



Investment Advisory Committee (IAC) Meeting

Via GoToWebinar

Tuesday, 6/2/2020

11:00 AM - 12:30 PM ET

I. Welcome and Introductions

II. Public Comment

III. Meeting Minutes

IAC Meeting Minutes Nov 13 2019 - Final - Page 2

IAC Meeting Minutes Apr 15 2020 - Final - Page 5

IV. CIO Report

IAC Meeting - June 2 2020 - CIO Report - Page 9

V. Macro Update

IAC Meeting Macro Scenarios Jun 2 2020 - Page 14

VI. Fixed Income Benchmark Phase-In

Fixed Income Benchmark Phase-In - Page 21

VII. Benchmark/Hurdle Study Review and Discussion

Benchmark - Hurdle Study Review - Page 22

VRS - Benchmark-Hurdle Study June 2020 Final 5-29-20 - Page 23

VIII. Adjournment

Minutes

A meeting of the Investment Advisory Committee of the Virginia Retirement System was held on November 13, 2019 with the following members present:

Larry Kochard, Chairperson
Deborah Allen Hewitt
Michael Beasley
Theodore Economou
Thomas Gayner
Bryan Lewis
Rod Smyth

The following Board members were present:

Mitch Nason (entered at 10:54am)
Brandon Bell (entered at 10:35am)
Wallace Harris
William Leighty
O'Kelly McWilliams, via telephone
Joseph Montgomery
Troilen Seward

The following staff members were in attendance:

Trish Bishop, Ron Schmitz, John Alouf, Rory Badura, Katie Baskind, Parham Behrooz, Warren Chang, Jeanne Chenault, Tom Coleman, Michael Cooper, Perry Corsello, Sara Denson, Jordan Evans, Laurie Fennell, Josh Fox, Katie Grawe, JT Grier, K.C. Howell, Robert Irving, Ross Kasarda, Matt Lacy, Chung Ma, Curt Mattson, Jennifer MacKnight, Steve McClelland, Scott Mootz, Walker Noland, Greg Oliff, Steven Peterson, Kristy Scott, Jennifer Schreck, Lisa Turner, Dan Whitlock, Cindy Wilkinson, and Steve Woodall.

Also in attendance was Jamie Bitz of JLARC; Marshall Terry and of Virginia Governmental Employees Association; and Brian Deveney of APA.

Minutes

Mr. Kochard called the meeting to order at 10:00 a.m.

A motion was made and seconded to approve the August 13, 2019 minutes. The motion was unanimously approved.

CIO Report

Mr. Schmitz began his report with a brief overview of current economic and market conditions. He then reviewed asset allocation, investment performance, and tracking error information. Mr. Schmitz concluded with a review of the New Investments and Terminations Report.

Annual Program Reviews

Mr. Howell provided an overview to the Private Market Assets Program reviews, including a summary of what VRS classifies as private assets, why VRS invests in private assets, and agenda items for the reviews.

Mr. Alouf provided an annual review of the Private Equity program. Annual review topics included: program overview, including team members, asset allocation, and philosophy; markets, exposures, and results; managers, including women and minority investments; co-investments; and forward looking plans for the program.

Mr. Noland provided an annual review of the Real Assets program. Annual review topics included: program overview, including program objectives, team members, and asset allocation; markets, exposures, and results; co-investments; managers, including women and minority investments; and forward looking plans for the program.

Mr. McClelland provided an annual review of the Credit Strategies program. Annual review topics included: program overview, including program objectives, team members, and asset allocation; markets, exposures, and results; co-investments; managers, including women and minority investments; and forward looking plans for the program.

Mr. McClelland also provided an annual review of the Private Investment Partnerships program. Annual review topics included: program overview, including program objectives, team members, and asset allocation; exposures and results; and forward looking plans for the program.

Mr. Gayner exited the meeting at 12:35pm.

Mr. Kasarda presented a review of the Risk-Based Investments (RBI) benchmark simplification plan. This review included a recap of RBI program components and goals, the current benchmark shortcomings, and the proposed benchmark.

A motion was made and seconded to provide support for changing the RBI benchmark to a blend of the RBI Diversifiers Benchmarks (80%) and the S&P Risk Parity 12% Volatility Benchmark (20%). The RBI Diversifiers Benchmark is composed of the Bloomberg Barclays US Treasury

Bellwethers: 3 month plus 250 basis points per annum. The motion was unanimously approved to support the change to the RBI benchmark.

Mr. Schmitz provided an update on the results of the Asset Liability Study. In addition, he reviewed the related Board approved changes to the long-term Defined Benefit Plan Strategic Asset Allocation and Allowable Ranges, as well as the related phase-in plan, to reflect the new Board target asset mix effective January 1, 2020. Mr. Schmitz then reviewed the Board approved changes, and the related applicable phase-in plans, to the Public Equity, Credit Strategies, and Fixed Income benchmarks

Mr. Schmitz requested the Committee concur with the benchmark implementation plan for Public Equity, Credit Strategies, and Fixed Income; endorse the phase-in plan for the long-term asset allocation policy with expanded allowable range targets for Private Investment Partnerships and Multi-Asset Public Strategies; support matching the Dynamic Strategies benchmark components to the relevant program benchmarks and the change in the Risk-Based Investments benchmark; and indicate philosophical agreement for a proposed Private Equity benchmark change. Mr. Kochard indicated the changes are consistent with what has been presented, and the Committee is in support of the changes as outlined.

Adjournment

The Committee members engaged in general discussion throughout all of the reviews provided.

The meeting was adjourned at 1:15 p.m.

Larry Kochard, Chairperson

Minutes

An electronic meeting, held in accordance with § 2.2-3708.2(A)(3) of the *Code of Virginia* and guidance provided in the Official Advisory Opinion 20-011 of the Virginia Attorney General, of the Investment Advisory Committee of the Virginia Retirement System was held on April 15, 2020 with the following members present:

Larry Kochard, Chairperson
Deborah Allen Hewitt
Michael Beasley
Theodore Economou
Thomas Gayner
Nan Leake
Bryan Lewis
Rod Smyth
Hance West

The following Board members were present:

O'Kelly McWilliams
Brandon Bell
Diana Cantor
William Garrett
Wallace Harris
Brett Hayes
William Leighty
Joseph Montgomery
Troilen Seward

The following staff members were in attendance:

Trish Bishop, Ron Schmitz, Stephen Adelaar, Rory Badura, Farley Beaton, Parham Behrooz, Jeanne Chenault, Michael Cooper, Kevin Cronin, Valerie Disanto, Laurie Fennell, Josh Fox, Brian Goodman, JT Grier, Krystal Groff, Dane Honrado, K.C. Howell, Ross Kasarda, LaShaunda King, Kristina Koutrakos, Matt Lacy, Chung Ma, Curt Mattson, Jennifer MacKnight, Steve McClelland, Walker Noland, Greg Oliff, Cat Pelletier, Steven Peterson, Laura Pugliese, Dan Schlusser, Jennifer Schreck, Kristy Scott, Michael Scott, Jillian Sherman, Virginia Sowers, Lisa Turner, Dan Whitlock, Cindy Wilkinson, and Olga Zozulya.

Also in attendance was Adam Rosatelli of the Virginia Senate Finance & Appropriations Committee; Kimberly Sarte of JLARC; Robert Matule of

Acadian Asset Management; David Peligal of Brookfield Asset Management; and Evelyn Porter, resident of the Commonwealth of Virginia.

Ms. Sherman served as host and walked participants through the logistics of an electronic meeting. Ms. Sherman turned the meeting over to Mr. Kochard to call the meeting to order.

Mr. Kochard called the meeting to order at 10:08 a.m. Mr. Kochard noted that given the current circumstances related to COVID-19, the IAC was unable to meet in person. However, utilizing electronic means, the IAC could hold this meeting in accordance with § 2.2-3708.2(A)(3) of the *Code of Virginia* and guidance provided by the Attorney General as it relates to conducting business during the pandemic.

Mr. Kochard took a roll call of each IAC member for attendance purposes:

Mr. West – present
Mr. Beasley – present
Mr. Economou – present
Mr. Gayner – present
Dr. Hewitt – present
Ms. Leake – joined after roll call
Mr. Lewis – joined after roll call
Mr. Smyth – present
Mr. Kochard – present

CIO Report

Mr. Schmitz gave a brief overview of economic and market conditions for the most recent month-end prior to COVID-19. Mr. Schmitz noted that current market conditions, including March updates considering COVID-19, will be addressed at the end of the meeting. Mr. Schmitz presented the Performance Summary and the Asset Allocation Report as of February 29, 2020; and Total Fund Tracking Error as of December 31, 2019. Mr. Schmitz then reviewed the New Investments and Terminations Report.

Annual Program Reviews

Mr. Grier provided an overview to the Public Investment Program reviews, including an introduction to the Public Investment Programs, an overview of public market assets, and agenda items for the reviews.

Mr. Behrooz and Mr. Oliff, Co-Directors of Fixed Income, provided an annual review of the Fixed Income program. Annual review topics included: program overview, including team members, asset allocation, and philosophy; markets, exposures, and results; forward looking plans;

collaboration across the programs; and markets as of March 31, 2020 for the program.

Mr. Whitlock provided an annual review of the Public Equity program. Annual review topics included: program overview, including team members, process, asset allocation, philosophy, and manager evaluation framework; markets, exposures, and results; managers, including women and minority investments; and forward looking plans for the program.

Mr. Schlussler provided an annual review of the Internal Equity Management program. Annual review topics included: program overview, including team members, asset allocation, philosophy, research process, factor selection and alpha score, and portfolio and risk management; markets, exposures, and results; March update; and forward looking plans for the program.

Asset Allocation Phase-In Mr. Schmitz led a discussion of the asset allocation phase-in and proposed changes to update the Defined Benefit Plan Strategic Asset Allocation and Allowable Ranges to reflect the new Board target asset mix that will be recommended to the Board of Trustees.

The last VRS target asset mix phase-in move toward the Long-Term Policy was effective July 1, 2019. The Board updated the long-term target asset mix effective January 1, 2020. Every year at fiscal year-end, the Chief Investment Officer (CIO) considers market conditions and progress in moving to the new policy portfolio and suggests specific target exposures to the Board for the upcoming year. Recent market action caused by the COVID-19 pandemic and related economic impacts affected the Fund so that the Fund has moved close to the expected 2021 phase-in target exposures at the current time. Therefore, Mr. Schmitz recommends new target exposures and allowable ranges to become effective April 1, 2020, and remain in effect for FY 2021.

In addition, Mr. Schmitz requested the Committee provide support for his recommendation. After discussion, the Committee supported the CIO's recommendation.

**Current Conditions
Dialogue**

Mr. Schmitz then gave an update on current market conditions, given the current circumstances related to COVID-19. Mr. Schmitz and the Committee members engaged in a general discussion of the impact of COVID-19 on current, as well as future, market conditions.

The Committee members engaged in general discussion throughout all of the reviews provided.

Mr. Smyth exited the meeting at 11:55 a.m.

Adjournment

Mr. West made a motion to adjourn the meeting. Mr. Gayner seconded the motion. Mr. Kochard asked for each Committee member to vote on the motion:

Mr. West – aye
Mr. Beasley – aye
Mr. Economou – aye
Mr. Gayner – aye
Dr. Hewitt – aye
Ms. Leake – aye
Mr. Lewis – aye
Mr. Kochard – aye

The motion to adjourn the meeting passed.

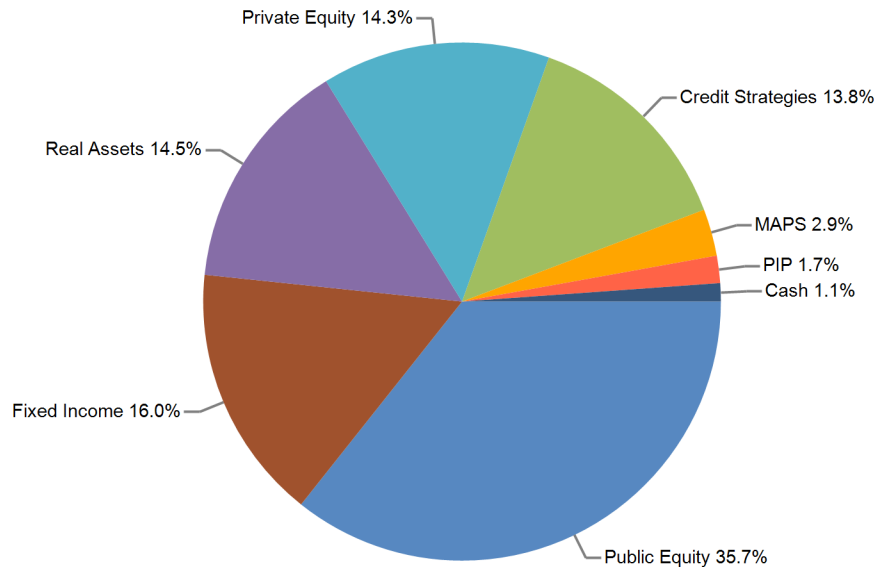
The meeting was adjourned at 12:03 p.m.

Larry Kochard, Chairperson

Asset Allocation Report

March 31, 2020

For Internal Investment Purposes Only



	Current \$Bil	Current Weight	Policy Weight	Variance	Allowable Range		Internal %
TOTAL FUND	76.9						31.2%
Public Equity	27.5	35.7%	37.0%	-1.3%	-5%	+5%	43.2%
Fixed Income	12.3	16.0%	16.0%	0.0%	-3%	+5%	93.8%
Credit Strategies	10.6	13.8%	14.0%	-0.2%	-5%	+5%	
RS Credit	4.5	5.8%	5.6%	0.2%			
NRS Credit	6.1	7.9%	8.4%	-0.5%			
Real Assets	11.2	14.5%	14.0%	0.5%	-5%	+5%	4.9%
Public RE	1.0	1.3%					56.4%
Private RE	6.7	8.7%					
Other RA	3.5	4.6%					
Private Equity	11.0	14.3%	13.0%	1.3%	-5%	+5%	
MAPS	2.3	2.9%	2.0%	0.9%	-1%	+1%	
DSTRAT	1.0	1.3%					
RBI	1.3	1.6%					4.5%
PIP	1.3	1.7%	3.0%	-1.3%	-1%	+2%	
Cash	0.9	1.1%	1.0%	0.1%	-1%	+4%	

	Current \$Bil	Current Weight	Policy Limit
Hedge Funds	7.4	9.6%	15.0%

3 Year Tracking Error
Total Fund: **1.47%**
Total Public: **0.51%**

*Total Fund includes the following amt held by the Treasurer of VA: \$ 363 million

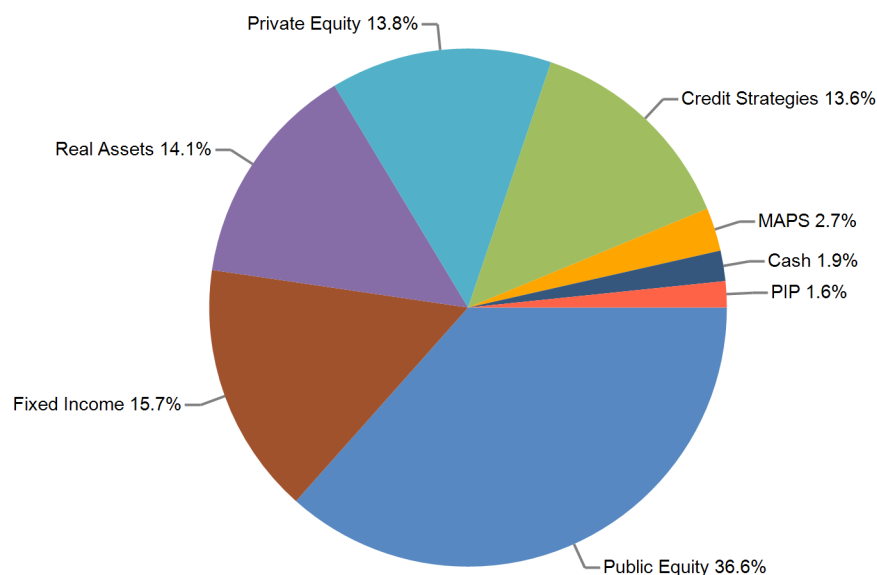
• The values shown for each asset class on this report may differ from the VRS Monthly Performance Report due to adjustments related to derivative positions in the Rebalance Account, pending transactions, and certain accruals. The values on this report are a more descriptive representation of the Virginia Retirement System's true economic exposure to each asset class. (6 adjustments applied)

*Total Fund and Total Public tracking error are calculated using monthly returns, then annualized

Daily Asset Allocation Report

May 26, 2020

For Internal Investment Purposes Only



	Current \$Bil	Current Weight	Policy Weight	Variance	Allowable Range		Internal %
TOTAL FUND	81.2						30.2%
Public Equity	29.7	36.6%	37.0%	-0.4%	-5%	+5%	39.9%
Fixed Income	12.8	15.7%	16.0%	-0.3%	-3%	+5%	93.4%
Credit Strategies	11.0	13.6%	14.0%	-0.4%	-5%	+5%	
RS Credit	4.7	5.8%	5.6%	0.2%			
NRS Credit	6.3	7.7%	8.4%	-0.7%			
Real Assets	11.4	14.1%	14.0%	0.1%	-5%	+5%	5.5%
Public RE	1.1	1.4%					56.3%
Private RE	6.7	8.2%					
Other RA	3.6	4.4%					
Private Equity	11.2	13.8%	13.0%	0.8%	-5%	+5%	
MAPS	2.2	2.7%	2.0%	0.7%	-1%	+1%	
DSTRAT	1.1	1.3%					
RBI	1.1	1.4%					5.0%
PIP	1.3	1.6%	3.0%	-1.4%	-1%	+2%	
Cash	1.5	1.9%	1.0%	0.9%	-1%	+4%	

	Current \$Bil	Current Weight	Policy Limit
Hedge Funds	8.0	9.9%	15.0%

3 Year Tracking Error

Total Fund: **1.48%**

Total Public: **0.55%**

*Total Fund includes the following amt held by the Treasurer of VA: \$ 334 million

• The values shown for each asset class on this report may reflect adjustments related to derivative positions in the Rebalance Account, pending transactions and certain accruals, in order to provide a more descriptive representation of the true economic exposure to each asset class (5 adjustments applied)

*Total Fund and Total Public tracking error are calculated using monthly returns, then annualized

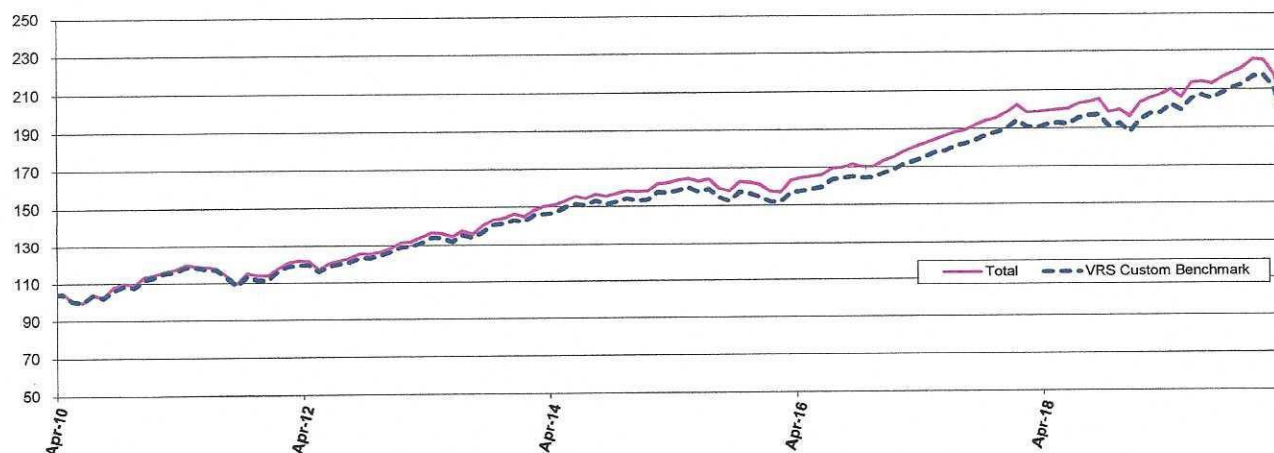
PERFORMANCE SUMMARY
Rolling Periods Ending
March 31, 2020



TOTAL FUND PERFORMANCE

	10 Yr	5 Yr	3 Yr	1 Yr	Qtr	Month	Fiscal YTD	Cal YTD	Market Value (\$MM)
Total Public Equity Strategies	6.1	1.9	-0.2	-13.9	-22.3	-14.6	-16.0	-22.3	26,291
<i>Benchmark</i>	5.9	2.2	0.6	-13.0	-22.2	-14.3	-15.6	-22.2	
Total Fixed Income	4.3	3.5	4.5	7.2	1.1	-2.2	3.9	1.1	11,942
<i>Benchmark</i>	3.8	3.0	4.3	7.2	1.5	-1.8	4.0	1.5	
Total Credit Strategies	5.5	3.6	2.7	-2.3	-8.3	-8.4	-5.4	-8.3	10,601
<i>Benchmark</i>	4.7	2.9	1.7	-4.7	-11.3	-10.9	-7.6	-11.3	
Total Real Assets	11.3	8.6	7.3	3.7	-1.7	-0.6	1.9	-1.7	11,186
<i>Benchmark</i>	9.5	7.0	5.6	2.2	-2.0	-2.0	0.6	-2.0	
Total Private Equity	14.2	14.2	16.4	16.4	3.3	3.5	11.2	3.3	10,970
<i>Benchmark</i>	14.2	12.5	15.8	29.0	8.9	3.5	15.0	8.9	
Total Private Investment Partnerships	n/a	7.9	8.5	8.0	2.2	2.2	5.9	2.2	1,309
<i>Benchmark</i>	n/a	7.7	8.3	12.5	1.6	-0.9	5.2	1.6	
Total Multi-Asset Public Strategies	n/a	n/a	n/a	-8.0	-12.8	-8.8	-9.5	-12.8	2,253
<i>Benchmark</i>	n/a	n/a	n/a	-0.7	-8.2	-5.9	-4.2	-8.2	
Total Fund	6.9	4.6	4.0	-2.2	-10.0	-6.9	-4.9	-10.0	76,912
<i>VRS Custom Benchmark</i>	6.5	4.4	4.0	-1.4	-10.1	-7.6	-5.1	-10.1	

**10-Year Performance
Indexed to 100**



Effective July 2013, the VRS Custom Benchmark is a blend of the Asset Class Benchmarks at policy weights.

The VRS Cash Account, the Treasurer Short-Term Investment Account, the VRS Rebalancing Account, transition activity and accounts with market values of less than \$1 million are included in the Total Fund's market value. Differences in market value totals are due to rounding.

Total Fund Tracking Error

Figure 1: Policy Tracking Error Rolling Three Year - Plan (as of 3/31/2020)

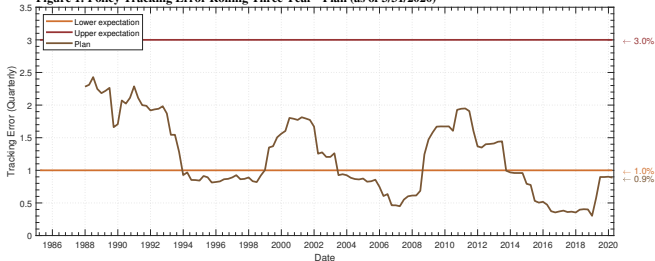
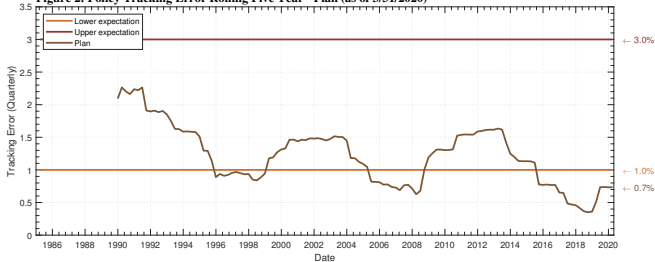


Figure 2: Policy Tracking Error Rolling Five Year - Plan (as of 3/31/2020)



Program	Action	Effective Date	Commitment/ Current Value	Funding/ Defunding Period	Description
Credit Strategies	Hired	04/27/2020	\$300 Million	3 Years	Farallon Special Situations – A closed-end fund focused on opportunistic financings to firms located globally.
Credit Strategies	Hired	04/29/2020	\$300 Million	3-4 Years	SSG Secured Lending Opportunities III – A closed-end fund focused on lending to firms in the Asia-Pacific region.
Real Assets	Hired	04/09/2020	\$150 Million	5 Years	Taurus Mining Finance Fund No. 2 – A partnership that provides financing for the mining industry.
Real Assets	Hired	05/22/2020	\$150 Million	5 Years	Stonepeak Infrastructure Partners Fund IV – A U.S. focused closed-end infrastructure fund.
Private Equity	Hired	05/04/2020	\$85 Million	6 Years	Spectrum Equity IX – A growth private equity fund focused on Internet-enabled software and information services businesses.
Risk-Based Investments	Terminated	04/30/2020	\$178 Million	Immediate	Bridgewater Pure Alpha II – A global hedge fund.

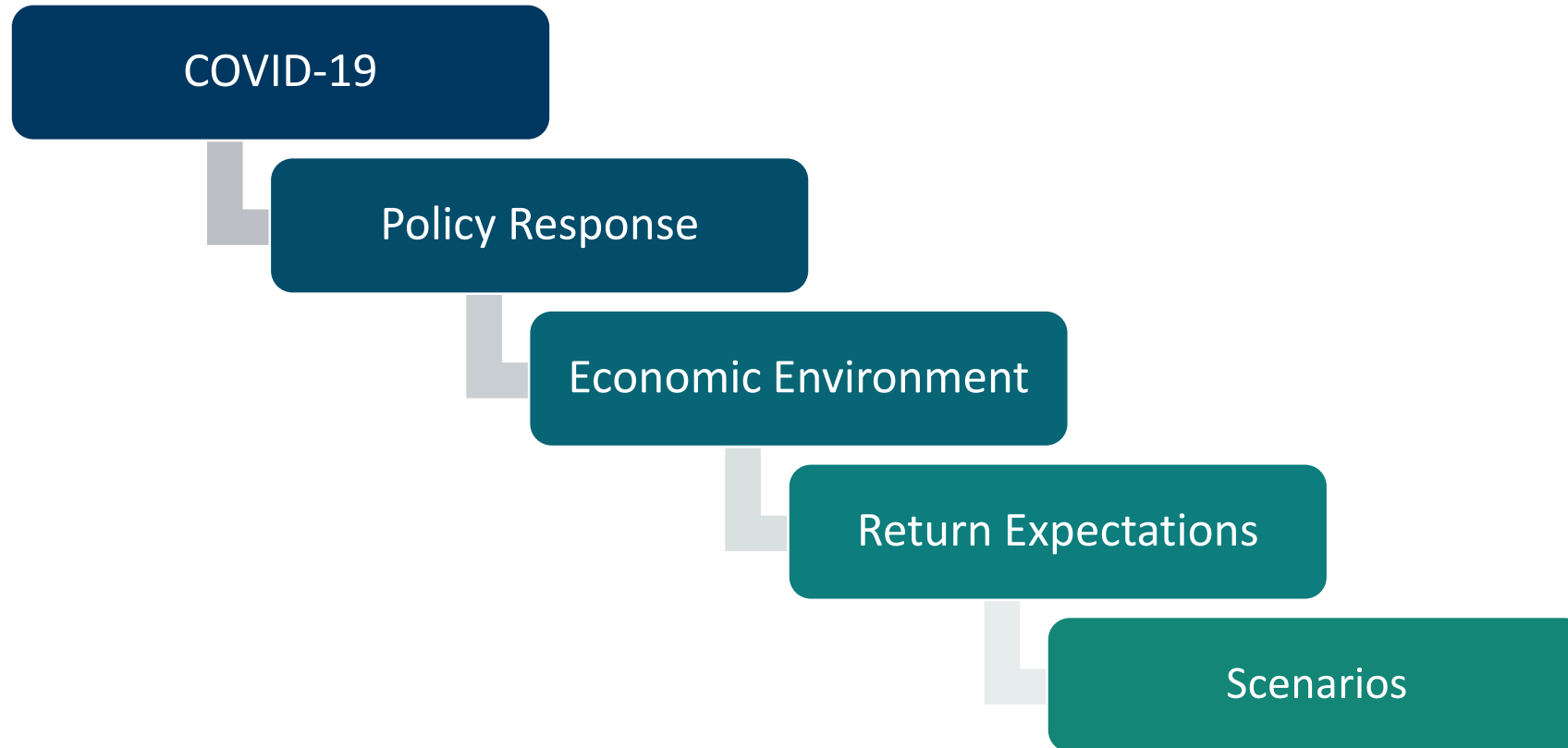
Macro Backdrop & Scenario Analysis

Steven Peterson, PhD

Program Director, Research



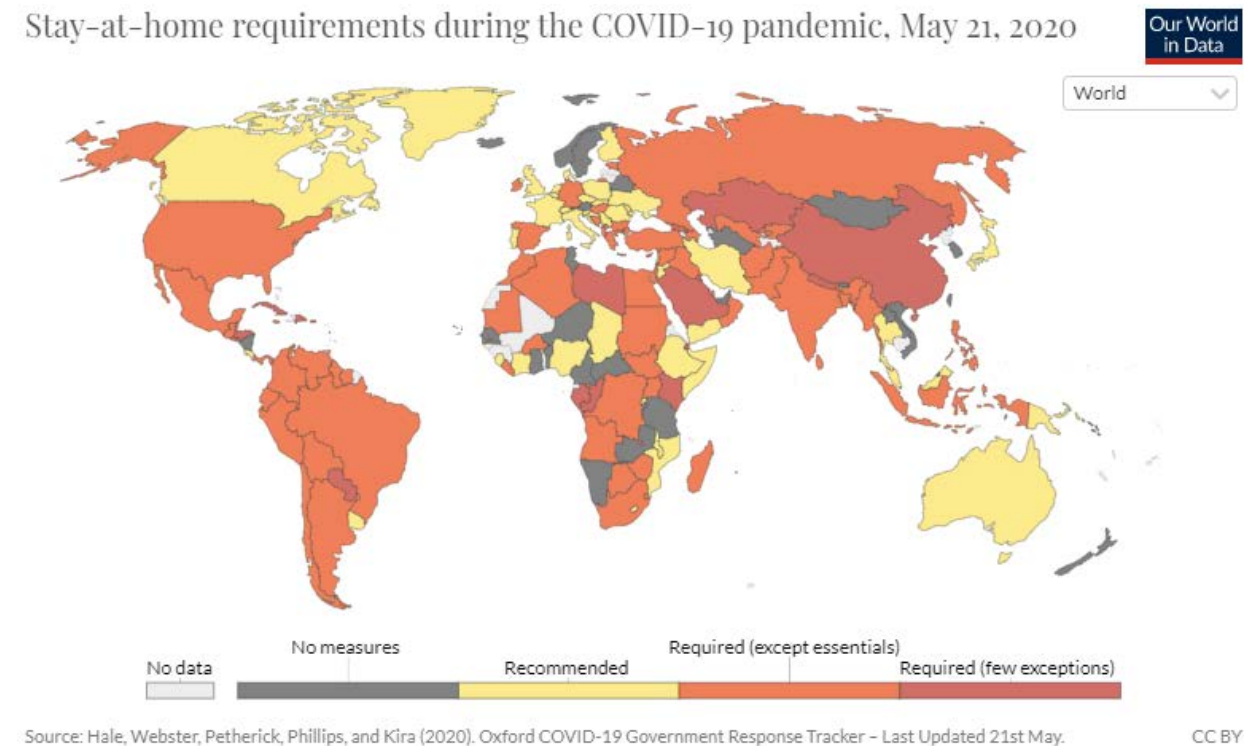
Overview: Preview of Agenda Items



COVID-19 Global Impacts

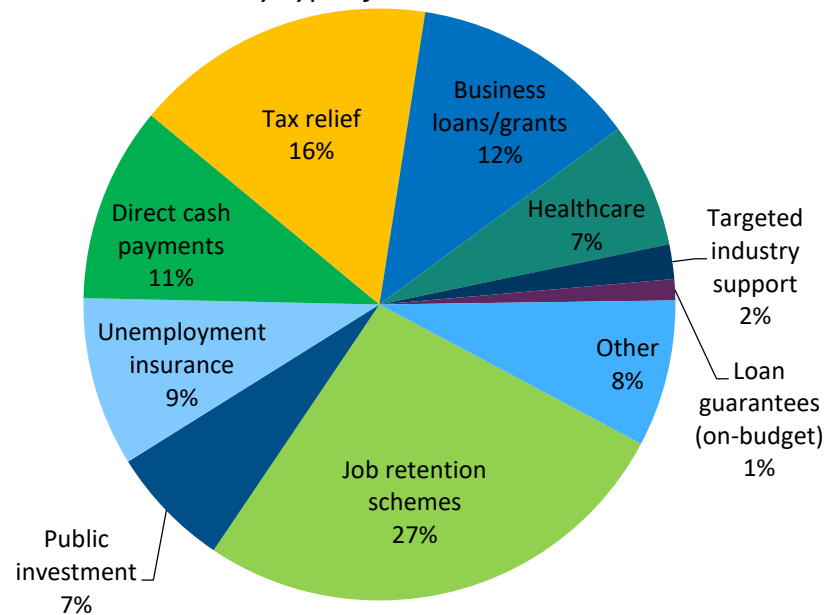
Onset of the COVID-19 pandemic has disrupted the global economy to a virtually unprecedented scale

- Over 6 million cases and more than 350,000 deaths worldwide
- Mortality rate of vulnerable populations at catastrophic levels
- Vast majority of the global economy face mobility restrictions
- Supply chains disrupted alongside massive demand shock
- Liquidity stress as safe haven demand surges
- “Twin shocks” roil energy markets



Global Policy Response

Global Fiscal Response to COVID-19 Outbreak
by Type of Stimulus

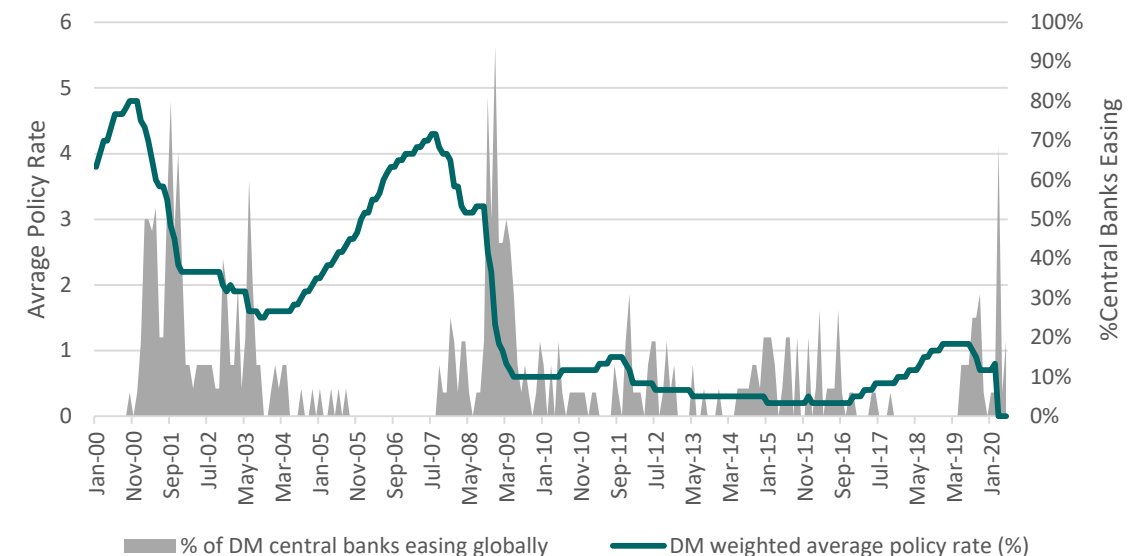


- U.S. unemployment expected to peak in the mid-20's
- Demand shock causing drop in price indexes
- Tax receipts forecasts plummet for federal, state, and local governments

Fiscal and monetary response to the crisis has been virtually unprecedented

- Global fiscal response approximately 3.5% of worldwide GDP
- Developed market policy rates expected to be at the zero/lower bound for the foreseeable future
- Emerging markets face commodity crash in the midst of public health crisis and global demand shock

Developed Market Monetary Policy



Source: UBS as of May 21, 2020

Current Economic Indicators

Economic impact of the COVID-19 outbreak has been severe with some stabilization apparent as economies reopen

- Recent releases on home sales and Richmond/Dallas Fed Manufacturing Activity surprised to the upside
- Slowing in initial jobless claims and some indication of bottoming in employment statistics
- Sentiment indicators depressed, but panic/hype metrics have come off their peaks

		24-Jan	31-Jan	7-Feb	14-Feb	21-Feb	28-Feb	6-Mar	13-Mar	20-Mar	27-Mar	3-Apr	10-Apr	17-Apr	24-Apr	1-May	8-May	15-May	22-May
Virus	New Covid-19 Cases ⁽¹⁾	2	5	4	2	2	45	202	1,917	17,094	82,384	173,710	221,168	203,171	205,652	198,423	180,148	159,259	158,063
	Lockdown Index ⁽²⁾	0	0	6	6	6	6	20	30	67	73	73	75	75	73	73	73	73	
Real Economy	Jobless Claims ⁽³⁾	212	201	204	215	220	217	211	282	3307	6867	6615	5237	4442	3867	3176	2687	2438	
	Public Transport Usage ⁽⁴⁾	1	3	3	3	4	5	4	-1	-36	-62	-68	-72	-73	-71	-71	-69	-68	-66
	Airline Passengers ⁽⁵⁾							2052	1814	1030	322	151	108	95	104	131	164	202	254
	Mortgage Applications ⁽⁶⁾	11	0	-6	-9	-4	-6	-1	-2	-16	-25	-34	-36	-34	-27	-22	-14	-9	
	Consumer Comfort ⁽⁷⁾	67	67	66	66	64	63	63	63	60	56	50	45	41	40	37	36	35	
	Johnson Redbook Same Store Sales ⁽⁸⁾	5	5	5	5	5	5	6	7	8	8	7	-2	-4	-6	-7	-8	-9	
	Restaurant Bookings ⁽⁹⁾					-1	1	-6	-36	-99	-100	-100	-100	-100	-100	-99	-97	-94	-87
	Oil Rigs ⁽¹⁰⁾	2	2	2	2	2	2	3	3	0	-6	-15	-24	-34	-43	-51	-56	-61	-64
	Steel Production ⁽¹¹⁾	0	0	-1	0	0	1	0	-2	-3	-13	-20	-34	-33	-35	-40	-37	-38	
	Electricity demand ⁽¹²⁾	0	1	-1	0	1	0	0	0	-1	-3	-6	-8	-7	-8	-8	-7	-8	-8
Financial Markets	S&P 500 ⁽¹³⁾	2	0	2	4	4	-5	-6	-16	-26	-24	-22	-16	-13	-14	-11	-11	-12	-9
	Financial Cond. Index ⁽¹⁴⁾	1	0	1	1	1	-1	-2	-4	-6	-6	-5	-3	-3	-3	-2	-1	-1	-1

Notes: 1. Weekly new Covid-19 cases based on data from Bloomberg News and Johns Hopkins. 2. Oxford COVID-19 Government Response Tracker based on a zero to 100 scale. 3. Jobless claims are in thousands. 4. Public Transport Use from Moovit, https://moovitapp.com/insights/en/Moovit-Insights_Public_Transit_Index-countries (average of New York area, Chicago and Los Angeles) 5. Airline passengers are in thousands. 6. Mortgage applications are percent changes from the average of the first two weeks in January. 7. Bloomberg Consumer Comfort index levels. 8. Redbook sales (%YoY) 9. Restaurant bookings (%YoY) from OpenTable; 10, 11, 13. Oil rigs, steel production and S&P 500 are percent changes from the average of the first two weeks in January. 12. Difference between actual daily load and business-as-usual expectation, weekly rolling average (%) 14. Bloomberg Financial Conditions Index.

Pre-COVID Forward Return Expectations

Entering 2020, global macroeconomic conditions were broadly strengthening

- Manufacturing recession ending
- Recovery in global PMI's off mid-2019 lows
- Valuations high but not extreme
- General belief that the economy was headed for another mid-cycle rebound

Expected returns reflected a stabilizing economic environment with limited stress in the overall financial system

Asset Class	Wt.	Current	
		E(r)	E(σ)
Public Equity	34%	6.5%	11.9%
Fixed Income	15%	2.9%	3.5%
Credit Strategies	14%	7.8%	4.3%
Real Assets	14%	6.9%	11.5%
Private Equity	14%	9.0%	20.0%
MAPS	6%	5.4%	5.5%
PIP	3%	7.9%	15.4%
Cash	0%	0.0%	0.5%
<i>Currency Return Addition</i>		0.1%	
Total Fund		6.6%	10.4%

Potential Future Paths

Painful but Short-lived

(V-shaped recovery)

- Treatments available by late-summer/fall to reduce mortality, vaccine for select populations in less than a year
- Social distancing reduced within the next few months
- Policy response proves effective in offsetting majority of economic impact
- Growth and inflation both rebound quickly
- 2020 viewed as transitory shock

Decrease of 0.2% to 0.4%

New Normal

(U- or W-shaped recovery)

- Treatments slow to limit mortality in vulnerable population, vaccine availability 1-3 years
- Outbreaks continue albeit with more informed response/targeted social distancing
- Policy response limits liquidity issues and proves effective, though not a panacea
- Growth recovers in late 2021
- Sentiment metrics suffer with heightened uncertainty

Decrease of 1.2% to 1.6%

COVID Redux

(L-shaped recovery)

- Mutations lead to difficulty with treatments/vaccines across populations
- Broad social distancing seen as only effective tool to limit mortality rates
- Extended economic stress begins to weaken political and financial systems as budget deficits and liquidity strains increase
- Growth impeded for several years
- Trade patterns severely disrupted and political stability deteriorates

Decrease of 1.6 to 2%

NOTE: Decreases represent reduction in Plan expected returns from pre-COVID level

Fixed Income Benchmark Phase-In

Ronald Schmitz,
Chief Investment Officer



Benchmark/Hurdle Study Review

Ronald Schmitz,
Chief Investment Officer





PERSPECTIVES THAT DRIVE ENTERPRISE SUCCESS



JUNE 2020

Benchmark and Performance Hurdle Analysis

Virginia Retirement System

Table of Contents



VERUSINVESTMENTS.COM

SEATTLE 206-622-3700

LOS ANGELES 310-297-1777

SAN FRANCISCO 415-362-3484

PITTSBURGH 412-784-6678

Benchmarks **PAGE 3**

Performance Hurdles **PAGE 7**

Summary **PAGE 16**

***Past performance is no guarantee of future results.** This document is provided for informational purposes only and is directed to institutional clients and eligible institutional counterparties only and is not intended for retail investors. Nothing herein constitutes investment, legal, accounting or tax advice, or a recommendation to buy, sell or hold a security or pursue a particular investment vehicle or any trading strategy. This document June include or imply estimates, outlooks, projections and other “forward-looking statements.” No assurance can be given that future results described or implied by any forward looking information will be achieved. Investing entails risks, including possible loss of principal. Verus Advisory Inc. and Verus Investors, LLC (“Verus”) file a single form ADV under the United States Investment Advisors Act of 1940, as amended. Additional information about Verus Advisory, Inc. and Verus Investors, LLC is available on the SEC’s website at www.adviserinfo.sec.gov.*

Benchmarks

Introduction to benchmarks

CFA Institute – Some of the characteristics of a good benchmark

- Unambiguous
- Investable
- Measurable
- Appropriate
- Specified in advance
- Reflective of current investment opinions

Source: Exposure Draft of GIPS® Guidance Statement on Benchmarks

VRS benchmarks

Program	Current Benchmarks	Recommended Benchmarks
Fixed Income	Fixed Policy-weighted Blend of Bloomberg Barclays U.S. Aggregate Index [90%], Bloomberg Barclays U.S. High Yield Ba-B 2% Issuer Cap Index [5%] and JP Morgan EMBI Global Core Index [5%]	Fixed Policy-weighted Blend of Bloomberg Barclays U.S. Aggregate Index [90%], Bloomberg Barclays U.S. High Yield Ba-B 2% Issuer Cap Index [5%] and JP Morgan EMBI Global Core Index [5%]
Credit Strategies	Fixed Policy-weighted Blend of Bloomberg Barclays U.S. High Yield Ba-B 2% Issuer Cap Index [30%], Bloomberg Barclays U.S. Aggregate Index [10%] and S&P Performing Loan Index [60%]	Fixed Policy-weighted Blend of Bloomberg Barclays U.S. High Yield Ba-B 2% Issuer Cap Index [30%], Bloomberg Barclays U.S. Aggregate Index [10%] and S&P Performing Loan Index [60%]
Public Equity	MSCI All Country World Investable Market Index net of VRS taxes	MSCI All Country World Investable Market Index net of VRS taxes
Internal Equity	Asset-weighted Blend of the MSCI U.S. Standard Index, MSCI U.S. Small Cap Index, MSCI USA Minimum Volatility Index, MSCI World ex-U.S. Index, MSCI World ex-U.S. Minimum Volatility Index, MSCI Emerging Markets Index and EPRA/NAREIT U.S. Index net of VRS taxes	Asset-weighted Blend of the MSCI U.S. Standard Index, MSCI U.S. Small Cap Index, MSCI USA Minimum Volatility Index, MSCI World ex-U.S. Index, MSCI World ex-U.S. Minimum Volatility Index, MSCI Emerging Markets Index and EPRA/NAREIT U.S. Index net of VRS taxes
Private Equity	MSCI All Country World Investable Market Index net of VRS taxes (lagged by 3 months) + 250 bps per annum	MSCI All Country World Investable Market Index net of VRS taxes (lagged by 3 months)
Real Assets	Asset-weighted Blend of the Total Real Estate benchmark (NCREIF ODCE Index (net, lagged by 3 months) [85%] and FTSE EPRA/NAREIT Developed REIT Index [15%]) and the Other Real Assets benchmark CPI-U Index + 400 bps per annum lagged by 3 months	Asset-weighted Blend of the Total Real Estate benchmark (NCREIF ODCE Index (net, lagged by 3 months) [85%], FTSE EPRA/NAREIT Developed REIT Index [15%]) and the Other Real Assets benchmark CPI-U Index + 400 bps per annum lagged by 3 months
Private Investment Partnership	40% Private Equity (MSCI All Country World Investable Market Index (net of VRS taxes lagged by 3 months) + 250 bps per annum) 30% Real Estate (NCREIF ODCE Index (net, lagged by 3 months)) 10% Other Real Assets (CPI-U Index + 400 bps per annum lagged by 3 months) 10% Credit Strategies Rate Sensitive (Bloomberg Barclays U.S. High Yield Ba-B 2% Issuer Cap Index) 10% Credit Strategies Non-Rate Sensitive (S&P Performing Loan Index)	33.3% Private Equity (MSCI All Country World Investable Market Index net of VRS taxes lagged by 3 months) 25% Real Estate (NCREIF ODCE Index, net, lagged by 3 months) 8.3% Other Real Assets (CPI-U Index + 400 bps per annum lagged by 3 months) 16.7% Credit Strategies Rate Sensitive (Bloomberg Barclays U.S. High Yield Ba-B 2% Issuer Cap Index) 16.7% Credit Strategies Non-Rate Sensitive (S&P Performing Loan Index)
Dynamic Strategies	60% MSCI All Country World Investable Market Index net of VRS taxes 20% Bloomberg Barclays U.S. Aggregate Index 10% Bloomberg Barclays U.S. High Yield Ba-B 2% Issuer Cap Index 10% JP Morgan EMBI Global Core Index	60% MSCI All Country World Investable Market Index net of VRS taxes 20% Bloomberg Barclays U.S. Aggregate Index 10% Bloomberg Barclays U.S. High Yield Ba-B 2% Issuer Cap Index 10% JP Morgan EMBI Global Core Index
Risk Based Investments	80% Diversifiers Benchmark (Bloomberg Barclays 3- month U.S. Treasury Bellwether + 250 bps per annum) 20% S&P Risk Parity 12% Volatility	80% Diversifiers Benchmark (Bloomberg Barclays 3- month U.S. Treasury Bellwether + 250 bps per annum) 20% S&P Risk Parity 12% Volatility

Discussion of changes

Private Equity

- Aspirational, non-investable – (global equity index + 250 bp)
 - Approach typically used by institutional investors
- Any outperformance relative to Public Equity is beneficial to the fund
- If not invested in Private Equity, monies would likely be invested in Public Equity

PIP

- Changed weightings to reflect new asset allocation weights
 - Implementation delayed until 7/1/2021 due to illiquid nature

Investigated changing other aspirational, non-investable benchmarks but did not change

- Other Real Assets – (CPI + 400 bps)
- RBI Diversifiers – (Cash + 250 bps)
 - Approach typically used by institutional investors
 - Risk and return, reflective of strategy characteristics were not improved, or approach not used by other institutional investors

Performance hurdles

Summary of performance hurdles (1X)

Program	Current Hurdle (bps)	Recommended Hurdle (bps)	Rationale for Change
Fixed Income	20	25	Consistently achieving 2X. Universe of active management consistently adds value. Encourage slightly more risk taking and value added. High yield and EMD added to mandate and opportunity set.
Credit Strategies	50	75	Restructuring of strategy expected to increase tracking error and therefore higher value added.
Public Equity	30	30	No change
Internal Equity	20	25	Higher expected tracking error and higher value added than when current 1X was developed as VRS has expanded into higher tracking error, strategies, primarily low volatility strategies. Expect higher IR due to global nature of portfolio
Private Equity	75	200	Removal of + 250 bps from benchmark. 2X is the same, 400 bps over the global equity index
Real Assets	75	75	No change
Private Investment Partnership	75	120	Weighted sum of new benchmark and new 1X's
Dynamic Strategies	30	25	Still early in the life of the strategy. Use the same 1X as internal public strategies. Diversification benefits from strategy not captured in performance hurdles
Risk Based Investments	30	25	Still early in the life of the strategies. Use the same 1X as internal public strategies. Diversification benefits from strategy not captured in performance hurdles
Total Fund	30	45	Adjustment for private equity benchmark change, expected universe top quartile ranking performance, greater asset class alpha expectations and increasing allocations to higher alpha asset classes

VRS results – Private Equity

PRIVATE EQUITY 5 YEAR ROLLING ANALYSIS

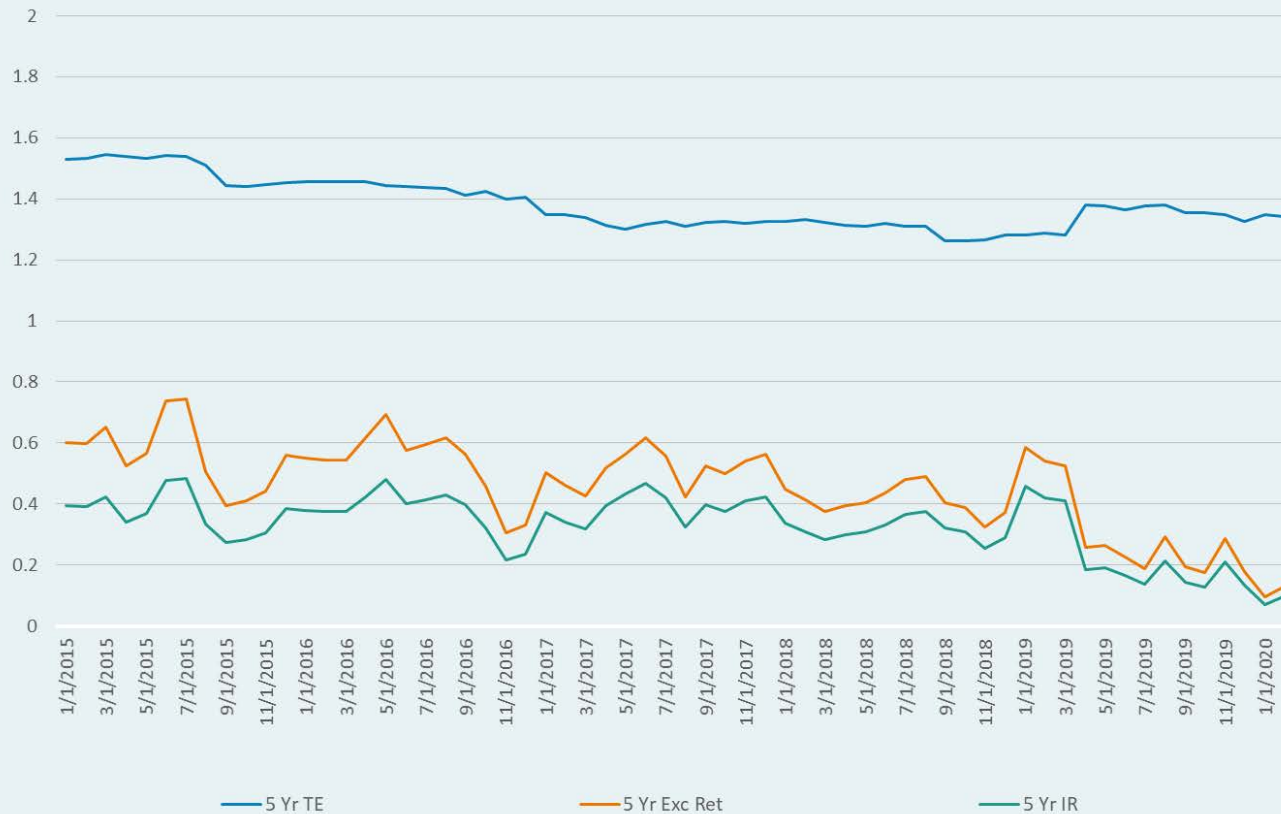


Any point of +2.5% line above zero is beneficial to VRS and would smooth out the incentive compensation

Source: VRS, BNY-Mellon

VRS results – Total Fund

TOTAL FUND 5 YEAR ROLLING ANALYSIS



Historical tracking error within a fairly narrow range and expected to increase some as new target allocation is implemented

Source: VRS, BNY-Mellon

Public fund universe – total fund value added

InvMetrics Public DB Net Universe ending 12/31/2019

	3 Year	5 Year	8 Year	10 Year
Universe				
5th Pctl.	1.36	0.77	1.14	0.95
25th Pctl.	0.38	0.20	0.28	0.24
Median	-0.09	-0.18	-0.03	-0.05
75th Pctl.	-0.45	-0.48	-0.43	-0.43
95th Pctl.	-1.26	-1.16	-1.14	-1.41
Observations	211	203	180	153

InvMetrics Public DB Net Universe ending 12/31/2018

	8 Year
Universe	
5th Pctl.	0.90
25th Pctl.	0.32
Median	-0.07
75th Pctl.	-0.43
95th Pctl.	-1.47
Observations	211

Aspirational benchmarks of +200 to +500 bps are normally used in policy performance benchmarks

Removing the aspirational contribution from every funds' policy return would likely shift the universe's value added by a similar amount that it does for VRS, 25 – 30 bps

1X of 45 bps estimated to be above adjusted median but below adjusted top quartile.

2X of 90 bps estimated to be above adjusted top quartile, and approximately adjusted top decile

VRS results – Fixed Income

FIXED INCOME 5 YEAR ROLLING ANALYSIS

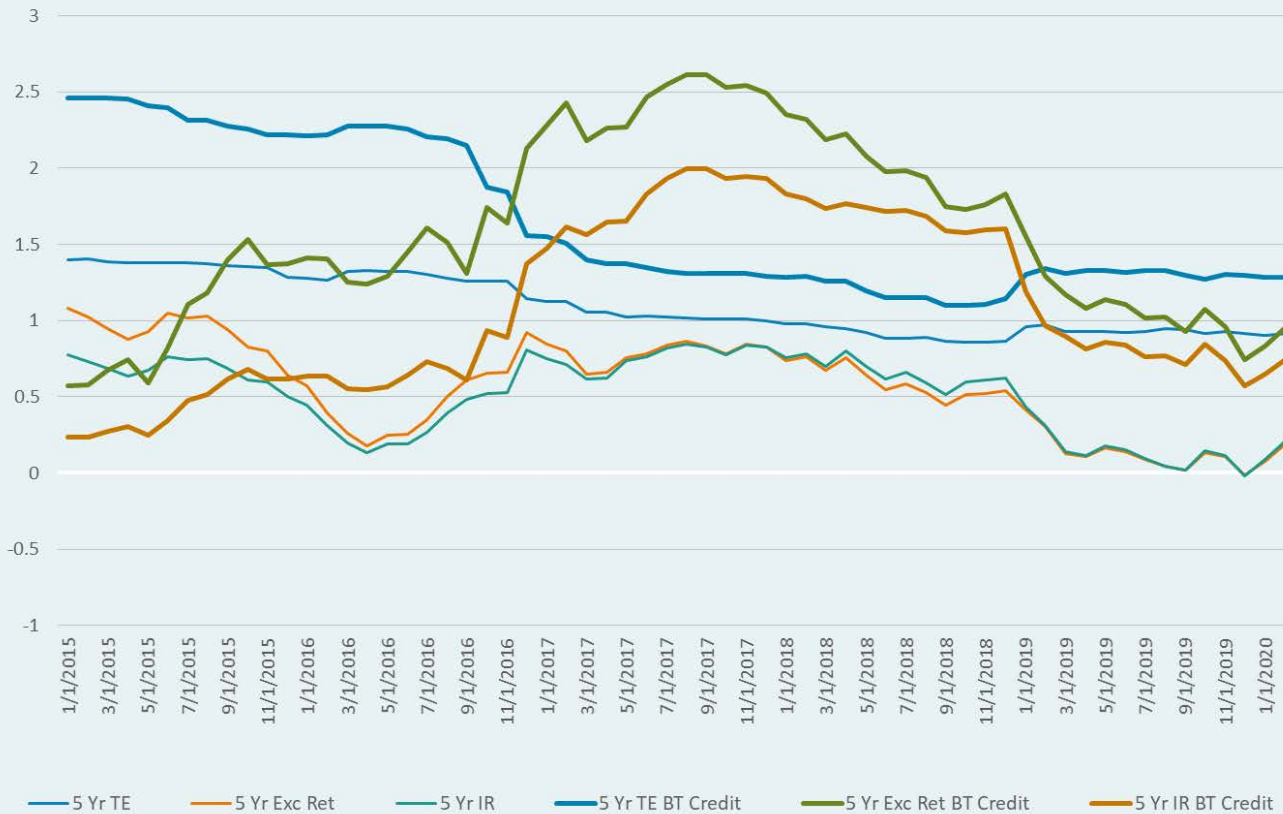


Excellent results. New hurdles encourage a bit more risk taking within the current capabilities and strategies

Source: VRS, BNY-Mellon

VRS results – Credit Strategies

CREDIT 5 YEAR ROLLING ANALYSIS

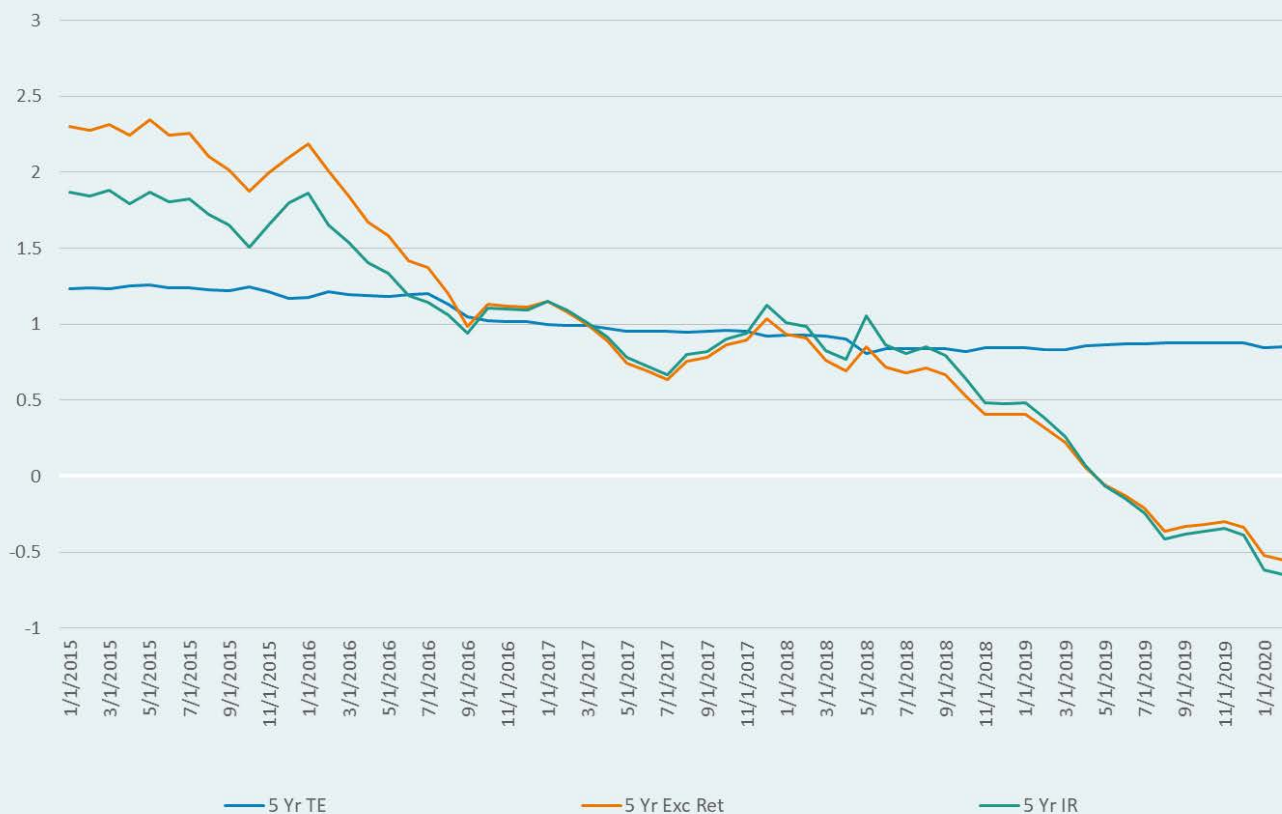


Backtest of proposed strategy demonstrates greater tracking error than program's historical risk

Source: VRS, BNY-Mellon

VRS results – Internal Equity

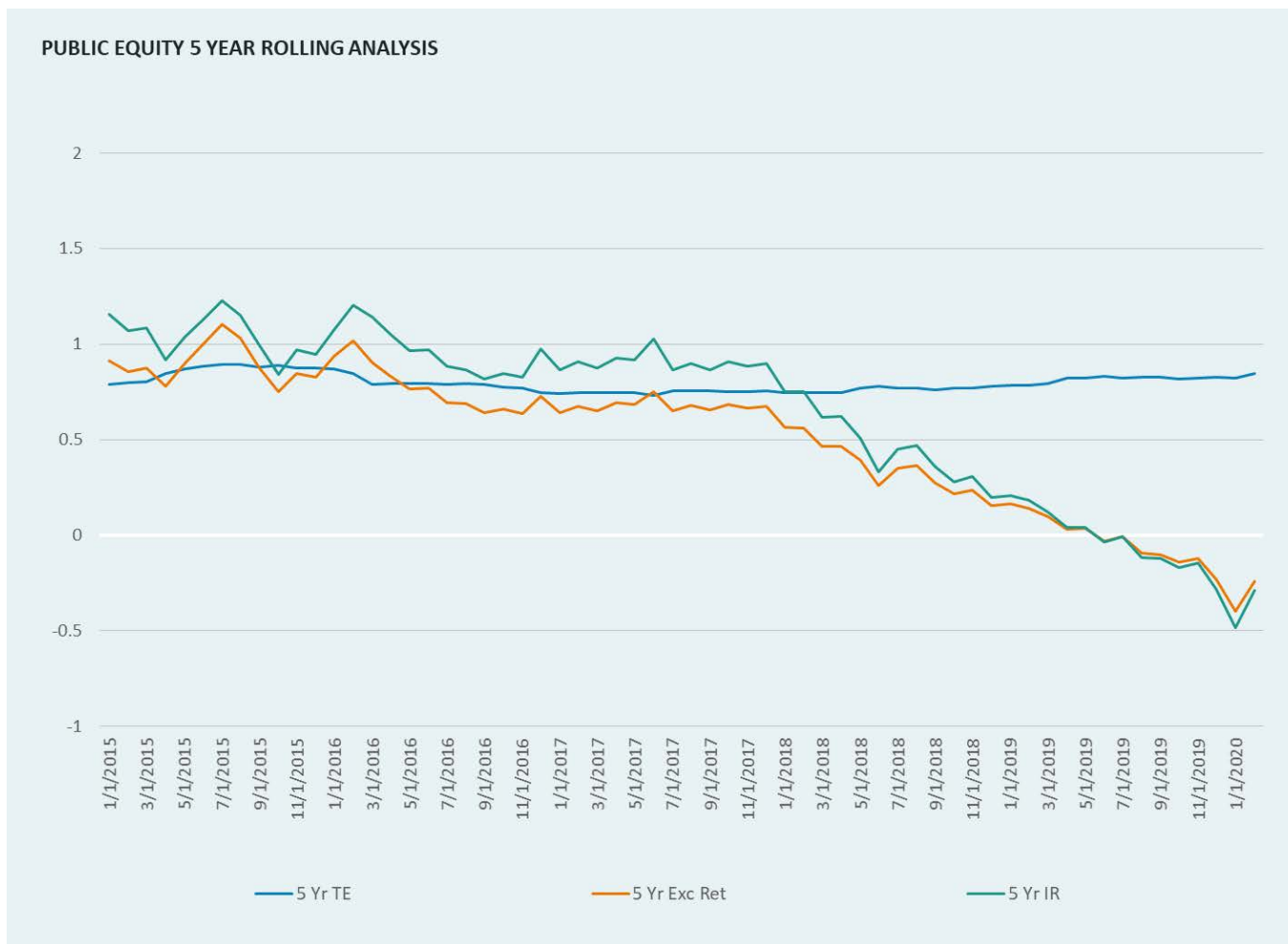
INTERNAL EQUITY 5 YEAR ROLLING ANALYSIS



Current 1X developed at a slightly lower tracking error expectation and lower, U.S. equity based, information ratio

Source: VRS, BNY-Mellon

VRS results – Public Equity



Source: VRS, BNY-Mellon

Summary

Program	Recommended Benchmarks	Recommended Hurdles (bps)
Fixed Income	Fixed Policy-weighted Blend of Bloomberg Barclays U.S. Aggregate Index [90%], Bloomberg Barclays U.S. High Yield Ba-B 2% Issuer Cap Index [5%] and JP Morgan EMBI Global Core Index [5%]	25
Credit Strategies	Fixed Policy-weighted Blend of Bloomberg Barclays U.S. High Yield Ba-B 2% Issuer Cap Index [30%], Bloomberg Barclays U.S. Aggregate Index [10%] and S&P Performing Loan Index [60%]	75
Public Equity	MSCI All Country World Investable Market Index net of VRS taxes	30
Internal Equity	Asset-weighted Blend of the MSCI U.S. Standard Index, MSCI U.S. Small Cap Index, MSCI USA Minimum Volatility Index, MSCI World ex-U.S. Index, MSCI World ex-U.S. Minimum Volatility Index, MSCI Emerging Markets Index and EPRA/NAREIT U.S. Index net of VRS taxes	25
Private Equity	MSCI All Country World Investable Market Index net of VRS taxes (lagged by 3 months)	200
Real Assets	Asset-weighted Blend of the Total Real Estate benchmark (NCREIF ODCE Index (net, lagged by 3 months) [85%], FTSE EPRA/NAREIT Developed REIT Index [15%]) and the Other Real Assets benchmark CPI-U Index + 400 bps per annum lagged by 3 months	75
Private Investment Partnership	33.3% Private Equity (MSCI All Country World Investable Market Index net of VRS taxes lagged by 3 months) 25% Real Estate (NCREIF ODCE Index, net, lagged by 3 months) 8.3% Other Real Assets (CPI-U Index + 400 bps per annum lagged by 3 months) 16.7% Credit Strategies Rate Sensitive (Bloomberg Barclays U.S. High Yield Ba-B 2% Issuer Cap Index) 16.7% Credit Strategies Non-Rate Sensitive (S&P Performing Loan Index)	120
Dynamic Strategies	60% MSCI All Country World Investable Market Index net of VRS taxes 20% Bloomberg Barclays U.S. Aggregate Index 10% Bloomberg Barclays U.S. High Yield Ba-B 2% Issuer Cap Index 10% JP Morgan EMBI Global Core Index	25
Risk Based Investments	80% Diversifiers Benchmark (Bloomberg Barclays 3-month U.S. Treasury Bellwether + 250 bps per annum) 20% S&P Risk Parity 12% Volatility	25
Total Fund	Fixed Policy-weighted Blend of individual program benchmarks	45