

**PUBLIC SAFETY PERSONNEL RETIREMENT SYSTEM
BOARD OF TRUSTEES INVESTMENT COMMITTEE MEETING**

OCTOBER 19, 2022

AGENDA

The Investment Committee Meeting of the Board of Trustees of the Public Safety Personnel Retirement System will be held at **PSPRS, 3010 E. Camelback Rd. Suite 200, Phoenix, AZ 85016**. This meeting is available to the public and all persons wishing to attend in person are invited.

A copy of the agenda for the meeting will be posted on the PSPRS website at least twenty-four hours in advance of the meeting. *To view the final agenda*, visit www.psprs.com/about/board-of-trustees, scroll to the Board of Trustees Meetings, select 'Investment Agendas' or 'Investment Meeting Materials' in the box, and select the appropriate meeting date. The agenda is subject to revision up to 24 hours prior to the meeting.

Interested members of the public and stakeholders may submit comments on any matter within the jurisdiction of the Investment Committee, including any item on the agenda for the October 19, 2022 meeting.

Public comments may be submitted in person or electronically to: PSPRSBoardMeetings@psprs.com. Commenters may elect to have electronic submissions presented by staff or address the Committee themselves either via phone or video through the live PSPRS Public Meeting Web stream: www.psprs.com/about/board-of-trustees. Commenters shall submit their full name, phone number (if appearing by phone), affiliation (if none, indicate 'member of the public'), Agenda item they wish to comment on, and their position for or against the item.

NOTE: For technological reasons, commenters choosing to address the Committee live during the meeting shall indicate so in their email, at least an hour before the meeting begins. Upon receipt of the request, PSPRS Staff will facilitate the appearance and contact you, if necessary, before the Committee meeting.

The foregoing procedures notwithstanding, the Chair reserves the right to control the duration of comments or impose other constraints in the interest of maintaining an orderly meeting.

Media Contact: Christian Palmer, Communications Director (cpalmer@psprs.com)

The meeting will begin at 9:30 a.m. and continue until 11:30 a.m. or until the matters set forth in this agenda are otherwise addressed. Members of the Committee will attend either in person or remotely via Zoom. The Investment Committee may vote to hold an executive session, which will not be open to the public, to discuss certain matters. The Investment Committee reserves the right to consider agenda items outside of their listed order.

One or more members of the Board of Trustees of the Public Safety Personnel Retirement System who are not members of the Investment Committee may be present for purposes of auditing the Investment Committee meeting but are not permitted to participate in the Investment Committee's discussions or deliberations.

1. Call to Order; Pledge of Allegiance; Roll Call; Opening Remarks.

*Mr. Harry A. Papp
Investment Committee Chairman*

2. Review, discussion and possible **Action** to approve Investment Committee Minutes from September 21, 2022.

Chairman Harry A. Papp

3. Call to the Public:

This is the time for the public to comment. Members of the Committee may not discuss items that are not specifically identified on the agenda. Therefore, pursuant to A.R.S. § 38-431.01 (H), action taken as a result of public comment will be limited to directing staff to study the matter, responding to any criticism, or scheduling the matter for a later date for further consideration and possible recommendations to the Board of Trustees.

4. Review and possible discussion regarding each of the following staff reports for the prior period.

*Mr. Mark Steed
Chief Investment Officer*

- a. **Written report:** Performance for the PSPRS Trust as of August 31, 2022.
- b. **Written report:** Firefighters and Peace Officers Cancer Insurance Program.
- c. **Written report:** Portfolio Risk as of August 31, 2022.
- d. **Written report:** Global Financial Market Developments.
- e. **Written report:** Executed Transactions during the prior period.

5. Presentation and discussion about Proxy Voting.

Mr. Mark Steed

6. The Investment Committee may vote to go into Executive Session (which will not be open to the public) to discuss matters pursuant to A.R.S. §§ 38-431.03(A) (1), (2), (3), (4) and (7), as applicable, including to receive legal advice from the Board's attorneys on any matter listed on the agenda.

7. The Committee may discuss future dates for meetings and direct staff to place matters on future agendas. The next meeting is currently scheduled for Thursday, November 17, 2022.

Chairman Harry A. Papp

8. Adjournment.

Chairman Harry A. Papp

Persons with a disability may request reasonable accommodation, such as a sign language interpreter, by contacting Cheryl Cohen, Executive Assistant, or Claudia Martinez, Executive Assistant, at (602) 255-5575. Requests should be made as early as possible to arrange the accommodation.

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PUBLIC SAFETY PERSONNEL RETIREMENT SYSTEM BOARD OF TRUSTEES INVESTMENT COMMITTEE MEETING

September 21, 2022

MINUTES

Present: Mr. Harry Papp, Chairman - remote
Mr. Chris Hemmen, Trustee - remote
Mr. Dean Scheinert, Trustee - remote
Ms. Randi Stein, Trustee - remote

Others Present: Mr. Mark Steed, Chief Investment Officer
Mr. James Ko, Deputy Chief Investment Officer - remote
Ms. Cheryl Cohen, Investment Executive Assistant - remote
Mr. Shan Chen, Lead Portfolio Manager
Mr. Jefferson Weston, Portfolio Manager - remote
Mr. Brandon Turner, Investment Analyst - remote
Ms. Katherine Boligitz, Investment Analyst - remote
Mr. Kevin Chen, Investment Analyst - remote
Ms. Laura Long, Sr. Investment Analyst - remote
Mr. Mike Townsend, Administrator
Mr. Allan Martin, Partner, NEPC, LLC - remote
Ms. Sarah Grist,, Albourne Partners - remote
Mr. Bret Parke, Assistant Administrator/General Counsel - remote
Mr. Mike Smarik, Deputy Administrator - remote
Mr. Owen Zhao, Sr. Quantitative Investment & Risk Analyst - remote
Ms. Jennifer Carlino, Investment Counsel - remote
Ms. Rose Crutcher, Paralegal Investments - remote

1. Call to Order; Pledge of Allegiance; Roll Call; Opening Remarks.

The meeting was called to order at 9:30, the Pledge of Allegiance recited and a roll was called.

*Mr. Harry A. Papp
Investment Committee Chairman*

2. Review, discussion and possible **Action** to approve Investment Committee Minutes from August 17, 2022.

Chairman Harry A. Papp

Moved by: Trustee - remote Ms. Randi Stein

Second by: Trustee - remote Mr. Chris Hemmen

Vote: 4 - 0 Passed

3. **Call to the Public:**

This is the time for the public to comment. Members of the Committee may not discuss items that are not specifically identified on the agenda. Therefore, pursuant to A.R.S. § 38-431.01 (H), action taken as a result of public comment will be limited to directing staff to study the matter, responding to any criticism, or scheduling the matter for a later date for further consideration and possible recommendations to the Board of Trustees.

There was no response to Call to the Public.

4. Review and possible discussion regarding each of the following staff reports for the prior period.

*Mr. Mark Steed
Chief Investment Officer*

a. **Written report:** Performance for the PSPRS Trust as of July 31, 2022.

Chairman Papp reviewed the report provided with no further discussion held.

b. **Written report:** Firefighters and Peace Officers Cancer Insurance Program.

Chairman Papp reviewed the report provided and highlighted a few aspects within the report. No further discussion was held.

c. **Written report:** Portfolio Risk as of July 31, 2022.

The risk model annual review and built a customized proxy for the Special Credit (SC) as we have been working on increasing the Private Credit portfolio to the policy allocation target. The new SC proxy was constructed using autoregressive modeling techniques with several defined public indexes. It enables a better model and evaluates the asset class/portfolio risk. The total forecasted volatility and VaR increased by 40 and 20 bps separately, and most of the additional risk came from public equities - the risk contributions from the Int'l and US equities grew by 2.7% and 1.7% compared to the prior month. Meanwhile, the risk from the PE Buyout & VC and Real Estate decreased.

d. **Written report:** Global Financial Market Developments.

Earnings are expected to increase by 8.3% annually over the next three years. While earnings are projected to increase over the next three years, the war in Ukraine, supply chain disruptions, persistent inflationary pressures, and increasing interest rates could temporarily curb the profit-growth outlook. The fall in equity prices this year has primarily been attributed to rising discount rates. The expectation is for the federal funds rate to increase by over 100 bps over the next 12 months, which poses a meaningful risk to equity price appreciation.

- e. **Written report:** Executed Transactions during the prior period.

Report provided with no further discussion held.

5. **The Investment Committee may vote to go into Executive Session (which will not be open to the public) to discuss matters pursuant to A.R.S. §§ 38-431.03(A) (1), (2), (3), (4) and (7), as applicable, including to receive legal advice from the Board's attorneys on any matter listed on the agenda.**

6. The BOT 2023 calendar is planning on moving the monthly investment meetings to Thursdays.

The Committee may discuss future dates for meetings and direct staff to place matters on future agendas. The next meeting is currently scheduled for October 19, 2022.

Committee members agreed to move monthly investment meetings to a Thursday.

Chairman Harry A. Papp

7. Adjournment.

Meeting adjourned at 10:19.

Chairman Harry A. Papp

Moved by: Trustee - remote Ms. Randi Stein

Second by: Trustee - remote Mr. Dean Scheinert

Vote: 4 - 0 Passed

Mr. Harry Papp, Trustee, Chairman

Arizona PSPRS Trust - Performance as of 8/31/2022 (Gross of Fees)

Description	Asset Allocation		7/1/2021 Target	Range	Performance % (TWR)								
	Market Values	%			Month	3 Months Ending	Fiscal YTD	Calendar YTD	1 Year	3 Years*	5 Years*	7 Years*	10 Years*
Arizona PSPRS Trust - Total Fund <i>Target Fund Benchmark[†]</i>	\$18,238,605,001	100.00%			-1.87 -2.29	-2.89 -2.85	0.65 3.55	-6.35 -11.87	-4.16 -9.68	8.43 7.45	7.37 6.76	7.64 7.26	7.89 7.21
Capital Appreciation	\$11,129,244,786	61.02%			-2.65	-3.68	1.41	-9.45	-6.73	10.69	8.81	9.19	9.63
US Public Equity** <i>Russell 3000</i>	\$3,969,583,837	21.76%	24%	17-29%	-3.60 -3.73	-3.42 -3.51	5.01 5.30	-16.45 -16.92	-12.33 -13.28	12.25 11.90	11.52 11.29	11.70 11.98	12.30 12.77
Int'l Public Equity <i>MSCI ACWI IMI ex-US Net</i>	\$2,852,916,946	15.64%	16%	13-21%	-3.48 -3.13	-8.28 -8.49	0.17 0.51	-18.28 -18.67	-19.58 -19.96	2.91 3.18	2.11 1.74	4.29 4.30	4.83 4.70
Global Private Equity <i>Russell 3000 + 1%</i>	\$4,175,819,718	22.90%	27%	17-32%	-1.21 -3.59	-1.27 -3.30	-0.94 5.39	4.39 -16.30	8.67 -12.28	14.90 12.92	11.27 12.30	10.54 12.99	10.48 13.77
Venture Capital & Buyouts	\$2,082,661,173	11.42%			-2.76	-4.57	-2.44	-2.06	0.97	19.97	17.24	15.97	17.11
Real Estate	\$1,313,038,010	7.20%			-1.39	-0.05	-1.73	7.23	14.14	9.17	3.99	3.98	4.48
Real Assets	\$780,120,536	4.28%			3.40	6.16	4.64	19.72	23.75	11.36	8.67	8.09	6.06
Other Assets	\$130,924,284	0.72%	0%	0-10%	-0.02	2.56	-0.02	5.49	8.78	10.86	8.92	11.59	13.05
Private Securities	\$130,924,284	0.72%			-0.02	2.56	-0.02	5.49	8.78	10.86	8.92	11.59	13.05
Contractual Income	\$3,190,684,300	17.49%			-1.15	-1.16	-0.83	0.43	2.19	6.38	6.44	7.24	7.33
Core Bonds <i>Bloomberg Barclays Government Bond Index</i>	\$567,377,725	3.11%	2%	1-15%	-2.09 -2.46	-1.67 -1.78	-0.19 -0.92	-5.92 -9.87	-5.92 -10.70	-1.28 -2.20	1.16 0.33	1.69 0.82	1.91 0.85
Private Credit <i>50% BofA ML US High Yield BB-B Cnstr/ 50% CSFB Leveraged Loans Index</i>	\$2,084,491,196	11.43%	20%	13-38%	-0.29 0.34	-0.50 0.18	-0.81 2.98	3.19 -2.45	5.87 -1.43	9.12 2.31	8.93 3.22	9.33 3.91	10.93 4.02
Private Lending	\$571,734,459	3.13%			0.04	0.73	0.41	5.86	8.74	9.15	8.43	8.34	8.32
Special Credit	\$1,512,756,737	8.29%			-0.42	-1.00	-1.31	2.15	4.75	9.08	9.27	9.98	11.57
Other Assets	\$538,815,379	2.95%	0%	0-10%	-3.45	-3.10	-1.72	-1.61	-0.45	6.21	5.32	6.92	6.16
Public Securities	\$278,056,686	1.52%			1.16	0.79	3.72	-3.52	-2.44				
Private Securities	\$260,758,693	1.43%			-7.94	-6.93	-6.93	0.77	1.97	9.48	7.50	12.41	16.06
Diversifying Strategies <i>LIBOR + 4%</i>	\$1,645,715,458	9.02%	10%	3-18%	-0.65 0.55	-3.35 1.52	-0.10 1.06	-3.55 3.47	-1.69 4.88	3.99 4.80	4.24 5.36	3.98 5.20	3.84 4.92
Cash*** <i>LIBOR (USD 3-Month Index)</i>	\$2,272,960,458	12.46%	1%	0-10%	0.18 0.23	0.37 0.56	0.26 0.42	0.48 0.84	0.52 0.88	0.80 0.80	1.83 1.36	1.94 1.20	2.06 0.92

* Please note that all the returns for all time periods exceeding 1 year are *annualized*.

** Please note that US Public Equity allocation above does not include additional \$294,526,593 in net futures exposure. When accounting for this exposure, percent allocation for US Public Equity equals 23.38%.

*** The returns for Cash account for both the interest on cash holdings and the revenue from securities lending.

† - Please see Page 2 for information on the blended fund benchmark changes and effective dates.

Target Fund Benchmarks/ Effective Dates:

July 1, 2021 to Present: 24% Russell 3000 Index, 16% MSCI ACWI Ex-US IMI Net Index, 27% Russell 3000 + 100 bps, 2% Bloomberg Barclays Gov't Bond Index, 20% BofA-ML US HY BB-B Constrained Index (50%) & CSFB Leveraged Loan Index (50%), 10% LIBOR +400 bps, and 1% LIBOR.

January 1, 2021 to June 30, 2021: 23% Russell 3000 Index, 15% MSCI ACWI Ex-US IMI Net Index, 25% Russell 3000 + 100 bps, 2% Bloomberg Barclays Gov't Bond Index, 22% BofA-ML US HY BB-B Constrained Index (50%) & CSFB Leveraged Loan Index (50%), 12% LIBOR +400 bps and 1% LIBOR.

July 1, 2020 to December 31, 2021: 23% Russell 3000 Index, 15% MSCI ACWI Ex-US IMI Net Index, 25% Russell 3000 + 100 bps, 2% Bloomberg Barclays US Aggregate Index, 22% BofA-ML US HY BB-B Constrained Index (50%) & CSFB Leveraged Loan Index (50%), 12% LIBOR +400 bps and 1% LIBOR.

July 1, 2019 to June 30, 2020: 20% Russell 3000 Index, 18% MSCI ACWI Ex-US IMI Net Index, 23% Russell 3000 + 100 bps, 3% Bloomberg Barclays US Aggregate Index, 22% BofA-ML US HY BB-B Constrained Index (50%) & CSFB Leveraged Loan Index (50%), 12% LIBOR +400 bps and 2% LIBOR.

July 1, 2018 to June 30, 2019: 16% Russell 3000, 14% MSCI World Ex-US Net, 12% Russell 3000 + 100 bps, 5% Bloomberg Barclays Global Aggregate ex-US (20%) & Bloomberg Barclays U.S. Aggregate (80%), 16% Private Credit (fka Credit Opportunities) Benchmark, 12% 3-Month LIBOR + 300 bps, 9% CPI + 200 bps, 10% NCREIF NPI, 4% Risk Parity Benchmark and 2% BofA ML 3-Month T-Bill.

July 1, 2017 to June 30, 2018: 16% Russell 3000, 14% MSCI World Ex-US Net, 12% Russell 3000 + 100 bps, 5% Bloomberg Barclays Global Aggregate Index, 16% Private Credit (fka Credit Opportunities) Benchmark, 12% 3-Month LIBOR + 300 bps, 9% CPI + 200 bps, 10% NCREIF NPI, 4% Risk Parity Benchmark and 2% BofA ML 3-Month T-Bill.

July 1, 2016 to June 30, 2017: 16% Russell 3000, 14% MSCI World Ex-US Net, 11% Russell 3000 + 100 bps, 5% Bloomberg Barclays Global Aggregate Index, 15% Credit Opportunities Benchmark, 5% BofA ML 3-Month T-Bill + 200 bps, 10% 3-Month LIBOR + 300 bps, 8% CPI + 200 bps, 10% NCREIF NPI, 4% Risk Parity Benchmark and 2% BofA ML 3-Month T-Bill.

July 1, 2015 - June 30, 2016: 16% Russell 3000, 14% MSCI World Ex-US Net, 11% Russell 3000 + 100 bps, 7% Bloomberg Barclays Global Aggregate Index, 13% Credit Opportunities Benchmark, 5% BofA ML 3-Month T-Bill + 200 bps, 10% 3-Month LIBOR + 300 bps, 8% CPI + 200 bps, 10% NCREIF NPI, 4% Risk Parity Benchmark and 2% BofA ML 3-Month T-Bill.

July 1, 2014 - June 30, 2015: 16% Russell 3000, 14% MSCI World Ex-US Net, 11% Russell 3000 + 100 bps, 7% Bloomberg Barclays Global Aggregate Index, 13% Credit Opportunities Benchmark, 4% BofA ML 3-Month T-Bill + 200 bps, 10% 3-Month LIBOR + 300 bps, 8% CPI + 200 bps, 11% NCREIF NPI, 4% Risk Parity Benchmark and 2% BofA ML 3-Month T-Bill.

July 1, 2013 - June 30, 2014: 17% Russell 3000, 14% MSCI ACWI Ex-US Net, 10% Russell 3000 + 100 bps, 8% Bloomberg Barclays Global Aggregate Index, 12% Credit Opportunities Benchmark, 4% BofA ML 3-Month T-Bill + 200 bps, 10% 3-Month LIBOR + 300 bps, 8% CPI + 200 bps, 11% NCREIF NPI, 4% Risk Parity Benchmark and 2% BofA ML 3-Month T-Bill.

July 1, 2012 - June 30, 2013: 18% Russell 3000, 14% MSCI World Ex-US Net, 9% Russell 3000 + 100 bps, 12% Bloomberg Barclays Global Aggregate Index, 12% Credit Opportunities Benchmark, 4% BofA ML 3-Month T-Bill + 200 bps, 8% 3-Month LIBOR + 300 bps, 7% CPI + 200 bps, 10% NCREIF NPI, 4% Risk Parity Benchmark and 2% BofA ML 3-Month T-Bill.

July 1, 2010 - June 30, 2012: 20% Russell 3000, 15% MSCI World Ex-US Net, 8% 3-Month LIBOR + 300 bps, 20% Bloomberg Barclays US Aggregate Index, 4% BofA ML 3-Month T-Bill + 200 bps, 9% BofA ML US High Yield BB-B Constrained, 8% Russell 3000 + 100 bps, 6% CPI + 200 bps, 8% NCREIF NPI and 2% BofA ML 3-Month T-Bill.

Public Safety Cancer Insurance Policy (CIP) Program - Performance as of 8/31/2022 (Net of Fees)

Description	Asset Allocation		7/1/2014 Target	Performance % (TWR)								
	Market Values	%		3 Months			Calendar	1 Year	3 Years*	5 Years*	7 Years*	10 Years*
				Month	Ending	Fiscal YTD	YTD					
CIP - Total Fund	\$27,832,731	100.00%		-3.12	-3.94	1.34	-12.81	-12.00	4.34	4.72	5.87	6.15
Target Fund Benchmark ⁱ				-2.97	-4.03	1.24	-13.27	-12.78	3.72	4.18	5.33	5.33
U.S. Equity	\$6,850,519	24.61%	25%	-3.73	-3.40	5.27	-17.18	-13.66	11.73	11.23	11.98	12.65
Russell 3000				-3.73	-3.51	5.30	-16.92	-13.28	11.90	11.29	11.98	12.77
Non-U.S. Equity	\$6,876,510	24.71%	25%	-4.69	-9.09	-1.21	-18.76	-20.06	3.01	1.64	4.23	4.59
MSCI ACWI Ex-US Net				-3.22	-8.51	0.10	-18.34	-19.52	2.87	1.67	4.15	4.48
Fixed Income	\$8,303,029	29.83%	30%	-3.05	-2.08	-0.40	-10.50	-11.50	-2.72	0.48	1.33	1.23
Fixed Income Blended Benchmark - CIP ⁱ				-3.26	-3.13	-1.00	-12.48	-13.71	-2.86	-0.15	1.13	0.30
Inflation-Linked Securities	\$2,808,907	10.09%	10%	-2.70	-1.67	1.49	-7.69	-6.20	2.47	3.01	2.95	N/A
Bloomberg Barclays U.S. TIPS Index				-2.66	-1.64	1.58	-7.49	-5.98	2.65	3.22	3.13	1.73
Commodities	\$1,382,941	4.97%	5%	0.15	-3.41	5.30	-3.14	2.22	9.70	8.59	10.84	N/A
SPDR® Gold Trust Index (GLD)				-0.03	-0.07	-0.05	0.03	0.78	5.96	6.33	6.67	0.41
Cash **	\$1,610,826	5.79%	5%	0.24	0.63	0.31	1.32	2.07	2.45	3.48	3.56	3.47
BofA ML 3-Month T-Bill				0.16	0.24	0.22	0.36	0.38	0.57	1.12	0.92	0.66

* Please note that all the returns for all time periods exceeding 1 year are *annualized*.

** The returns for Cash account for both the interest on cash holdings and the revenue from securities lending.

† - Please see below for information on the blended benchmark changes and effective dates.

Target Fund Benchmarks/ Effective Dates:

July 1, 2014 to Present: 25% Russell 3000, 25% MSCI ACWI Ex-US Net, 30% Fixed Income Blended Benchmark - CIP, 10% Barclays U.S. TIPS, 5% GLD Index Return, 5% BofA ML 3-Month T-Bill.

July 1, 2009 - June 30, 2014: 30% Russell 3000, 30% MSCI ACWI Ex-US Net, 35% Fixed Income Blended Benchmark - CIP, 5% BofA ML 3-Month T-Bill.

Target Fixed Income Benchmarks/ Effective Dates:

July 1, 2018 to Present: 20% Bloomberg Barclays Global Aggregate ex-US and 80% Bloomberg Barclays U.S. Aggregate.

July 1, 2014 - June 30, 2018: 100% Bloomberg Barclays Global Aggregate.

July 1, 2002 - June 30, 2014: 100% Bloomberg Barclays U.S. Aggregate.



PORTFOLIO RISK & ANALYTICS REPORT

10/19/2022

The PSPRS Trust



Agenda - Portfolio Risk as of August 31, 2022

Asset Allocation Structure

Slide 3

PSPRS Overview

- AUM Growth & 7-Year Rolling Return
- FYTD Attribution by Portfolio & Asset Class
- PSPRS Currency & Country Exposure

Slide 4

Slide 5

Slide 6

Realized and Forecasted Levels of PSPRS Trust Portfolio Risk

- Current Status
- Trailing Volatility Comparison
- Risk Decomposition by Asset Class
- Exposure to Major Market Factors
- Stress Test Results
- Upside and Downside Performance

Slide 7

Slide 8

Slide 9

Slide 10-11

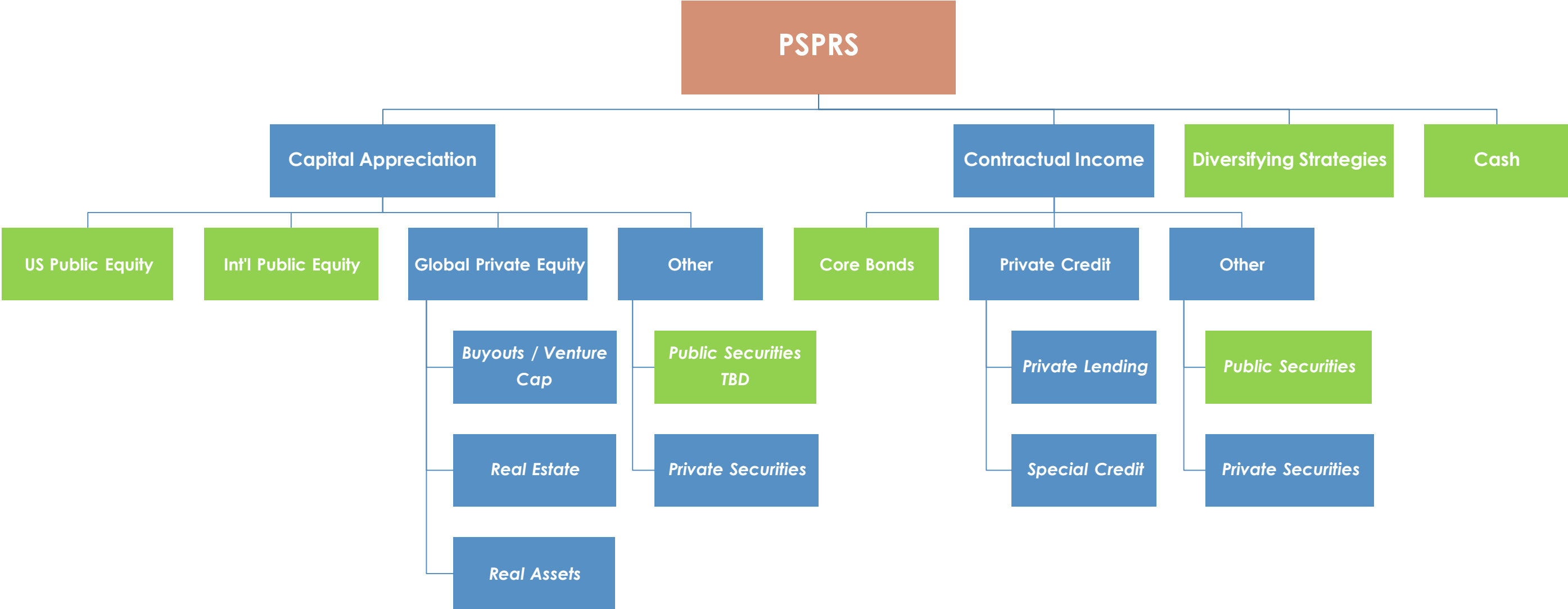
Slide 12

Slide 13

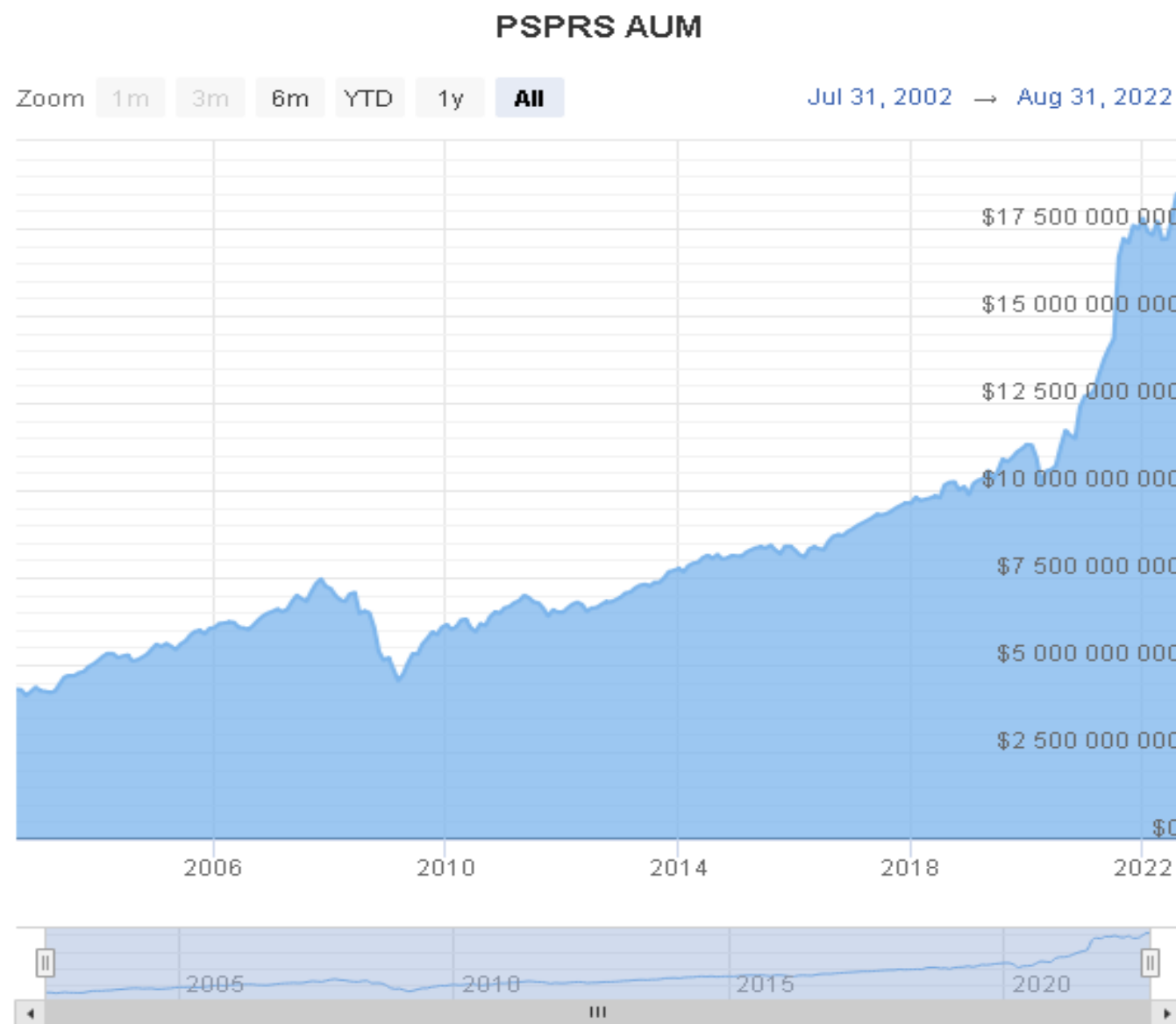
Summary

Slide 14

Asset Allocation Structure



AUM Growth & 7-Year Rolling Return



AUM & 7Y

FYTD Attribution by Portfolio & Asset Class

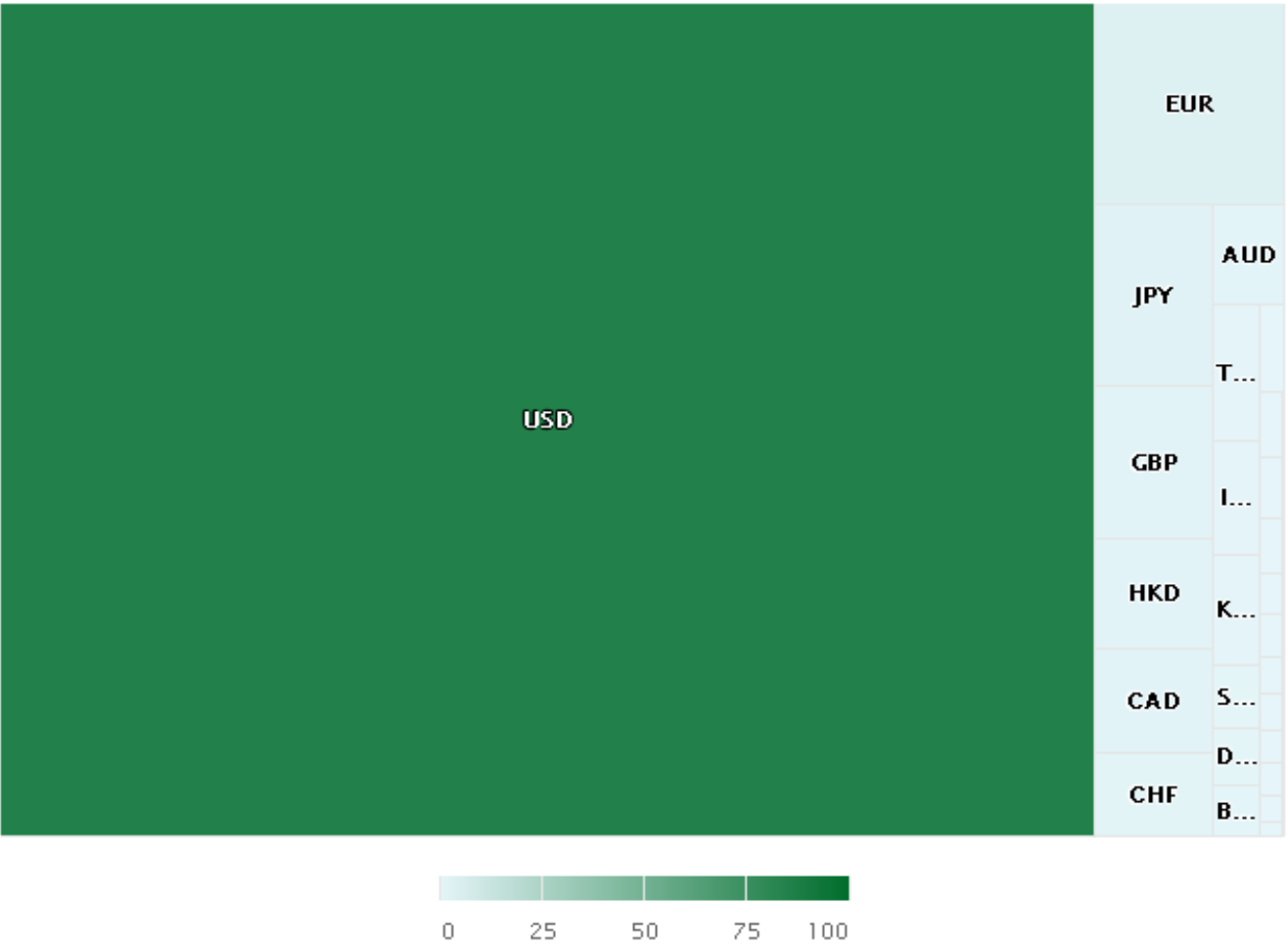
Asset Class	Market Value	FYTD	Performance Attribution
PSPRS Trust	18,238,605,001	0.65%	0.65%
CAPITAL APPRCN	11,129,244,786	1.41%	0.86%
CONTRACTUAL INCOME	3,190,684,300	-0.83%	-0.15%
DIVERSIFYING STRTGIES	1,645,715,458	-0.10%	-0.01%
PSPRS Cash	2,272,960,458	0.26%	0.03%

Asset Class	Market Value	FYTD	Performance Attribution
PSPRS Trust	18,238,605,001	0.65%	0.65%
CA - US PUBLIC EQTY	3,969,583,837	5.01%	1.09%
CA - INTL PUBLIC EQTY	2,852,916,946	0.17%	0.03%
CA-GLB PRIVATE EQTY	4,175,819,718	-0.94%	-0.21%
CA - OTHER ASSETS	130,924,284	-0.02%	-0.00%
CI - CORE BONDS	567,377,725	-0.19%	-0.01%
CI-PRIVATE CREDIT	2,084,491,196	-0.81%	-0.09%
CI-OTHER ASSETS	538,815,379	-1.72%	-0.05%
DIVERSIFYING STRTGIES	1,645,715,458	-0.10%	-0.01%
PSPRS Cash	2,272,960,458	0.26%	0.03%

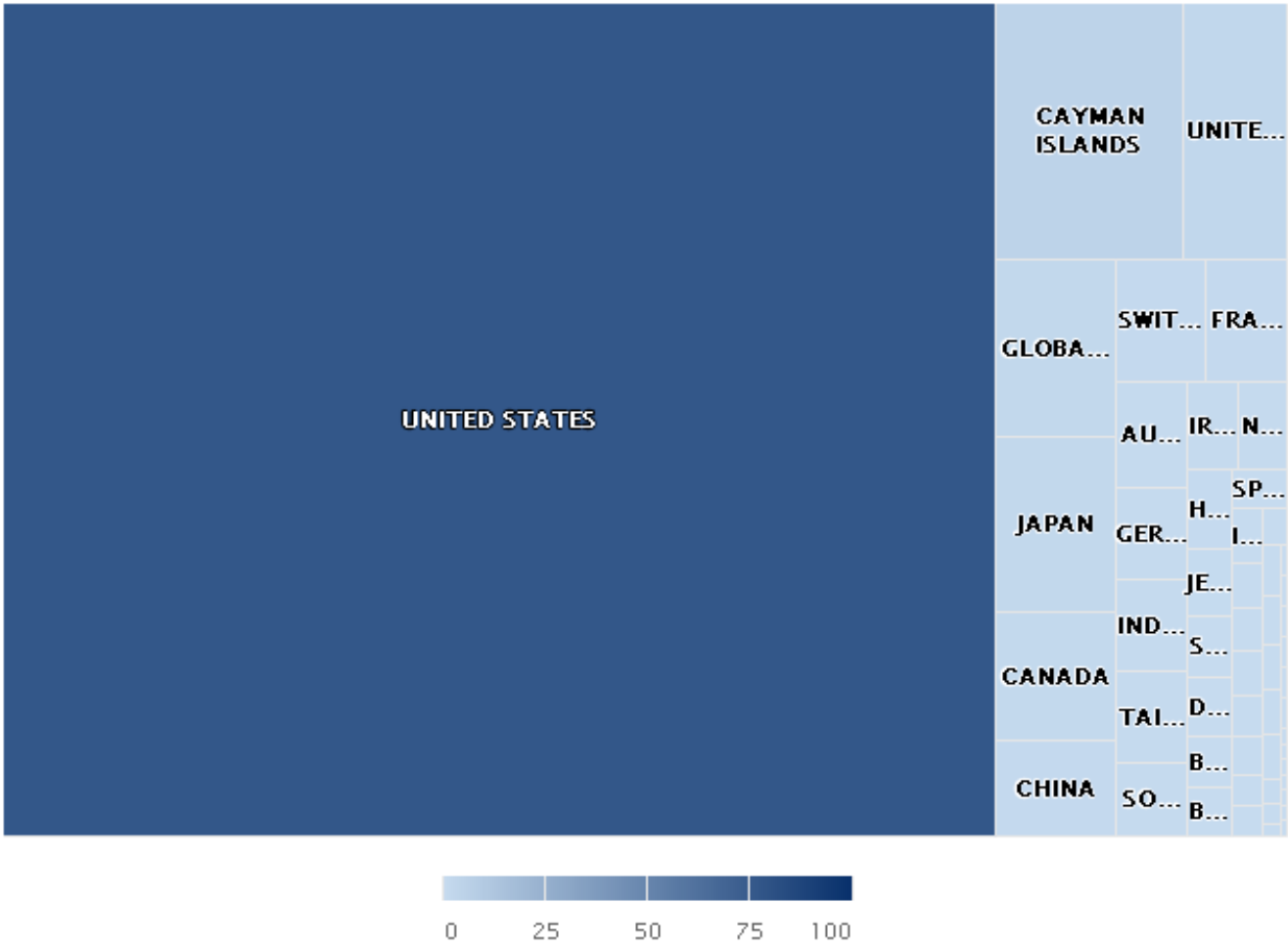
Attribution

PSPRS Currency & Country Exposure

PSPRS Currency Exposure



PSPRS Country Exposure



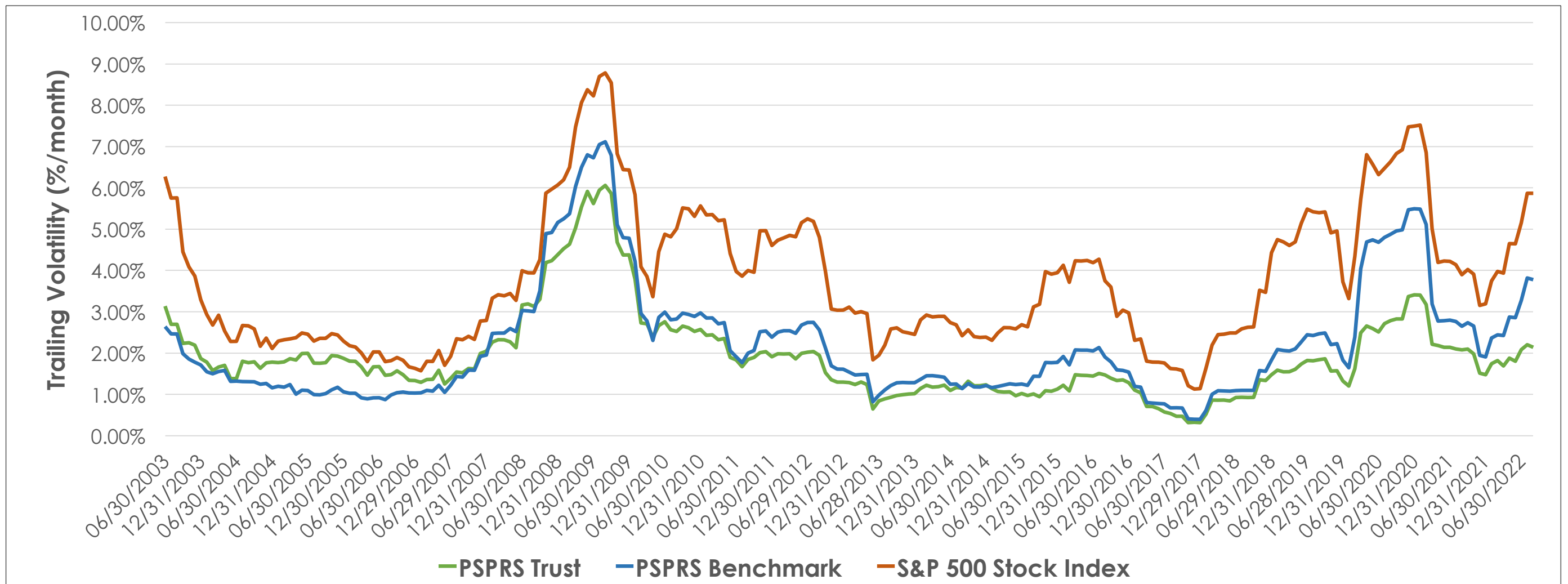
Exposure

Current Status Overview

	Portfolio Weight	Historic Volatility (12m Std. Dev.)	Monthly Volatility (Forecast)	Monthly VAR Forecast (95% Confidence)
Capital Appreciation	61%			
• US Public Equity	<u>22%</u>	5.7%	4.1%	-6.5%
• Int'l Public Equity	<u>16%</u>	4.0%	4.3%	-7.1%
• Global Private Equity	<u>23%</u>			
• Buyouts & VC	11%	1.9%	4.6%	-7.7%
• Real Estate	7%	1.9%	3.8%	-6.4%
• Real Assets	4%	1.8%	3.4%	-2.3%
• Other Assets	<u>1%</u>			
• Other Private Holdings	1%	1.2%	6.3%	-5.1%
Contractual Income	17%			
• Core Bonds	<u>3%</u>	1.2%	1.4%	-2.4%
• Private Credit	<u>11%</u>			
• Private Lending	3%	0.8%	0.9%	-0.3%
• Special Credit	8%	0.7%	0.9%	-0.6%
• Other Assets	<u>3%</u>			
• Public Holdings	2%	1.6%	2.4%	-2.7%
• Private Holdings	1%	3.0%	2.9%	-2.0%
Diversifying Strategies	9%	1.4%	1.6%	-1.8%
PSPRS Trust	88%	2.1%	2.4%	-3.8%

Status

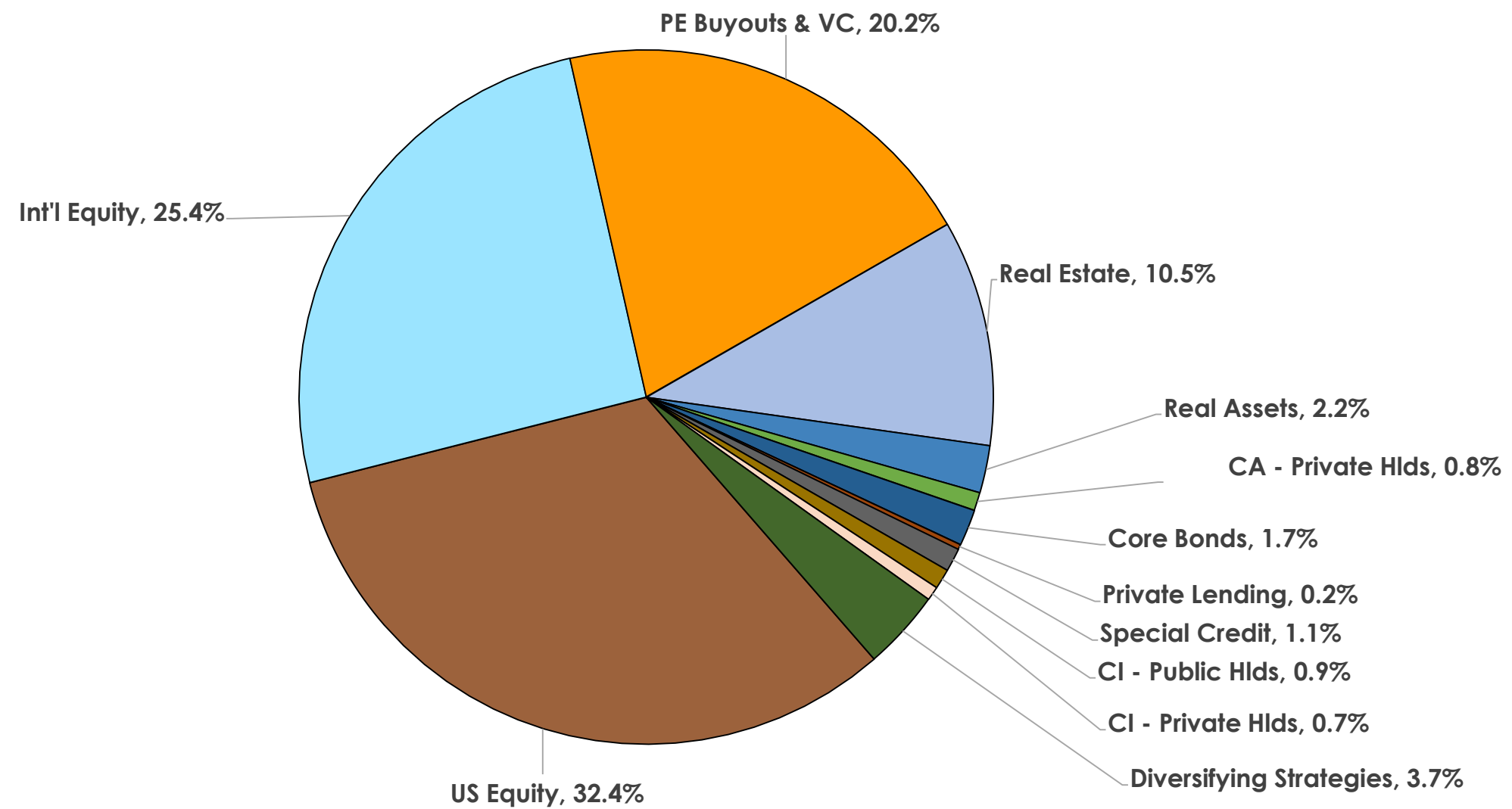
Trailing Volatility Comparison



The Trust portfolio is 64% less volatile than the market.

Volatility

Risk Decomposition by Asset Class



Risk Decomp.

Notable Drivers of Asset Class Risk

PSPRS Portfolio	Portfolio Weight	Primary Driver	Secondary Driver	Fraction Explained
Capital Appreciation	61%			
• US Public Equity	<u>22%</u>	Russell 3000 TR	TLT	98%
• Int'l Public Equity	<u>16%</u>	MSCI ex US	Commodity	98%
• Global Private Equity	<u>23%</u>			
• Buyouts & VC	11%	Russell 3000 TR	Commodity	99%
• Real Estate	7%	Russell 3000 TR	US Specialized REITs	71%
• Real Assets	4%	Commodity	Russell 3000 TR	93%
• Other Assets	<u>1%</u>			
• Other Private Holdings	1%	--	--	--
Contractual Income	17%			
• Core Bonds	<u>3%</u>	SHYG	HYG	67%
• Private Credit	<u>11%</u>			
• Private Lending	3%	FTSL	HYG	95%
• Special Credit	8%	JNK	HYG	67%
• Other Assets	<u>3%</u>			
• Public Holdings	2%	SRLN	TLT	100%
• Private Holdings	1%	Crude Oil WTI	TLT	44%
Diversifying Strategies	9%	Credit Suisse HF Index	TLT	81%

Notable Drivers of Asset Class Risk

- Risk modeling indicates that the PSPRS global portfolio is subject – in part – to two main drivers (explaining 90% of variance, or market risk):
 - Russell 3000 Total Return
 - Crude Oil WTI
- We report the (all other things being equal) results of stress tests on these drivers in order to gauge our exposure to them.

Market Factor Change	Portfolio Return
Russell 3000 Total Return-3 std	-4.1%
Russell 3000 Total Return-2 std	-2.5%
Russell 3000 Total Return-1 std	-0.9%
Russell 3000 Total Return+1 std	4.0%
Russell 3000 Total Return+2 std	5.6%
Russell 3000 Total Return+3 std	7.3%

Market Factor Change	Portfolio Return
Crude Oil WTI-3 std	1.3%
Crude Oil WTI-2 std	1.5%
Crude Oil WTI-1 std	1.8%
Crude Oil WTI+1 std	2.7%
Crude Oil WTI+2 std	2.9%
Crude Oil WTI+3 std	3.2%

Historical Worst-Case Scenarios

Stress Testing: The style analysis model of our current holdings can be subjected to stress scenarios.

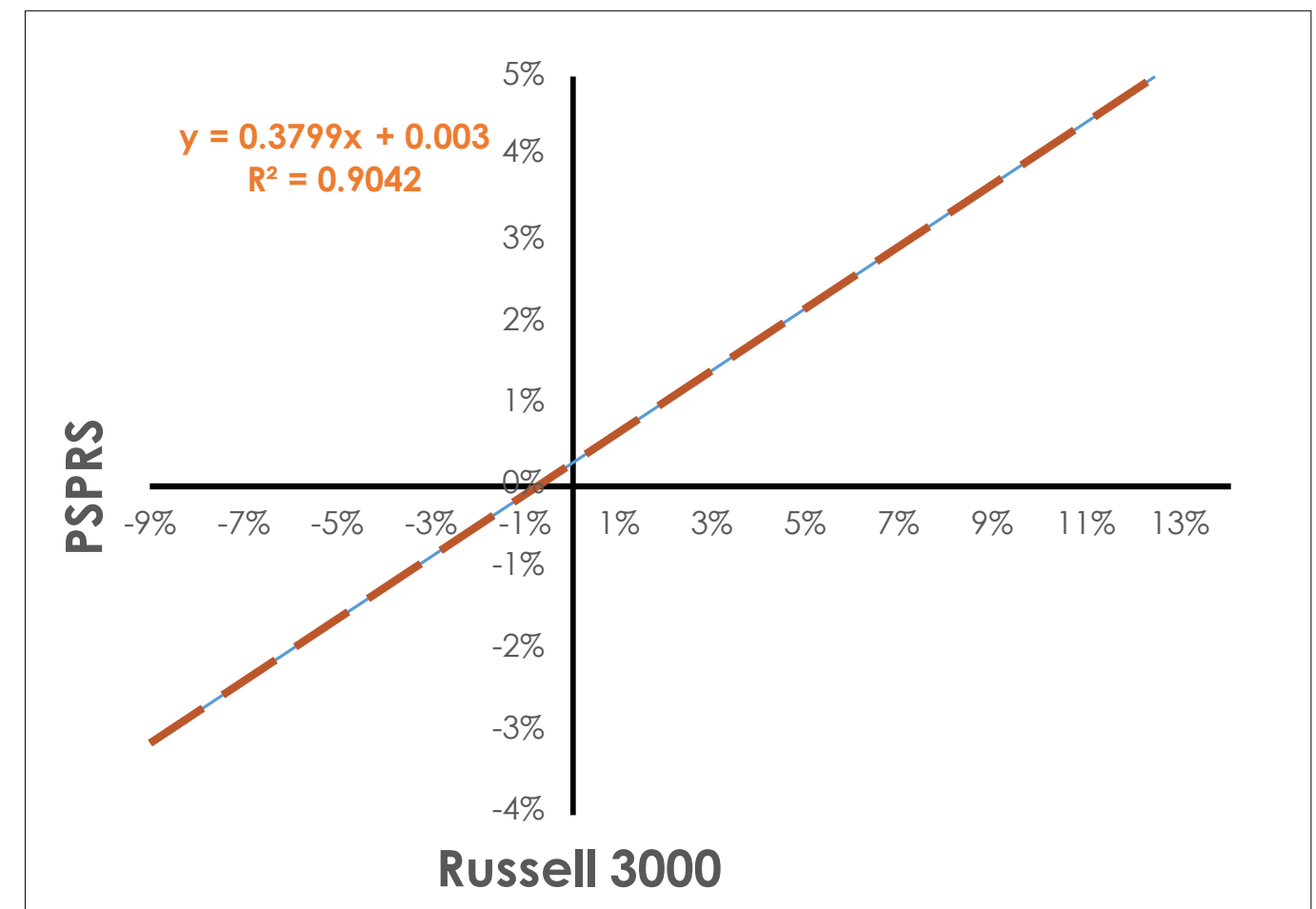
Events	Today's Portfolio	PSPRS Trust Actual
WTC Attacks - Sept. 11	-2.7%	-11.7%
Stock Market Crash 2002	-3.0%	-21.1%
August Crisis 2007	0.7%	1.6%
January Crisis 2008	-2.7%	-2.7%
Credit Crunch 2008 (Aug to Nov)	-11.7%	-23.1%
Crisis 2009 (Jan-Feb)	-4.3%	-12.9%
Flash Crash 2010	-2.8%	-3.7%
Brexit (2016)	0.8%	-0.3%
COVID-19 (2020)	-5.7%	-6.2%

Upside and Downside Performance

Actual Portfolio Returns During Market Upside and Downside

Upside			In 6-month	
Period	Russell 3000	PSPRS Actual	Russell 3000	PSPRS Actual
4/30/2020	13.1%	3.5%	14%	7%
11/30/2020	12.0%	6.6%	19%	14%
10/31/2011	11.4%	3.1%	12%	4%
07/29/2022	9.3%	2.6%	N/A	N/A
09/30/2010	9.3%	4.4%	18%	8%

Downside			In 6-month	
Period	Russell 3000	PSPRS Actual	Russell 3000	PSPRS Actual
03/31/2020	-13.9%	-6.2%	32%	11%
12/31/2018	-9.5%	-2.0%	18%	8%
04/30/2022	-9.0%	-2.8%	N/A	N/A
06/30/2022	-8.5%	-3.5%	N/A	N/A
02/28/2020	-8.4%	-3.1%	18%	5%



- Upside participation: 46%
- Downside mitigation: 67% (33% participation)

Summary

- The market volatility remained high in August, and the major equity indices were down 3-6%. The Trust returned -1.9% MTD, 0.7% FYTD, and 7.6% 7-year annualized. For the fiscal year, Capital Appreciation attributed 86 bps, Diversifying Strategies was flat, and Contractual Income detracted 15 bps.
- While the historical and forecasted risk remained largely the same at the asset class level, the monthly VaR (Value-at-Risk) forecast (95% confidence) for the Trust portfolio increased by 40 bps to -3.8%. The primary risk contributors were the public and private equities. Among the former, the US Equity accounted for about one-third of the total risk, and a quarter came from the Int'l Equity.
- The market volatility did not show any sign of slowing. The S&P 500's 12-month trailing volatility was close to 6% (7.5% was the pandemic high). In comparison, the Trust portfolio maintained a volatility level of approximately 2%, about two-thirds lower than the public market. As the energy crisis continues to intensify, the Crude Oil WTI revealed a higher impact on the total portfolio risk and thus became the secondary risk driver. Besides, the scenario and market performance analysis suggested that the Trust was well-positioned for extreme market events.
- In addition to the PSPRS Trust being:
 - Top decile on risk-terms since 2009.
 - Top quartile in efficiency (Sharpe Ratio) terms since 2010.



GLOBAL FINANCIAL MARKETS UPDATE

October 19th, 2022

The PSPRS Trust



GLOBAL STOCK MARKETS HIGHLIGHTS

- ✓ Global Stocks Fell Hard in September – Most Markets Down 7-11% in September
- ✓ Most Major Stock Markets Remain Negative YTD
 - ✓ US down ~12-22%
 - ✓ Europe down ~20-35% (in US\$ terms)
 - ✓ Asia down ~18-30% (in US\$ terms)
- ✓ Emerging Markets Significantly Impacted by US Dollar Strength
- ✓ War, Inflation and Rising Rates Continue To Be Major Concerns Among Investors

GLOBAL STOCKS - ROLLING TOTAL RETURNS ENDING 09/30/2022

	S&P 500 Total Return				Russell 2000				Russell 3000			
Start/End Date	02/29/1988		09/30/2022		01/31/1979		09/30/2022		01/31/1979		09/30/2022	
Timeframe	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year
Rolling Average	12.2%	11.0%	10.5%	10.2%	12.9%	10.8%	10.5%	10.2%	13.3%	12.0%	11.7%	11.5%
Stdev.	16.2%	10.2%	8.0%	6.2%	21.3%	8.3%	6.1%	4.2%	17.0%	9.2%	7.3%	5.7%
Trailing Return	-15.5%	8.2%	9.2%	11.4%	-23.5%	4.3%	3.6%	7.5%	-17.6%	7.7%	8.6%	10.9%
# of σ away from avg.	-1.71	-0.28	-0.16	0.20	-1.71	-0.79	-1.15	-0.64	-1.81	-0.47	-0.43	-0.10
How Often This Happens	4%	39%	44%	42%	4%	22%	13%	26%	3%	32%	33%	46%

	STOXX Europe 600				Japan Nikkei 225				UK: FTSE 100			
Start/End Date	01/31/2001		09/30/2022		02/28/2007		09/30/2022		01/31/1986		09/30/2022	
Timeframe	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year
Rolling Average	6.7%	6.4%	6.3%	5.8%	7.7%	8.5%	9.7%	10.3%	9.6%	8.4%	8.3%	8.2%
Stdev.	18.5%	9.3%	5.5%	3.6%	22.6%	11.3%	8.0%	4.6%	15.5%	8.8%	6.5%	5.1%
Trailing Return	-12.0%	2.4%	3.1%	4.8%	-10.0%	8.1%	7.1%	8.0%	0.9%	1.2%	2.6%	5.9%
# of σ Away from Avg.	-1.01	-0.43	-0.58	-0.26	-0.78	-0.03	-0.33	-0.50	-0.56	-0.82	-0.88	-0.44
How Often This Happens	16%	33%	28%	40%	22%	49%	37%	31%	29%	21%	19%	33%

	Hang Seng Composite				SSE Composite Index				Brazil Bovespa Index			
Start/End Date	02/29/2000		09/30/2022		06/30/1992		09/30/2022		02/26/1999		09/30/2022	
Timeframe	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year
Rolling Average	9.0%	8.7%	9.2%	8.7%	10.8%	6.6%	6.2%	5.8%	14.1%	11.5%	11.9%	10.8%
Stdev.	24.7%	10.1%	7.6%	4.6%	42.4%	16.2%	10.4%	6.1%	30%	15%	12%	9%
Trailing Return	-30.7%	-7.3%	-4.9%	1.5%	-15.2%	1.3%	-2.0%	-0.1%	-0.8%	1.7%	8.2%	13.6%
# of σ Away from Avg.	-1.61	-1.58	-1.84	-1.56	-0.61	-0.32	-0.78	-0.96	-0.50	-0.64	-0.32	0.31
How Often This Happens	5%	6%	3%	6%	27%	37%	22%	17%	31%	26%	38%	38%

GLOBAL STOCKS - ROLLING PRICE RETURNS ENDING 09/30/2022

	S&P 500				Russell 2000				Russell 3000			
Start/End Date	02/29/1928		09/30/2022		01/31/1979		09/30/2022		01/31/1979		09/30/2022	
Timeframe	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year
Rolling Average	7.9%	6.4%	6.5%	6.5%	11.0%	9.0%	8.7%	8.5%	10.4%	9.2%	9.0%	8.8%
Stdev.	20.1%	11.0%	8.0%	6.0%	20.8%	8.0%	5.8%	4.0%	16.5%	8.8%	6.8%	5.1%
Trailing Return	-16.8%	6.4%	7.3%	9.3%	-24.5%	3.0%	2.2%	6.1%	-18.8%	6.0%	6.8%	8.9%
# of σ away from avg.	● -1.22	● 0.00	● 0.11	● 0.47	● -1.70	● -0.75	● -1.12	● -0.61	● -1.78	● -0.36	● -0.33	● 0.03
How Often This Happens	11%	50%	46%	32%	4%	23%	13%	27%	4%	36%	37%	49%

	STOXX Europe 600				Japan Nikkei 225				UK: FTSE 100			
Start/End Date	01/30/1987		09/30/2022		06/30/1949		09/30/2022		01/31/1986		09/30/2022	
Timeframe	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year
Rolling Average	6.5%	5.4%	5.1%	5.1%	10.4%	8.8%	7.9%	7.5%	5.5%	4.4%	4.3%	4.2%
Stdev.	18.5%	11.1%	8.0%	5.8%	25.1%	15.0%	11.5%	9.5%	14.8%	8.3%	6.0%	4.6%
Trailing Return	-14.7%	-0.5%	0.0%	1.6%	-11.9%	6.0%	5.0%	5.9%	-2.7%	-2.4%	-1.3%	1.9%
# of σ Away from Avg.	● -1.15	● -0.53	● -0.64	● -0.60	● -0.89	● -0.19	● -0.26	● -0.17	● -0.55	● -0.81	● -0.94	● -0.52
How Often This Happens	13%	30%	26%	27%	19%	43%	40%	43%	29%	21%	17%	30%

	Hang Seng Composite				SSE Composite Index				Brazil Bovespa Index			
Start/End Date	02/28/2001		09/30/2022		06/30/1992		09/30/2022		08/30/1991		09/30/2022	
Timeframe	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year
Rolling Average	6.8%	6.0%	6.0%	5.0%	10.8%	6.6%	6.2%	5.8%	302.3%	107.8%	47.4%	32.4%
Stdev.	23.6%	9.1%	7.4%	4.3%	42.4%	16.2%	10.4%	6.1%	1178%	380%	120%	66%
Trailing Return	-33.0%	-10.0%	-7.8%	-1.7%	-15.2%	1.3%	-2.0%	-0.1%	-0.8%	1.7%	8.2%	13.6%
# of σ Away from Avg.	● -1.69	● -1.75	● -1.85	● -1.53	● -0.61	● -0.32	● -0.78	● -0.96	● -0.26	● -0.28	● -0.33	● -0.29
How Often This Happens	5%	4%	3%	6%	27%	37%	22%	17%	40%	39%	37%	39%

COMMODITY MARKETS HIGHLIGHTS

- ✓ Energy Prices Remain Elevated, But Have Recently Stabilized Over the Past Month Despite Europe Energy Crisis
- ✓ OPEC+ Recently Agreed to Cut Oil Production - First Time Since Pandemic
- ✓ Copper Prices Remain Down ~22% YTD (Copper Generally Considered a Useful Economic Predictor)
- ✓ Still A High Correlation Between Mortgage Rates and Housing Demand, Lumber, Copper, Aluminum Prices
- ✓ Mortgage Rates Continue to Trend Upwards – Average 30 Year Fixed Rate is ~7.05%

COMMODITY PRICES - ROLLING RETURNS ENDING 09/30/2022

	Brent Crude				WTI				Natural Gas			
Start/End Date	08/31/1989		09/30/2022		08/31/1989		09/30/2022		05/31/1990		09/30/2022	
Timeframe	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year
Rolling Average	11.2%	5.1%	5.1%	5.1%	10.9%	4.5%	4.5%	4.5%	12.4%	3.7%	2.8%	2.4%
Stdev.	37.1%	15.6%	11.7%	10.3%	38.1%	14.9%	11.2%	9.9%	46.4%	16.6%	12.4%	10.6%
Trailing Return	8.7%	12.8%	8.4%	8.2%	5.7%	13.7%	9.0%	8.4%	15.3%	42.7%	17.6%	15.1%
# of σ Away from Avg.	● -0.07	● 0.50	● 0.28	● 0.30	● -0.14	● 0.62	● 0.40	● 0.40	● 0.06	● 2.35	● 1.19	● 1.20
How Often This Happens	47%	31%	39%	38%	44%	27%	35%	34%	47%	1%	12%	12%

	Corn				Feeder Cattle Near Term				Soybeans			
Start/End Date	08/31/1989		09/30/2022		08/31/1989		09/30/2022		08/31/1989		09/30/2022	
Timeframe	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year
Rolling Average	6.5%	3.1%	2.5%	2.1%	3.2%	2.2%	2.2%	2.5%	5.4%	3.0%	2.4%	2.3%
Stdev.	29.0%	13.0%	9.0%	7.5%	14.8%	7.4%	5.9%	3.7%	24.0%	10.9%	7.8%	6.4%
Trailing Return	26.2%	20.4%	13.8%	8.3%	13.2%	6.9%	2.7%	-0.3%	8.7%	14.6%	7.1%	6.3%
# of σ Away from Avg.	● 0.68	● 1.34	● 1.25	● 0.82	● 0.67	● 0.64	● 0.09	● -0.75	● 0.14	● 1.06	● 0.60	● 0.62
How Often This Happens	25%	9%	11%	21%	25%	26%	46%	23%	45%	14%	28%	27%

	Gold				Copper				Aluminum			
Start/End Date	08/31/1989		09/30/2022		08/31/1989		09/30/2022		08/31/1989		09/30/2022	
Timeframe	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year
Rolling Average	6.0%	5.8%	5.7%	5.7%	8.3%	5.2%	4.9%	4.4%	4.1%	1.8%	1.8%	1.3%
Stdev.	15.1%	10.8%	9.4%	8.5%	32.4%	17.1%	12.8%	10.5%	22.8%	9.7%	6.0%	4.5%
Trailing Return	-4.8%	4.3%	5.4%	6.0%	-15.8%	10.3%	3.2%	5.6%	-23.5%	8.6%	0.7%	4.9%
# of σ Away from Avg.	● -0.72	● -0.14	● -0.03	● 0.03	● -0.74	● 0.30	● -0.13	● 0.12	● -1.21	● 0.70	● -0.18	● 0.79
How Often This Happens	24%	44%	49%	49%	23%	38%	45%	45%	11%	24%	43%	22%

GLOBAL BOND MARKETS HIGHLIGHTS

- ✓ **Bond Yields Continue to Rise Across The Globe - Especially Europe and the Americas**
- ✓ The US Govt. Bond Yield Curve Remains Inverted
- ✓ UK Govt. Bond (Gilt) Yields Spike
- ✓ Investors Concerned About Rising Cost of Debt for Italy and Other High Debt Nations
- ✓ Japan Intervenes in Currency Markets to Prop Up Yen

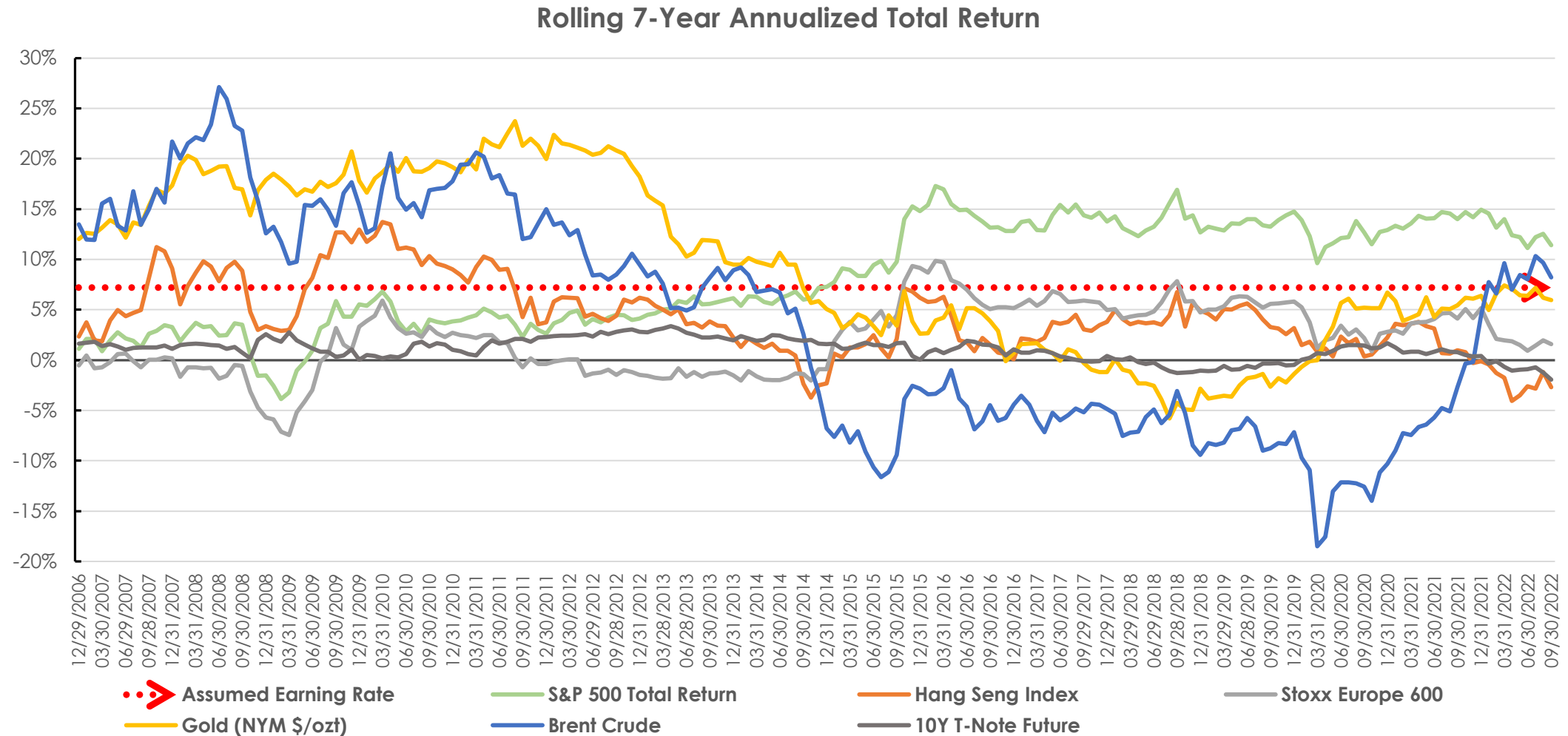
GLOBAL BOND MARKETS - ROLLING RETURNS ENDING 09/30/2022

	US 10Y T-Note Yield (TPI)				Canada Benchmark Bond (10Y)				UK 10Y Yield			
Start/End Date	08/31/1999		09/30/2022		01/31/2006		09/30/2022		04/28/2006		09/30/2022	
Timeframe	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year
Rolling Average	3.17	3.14	3.13	3.11	2.33	2.27	2.22	2.17	2.26	2.18	2.14	2.11
Stdev.	1.30	1.11	1.00	0.93	0.97	0.80	0.66	0.54	1.37	1.16	0.96	0.78
Trailing Average	2.39	1.58	1.97	2.00	2.39	1.52	1.70	1.64	1.85	0.94	1.04	1.10
# of σ Away from Avg.	● -0.60 ●	● -1.40 ●	● -1.15 ●	● -1.20 ●	● 0.06 ●	● -0.93 ●	● -0.78 ●	● -0.99 ●	● -0.30 ●	● -1.06 ●	● -1.13 ●	● -1.29 ●
How Often This Happens	27%	8%	12%	12%	48%	18%	22%	16%	38%	14%	13%	10%

	Euro Benchmark Bond (10Y)				France Benchmark Bond (10Y)				Italy Benchmark Bond (10Y)			
Start/End Date	02/28/2006		09/30/2022		02/28/2006		09/30/2022		02/28/2006		09/30/2022	
Timeframe	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year
Rolling Average	1.49	1.43	1.38	1.33	1.86	1.82	1.79	1.76	3.12	3.17	3.20	3.20
Stdev.	1.55	1.39	1.19	0.98	1.50	1.37	1.20	1.01	1.49	1.33	1.18	1.02
Trailing Average	0.63	-0.07	0.04	0.10	1.13	0.31	0.39	0.46	2.33	1.43	1.79	1.77
# of σ Away from Avg.	● -0.56 ●	● -1.08 ●	● -1.13 ●	● -1.25 ●	● -0.49 ●	● -1.10 ●	● -1.17 ●	● -1.29 ●	● -0.53 ●	● -1.30 ●	● -1.20 ●	● -1.40 ●
How Often This Happens	29%	14%	13%	10%	31%	14%	12%	10%	30%	10%	12%	8%

	Japan 10Y Yield (TPI)				Korea Benchmark Bond (10Y)				Australia Benchmark Bond (10Y)			
Start/End Date	03/31/2006		09/30/2022		02/28/2006		09/30/2022		02/28/2006		09/30/2022	
Timeframe	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year	1-Year	3-Year	5-Year	7-Year
Rolling Average	0.63	0.60	0.58	0.57	3.26	3.21	3.16	3.11	3.52	3.48	3.48	3.44
Stdev.	0.61	0.56	0.50	0.41	1.32	1.22	1.06	0.88	1.60	1.42	1.21	1.00
Trailing Average	0.18	0.07	0.04	0.03	3.05	2.16	2.17	2.11	2.76	1.69	1.90	2.08
# of σ Away from Avg.	● -0.74 ●	● -0.94 ●	● -1.09 ●	● -1.29 ●	● -0.16 ●	● -0.85 ●	● -0.93 ●	● -1.14 ●	● -0.48 ●	● -1.26 ●	● -1.30 ●	● -1.37 ●
How Often This Happens	23%	17%	14%	10%	44%	20%	18%	13%	32%	10%	10%	9%

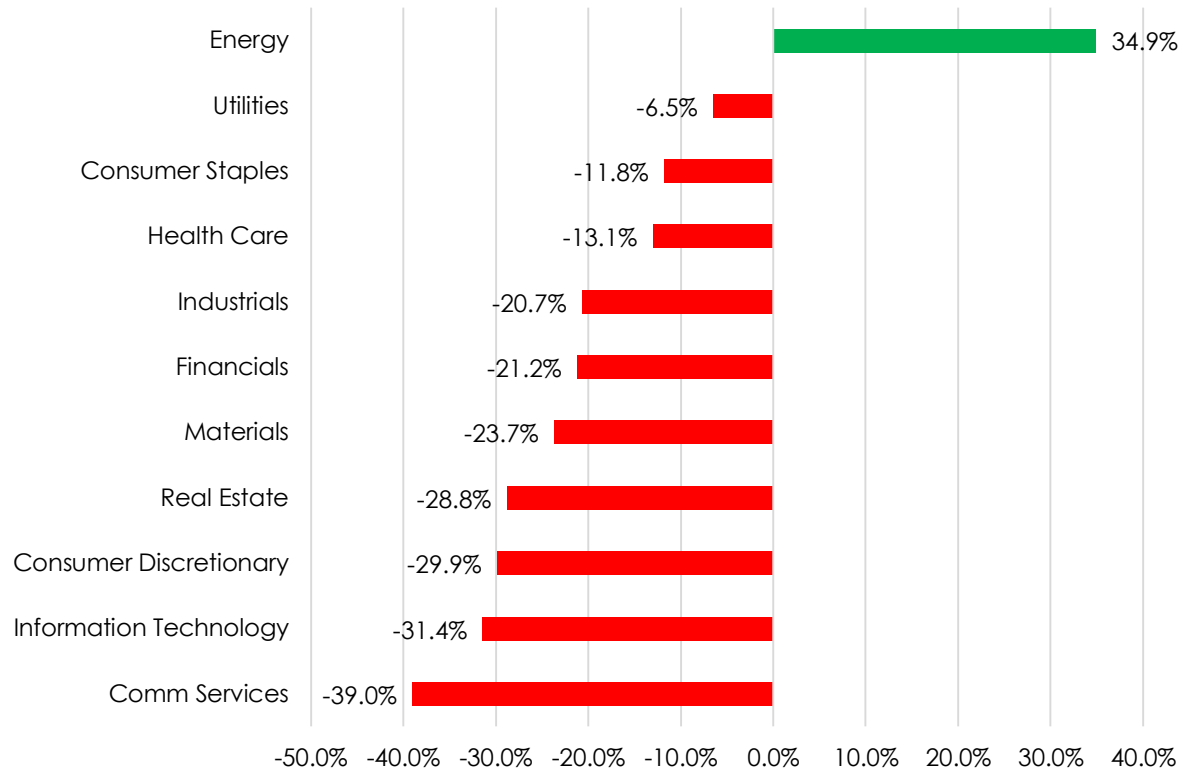
MAJOR MARKETS – 7-YEAR ROLLING RETURNS



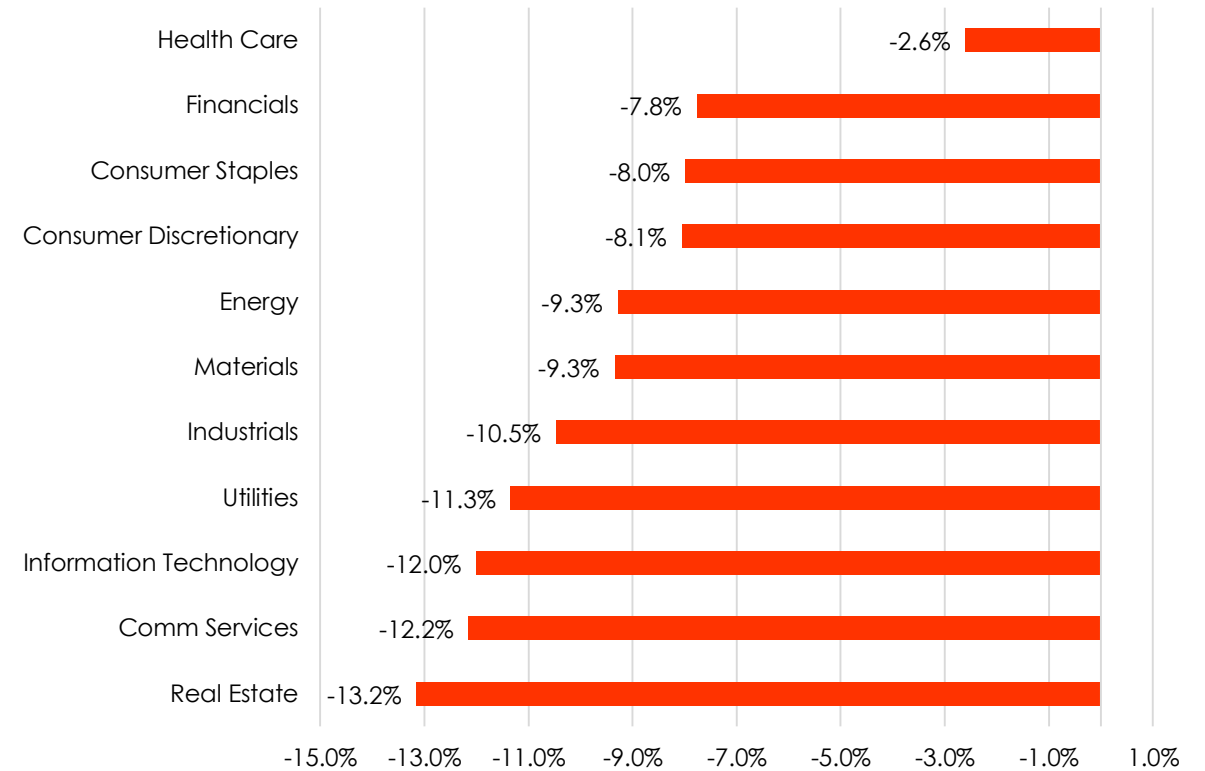
- The above chart highlights the importance of diversification across various asset classes within the portfolio. This is demonstrated by the rebound in Brent Crude and drawdown in 10 year Treasury Note returns.
- The S&P 500 continues to be the best performing investment in the above chart since 2014.

S&P 500 SECTOR PERFORMANCE

YTD Sector Performance



September MTD Sector Performance



- As of 09/30/2022, Energy is the only sector with positive returns on a YTD basis as the equity sell-off continues. Real Estate was the worst performing sector on a MTD basis.
- The increase in interest rates to tame inflation and deceleration in economic growth continue to drive volatility in the broader equity markets.

S&P 500 THEORETICAL VALUE INPUTS AND ASSUMPTIONS

- ✓ S&P 500 As of October 10th, 2022 was \$3,612.39
- ✓ Markets Are Now Discounting 2023 Earnings – Analyst Estimates Drop to \$239.58 for 2023 EPS
- ✓ The S&P 500 Is Now Trading at ~15.1x 2023 Estimated EPS (**vs 10-Year Average of 18.3x**)
- ✓ Earnings Growth Expectations Fell to 7.4% in 2022 and 8.0% Per Year Through 2025

S&P 500 VALUATION EXAMPLE

Hypothetical input for illustration only

Earnings (TTM):	\$206.90 /share (EPS of S&P 500)	} Determine Cash Flow
Expected Earnings Growth:	8.00% (growth rate in EPS)	
Expected cash payout:	80.00% (cash distribution to shareholders)	
Risk-Free Rate:	3.75% (10 Year Treasury Yield)	} Determine Discount Rate
Risk Premium:	4.25% (expected return above the risk-free rate)	
Expected Long Term Growth Rate:	2.00%	

	Last 12 months	1	2	3	4	5	Terminal Year
Expected Earnings	\$207	\$223	\$241	\$261	\$281	\$304	\$310
Expected cash payout (dividends + buybacks) as % of earnings	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%
Expected Dividends + Buybacks =	\$166	\$179	\$193	\$209	\$225	\$243	\$248
Expected Terminal Value =						\$4,134	
Present Value =		\$166	\$166	\$166	\$166	\$2,979	
Intrinsic Value of Index =		3,641					

- The trailing twelve month (TTM) earnings was updated to \$206.90.
- The expected earnings growth rate over the next 5 years remained unchanged at 8.0%.
- The risk-free rate was increased by 50bps to 3.75%.
- The implied equity risk premium assumption remained unchanged at 4.25%.
- The long-term earnings growth rate remained unchanged at 2.0%.

SENSITIVITY ANALYSIS – ADJUSTMENT TO ONE INPUT

Expected Earnings Growth	Estimated Intrinsic Value	% Change
4.0%	3,070	-15.7%
5.0%	3,205	-12.0%
6.0%	3,346	-8.1%
7.0%	3,491	-4.1%
8.0%	3,641	0.0%
9.0%	3,797	4.3%
10.0%	3,959	8.7%
11.0%	4,126	13.3%
12.0%	4,299	18.1%

Expected Long Term Growth	Estimated Intrinsic Value	% Change
-0.5%	2,765	-24.1%
0.0%	2,897	-20.5%
0.5%	3,046	-16.4%
1.0%	3,216	-11.7%
1.5%	3,412	-6.3%
2.0%	3,641	0.0%
2.5%	3,912	7.4%
3.0%	4,237	16.4%
3.5%	4,635	27.3%

Risk-Free Rate 10 Year Treasury Yield	Estimated Intrinsic Value	% Change
2.0%	5,180	42.3%
2.5%	4,624	27.0%
3.0%	4,175	14.7%
3.5%	3,804	4.5%
3.75%	3,641	0.0%
4.0%	3,492	-4.1%
4.5%	3,227	-11.4%
5.0%	2,998	-17.7%
5.5%	2,799	-23.1%

Expected Risk Premium	Estimated Intrinsic Value	% Change
2.5%	5,180	42.3%
3.0%	4,624	27.0%
3.5%	4,175	14.7%
4.0%	3,804	4.5%
4.25%	3,641	0.0%
4.5%	3,492	-4.1%
5.0%	3,227	-11.4%
5.5%	2,998	-17.7%
6.0%	2,799	-23.1%

S&P 500 (As of 10/10/2022): \$3,612.39

S&P 500 EARNINGS PER SHARE FORECAST

Earnings Per Share	7/6/22	YoY	8/3/22	YoY	9/9/22	YoY	10/5/22	YoY
CY 2016	117.82	1.0%	117.82	1.0%	117.82	1.0%	117.74	1.0%
CY 2017	130.53	10.8%	130.53	10.8%	130.53	10.8%	130.47	10.8%
CY 2018	158.33	21.3%	158.33	21.3%	158.33	21.3%	158.48	21.5%
CY 2019	159.75	0.9%	159.75	0.9%	159.75	0.9%	159.81	0.8%
CY 2020	137.33	-14.0%	137.33	-14.0%	137.33	-14.0%	137.68	-13.8%
CY 2021	206.18	50.1%	206.19	50.1%	206.18	50.1%	206.20	49.8%
CY 2022E	227.28	10.2%	224.33	8.8%	222.63	8.0%	221.54	7.4%
CY 2023E	248.35	9.3%	242.76	8.2%	241.23	8.4%	239.58	8.1%
CY 2024E	269.50	8.5%	263.50	8.5%	261.87	8.6%	259.84	8.5%
Q1 2022	53.20	9.6%	53.20	9.6%	53.20	9.6%	53.20	9.6%
Q2 2022	54.89	5.2%	55.79	6.9%	55.80	6.9%	55.80	6.9%
Q3 2022E	58.80	10.9%	56.52	6.6%	55.31	4.3%	54.78	3.3%
Q4 2022E	60.17	14.8%	58.38	11.4%	57.95	10.6%	57.30	9.3%

Source: FactSet

- **Analysts' earnings per share estimates continue to be revised downwards.**
- Earnings per share are forecasted to increase by 7.4% for 2022 and by 8.0% annually over the next three years.

S&P 500 SALES PER SHARE FORECAST

Sales Per Share	7/6/22	YoY	8/3/22	YoY	9/9/22	YoY	10/5/22	YoY
CY 2016	1,148.78	2.7%	1,149.35	2.7%	1,149.35	2.7%	1,148.45	2.6%
CY 2017	1,212.42	5.5%	1,213.08	5.5%	1,213.08	5.5%	1,212.71	5.6%
CY 2018	1,332.26	9.9%	1,333.28	9.9%	1,333.28	9.9%	1,333.78	10.0%
CY 2019	1,387.51	4.1%	1,388.71	4.2%	1,388.71	4.2%	1,388.45	4.1%
CY 2020	1,335.11	-3.8%	1,336.43	-3.8%	1,336.43	-3.8%	1,336.87	-3.7%
CY 2021	1,570.09	17.6%	1,571.96	17.6%	1,571.98	17.6%	1,571.92	17.6%
CY 2022E	1,738.70	10.7%	1,741.46	10.8%	1,750.25	11.3%	1,747.74	11.2%
CY 2023E	1,823.51	4.9%	1,813.21	4.1%	1,823.01	4.2%	1,820.00	4.1%
CY 2024E	1,921.88	5.4%	1,908.63	5.3%	1,909.67	4.8%	1,907.62	4.8%
Q1 2022	417.92	14.7%	417.92	14.7%	417.92	14.7%	417.92	14.7%
Q2 2022	425.97	11.4%	436.64	14.2%	441.73	15.5%	441.73	15.5%
Q3 2022E	439.65	10.6%	436.88	9.9%	436.45	9.8%	435.11	9.4%
Q4 2022E	456.69	11.0%	453.82	10.3%	454.28	10.5%	452.70	10.1%

Source: FactSet

- Analysts expect sales to increase by 11.2% for 2022.
- Sales are expected to increase by 6.7% annually over the next three years.

LEADING STOCKS IN THE S&P 500

- ✓ Energy Stocks Remain Resilient – **Exxon and Chevron Up ~36-62% YTD**
- ✓ Major Tech Stocks Remain Weak – **Nvidia and Facebook (Meta) Down ~60-61% YTD**
- ✓ Vanguard Information Technology ETF (VGT) – **Down ~33% YTD**
- ✓ Long Duration Stocks Remain Depressed
- ✓ US Small Cap Stocks Continue to Trade At Valuation Discounts vs S&P 500 Valuations

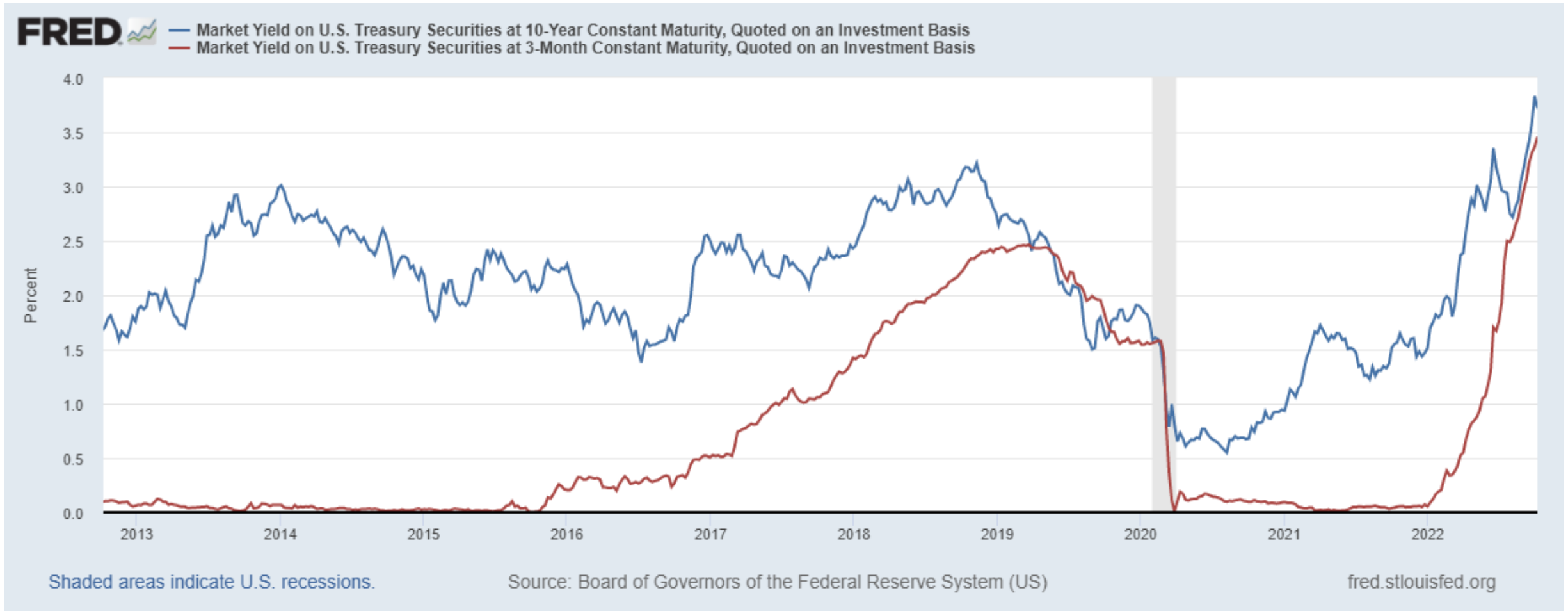
COMPONENTS OF THE S&P 500 (AS OF 09/30/2022)

Symbol	Company	Sector	Industry	YTD	3 Years	5 Years	Sales 1 Yr Gr	EPS 1 Yr Gr	Broker Est EPS 4Wk Chg	Broker Est Sales 4Wk Chg	Broker Est Curr EV/ Broker Est Sales	MKT CAP (in \$ mm)
AAPL	Apple Inc.	Information Technology	Technology Hardware Storage & Peripherals	-17.3%	39.3%	31.8%	11.5%	71.3%	0.1%	0.0%	6.0x	2,289,279
MSFT	Microsoft Corporation	Information Technology	Software	-25.4%	23.4%	29.0%	18.0%	19.5%	-0.3%	-0.5%	8.2x	1,795,413
AMZN	Amazon.com, Inc.	Consumer Discretionary	Internet & Direct Marketing Retail	-27.4%	12.0%	20.4%	9.6%	54.6%	-70.4%	-0.2%	2.4x	1,180,534
TSLA	Tesla Inc	Consumer Discretionary	Automobiles	-29.2%	152.0%	60.8%	60.4%	657.6%	3.2%	0.1%	9.6x	759,553
GOOG	Alphabet Inc. Class C	Communication Services	Interactive Media & Services	-29.2%	19.9%	16.4%	25.8%	92.5%	-0.3%	-0.2%	4.3x	611,986
GOOGL	Alphabet Inc. Class A	Communication Services	Interactive Media & Services	-29.8%	19.5%	15.9%	25.8%	92.5%	-0.3%	-0.2%	4.2x	591,445
UNH	UnitedHealth Group Incorporated	Health Care	Health Care Providers & Services	5.1%	36.3%	23.1%	12.7%	12.9%	0.0%	0.0%	1.6x	482,199
JNJ	Johnson & Johnson	Health Care	Pharmaceuticals	-1.2%	10.9%	7.4%	7.3%	41.9%	-0.1%	-0.1%	4.6x	429,082
XOM	Exxon Mobil Corporation	Energy	Oil Gas & Consumable Fuels	60.0%	18.8%	8.7%	65.3%	N/A	-0.4%	-0.5%	0.9x	383,089
WMT	Walmart Inc.	Consumer Staples	Food & Staples Retailing	-6.1%	6.6%	13.2%	3.8%	2.6%	0.2%	0.0%	0.7x	359,718
BRK.B	Berkshire Hathaway Inc. Class B	Financials	Diversified Financial Services	-6.2%	11.0%	8.6%	10.8%	123.0%	0.0%	0.0%	2.4x	354,947
FB	Meta Platforms Inc. Class A	Communication Services	Interactive Media & Services	-58.3%	-7.9%	-3.8%	14.0%	36.8%	-0.1%	-0.3%	3.1x	316,124
JPM	JPMorgan Chase & Co.	Financials	Banks	-26.9%	3.0%	5.9%	0.7%	73.1%	0.1%	-0.1%	7.0x	315,926
NVDA	NVIDIA Corporation	Information Technology	Semiconductors & Semiconductor Equipment	-55.2%	42.8%	24.3%	35.8%	122.6%	1.1%	-1.3%	11.4x	311,549
PG	Procter & Gamble Company	Consumer Staples	Household Products	-18.8%	4.8%	10.1%	5.3%	5.4%	-0.6%	-0.6%	4.4x	307,082
LLY	Eli Lilly and Company	Health Care	Pharmaceuticals	20.5%	47.9%	33.3%	8.8%	-9.8%	-0.3%	-0.2%	10.6x	305,529
CVX	Chevron Corporation	Energy	Oil Gas & Consumable Fuels	38.0%	17.2%	10.8%	77.5%	N/A	-0.9%	-1.3%	1.3x	297,002
V	Visa Inc. Class A	Information Technology	IT Services	-13.8%	3.1%	12.7%	24.0%	15.2%	0.1%	0.0%	13.4x	297,000
HD	Home Depot, Inc.	Consumer Discretionary	Specialty Retail	-28.9%	11.0%	14.5%	7.5%	30.1%	0.1%	0.0%	2.2x	290,431
MA	Mastercard Incorporated Class A	Information Technology	IT Services	-15.7%	4.5%	16.7%	25.3%	37.4%	-0.2%	-0.1%	13.2x	278,476

SURGING SHORT TERM TREASURY AND T-BOND YIELDS

- ✓ As You Will See on the Next Slide, the US 10-year Treasury Yield Continues to Climb at a Rapid Pace Hitting 3.88% on Oct. 11th.
- ✓ 3-Month T-Bills Yields **Have Risen YTD From 8 bps (Jan. 3rd) to 3.34% (Oct. 11th)**
- ✓ 6-Month T-Bill Yields **Have Risen YTD From 22bps (Jan. 3rd) to 3.97% (Oct. 11th)**
- ✓ 10-Year Treasury Yields **Have Risen YTD From 1.63% (Jan. 3rd) to 3.88% (Oct. 11th)**
- ✓ The 10-year Treasury yield often signals investor confidence or expectations for future inflation.
- ✓ Since Treasury bonds are sold via auction, bond prices drop and yields rise when confidence is high and vice versa when confidence is low.

US 10-YEAR vs. 3 MONTH TREASURY YIELDS SINCE 2012



Source: FRED (As of 10/07/2022)

IMPLICATIONS OF FEDERAL RESERVE HIKES AND RISING RATES

- ✓ Market Participants Continue to Predict Multiple Rate Hikes This Year And Possibly Next
- ✓ As of 10/07/2022 the Federal Funds Rate Was 308 bps
- ✓ **A Majority of Market Participants Expect the Fed Funds Rate to Increase Beyond 400 bps In 2023.**

SHORT-TERM RATES FORECAST

Target Federal Funds Rate Probabilities								
Meeting Date	325-350	350-375	375-400	400-425	425-450	450-475	475-500	500-525
11/2/2022	0.0%	31.3%	68.7%	0.0%	0.0%	0.0%	0.0%	0.0%
12/14/2022	0.0%	0.0%	0.0%	28.3%	65.0%	6.8%	0.0%	0.0%
2/1/2023	0.0%	0.0%	0.0%	5.3%	35.1%	54.1%	5.5%	0.0%
3/22/2023	0.0%	0.0%	0.0%	4.5%	30.7%	51.3%	12.7%	0.8%
5/3/2023	0.0%	0.0%	0.7%	8.4%	33.8%	45.5%	10.9%	0.7%
6/14/2023	0.0%	0.0%	1.1%	9.8%	34.4%	43.6%	10.3%	0.7%
7/26/2023	0.0%	0.2%	2.7%	14.4%	36.1%	37.4%	8.5%	0.5%
9/20/2023	0.1%	0.7%	4.9%	18.5%	36.4%	31.9%	7.0%	0.4%
11/1/2023	0.3%	2.1%	9.4%	24.4%	34.9%	23.7%	4.8%	0.3%
12/13/2023	0.8%	4.4%	14.1%	27.7%	31.4%	17.9%	3.4%	0.2%

Source: CME Group (As of 10/05/2022)

WALL STREET STRATEGISTS CONTINUE TO CUT FORECASTS

As of 01/10/2022

Firm	2022 Target	2022 EPS	Implied P/E
BAML	4,600	\$173.0	26.6
Barclays	4,800	\$235.0	20.4
BMO	5,300	\$245.0	21.6
CFRA	5,024	\$220.0	22.8
Citigroup	5,100	\$221.0	23.1
Credit Suisse	5,200	\$235.0	22.1
Deutsche Bank	NA	NA	NA
Evercore ISI	5,100	\$233.0	21.9
Goldman Sachs	5,100	\$226.0	22.6
JPMorgan Chase	5,050	\$240.0	21.0
Morgan Stanley	4,400	\$227.0	19.4
Oppenheimer	5,330	\$230.0	23.2
RBC	5,050	\$222.0	22.7
UBS	4,850	\$242.0	20.0
Wells Fargo	5,200	\$235.0	22.1

Average Target:	5,007
Median Target:	5,075

Source: S&P 500 CNBC Market Strategist Survey

As of 10/05/2022

Firm	2022 Target	2022 EPS	Implied P/E
BAML	3,600	\$218.0	16.5
Barclays	4,500	\$223.0	20.2
BMO	4,800	\$245.0	19.6
CFRA	4,675	\$228.0	20.5
Citigroup	4,000	\$221.0	18.1
Credit Suisse	3,850	\$227.0	17.0
Deutsche Bank	4,750	\$227.0	20.9
Evercore ISI	3,975	\$222.0	17.9
Goldman Sachs	3,600	\$226.0	15.9
JPMorgan Chase	4,800	\$225.0	21.3
Morgan Stanley	3,900	\$225.0	17.3
Oppenheimer	4,800	\$230.0	20.9
RBC	4,200	\$214.0	19.6
UBS	4,000	\$228.0	17.5
Wells Fargo	3,900	\$215.0	18.1

Average Target:	4,223
Median Target:	4,000

S&P 500 (As of 10/10/2022): \$3,612.39

SUMMARY

- ✓ **Earnings and Earnings Growth:** Earnings are expected to increase by 8.0% annually over the next three years. While earnings are projected to increase over the next three years, the war in Ukraine, persistent inflationary pressures, and increasing interest rates across the globe could temporarily curb the profit growth outlook.
- ✓ **Discount Rate:** The fall in equity prices this year has primarily been attributed to rising discount rates. ***The expectation is for the federal funds rate to increase by over ~100-150 bps over the next 12 months, which poses a meaningful risk to equity price appreciation.***
- ✓ **Intrinsic Value:** In September, we observed a decrease in the intrinsic value for the S&P 500 index when compared to the intrinsic value in August due to a 50 basis point increase in the risk-free rate.

Investment Committee Meeting

October 19, 2022



<u>Fund Name</u>	<u>Asset Type</u>	<u>Date Closed</u>
Tritium III	Capital Appreciation	September 30, 2022
Oberland Capital Healthcare Fund	Contractual Income	October 7, 2022



Proxy Voting Primer

The PSPRS Trust



AGENDA

1. Describe the proxy voting process and routine proposals
2. Discuss common approaches amongst public pension plans and potential next steps

WHAT IS PROXY VOTING

- Publicly traded companies are required to report to shareholders (by the SEC, exchanges and/or state laws)
- Companies communicate in a variety of ways, including through required public filings, but most notably through an annual meeting
- Companies use the annual meeting to conduct shareholder votes on a number of required initiatives but voting might still be required outside an annual meeting for certain decisions
- Most shareholders do not physically attend the annual meeting and vote “by proxy”
- Shareholders can also add proposals to the ballot (but there are some restrictions)
- Mutual funds and ETFs vote according to their policies. Shareholders of mutual funds and ETFs do not vote on the proposals of the underlying companies (although this is changing)
- Proxy voting “season” usually runs from March to June

COMMON MANAGEMENT PROPOSALS

The following decisions often require shareholder approval but the company can, and often does, seek shareholder input on other matters:

1. Election of directors (a corporate nominating committee will propose a slate of candidates)
2. CEO pay
3. The sale of the company in a merger
4. The sale of substantially all of the company's assets
5. Dissolution
6. Proposed changes to the company's bylaws or governing documents



SHAREHOLDER RIGHTS

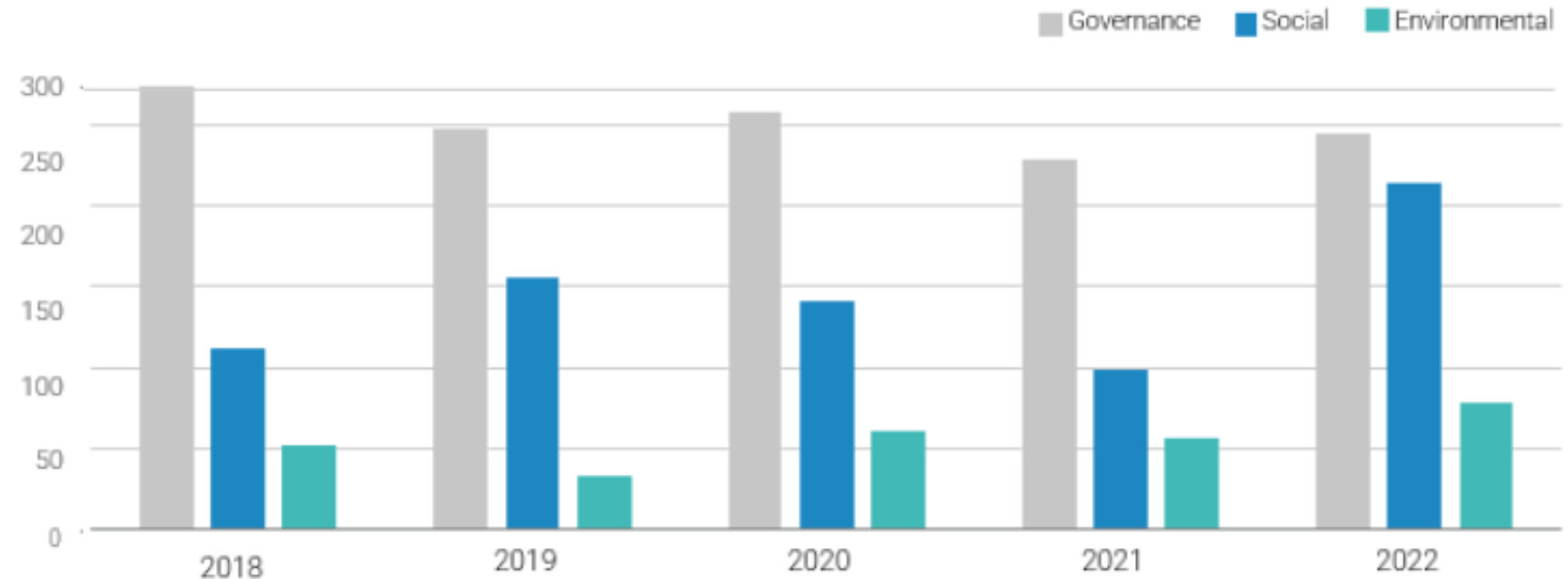
- Shareholders deserve to have mechanisms to protect their interests from abuse by corporations
- Examples of management proposals that can reduce shareholders' rights include:
 - **Poison Pill** or Shareholder Rights Plans. A poison pill is a strategy meant to prevent a hostile takeover by making the company look less attractive and/or diluting the acquirer's ownership. This strategy may not be in the best interest of shareholders if it merely sustains an underperforming company.
 - **Staggered Boards**. Members of a company's board are put in to different classes, (Class 1, Class 2, Class 3) with only one class eligible for election in a given year. This means that only a third of the Board can be replaced in any year.



2022 SHAREHOLDER PROPOSALS

- While Management proposals significantly outnumber Shareholder proposals, Shareholder proposals are on the rise
- Specifically, proposals relating to environmental and social policies are increasing

TOTAL SHAREHOLDER PROPOSALS 2018-2022



WHAT DOES “ESG” STAND FOR?

ENVIRONMENTAL

Activities or products that may affect the natural environment including; energy efficiency, air pollution, water scarcity and carbon emissions

SOCIAL

Activities or products that may affect society including; equality, political influence and community

GOVERNANCE

Activities that may affect the success of the firm and/or shareholder rights including; Board independence, stakeholder alignment and executive compensation



CASE STUDIES

Amazon

- Shareholders asked the company to produce a report “on the environmental and social impacts of food waste generated from the company’s operations” arguing wasted food production was responsible for consuming 25% of U.S. freshwater

Pfizer

- Shareholders requested a report on the 10 best-selling branded prescription drugs. The proposal asked the company to explain the rationale behind the price increases given “that one in four people in the U.S. have difficulty affording their prescription medicine”

Thematic: Say-on-climate

- Shareholders must accept the company’s climate action plan on an annual basis and the strategy the company pursues to reduce greenhouse gas emissions
- Exxon Mobil Corporation in 2021. In a contested election Exxon was challenged to appoint new directors to its board on account of investor concerns regarding the oil major’s climate transition strategies and assumptions. The dissident campaign was largely focused on Exxon’s potential overreliance on carbon capture and storage to ease it into a low-carbon future. This campaign resonated with many shareholders and resulted in three of the dissident’s four proposed directors being appointed to the board.

COMMON APPROACHES (OR NOT) AMONG PUBLIC PENSION PLANS

- While larger plans (>\$75bln) tend to develop their own policies and have dedicated staff, or an entire department, to research each proposal, take meetings and vote, there's no common approach among pension funds
- However, there ARE common factors that drive what a system ultimately decides

Bandwidth

- The number of proposals is the same, regardless of AUM
- There will always be novel issues that require research
- Economic efficiency given that the season runs March to June

Philosophy – Externally managed pools

- External managers of commingled pools vote according to their own policies but investors can always “vote with their feet” by firing the manager
- What if firing a manager is sub-optimal due to a lack of acceptable alternatives?
- What about subadvisors and their willingness to accept internal proxy voting guidelines?

Philosophy – Internally managed pools

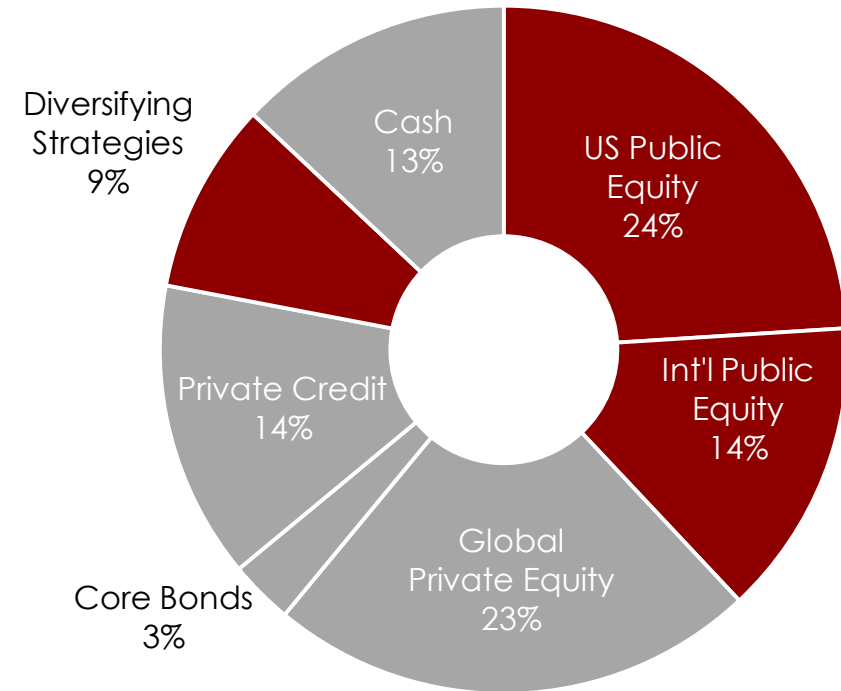
- Utility of proxy voting versus engagement with management team
- How much time should staff dedicate to proposal research and management meetings?

Policy Design

- Principle/Thematic approach
- Is consensus on routine voting matters amongst stakeholders (Trustees, employers, etc.) likely?
- What about novel proposals?
- Develop policy in-house using “benchmark” policies or hire a third-party?

APPLICATIONS FOR THE TRUST

- Proxy voting is only relevant for publicly traded stocks and thus only applies to US and International Equities as well as Diversifying Strategies
- Funds in **Diversifying Strategies** are commingled and the Trust allows the investment partner to follow their own proxy voting guidelines since 1) the positions are relatively liquid and the Trust can redeem (although not without friction) and 2) more importantly, investment partners are under fiduciary obligations and must act in the Trust's best interest
- Materially all capital in **US and Int'l Equity** is managed by State Street, the rest is invested in mutual funds or ETFs which can be redeemed if necessary. State Street follows their own proxy voting guidelines but would adopt internal guidelines. State Street can also be terminated



SURVEY OF PEER PRACTICES

- Both LA and Orange County have detailed proxy policies because it is required by state law
- Maine mentions Proxy Voting in their Governance Manual and indicates Investment Staff shall work with a proxy agent to develop an implementation plan to guide voting
- Ohio Police & Fire have separate proxy voting policies for U.S. and Int'l Equity
- Idaho and Oklahoma briefly mention proxy voting in their respective Investment Policy Statements but only as it relates to externally managed funds. They do not impose guidelines on externally managed funds.
- Staff could not locate public information about proxy voting for Georgia, Arkansas, Minnesota or West Virginia

Peer Group by AUM for preliminary review

	AUM
New Mexico Public Employees Retirement Association	\$ 18,035,058
Maine Public Employees Retirement System	\$ 18,651,802
Ohio Police & Fire Pension Fund	\$ 18,776,918
New York City Fire	\$ 18,908,561
Los Angeles City Employees Retirement System	\$ 19,023,688
Georgia Employees Retirement System	\$ 20,001,520
Minnesota State Retirement System	\$ 20,255,506
West Virginia Consolidated Public Retirement Board	\$ 21,343,108
Arkansas Teachers Retirement System	\$ 21,468,773
Idaho Public Employee Retirement System	\$ 21,819,751
Orange County ERS	\$ 21,922,182
Oklahoma Teachers Retirement System	\$ 22,052,069

*Note: As this was a preliminary survey of pension practices for educational purposes, staff reviewed only publicly available information and did not speak with anyone at the systems indicated in the peer group. It is possible that some of these practices have changed.