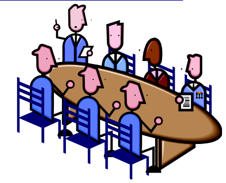
Michigan Department of Treasury
Bureau of Investments

Jon M. Braeutigam
Chief Investment Officer
May 5, 2022

Executive Summary

- Long term market returns have been robust but in the next ten years most industry experts anticipate lower returns.
- Therefore, most plans are lowering (or have lowered already) their plans actuarial assumed rate of return.
- The plan substantially beat peers across all time periods.

Bureau of Investments (BOI)



As of December 31, 2021

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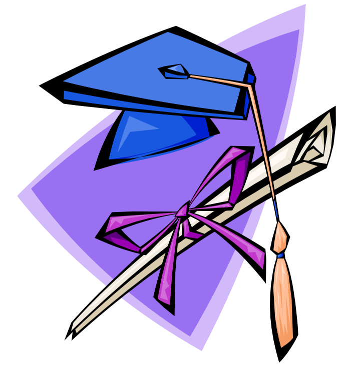
Bureau of Investments

As of December 31, 2021



- 75 BOI Employees.
- 49 Investment Professionals.
- 33 Individuals with a Masters Degree or higher.
- 16 C.F.A. Charter holders.
- 11 Other professional designations.
- Total of $146.3 billion assets under management.
- The large investment pool is an advantage for the funds.

MSPRS Funded Ratio

$1.9 Billion as of December 31, 2021

FY Ending September	Market Value of Assets	Actuarial Value of Assets	Actuarial Accrued Liability	Funded Ratio Based on Actuarial
2020	$1,513	$1,545	$2,374	65.1%
2019	$1,504	$1,520	$2,321	65.5%
2018*	$1,492	$1,499	$2,271	66.0%
2017*	$1,391	$1,398	$2,147	65.1%
2016	$1,278	$1,273	$2,008	63.4%
2015	$1,233	$1,197	$1,851	64.7%
2014*	$1,250	$1,133	$1,800	63.0%
1983	$178	$178	$272	65.4%

($ in Millions)

*Revised actuarial assumptions and/or methods.

Source: Pension Plans Component Unit Financial Reports and Actuarial Valuations, years ending in September

Pension Plan Only

MSPRS
Contributions and Distributions
FY 2021

Contributions	
Members	$3.9
Employer	117.9
Total Contributions	$121.8
Pension Benefit Distributions	155.3
Net	**($33.5)**

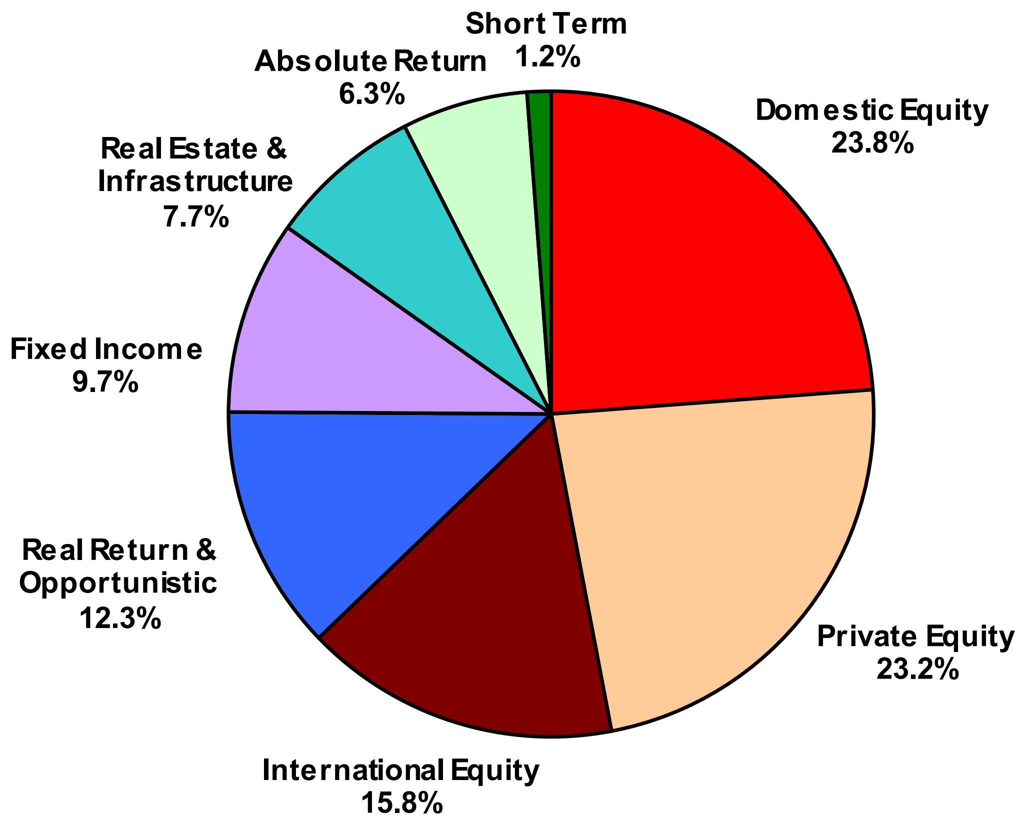
- Equal to (per quarter on average) ($8.4)
- Or about 1.5% of total market value of fund

Figures are in millions

Includes Pension Plan and OPEB

MSPRS Asset Allocation

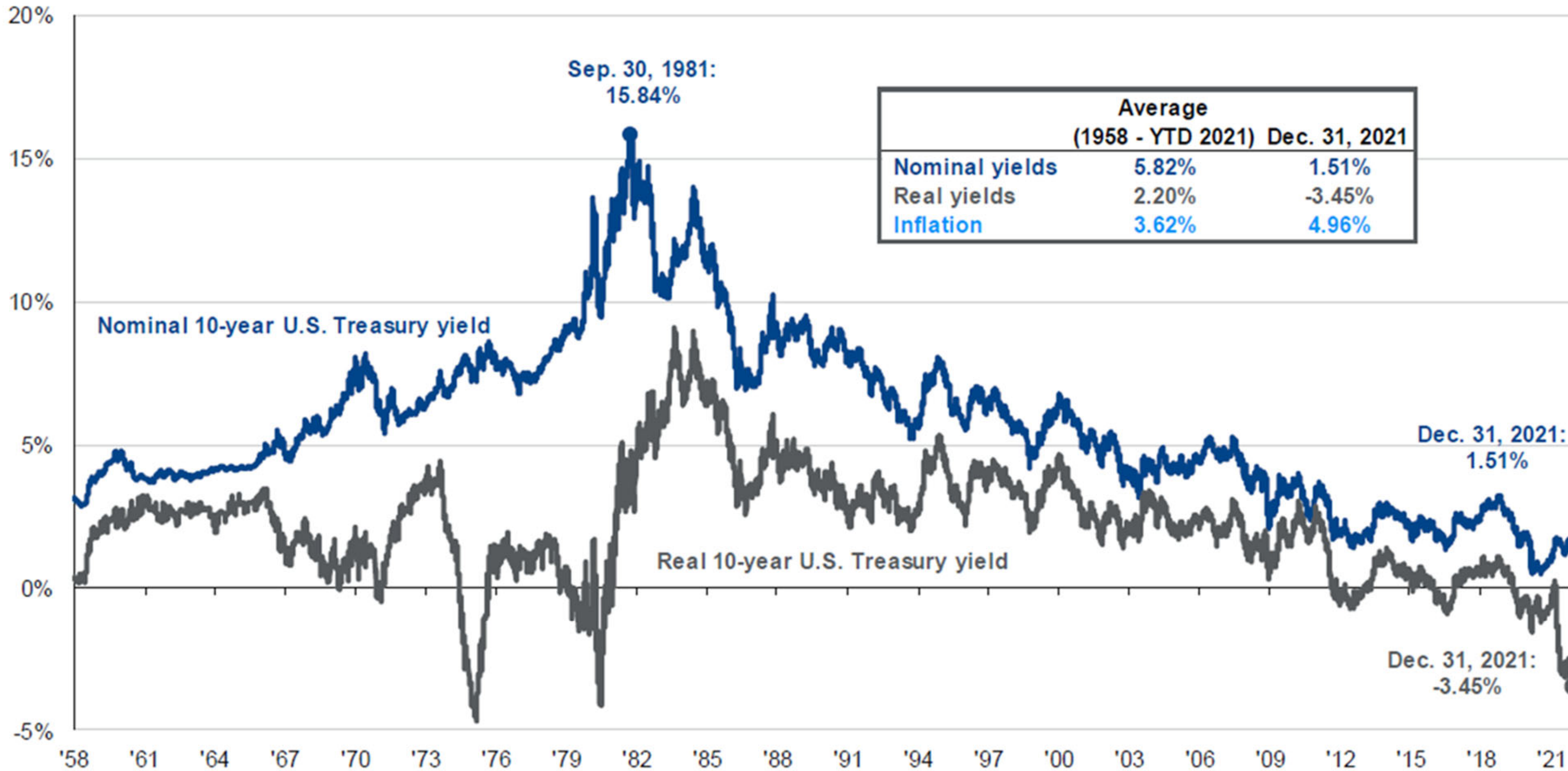
As of December 31, 2021



Diversification is essential to protect the funds. However, still reliant on equity markets to generate the actuarial rate of return.

Interest Rates and Inflation

Nominal and real U.S. 10-year Treasury yields



Source: BLS, FactSet, Federal Reserve, J.P. Morgan Asset Management.
Real 10-year Treasury yields are calculated as the daily Treasury yield less year-over-year core CPI inflation for that month. For the current month, we use the prior month's core CPI figures until the latest data is available.
Guide to the Markets – U.S. Data are as of December 31, 2021.

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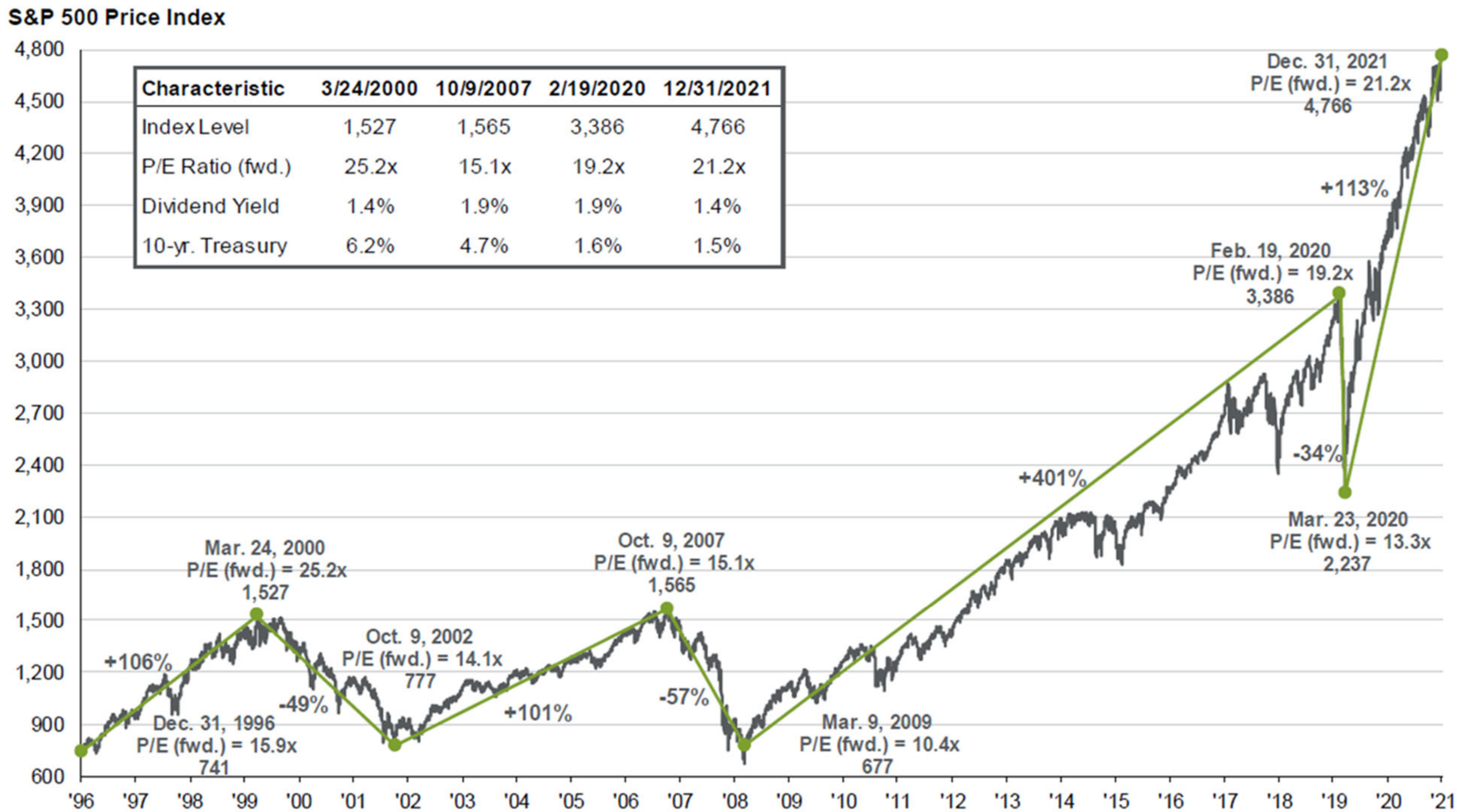
S&P 500 – Index at Inflection Points



Characteristic	3/24/2000	10/9/2007	2/19/2020	12/31/2021
Index Level	1,527	1,565	3,386	4,766
P/E Ratio (fwd.)	25.2x	15.1x	19.2x	21.2x
Dividend Yield	1.4%	1.9%	1.9%	1.4%
10-yr. Treasury	6.2%	4.7%	1.6%	1.5%

Source: Compustat, FactSet, Federal Reserve, Refinitiv Datastream, Standard & Poor's, J.P. Morgan Asset Management.
Dividend yield is calculated as consensus estimates of dividends for the next 12 months, divided by most recent price, as provided by Compustat. Forward price-to-earnings ratio is a bottom-up calculation based on J.P. Morgan Asset Management estimates. Returns are cumulative and based on S&P 500 Index price movement only, and do not include the reinvestment of dividends. Past performance is not indicative of future returns.
Guide to the Markets – U.S. Data are as of December 31, 2021.

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MSPRS FUND
Time-Weighted Rate of Return

As of December 31, 2021

Asset Class w/Benchmark	One Year*		Three Years*		Five Years*		Seven Years*		Ten Years*	
	Rate	Rank	Rate	Rank	Rate	Rank	Rate	Rank	Rate	Rank
Total Plan	**22.2%**	**6**	**16.2%**	**24**	**13.4%**	**16**	**10.9%**	**12**	**11.6%**	**14**
Median - Greater than $10 Billion**	17.1%		15.1%		11.4%		9.4%		10.0%	

- Historically the investment results have compared favorably to other large public pension plans.

* Annualized Returns
** Comparison universe is the State Street Universe comprised of Pubic Funds greater than $10 billion on the total plan level.

U.S. Economy

- Unprecedented fiscal & monetary stimulus was sustaining the US economy through the end of 2021.
- 2022 GDP growth estimate is around 2.5%, and with higher than normal inflation.
- Global events in Ukraine have pushed expected inflation even higher and may ultimately reduce 2022 US GDP growth lower than 2.5%.
- Fed Reserve appears willing to manage inflation; but has fewer tools during a potential economic slowdown.

Conclusion

- 2020 began with the sharpest recession on record, then experienced the fastest-ever rebound.
- Most of the US economy recovered well in 2021 with unprecedented federal stimulus. With expanded access to vaccines and significant additional stimulus, 2021 rebounded strongly. 2022 begins with new concerns weighing on the US and global economies.
- We will continue to maintain a long-term focus with sufficient liquidity to manage through short-term market changes.