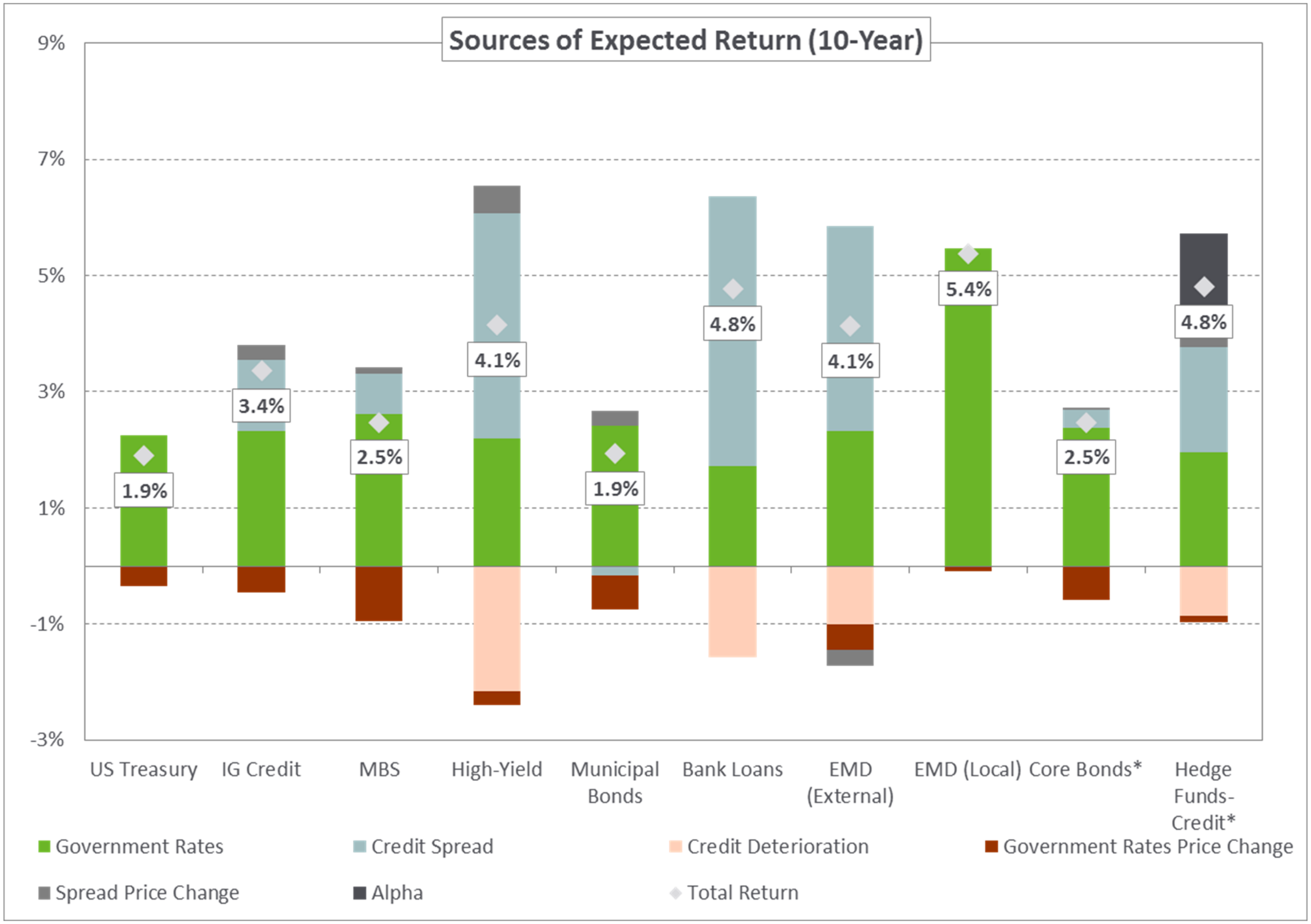
The 'Late-Cycle Dynamics' Key Market Theme may cause periods of stress in credit markets, which can cause spreads to unexpectedly blow out





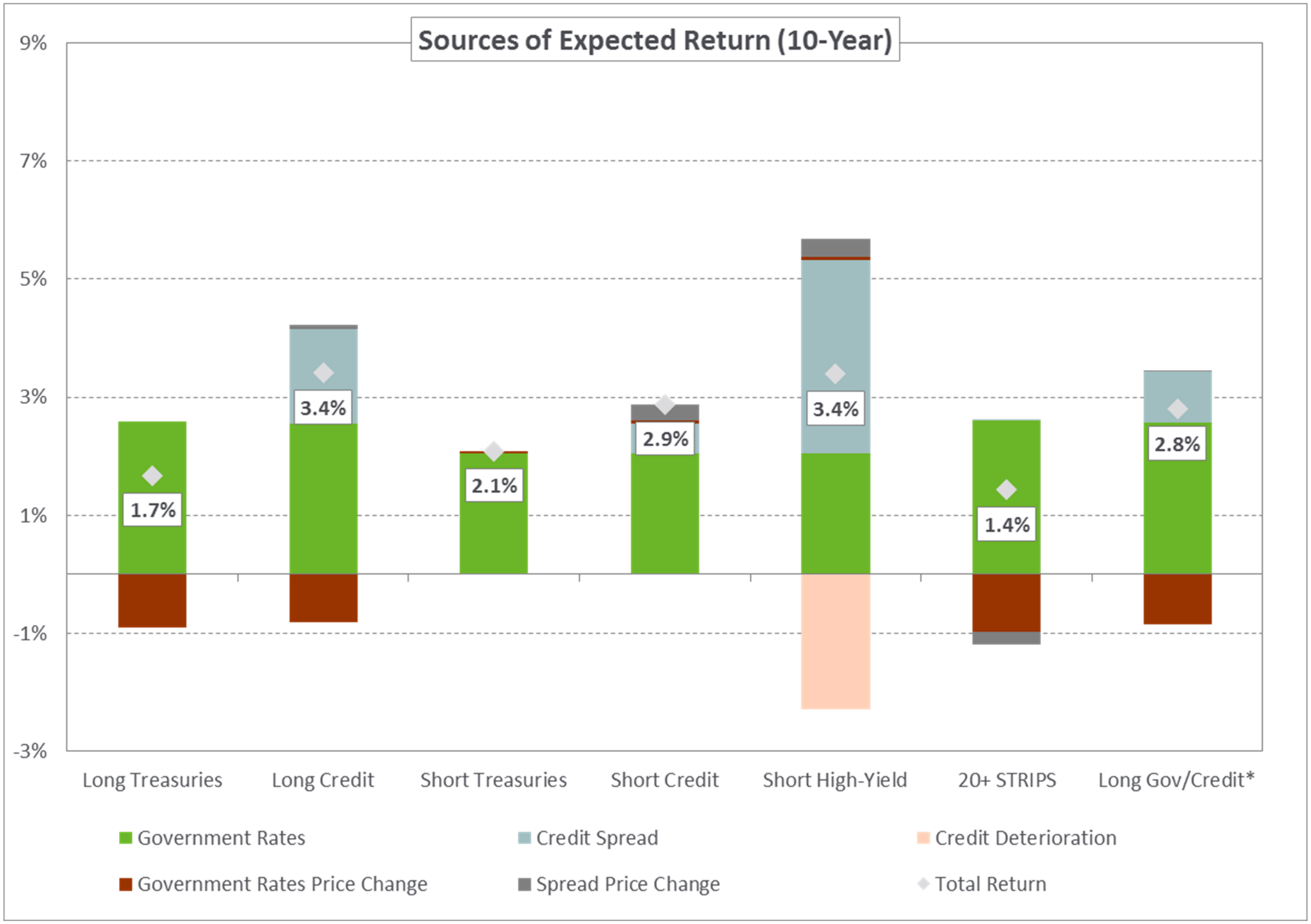
Source: (Top) Barclays, FactSet, NEPC; as of 01/31/2000
Source: (Bottom) Barclays, JPM, FactSet, NEPC; as of 01/31/2000

FIXED INCOME: BUILDING BLOCKS



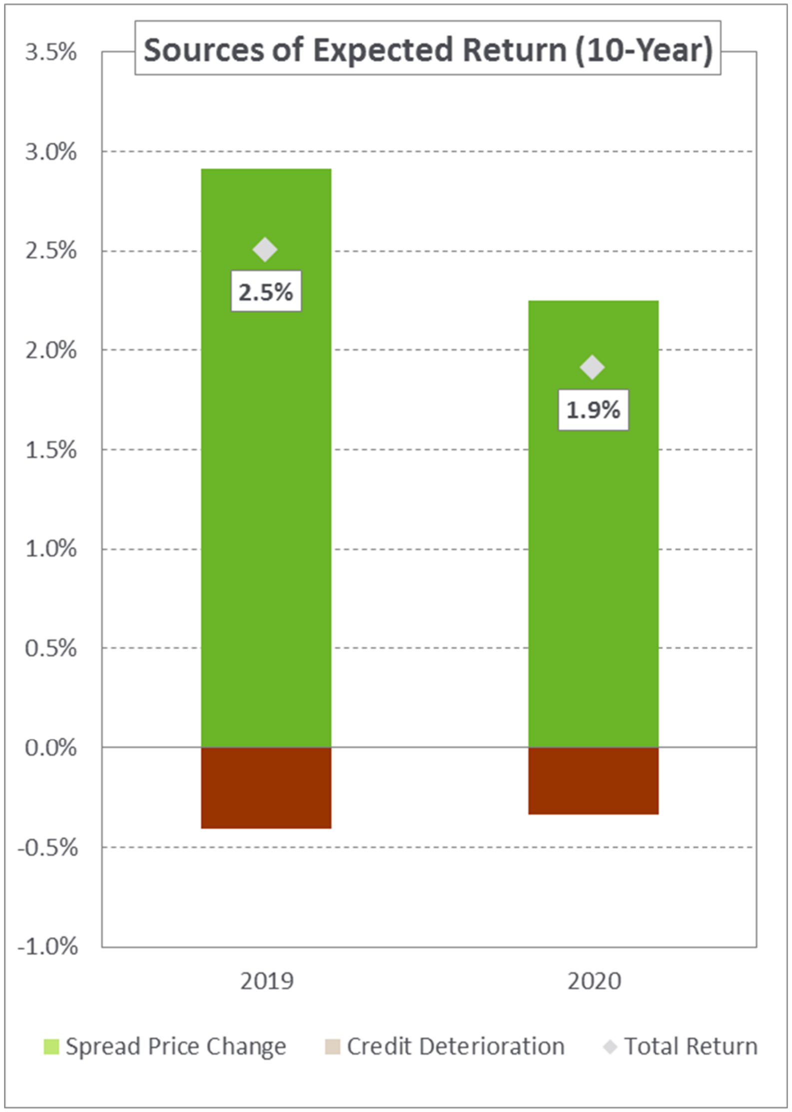
Source: NEPC
*Calculated as a blend of other classes

FIXED INCOME: BUILDING BLOCKS



Source: NEPC
*Calculated as a blend of other classes

FIXED INCOME FOCUS: TREASURIES



Source: NEPC

2019 return number reflects NEPC's implied 10-year assumption

US Treasury prices have risen significantly as the Fed cut rates to offset growth and trade concerns

The magnitude of returns experienced in recent years subdues the forward-looking outlook for most fixed income assets

Yields across the curve are near record lows, implying there is little upside potential for price gain

This also suggests lower total returns as lower yields are compounded over the forecast horizon

Lower long-term rate expectations reflect muted inflation levels and continued Fed accommodation

STRATEGIC FIXED INCOME VIEW

As part of a strategic allocation, safe-haven fixed income can provide downside protection and lower portfolio-level volatility

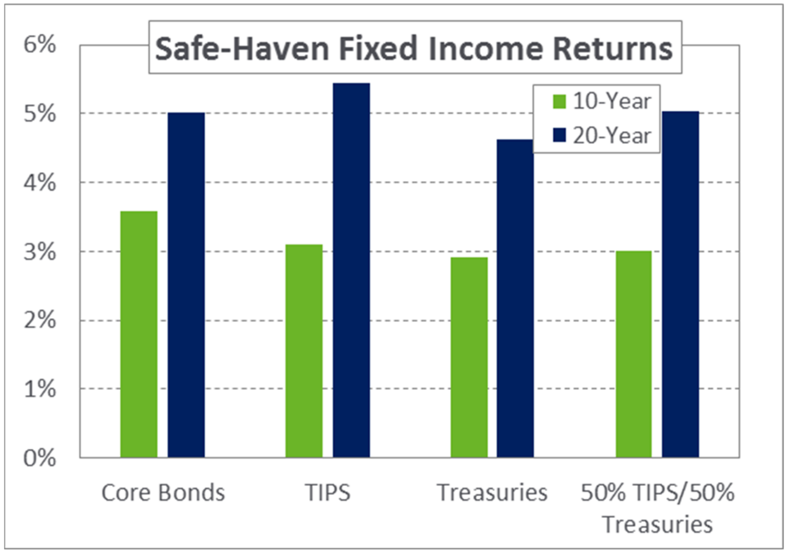
For investors without a natural hedge, NEPC suggests a strategic safe-haven allocation of 50% Treasuries and 50% TIPS

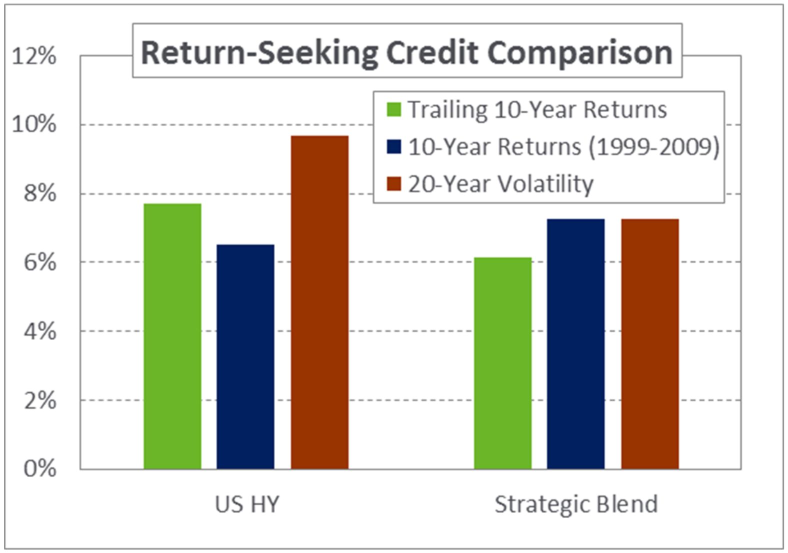
- Provides diversification and inflation protection without sacrificing returns
- The duration profile of this exposure should be considered relative to an investor's objectives and need for capital efficiency

A strategic allocation to return-seeking credit can enhance risk-adjusted returns with additional yield and diversification benefits

NEPC recommends an equal weight to bank loans, blended emerging market debt, and high-yield

- In this framework, investors should source capital calls for private debt from bank loans and high yield





Source: (Top) Barclays, FactSet, NEPC
Source: (Bottom) Barclays, S&P, JPM, FactSet, NEPC
*Represents 1/3 US High Yield, 1/3 Bank Loans, and 1/3 Blended EMD

REAL ASSETS ASSUMPTIONS

REAL ASSETS: ASSUMPTIONS

Real Assets Building Blocks	
Illiquidity Premium	The additional return expected for investments carrying liquidity risk
Valuation	The expected change in price of the underlying asset reverting to a long-term real average or terminal value assumption
Inflation	Incorporates the inflation paths as defined by TIPS breakeven expectations and NEPC expected inflation assumptions
Growth	Reflects market-specific growth for each equity asset class as a weighted-average derived from index country revenue contribution and forecasted GDP growth
Real Income	Represents the inflation-adjusted income produced by the underlying tangible or physical asset

Asset Class	2020 10-Year Return	2019 10- Year Return
Commodities	**4.0%**	**4.4%**
Midstream Energy	**7.4%**	**8.5%**
REITs	**5.4%**	**6.9%**
Public Infrastructure	**5.3%**	**-**
Public Resource Equity	**7.3%**	**-**
Core Real Estate	**5.2%**	**6.0%**
Non-Core Real Estate	**6.4%**	**7.0%**
Private RE Debt	**5.0%**	**5.8%**
Private Real Assets: Energy/ Metals	**9.1%**	**9.7%**
Private Real Assets: Infra/Land	**5.9%**	**6.4%**

Source: NEPC
2019 return number reflects NEPC’s implied 10-year assumption

REAL ASSETS: REAL INCOME

Equity-like real assets: Real income represents the inflation-adjusted dividend yield

Includes midstream energy, REITS, public infrastructure, natural resource and global infrastructure equities

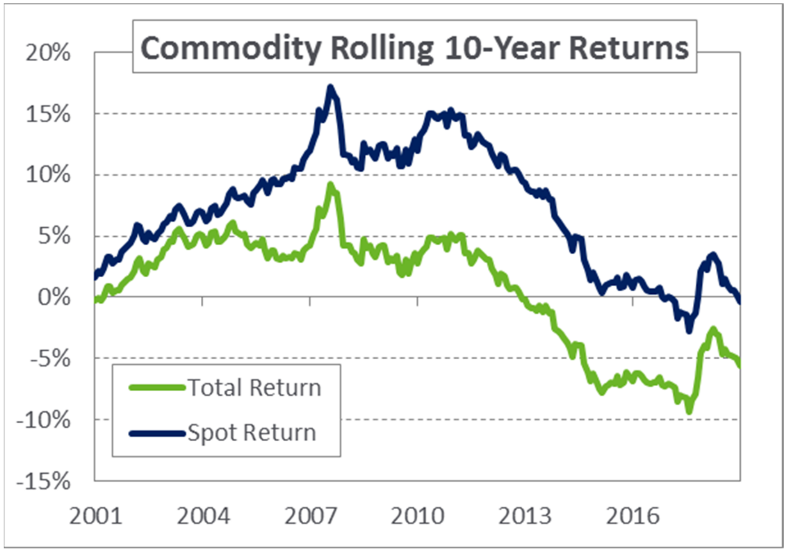
These publicly-traded real assets tend to have lucrative dividend yields relative to traditional global equity indices

Real Estate: Real income is a function of Net Operating Income

NOI growth exhibits a cyclical economic pattern and appears to have retreated off cyclical highs

Commodities: Real income includes the collateral return

A cash proxy is used to represent the collateral and as such, it represents the return on cash over the investment horizon



Real Assets Yields	12/31/18	11/30/19
Midstream Energy	6.8%	6.7%
Core Real Estate	4.6%	4.4%
US REITs	4.4%	3.5%
Global REITs	4.8%	4.1%
Global Infra Equities	4.4%	4.1%
Natural Resource Equities	4.1%	4.1%
US 10-Yr Breakeven Inflation	1.7%	1.6%
Commodity Index Roll Yield	-6.1%	0.5%

Source: (Top) Bloomberg, FactSet, NEPC

Source: (Bottom) NCREIF, Alerian, NAREIT, S&P, FactSet, NEPC

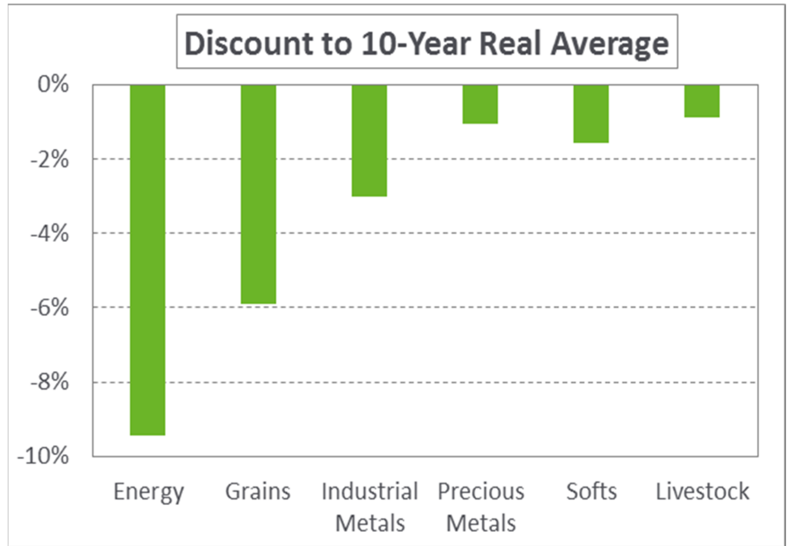
*Commodity Index Roll Yield represents a proprietary calculation methodology

REAL ASSETS: VALUATION

Commodity valuations represent spot price relative to the long-term real average of spot prices

Commodity prices continue to trade below their long-term real averages, particularly in the energy and grains sectors

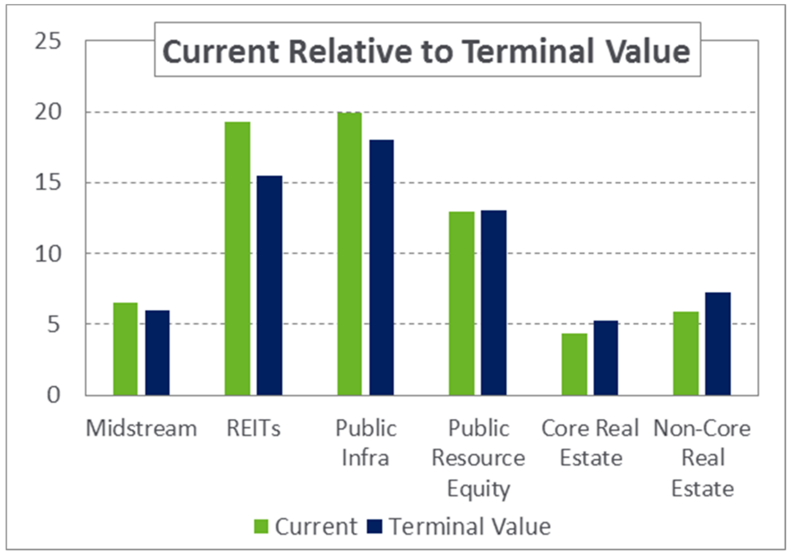
The potential for higher spot prices is additive to future expected returns



Valuation adjustments for other real assets reflect a terminal value with the relevant valuation metrics

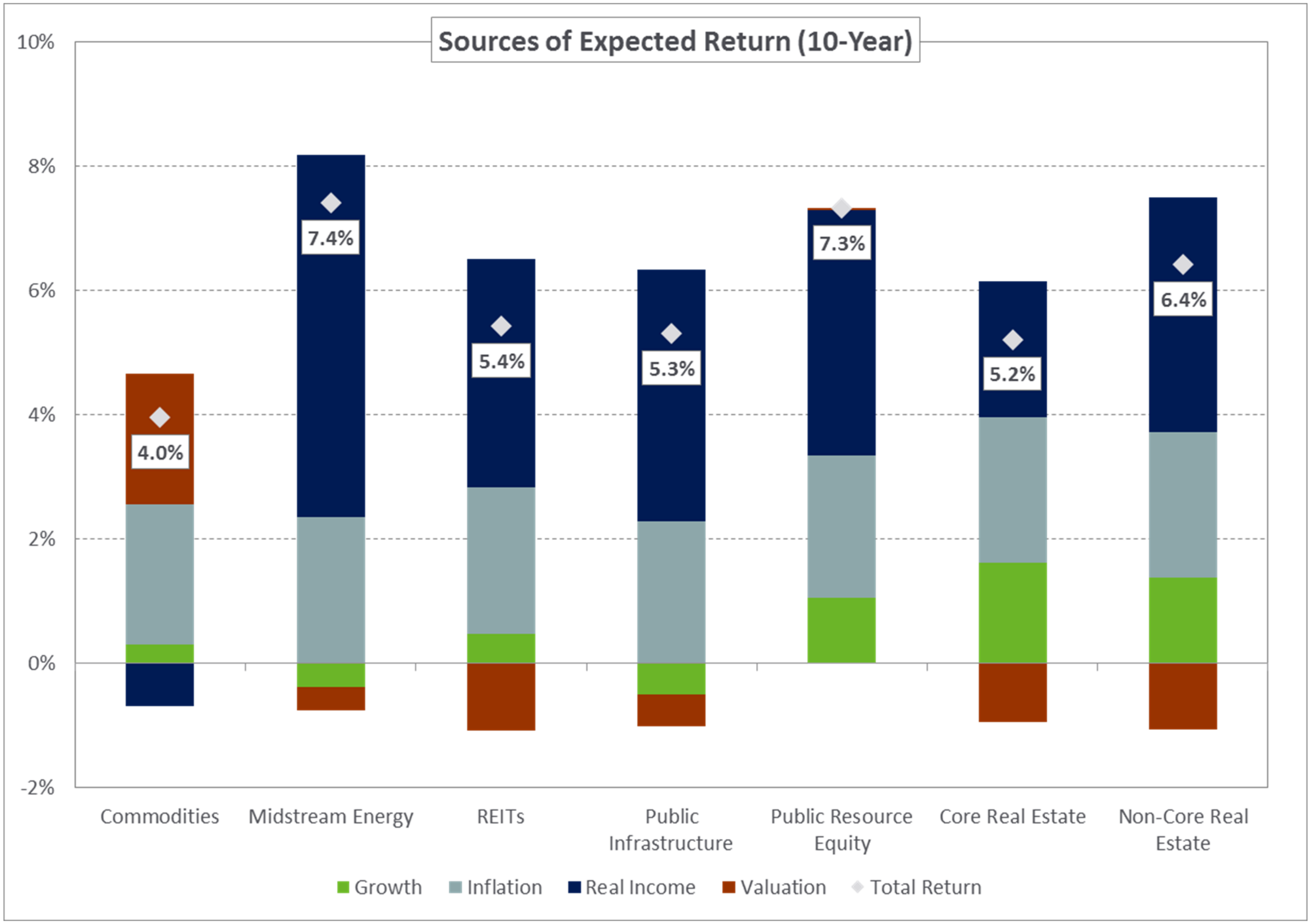
For example, Price over Cashflow from Operations is used for midstream energy to reflect the cash flow intense nature of the business, whereas cap rates are used for real estate

Elevated valuations in REITs are expected to detract from future returns as valuations trend downward toward long-term averages



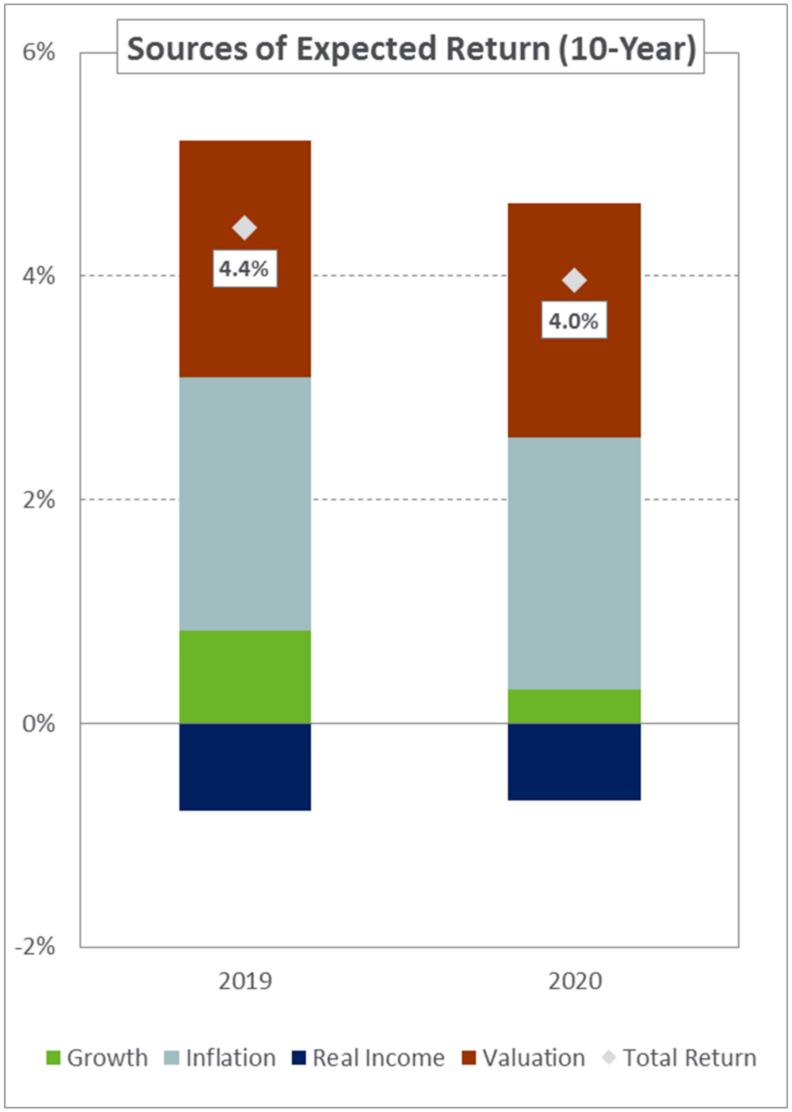
Source: (Top) FactSet, NEPC
Source: (Bottom) Alerian, FTSE, S&P, FactSet, NEPC

REAL ASSETS: BUILDING BLOCKS



Source: NEPC

REAL ASSETS FOCUS: COMMODITIES



Source: NEPC
2019 return number reflects NEPC's implied 10-year assumption

The NEPC commodity assumption is constructed using the Bloomberg Commodity index, which is a liquid and highly diversified exposure to commodities

NEPC's 10-year return assumption declined reflecting the lower rate and inflation outlook

Commodity prices are generally well below long-term real averages – adding a valuation tailwind as spot prices are expected to trend upward

A negative roll yield continues to be a hurdle for investing in commodity futures

- Post-2008, spot returns have had consistently higher returns than total return indices – demonstrating the impact of negative roll yield on overall investments

STRATEGIC REAL ASSETS VIEW

Exposure to real assets can provide inflation protection, low correlation to traditional assets, and diversification benefits

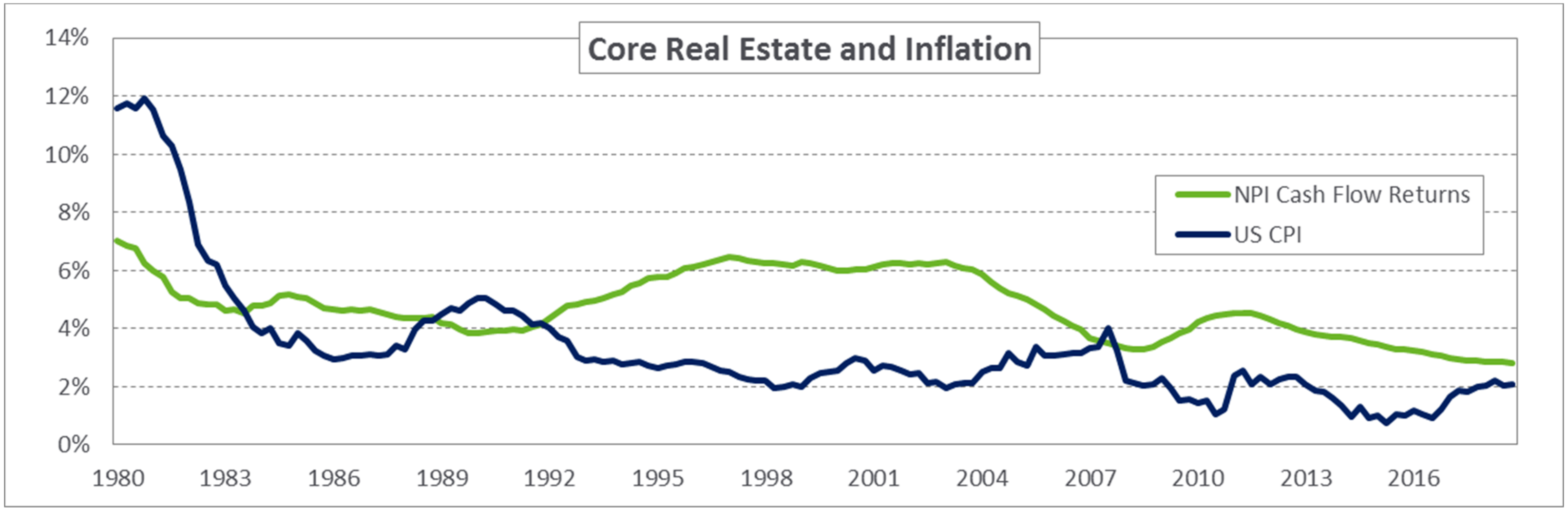
Across the complex, real assets exhibit different betas to inflation and inflation-sensitive objectives should influence an investor's strategic allocation decision

Within a real assets allocation, NEPC recommends a strategic allocation to infrastructure and real estate, which offer inflation-sensitive income

While commodities provide the most pure market beta to inflation, a persistently negative roll yield reduces expected long-term returns

For total return-focused investors, private real assets are preferred

Private equity energy strategies have historically outperformed public market proxies



Source: NCREIF, US Bureau of Statistics, NEPC
Lines incorporate a rolling 3-year average for NPI returns and inflation

ALTERNATIVES

PRIVATE MARKETS METHODOLOGY

Private market assumptions are constructed using betas to public market assumptions with an added illiquidity premia based on historical returns analysis relative to appropriate public market equivalents

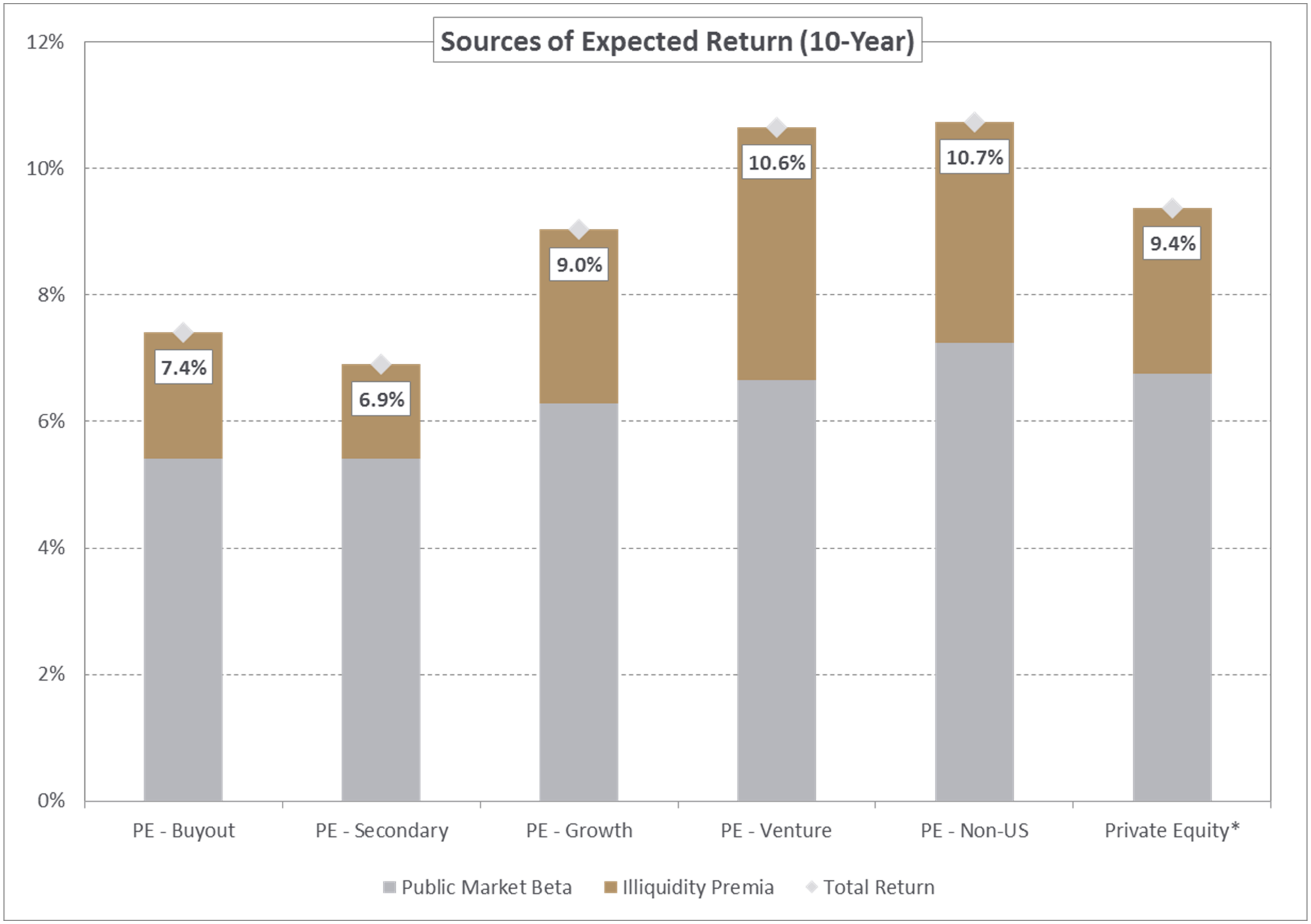
Private Equity – Buyout: 25% US Large Cap, 75% US Small/Mid Cap
Private Equity – Secondary: 25% US Large Cap, 75% US Small/Mid Cap
Private Equity – Growth: 50% US Small/Mid Cap, 50% US Microcap
Private Equity – Venture: 25% US Small/Mid Cap, 75% US Microcap
Private Equity – Non-US: 70% International Small Cap, 30% Emerging Small Cap
PE Composite: 34% Buyout, 34% Growth, 15 % Non-US, 8.5% Secondary, 8.5% Venture

Private Debt – Direct Lending: 100% Bank Loans
Private Debt – Distressed: 20% US Small/Mid Cap, 60% US High Yield, 20% Bank Loans
Private Debt – Credit Opportunities: 24% US SMID Cap, 33% US High Yield, 33% Bank Loans
Private Debt Composite: 50% Direct Lending, 25% Credit Opportunities, 25% Distressed

Private Real Assets – Energy: 30% Comm., 35% Midstream, 35% Public Resource Equity
Private Real Assets - Infra/Land: 30% Commodities, 70% Public Infrastructure
Private Real Estate Debt: 50% CMBS, 50% Core Real Estate

Changes to private market return assumptions will reflect changes to the underlying public market assumption and the illiquidity premia

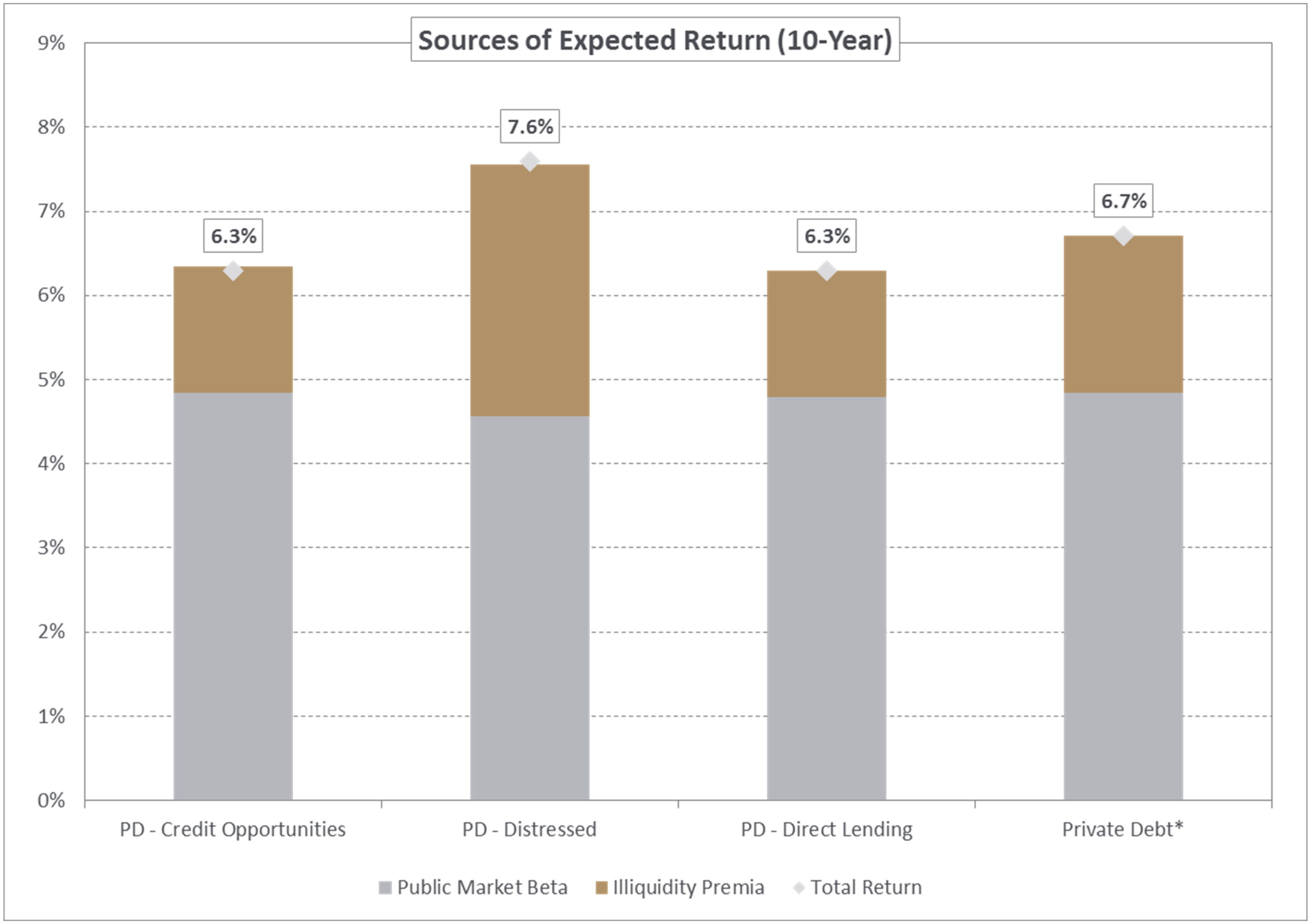
PRIVATE EQUITY BUILDING BLOCKS



Source: NEPC

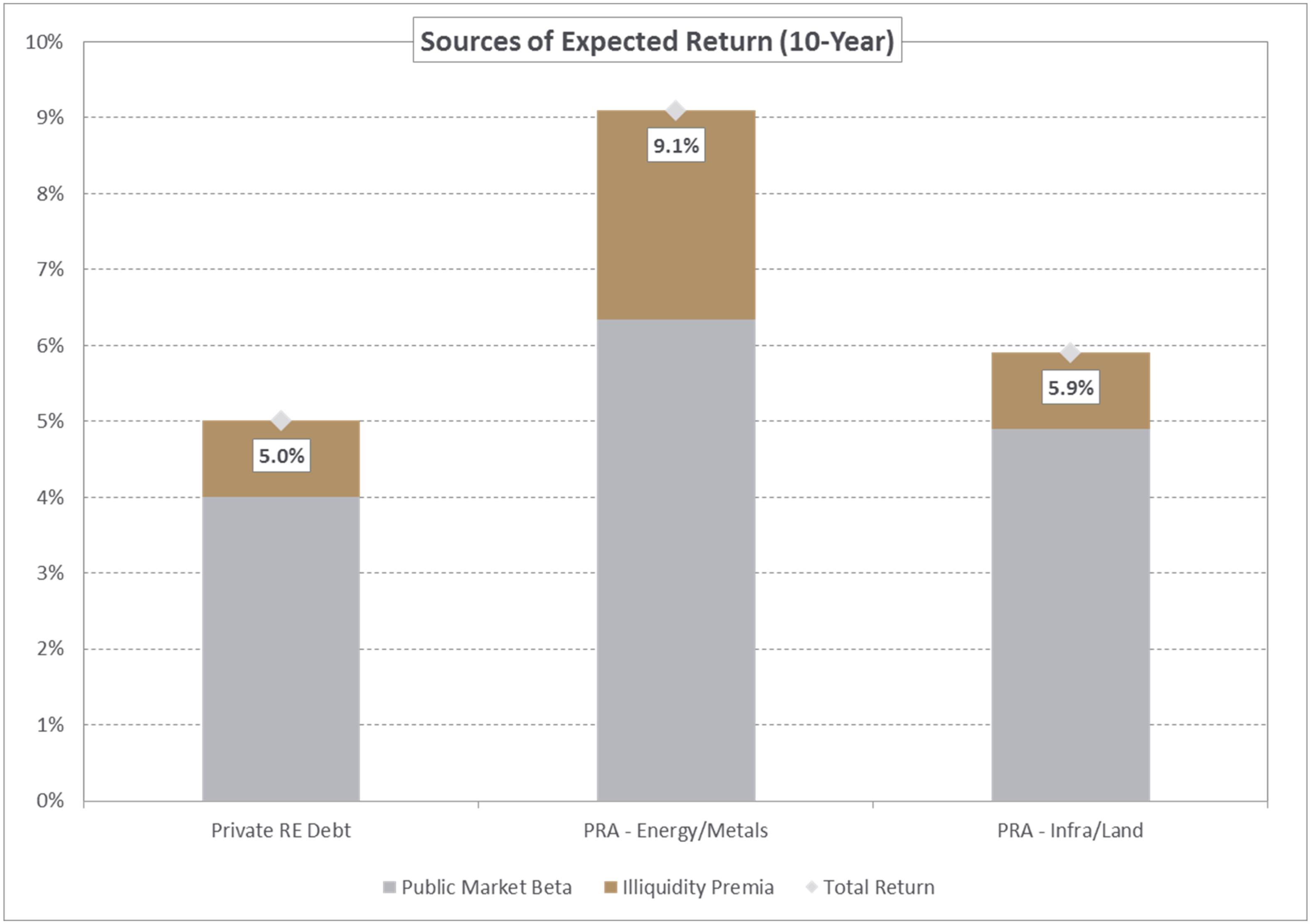
*Private Equity is a derived composite of 34% US Buyout, 34% US Growth, 8.5% US Secondary, 8.5% US Venture, 15% Non-US PE

PRIVATE DEBT BUILDING BLOCKS



Source: NEPC
*Private Debt is a derived composite of 25% Mezzanine, 25% Distressed, 50% Direct Lending

PRIVATE REAL ASSETS BUILDING BLOCKS



Source: NEPC

2020 CAPITAL MARKET FORECASTS

NEPC, LLC

2020 CAPITAL MARKET FORECASTS

Asset Class	10-Year	30-Year	Volatility
Inflation	2.3%	2.5%	-
Cash	1.8%	2.4%	1.00%
US Leverage Cost	2.1%	2.7%	1.00%
Non-US Cash	0.4%	2.1%	1.00%
Large Cap Equities	5.0%	6.7%	16.50%
Small/Mid Cap Equities	5.5%	7.2%	20.00%
Int'l Equities (Unhedged)	6.0%	7.0%	20.50%
Int'l Equities (Hedged)	6.2%	7.2%	17.50%
Int'l Sm Cap Equities (Unhedged)	6.4%	7.5%	22.00%
Emerging Int'l Equities	9.0%	9.2%	28.00%
Emerging Int'l Sm Cap Equities	9.2%	9.2%	31.00%
Hedge Funds - Long/Short	4.8%	5.7%	11.50%
PE Buyout	7.4%	9.0%	18.50%
PE Growth	9.0%	10.4%	30.50%
PE Venture	10.6%	11.5%	45.00%
PE Secondary	6.9%	8.5%	21.00%
PE Non-US	10.7%	11.1%	33.00%
China Equity	8.8%	9.1%	29.50%
US Microcap Equity	7.0%	8.2%	25.00%

2020 CAPITAL MARKET FORECASTS

Asset Class	10-Year	30-Year	Volatility
TIPS	2.2%	2.7%	6.50%
Treasuries	1.9%	2.7%	5.50%
IG Corp Credit	3.4%	4.4%	7.50%
MBS	2.5%	3.4%	7.00%
High-Yield Bonds	4.1%	5.6%	12.50%
Bank Loans	4.8%	5.2%	9.00%
EMD (External)	4.1%	5.0%	13.00%
EMD (Local Currency)	5.4%	5.3%	13.00%
Non-US Bonds (Unhedged)	0.2%	2.1%	10.00%
Non-US Bonds (Hedged)	0.3%	2.3%	4.50%
Short TIPS (1-5 yr)	2.2%	2.8%	3.50%
Short Treasuries (1-3 yr)	2.1%	2.7%	2.50%
Short Credit (1-3 yr)	2.9%	3.6%	3.50%
Short HY (1-3 yr)	3.4%	4.1%	8.50%
Municipal Bonds	1.9%	2.6%	7.00%
Municipal Bonds (1-10 Year)	1.9%	2.6%	5.50%
High-Yield Municipal Bonds	3.2%	5.0%	12.00%
Hedge Funds - Credit	4.8%	5.9%	9.00%
PD Credit Opportunities	6.3%	7.5%	14.00%

2020 CAPITAL MARKET FORECASTS

Asset Class	10-Year	30-Year	Volatility
PD Distressed	7.6%	8.3%	14.00%
PD Direct Lending	6.3%	7.5%	11.00%
Long Treasuries	1.7%	2.7%	12.00%
Long TIPS	2.2%	2.7%	10.00%
Long Credit	3.4%	4.6%	12.00%
20+ YR STRIPS	1.4%	2.5%	21.00%
Corp - AAA	2.7%	3.6%	7.00%
Corp - AA	2.7%	3.6%	6.50%
Corp - A	3.0%	4.0%	7.50%
Corp - BBB	3.7%	4.6%	8.50%
Corp - BB	4.6%	6.2%	10.50%
Corp - B	4.4%	5.7%	12.50%
Corp - CCC/Below	0.7%	0.8%	20.00%
IG ABS/CMBS	2.8%	3.7%	9.00%
IG CLO	2.9%	3.5%	7.50%
HY Securitized	4.2%	5.6%	11.00%
HY CLO	5.3%	5.8%	11.00%
Taxable Muni Debt	2.8%	4.3%	8.00%
US 10 yr Treasuries	1.9%	2.9%	7.50%

2020 CAPITAL MARKET FORECASTS

Asset Class	10-Year	30-Year	Volatility
Non-US 10-Year Sovereign (Hedged)	0.4%	2.6%	5.50%
Commodities	4.0%	4.8%	19.00%
Midstream Energy	7.4%	7.1%	18.50%
REITs	5.4%	6.5%	20.00%
Public Infrastructure	5.3%	6.1%	18.50%
Public Resource Equity	7.3%	7.4%	22.00%
Core Real Estate	5.2%	6.0%	13.00%
Non-Core Real Estate	6.4%	7.4%	19.50%
Private RE Debt	5.0%	5.7%	11.00%
Private Real Assets - Energy/Metals	9.1%	9.0%	32.00%
Private Real Assets - Infra/Land	5.9%	6.7%	12.00%
Hedge Funds - Macro	5.0%	5.4%	9.50%
*Global Equity**	6.2%	7.5%	17.79%
*Private Equity**	*9.4%*	*10.7%*	*24.58%*
*Core Bonds**	*2.5%*	*3.4%*	*6.01%*
*Private Debt**	*6.7%*	*7.8%*	*11.54%*
*Long Govt/Credit**	*2.8%*	*3.9%*	*11.25%*
*Hedge Funds**	*5.0%*	*5.9%*	*8.18%*

*Assumptions are derived from the underlying equity, credit, and real assets building blocks

YOY MARKET FORECASTS CHANGES

NEPC, LLC

2020 EQUITY ASSUMPTION YOY CHANGES

Asset Class	5-7 Year Return (2019)	10 Year Return (2020)	Δ	30 Year Return (2019)	30 Year Return (2020)	Δ	Standard Deviation
Large Cap Equities	6.00%	4.98%	(1.02%)	7.50%	6.71%	(0.79%)	16.50% - 16.50% = 0.00%
Small/Mid Cap Equities	6.25%	5.55%	(0.70%)	7.75%	7.15%	(0.60%)	20.00% - 20.00% = 0.00%
Int'l Equities (Unhedged)	6.75%	6.02%	(0.73%)	7.75%	6.96%	(0.79%)	20.50% - 20.50% = 0.00%
Int'l Equities (Hedged)	7.07%	6.22%	(0.85%)	8.13%	7.19%	(0.94%)	17.50% - 17.50% = 0.00%
Int'l Small Cap Equities (Unhedged)	7.25%	6.41%	(0.84%)	8.00%	7.48%	(0.52%)	22.00% - 22.00% = 0.00%
Emerging Int'l Equities	9.25%	9.00%	(0.25%)	9.25%	9.20%	(0.05%)	28.00% - 28.00% = 0.00%
Emerging Int'l Small Cap Equities	9.50%	9.16%	(0.34%)	9.50%	9.16%	(0.34%)	31.00% - 31.00% = 0.00%
Global Equity	6.99%	6.21%	(0.78%)	8.18%	7.52%	(0.66%)	17.79% - 17.57% = 0.22%
PE Buyout	8.25%	7.41%	(0.84%)	9.75%	9.04%	(0.71%)	18.50% - 19.00% = (0.50%)
PE Growth	9.75%	9.03%	(0.72%)	10.75%	10.45%	(0.30%)	30.50% - 30.00% = 0.50%
PE Venture	11.00%	10.65%	(0.36%)	11.75%	11.47%	(0.28%)	45.00% - 45.00% = 0.00%
PE Secondary	7.75%	6.91%	(0.84%)	9.50%	8.54%	(0.96%)	21.00% - 19.00% = 2.00%
PE Non-US	11.50%	10.74%	(0.76%)	11.50%	11.11%	(0.39%)	33.00% - 30.00% = 3.00%
Private Equity	10.01%	9.37%	(0.64%)	11.15%	10.71%	(0.44%)	24.58% - 24.16% = 0.42%
US Microcap Equity	7.25%	7.01%	(0.24%)	8.50%	8.24%	(0.26%)	25.00% - 25.00% = 0.00%

2020 FIXED INCOME ASSUMPTION YOY CHANGES

Asset Class	5-7 Year Return (2019)	10 Year Return (2020)	Δ	30 Year Return (2019)	30 Year Return (2020)	Δ	Standard Deviation
TIPS	3.00%	2.19%	(0.81%)	4.00%	2.73%	(1.27%)	6.50% - 6.50% = 0.00%
Treasuries	2.50%	1.91%	(0.59%)	3.75%	2.72%	(1.03%)	5.50% - 5.50% = 0.00%
IG Corp Credit	4.00%	3.36%	(0.64%)	5.75%	4.39%	(1.36%)	7.50% - 7.50% = 0.00%
MBS	2.75%	2.48%	(0.27%)	3.75%	3.42%	(0.33%)	7.00% - 7.00% = 0.00%
Core Bonds	3.04%	2.51%	(0.53%)	4.37%	3.42%	(0.94%)	6.01% - 6.10% = (0.08%)
High-Yield Bonds	5.25%	4.15%	(1.10%)	6.50%	5.61%	(0.89%)	12.50% - 12.50% = 0.00%
Bank Loans	5.50%	4.78%	(0.72%)	5.50%	5.22%	(0.28%)	9.00% - 9.00% = 0.00%
EMD (External)	4.75%	4.14%	(0.61%)	6.25%	4.97%	(1.28%)	13.00% - 13.00% = 0.00%
EMD (Local Currency)	6.50%	5.38%	(1.12%)	6.75%	5.29%	(1.46%)	13.00% - 13.00% = 0.00%
Non-US Bonds (Unhedged)	0.75%	0.22%	(0.53%)	2.50%	2.15%	(0.35%)	10.00% - 10.00% = 0.00%
Non-US Bonds (Hedged)	0.98%	0.32%	(0.66%)	2.77%	2.27%	(0.50%)	4.50% - 4.50% = 0.00%
Global Bonds (Unhedged)	1.42%	0.87%	(0.55%)	3.01%	2.43%	(0.59%)	7.63% - 7.59% = 0.04%
Global Bonds (Hedged)	1.51%	0.88%	(0.63%)	3.18%	2.44%	(0.74%)	4.48% - 4.46% = 0.02%
Diversified Fixed Income	4.45%	3.71%	(0.75%)	5.71%	4.66%	(1.05%)	7.57% - 7.50% = 0.07%
Global Multi-Sector Fixed Income	4.45%	3.71%	(0.75%)	5.71%	4.66%	(1.05%)	7.57% - 7.50% = 0.07%

2020 FIXED INCOME ASSUMPTION YOY CHANGES

Asset Class	5-7 Year Return (2019)	10 Year Return (2020)	Δ	30 Year Return (2019)	30 Year Return (2020)	Δ	Standard Deviation
Absolute Return Fixed Income	3.91%	3.15%	(0.76%)	4.75%	3.90%	(0.85%)	3.92% - 3.93% = (0.01%)
Short Treasuries (1-3 yr)	2.50%	2.09%	(0.41%)	3.50%	2.68%	(0.82%)	2.50% - 2.50% = 0.00%
Short Credit (1-3 yr)	3.50%	2.89%	(0.61%)	4.50%	3.56%	(0.94%)	3.50% - 3.50% = 0.00%
Short HY (1-3 yr)	4.50%	3.40%	(1.10%)	5.25%	4.11%	(1.14%)	8.50% - 8.50% = 0.00%
Municipal Bonds	3.00%	1.93%	(1.07%)	3.75%	2.58%	(1.17%)	7.00% - 7.00% = 0.00%
PD Distressed	8.50%	7.56%	(0.94%)	9.00%	8.34%	(0.66%)	14.00% - 16.00% = (2.00%)
PD Direct Lending	7.50%	6.28%	(1.22%)	7.75%	7.47%	(0.28%)	11.00% - 11.00% = 0.00%
Private Debt	7.60%	6.72%	(0.88%)	8.11%	7.81%	(0.31%)	11.54% - 11.97% = (0.43%)
Long Treasuries	1.75%	1.68%	(0.07%)	3.75%	2.67%	(1.08%)	12.00% - 12.00% = 0.00%
Long Credit	3.50%	3.42%	(0.08%)	6.00%	4.58%	(1.42%)	12.00% - 12.00% = 0.00%
20+ YR STRIPS	1.50%	1.43%	(0.07%)	3.50%	2.47%	(1.03%)	21.00% - 21.00% = 0.00%
Long Govt/Credit	2.84%	2.77%	(0.07%)	5.14%	3.86%	(1.28%)	11.25% - 11.26% = (0.01%)
Corp - AAA	3.40%	2.66%	(0.74%)	4.70%	3.58%	(1.12%)	7.00% - 7.00% = 0.00%
Corp - AA	3.40%	2.71%	(0.69%)	4.60%	3.61%	(0.99%)	6.50% - 6.50% = 0.00%
Corp - A	3.90%	2.97%	(0.93%)	5.20%	3.96%	(1.24%)	7.50% - 7.50% = 0.00%

2020 FIXED INCOME ASSUMPTION YOY CHANGES

Asset Class	5-7 Year Return (2019)	10 Year Return (2020)	Δ	30 Year Return (2019)	30 Year Return (2020)	Δ	Standard Deviation
Corp - BBB	4.20%	3.68%	(0.52%)	6.30%	4.61%	(1.69%)	8.50% - 8.50% = 0.00%
Corp - BB	5.90%	4.59%	(1.31%)	7.60%	6.15%	(1.45%)	10.50% - 10.50% = 0.00%
Corp - B	6.60%	4.42%	(2.18%)	7.90%	5.66%	(2.24%)	12.50% - 12.50% = 0.00%
Corp - CCC/Below	(0.40%)	0.72%	1.12%	(1.10%)	0.77%	1.87%	20.00% - 20.00% = 0.00%
IG ABS/CMBS	3.50%	2.75%	(0.75%)	5.00%	3.74%	(1.26%)	9.00% - 9.00% = 0.00%
HY Securitized	4.75%	4.21%	(0.54%)	5.75%	5.63%	(0.12%)	11.00% - 11.00% = 0.00%
US 10 yr Treasuries	2.50%	1.88%	(0.62%)	4.00%	2.92%	(1.08%)	7.50% - 7.50% = 0.00%
Non-US 10 Year Sovereigns (Hedged)	0.50%	0.31%	(0.19%)	2.25%	2.55%	0.30%	5.50% - 6.50% = (1.00%)
Private RE Debt	5.75%	5.01%	(0.74%)	6.25%	5.66%	(0.59%)	11.00% - 11.00% = 0.00%

2020 REAL ASSET ASSUMPTION YOY CHANGES

Asset Class	5-7 Year Return (2019)	10 Year Return (2020)	Δ	30 Year Return (2019)	30 Year Return (2020)	Δ	Standard Deviation
Commodities	4.25%	3.96%	(0.29%)	5.50%	4.77%	(0.73%)	19.00% - 19.00% = 0.00%
Midstream Energy	8.25%	7.41%	(0.84%)	7.50%	7.14%	(0.36%)	18.50% - 18.50% = 0.00%
Real Assets (Liquid)	5.79%	5.20%	(0.59%)	6.92%	6.12%	(0.80%)	11.98% - 11.71% = 0.27%
REITs	6.75%	5.42%	(1.33%)	7.00%	6.45%	(0.55%)	20.00% - 20.00% = 0.00%
Core Real Estate	6.00%	5.21%	(0.79%)	6.25%	5.95%	(0.30%)	13.00% - 13.00% = 0.00%
Non-Core Real Estate	7.00%	6.42%	(0.58%)	7.25%	7.38%	0.13%	19.50% - 17.00% = 2.50%
Private Real Assets - Energy/Metals	9.50%	9.09%	(0.41%)	9.50%	9.01%	(0.49%)	32.00% - 21.00% = 11.00%
Private Real Assets - Infrastructure/Land	6.25%	5.91%	(0.34%)	7.00%	6.70%	(0.30%)	12.00% - 12.00% = 0.00%

2020 OTHER ASSUMPTION YOY CHANGES

Asset Class	5-7 Year Return (2019)	10 Year Return (2020)	Δ	30 Year Return (2019)	30 Year Return (2020)	Δ	Standard Deviation
Cash	2.50%	1.81%	(0.69%)	3.00%	2.38%	(0.62%)	1.00% - 1.00% = 0.00%
Hedge Funds	5.74%	5.02%	(0.72%)	6.76%	5.88%	(0.88%)	8.18% - 8.15% = 0.03%

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The goal of this report is to provide a basis for substantiating asset allocation recommendations. The opinions presented herein represent the good faith views of NEPC as of the date of this report and are subject to change at any time.

Information on market indices was provided by sources external to NEPC. While NEPC has exercised reasonable professional care in preparing this report, we cannot guarantee the accuracy of all source information contained within.

All investments carry some level of risk. Diversification and other asset allocation techniques do not ensure profit or protect against losses.

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