



ARIZONA STATE RETIREMENT SYSTEM

Public Equity Implementation For CY 2023 and Related Asset Class Material

Cole Smith, Senior Public Equity Portfolio Manager

Investment Committee Meeting
March 15, 2023



Executive Summary

- The objective of the Public Equity Implementation is to provide alignment with the Strategic Asset Allocation Policy Investment (“SAAP”) approved by the ASRS Board on September 30, 2022.
- The Public Equity Team took a strategic shift in 2018 – 2020, with regards to managing the domestic and international portfolios. This initiative included terminating externally managed active strategies and repurposing internally managed strategies due to persistent underperformance.
- Starting in 2020, the Public Equity Team has implemented an enhanced passive portfolio management strategy. We now use passive trading strategies which gives the portfolio managers discretion to take advantage of market opportunities with a significant tracking error against our benchmarks.
 - These changes have started to show incremental outperformance across the portfolios with a lower tracking error and volatility away from the benchmark). Further, we expect this incremental outperformance to compound over time and generate consistent excess returns over longer time periods.
- House Views: ASRS expects US equities, represented by the S&P 500 Index, to have a range of values between 4,200 - 4,800 over the coming 12 months. This would translate into a return between 9% - 22%, based on a year-end 2022 price of 3,830 for the S&P 500 Index. We are also constructive on International Equity markets as headwinds begin to diminish and equity market future growth projections.
- For the 2023 Public Equity Implementation, the Public Equity Team has maintained a target outperformance of 0.25% and an error budget of 0.40%.



Performance & Risk



Total Public Equity Performance

Name	Ending Market Value	3 Months	6 Months	1 Year	3 Years	5 Years	10 Years
Total Public Equity	18,444,081,080.00	10.07	2.81	(17.91)	3.81	4.86	
Total Public Equity BM		9.93	2.71	(18.17)	4.18	5.31	
Excess Return		0.14	0.10	0.26	(0.37)	(0.45)	

- The benchmark for the Total Public Equity asset class is MSCI ACWI IMI (MSCI All Country World Investable Market Index), which captures large, mid and small cap representation across 23 Developed Markets and 24 Emerging Markets countries, covering approximately 99% of the global equity investment opportunity set.

Inception Date: Jan '98

As of 31-Dec-2022



Public Equity Performance, Domestic Equities

Name	Ending Market Value	3 Months	6 Months	1 Year	3 Years	5 Years	10 Year
Total US Equity	10,944,270,801.83	7.27	2.45	(19.11)	6.41	8.05	11
Combined Domestic Equity Index		7.21	2.44	(19.22)	7.25	8.97	12
Excess Return		0.06	0.00	0.12	(0.84)	(0.92)	(0)

Name	Ending Market Value	3 Months	6 Months	1 Year	3 Years	5 Years	10 Year
US Equity Large Cap	8,484,828,976.97	6.83	1.59	(19.53)	5.97	8.31	11
Domestic Large Cap Equity BM		6.76	1.58	(19.66)	7.46	9.47	12
Excess Return		0.07	0.01	0.13	(1.49)	(1.16)	(0)

Name	Ending Market Value	3 Months	6 Months	1 Year	3 Years	5 Years	10 Year
US Equity Mid Cap	1,332,438,145.20	9.52	5.43	(17.97)	7.81	7.16	11
Domestic Mid Cap Equity BM		9.46	5.38	(18.18)	7.50	8.13	11
Excess Return		0.06	0.05	0.21	0.31	(0.97)	(0)

Name	Ending Market Value	3 Months	6 Months	1 Year	3 Years	5 Years	10 Year
US Equity Small Cap	1,127,003,679.66	8.01	5.47	(17.24)	6.37	6.38	10
Small Cap Custom Index		8.02	5.51	(17.17)	5.60	6.79	11
Excess Return		(0.01)	(0.04)	(0.07)	0.77	(0.40)	(1)



Public Equity Performance, International Equities

Name	Ending Market Value	3 Months	6 Months	1 Year	3 Years	5 Years	10 Years
Total International Equity	7,499,810,278.17	14.42	3.33	(16.10)	0.47	1.07	4.00
Custom International Equity BM		14.15	3.09	(16.58)	0.20	0.89	4.00
Excess Return		0.28	0.24	0.48	0.27	0.18	(0.00)

Name	Ending Market Value	3 Months	6 Months	1 Year	3 Years	5 Years	10 Years
INTL Dev Large Cap	4,630,320,669.78	16.59	5.96	(13.60)	1.71	2.18	5.00
MSCI EAFE Net (Blend)		16.18	5.50	(14.29)	1.27	1.80	4.00
Excess Return		0.41	0.46	0.69	0.44	0.39	0.00

Name	Ending Market Value	3 Months	6 Months	1 Year	3 Years	5 Years	10 Years
INTL Dev Small Cap	766,310,193.70	15.46	4.84	(19.79)	0.42	1.08	6.00
MSCI World Ex US Small Cap Net Index		15.21	4.31	(20.59)	(0.15)	0.45	5.00
Excess Return		0.25	0.53	0.80	0.57	0.63	0.00

Name	Ending Market Value	3 Months	6 Months	1 Year	3 Years	5 Years	10 Years
Emerging Markets IMI	2,103,179,414.69	9.49	(2.58)	(19.86)	(1.97)	(1.48)	1.00
MSCI Emerging Markets IMI Net		9.50	(2.31)	(19.83)	(1.82)	(1.10)	1.00
Excess Return		(0.01)	(0.28)	(0.03)	(0.16)	(0.38)	(0.00)



Public Equity Tracking Error

Asset Class / Portfolio	Realized 2022 Tracking Error (bps)	Tracking Error budget (bps)
Total Public Equity	20.8	40
INTERNAL US LARGE CAP EQUITY	5.2	30
INTERNAL US MID CAP EQUITY	6.1	30
INTERNAL US SMALL CAP EQUITY	8.3	30
BLACKROCK WORLD EX US INDEX	26.2	50
LG WORLD MSCI X US NET RETURN	17.4	50
BLACKROCK WORLD EX US SC INDEX	16.2	50
BLACKROCK EMERGING MARKETS	163.1	70
LG MSCI EM IMI CIT	78.9	70

- Realized tracking stayed within budget for CY2022, the exception being our Emerging Markets portfolios due to timing differences from international holidays



Positioning and Strategy Targets



Current and Target Weights of Strategies

- As of December 31, 2022, we had \$18.4 billion invested in the Public Equity asset class, representing a 37.6% allocation within Total Fund.
- We are at equal weight to our benchmark index: MSCI ACWI IMI
 - Sub-asset class benchmark weights will drift based on respective performance
 - We rebalance these weights periodically to keep in line with the benchmark index

Sub-Asset Class	Portfolio & Strategy	% of Public Equity	
		Current	Target
US LC	Internal US Large Cap	46.0%	46.0%
US MC	Internal US Mid Cap	7.2%	7.2%
US SC	Internal US Small Cap	6.1%	6.1%
Int'l Developed LC	MSCI World ex-USA SMA	25.1%	25.0%
Int'l Developed SC	MSCI World ex-USA Small Cap SMA	4.2%	4.2%
Emerging Markets	MSCI Emerging Markets IMI CIT	11.4%	11.4%



Strategies & Benchmarks

- The benchmark for the Total Public Equity asset class is MSCI ACWI IMI (MSCI All Country World Investable Market Index), which captures large, mid and small cap representation across 23 Developed Markets and 24 Emerging Markets countries, covering approximately 99% of the global equity investment opportunity set.
- Sub-asset classes within Public Equity retain specific regional and market capitalization benchmarks up to the total MSCI ACWI IMI, detailed in the table down below.
- All domestic equity portfolios are managed internally, while our international equity portfolios are managed externally by BlackRock and Legal & General:

Sub-Asset Class	Portfolio & Strategy	Benchmark	Manager
US LC	Internal US Large Cap	MSCI USA Large Cap	ASRS Internal
US MC	Internal US Mid Cap	MSCI USA Mid Cap	ASRS Internal
US SC	Internal US Small Cap	MSCI USA Small Cap	ASRS Internal
Int'l Developed LC	MSCI World ex-USA Index Plus SMA	MSCI World ex-USA	BlackRock / Legal & General
Int'l Developed SC	MSCI World ex-USA Small Cap Index Plus SMA	MSCI World ex-USA Small Cap	BlackRock / Legal & General
Emerging Markets	MSCI Emerging Markets IMI CIT	MSCI Emerging Markets IMI	BlackRock / Legal & General



Excess Returns & Tracking Error Targets

- The Public Equity Asset Class excess return target is 25 basis points (0.25%)
- Target tracking error will not exceed our allocated budget of 40 basis points (0.40%)
- Excess return targets and tracking error budgets for sub-asset classes are as follows:

Sub-Asset Class	Portfolio & Strategy	Current Weight	Excess Return	Tracking
US LC	Internal US Large Cap	46%	0.10%	0.30%
US MC	Internal US Mid Cap	7%	0.10%	0.30%
US SC	Internal US Small Cap	6%	0.10%	0.30%
Int'l Developed LC	MSCI World ex-USA SMA	25%	0.50%	0.50%
Int'l Developed SC	MSCI World ex-USA Small Cap SMA	4%	0.50%	0.50%
Emerging Markets	MSCI Emerging Markets IMI CIT	11%	0.40%	0.70%



Public Equity House Views

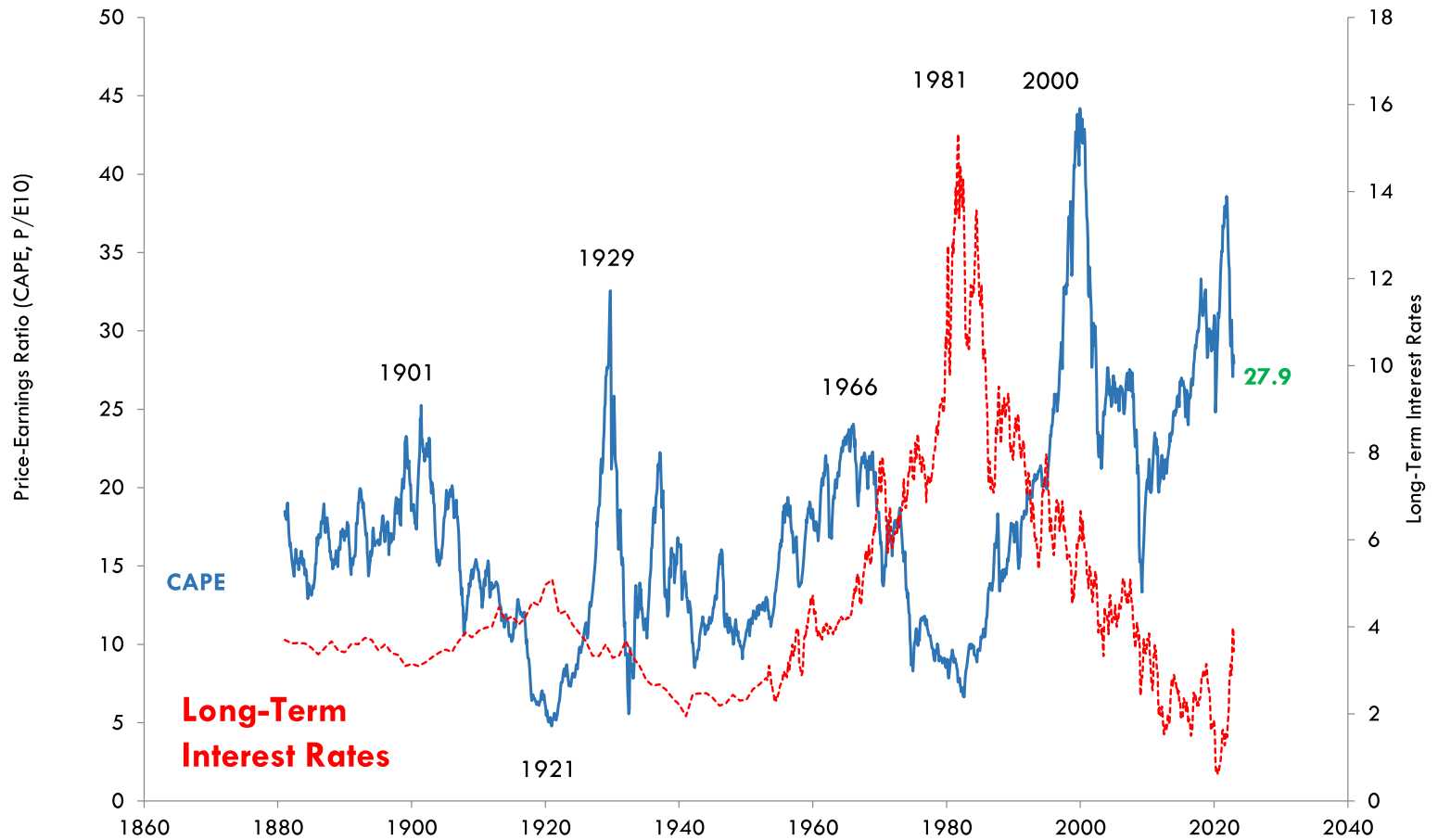


House Views, Valuations

- US markets, measured by the S&P 500 Index, went through a correction in 2022, dropping -18.13% for the period. The Y-t-D performance for global markets, measured by the MSCI ACWI Index (All Country World Index), followed suit and stands at -17.96%.
- Valuations continued to contract into the end of 2022, with Forward Price-Earnings ratios (P/Es) dropping below the long-term average of approximately 17.5x.
- We expect US equities, represented by the S&P 500 Index, to have a range of values between 4,200 - 4,700 for the coming 12 months, based on the following framework:
 - At an expected valuation multiple of 20x forward earnings, and at an average earnings per share between \$210 – \$234 (EPS for 2022 stood at \$224), the Index value would range between 4,200 - 4,700.
 - This would translate into a return between 9% - 22%, based on a year-end 2022 price of 3,839 for the S&P 500 Index.
- We are also constructive on global equity markets ex-US, as headwinds begin to diminish and equity markets begin to discount future growth projections.



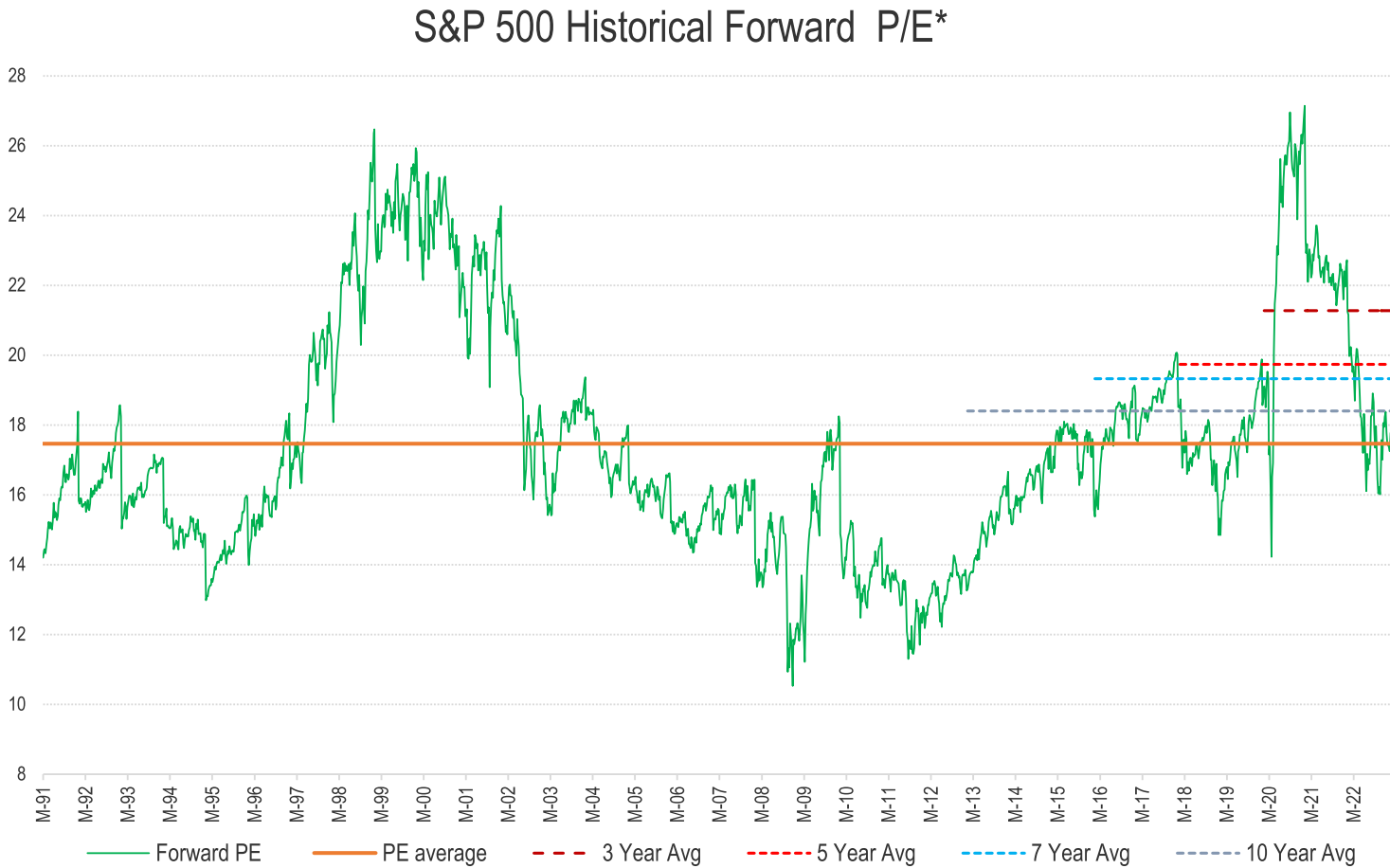
US Equities, CAPE – Shiller* ratio stands at 27.9x after recording 39.6x (third highest) in Q1 '22



*CAPE – Shiller (Yale - <http://www.econ.yale.edu/~shiller/data.htm>)
As of 17-Jan-2023



US Equities, S&P 500 Forward P/E at 30-year average, and lower than 3, 5, 7 and 10-Year averages



*Data as of 17-Jan-2023



ASRS's S&P 500 2023 Projections

- At a Forward Price-Earnings Ratio (P/E) of 20x, and;
- At an average Earnings per Share (EPS) between \$210 – \$234 (EPS for 2022 stood at \$224):
 - The Index value would range between 4,200 – 4,700.
 - This would translate into a return between 9% - 22%, based on a year-end 2022 price of 3,839.5 for 500 Index.
 - As of January 17th, 2023, at the time of creating this report, the S&P 500 Index stood at 3,990. These projections for Forward P/E and EPS translate into a potential gain of 5% to 18% for remainder of 2023.

Current Level 3,990		S&P EPS (2023)							
		180	190	200	210	224	234	254	274
Forward PE	13.0	2,340	2,470	2,600	2,730	2,912	3,042	3,302	3,562
	16.0	2,880	3,040	3,200	3,360	3,584	3,744	4,064	4,384
	17.0	3,060	3,230	3,400	3,570	3,808	3,978	4,318	4,658
	18.0	3,240	3,420	3,600	3,780	4,032	4,212	4,572	4,932
	19.0	3,420	3,610	3,800	3,990	4,256	4,446	4,826	5,206
	20.0	3,600	3,800	4,000	4,200	4,480	4,680	5,080	5,480
	22.0	3,960	4,180	4,400	4,620	4,928	5,148	5,588	6,028
	24.0	4,320	4,560	4,800	5,040	5,376	5,616	6,096	6,576
	26.0	4,680	4,940	5,200	5,460	5,824	6,084	6,604	7,124
	28.0	5,040	5,320	5,600	5,880	6,272	6,552	7,112	7,672
	30.0	5,400	5,700	6,000	6,300	6,720	7,020	7,620	8,220

*Data as of 17-Jan-2023

Public Equity Team

Samer Ghaddar, CFA

Deputy Chief Investment Officer

Samer is Deputy Chief Investment Officer with over 20 years of experience. He holds an MBA from Imperial College Business School and an MS in Quantitative Finance from University of London. Samer also holds the Chartered Financial Analyst® designation.

Cole Smith, CFA

Senior Portfolio Manager, Public Equity

Cole has been with the Arizona State Retirement System since 2014, and is currently Senior Public Equity Portfolio Manager. In his role, he directly manages the domestic equity index portfolios, while providing oversight of the international portfolios that are managed externally. Prior to joining ASRS, Cole served as a Trade Administrator at the Vanguard Group in Scottsdale, where he monitored brokerage associates and execution quality of clients' orders. In 2009, he received a Bachelor's Degree from New Mexico State University, majoring in Finance. Currently, he is pursuing his MBA from Arizona State University and will complete the program in December 2023. Cole holds the Chartered Financial Analyst® designation, awarded in 2015.

Vicente Federico

Portfolio Analyst, Public Equity

Vicente Federico has been with the Arizona State Retirement System since November 2021, and is currently the Public Equity Portfolio Analyst. In his role, he assists in the management of the domestic equity index portfolios; providing direct support to the Senior Public Equity Portfolio Manager. Prior to joining ASRS, Vicente served multiple roles at the Vanguard Group in Scottsdale from client facing to middle office fund support. His most recent role as an Equity Trade Support Analyst entailed providing institutional support for domestic and international equity portfolios. In 2010, he received a Bachelor's Degree from The University of Arizona, majoring in Finance. Currently, he is a CFA Level II candidate pursuing the CFA Charter.