



CIO Report
March 26, 2021



February 28, 2021
Estimated Performance

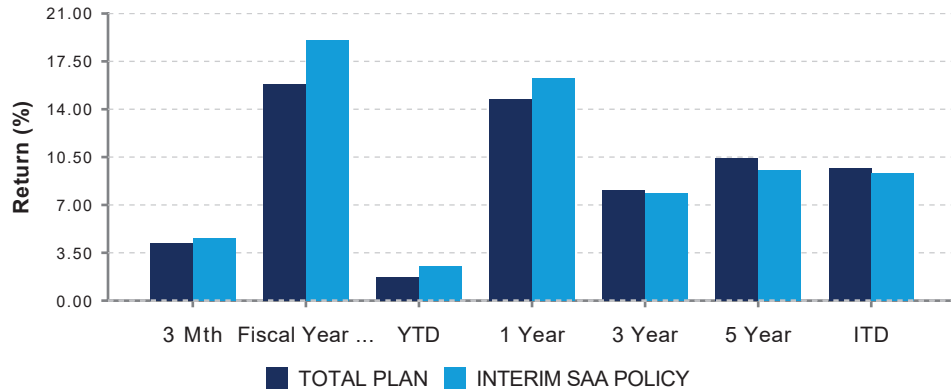
ARIZONA STATE RETIREMENT SYSTEM

February 28, 2021

Net All



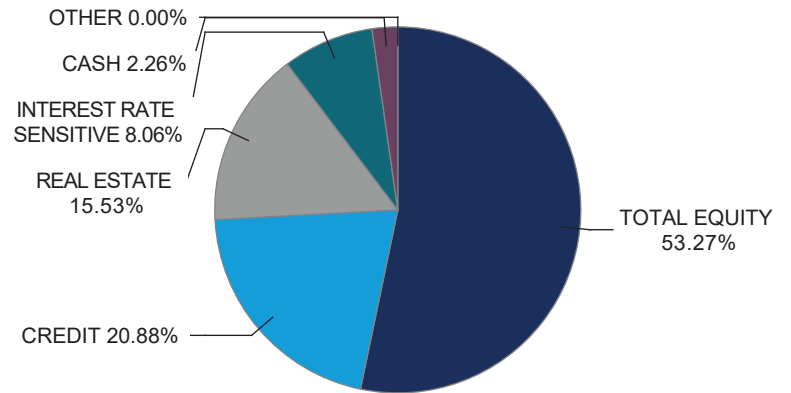
Performance



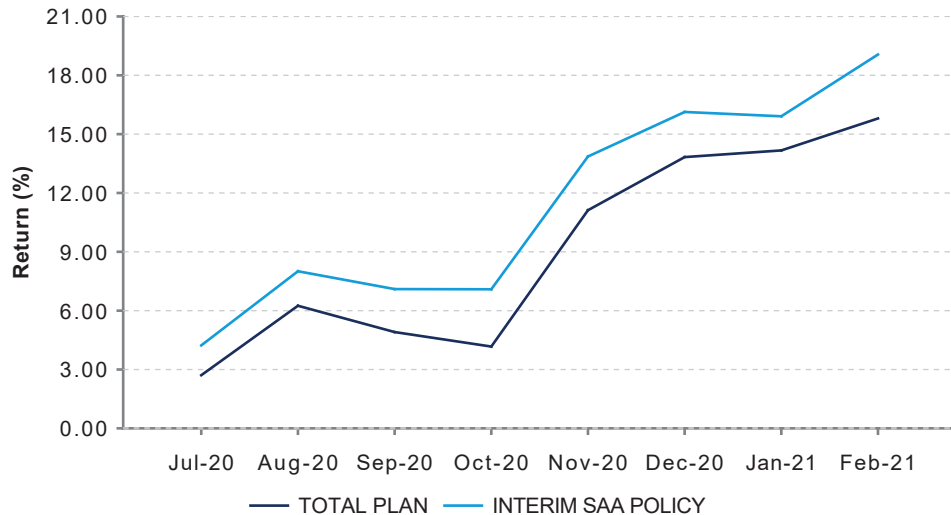
	3 Mth	Fiscal Year to Date	YTD	1 Year	3 Year	5 Year	ITD	Incept Date
TOTAL PLAN	4.21	15.80	1.73	14.74	8.10	10.42	9.66	07/75
INTERIM SAA POLICY	4.56	19.06	2.52	16.31	7.89	9.53	9.30	07/75
Excess	-0.35	-3.25	-0.78	-1.57	0.20	0.89	0.36	

Asset Allocation

	Ending Market Value
TOTAL PLAN	45,972,605,984

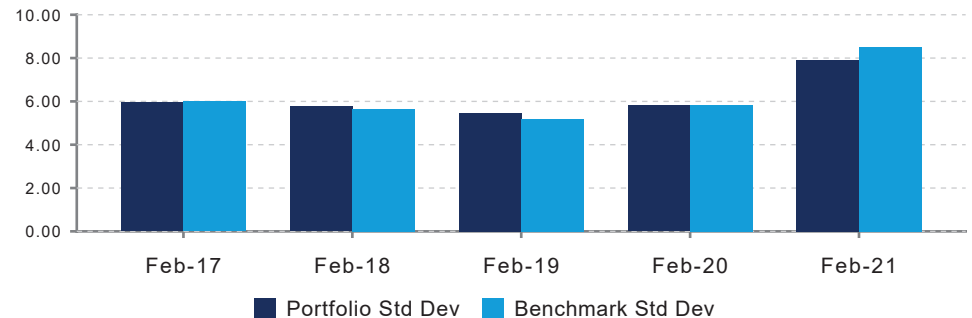


Cumulative Return (%)



3 Year Risk Statistics

	Return	Portfolio Std Dev	Benchmark Std Dev	Sharpe Ratio	Beta	Tracking Error	Information Ratio
TOTAL PLAN	8.10	7.92	8.52	0.83	0.86	3.28	0.06





December 31, 2020
Quarterly Performance

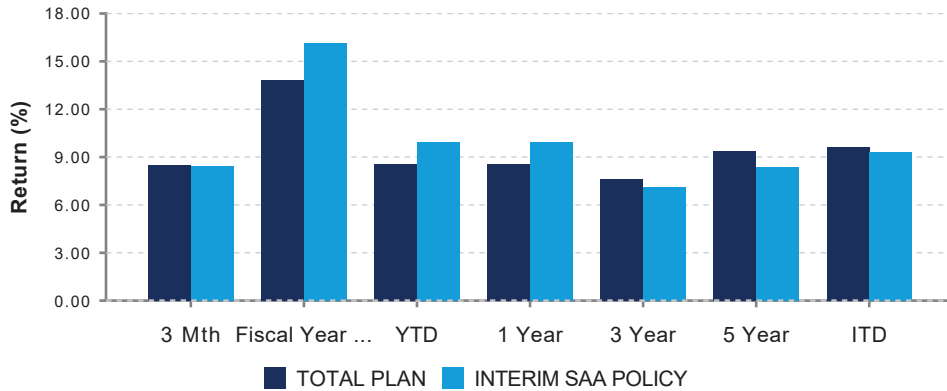
ARIZONA STATE RETIREMENT SYSTEM

December 31, 2020

Net All



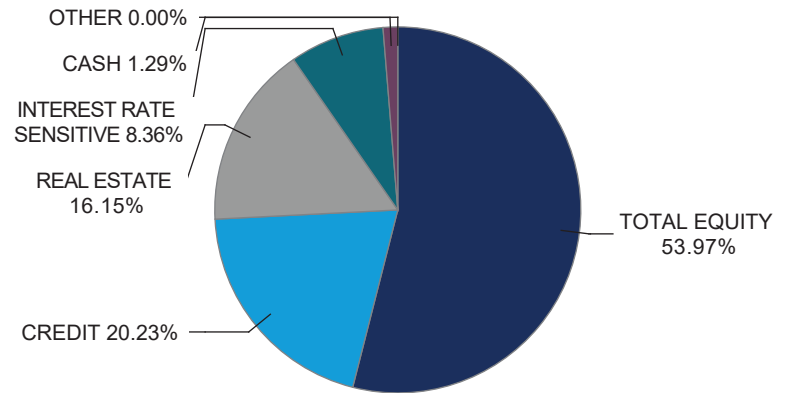
Performance



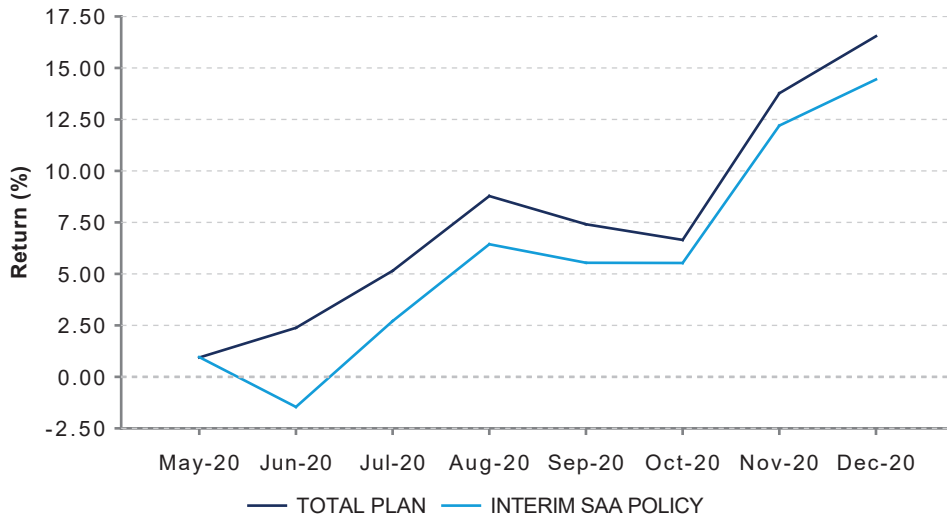
	3 Mth	Fiscal Year to Date	YTD	1 Year	3 Year	5 Year	ITD	Incept Date
TOTAL PLAN	8.51	13.83	8.55	8.55	7.64	9.35	9.65	07/75
INTERIM SAA POLICY	8.43	16.13	9.92	9.92	7.12	8.40	9.28	07/75
Excess	0.07	-2.30	-1.37	-1.37	0.52	0.95	0.38	

Asset Allocation

	Ending Market Value
TOTAL PLAN	45,400,640,216

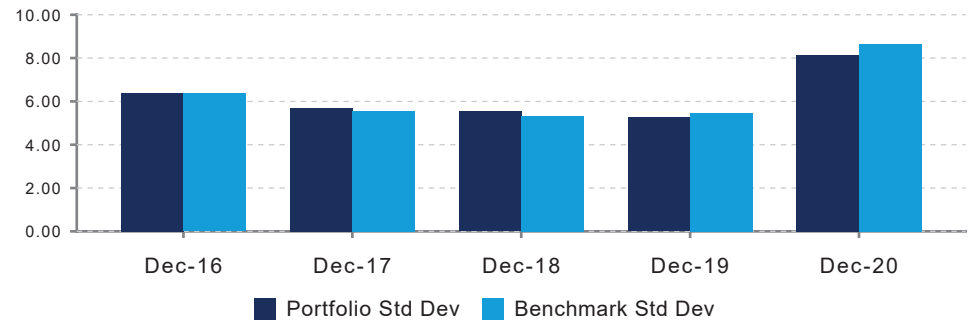


Cumulative Return (%)



3 Year Risk Statistics

	Return	Portfolio Std Dev	Benchmark Std Dev	Sharpe Ratio	Beta	Tracking Error	Information Ratio
TOTAL PLAN	7.64	8.15	8.65	0.74	0.88	3.18	0.17



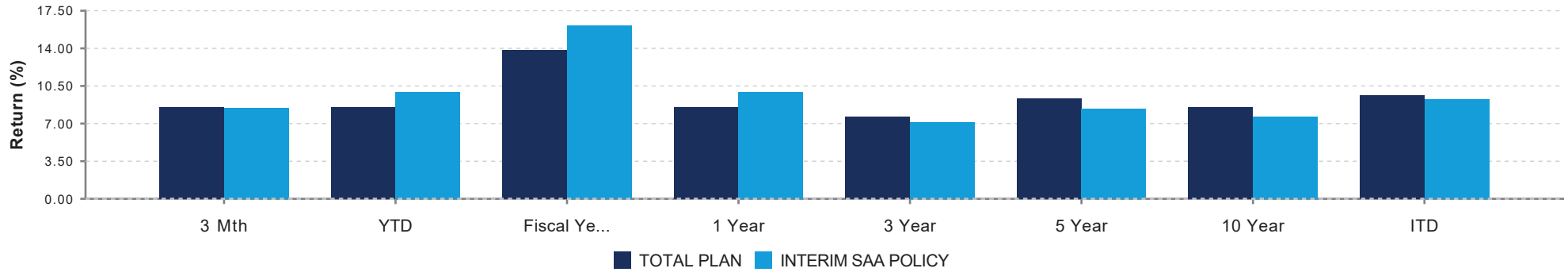
ARIZONA STATE RETIREMENT SYSTEM

December 31, 2020

Net All



Performance



	<u>Ending Market Value</u>	<u>Actual Weight</u>	<u>3 Month</u>	<u>Fiscal Year to Date</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	<u>Since Incept</u>	<u>Inception Date</u>
TOTAL PLAN	45,400,640,216		8.51	13.83	8.55	7.64	9.35	8.56	9.65	01 Jul 1975
INTERIM SAA POLICY			8.43	16.13	9.92	7.12	8.40	7.62	9.28	01 Jul 1975
Excess			0.07	-2.30	-1.37	0.52	0.95	0.94	0.38	
TOTAL EQUITY	24,499,755,377	53.96	14.12	23.32	12.34	8.73	11.34	9.85	7.42	01 Jan 1998
Custom Total Equity Benchmark			14.33	26.01	15.22	9.14	11.97	10.18	7.07	01 Jan 1998
Excess			-0.21	-2.70	-2.88	-0.41	-0.63	-0.33	0.34	
CREDIT	9,185,170,485	20.23	3.10	6.37	6.38	8.08	8.76		7.42	01 Jul 2013
REAL ESTATE	7,334,198,869	16.15	2.39	2.34	-0.14	4.48	7.49	10.70	5.95	01 Dec 2005
Custom ASRS ODCE (Net)			0.27	-1.49	0.33	4.50	5.84	9.33	6.05	01 Dec 2005
Excess			2.12	3.83	-0.47	-0.02	1.65	1.37	-0.11	
INTEREST RATE SENSITIVE	3,793,357,059	8.36	0.69	1.33	7.85	5.45	4.73	4.05	7.83	01 Jul 1975
BBG BARC Agg (Dly)			0.67	1.29	7.51	5.34	4.44	3.84		01 Jul 1975
Excess			0.02	0.04	0.34	0.11	0.30	0.21		
CASH	587,780,261	1.29	0.00	-0.09	0.54	1.51	4.00	1.61	3.90	01 Apr 1990
CASH CUSTOM INDEX			0.03	0.07	0.67	1.52	3.98	1.96	3.25	01 Apr 1990
Excess			-0.03	-0.16	-0.13	-0.01	0.02	-0.35	0.64	
OTHER	378,164	0.00	12.31	97.56	972.93	231.29	107.89		64.06	01 Jul 2013
ICE BofA US 3-Month Treasury Bill			0.03	0.07	0.67	1.61	1.20		0.81	01 Jul 2013
Excess			12.28	97.49	972.26	229.69	106.69		63.25	

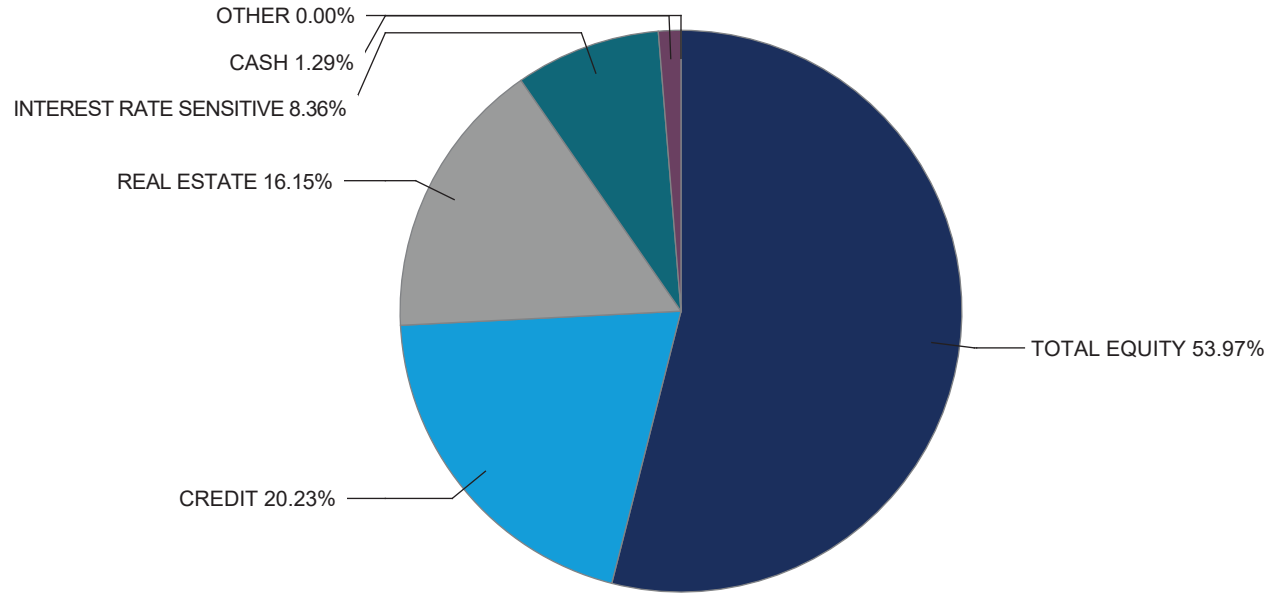
ARIZONA STATE RETIREMENT SYSTEM

December 31, 2020

Net All



Total Fund Allocation



	Market Value (\$000)	Weight (%)
TOTAL EQUITY	24,499,755,377	54.0
CREDIT	9,185,170,485	20.2
REAL ESTATE	7,334,198,869	16.2
INTEREST RATE SENSITIVE	3,793,357,059	8.4
CASH	587,780,261	1.3
OTHER	378,164	0.0

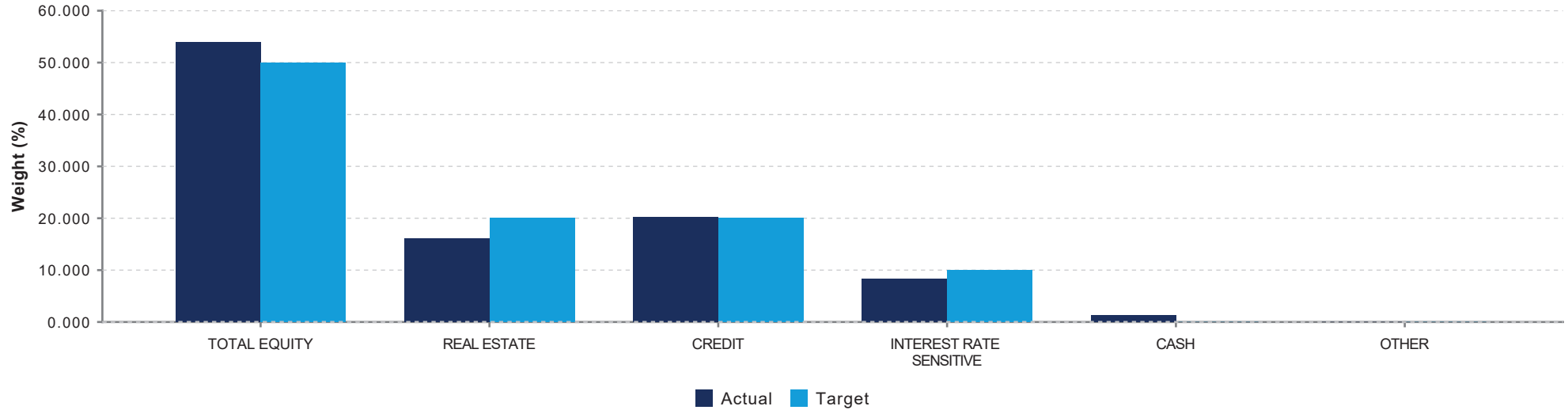
ARIZONA STATE RETIREMENT SYSTEM

December 31, 2020

Net All



Actual vs Target Weights



	Ending Market Value	Actual	Target	Relative	Min	Max
TOTAL PLAN	45,400,640,216	100.0	100.0	0.0		
TOTAL EQUITY	24,499,755,377	54.0	50.0	4.0	35.0	65.0
REAL ESTATE	7,334,198,869	16.2	20.0	-3.8	10.0	30.0
CREDIT	9,185,170,485	20.2	20.0	0.2	10.0	30.0
INTEREST RATE SENSITIVE	3,793,357,059	8.4	10.0	-1.6	0.0	20.0
CASH	587,780,261	1.3	0.0	1.3	0.0	5.0
OTHER	378,164	0.0	0.0	0.0	0.0	10.0

ARIZONA STATE RETIREMENT SYSTEM

December 31, 2020

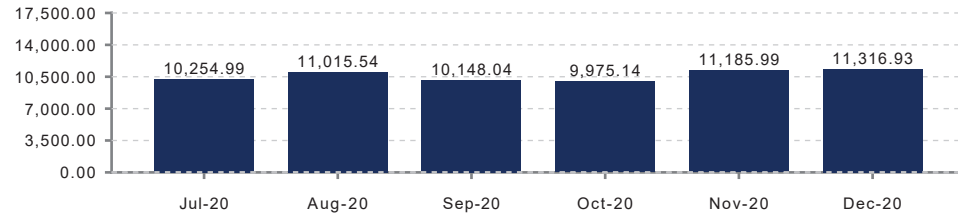
Net All



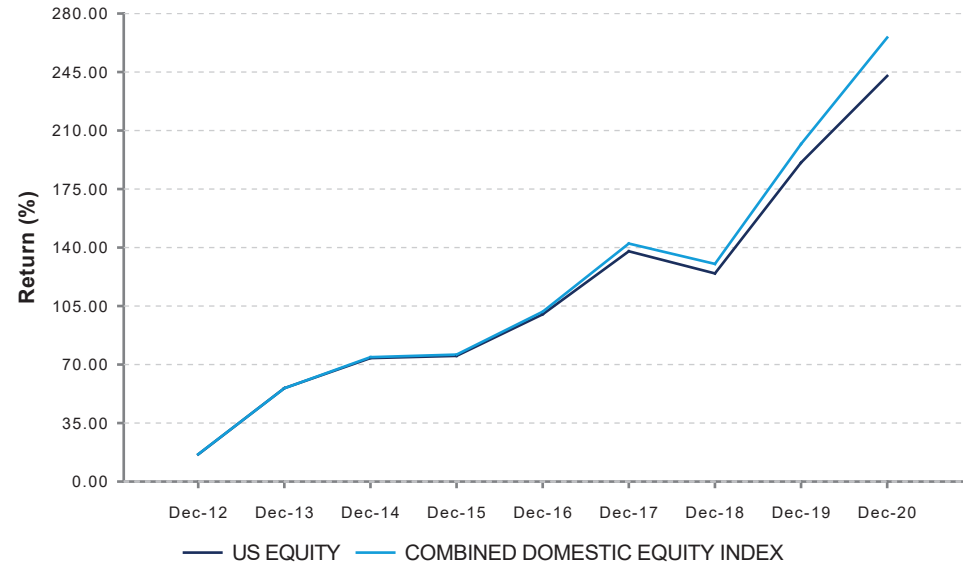
Record of Asset Growth

	One Quarter	One Year	Three Years
US EQUITY			
Beginning Market Value	10,148,038,150	10,545,319,497	10,341,094,850
Net Cash Flow	-328,213,266	-1,016,822,885	-2,334,403,266
Income Received	45,679,461	161,484,571	294,363,031
Gain/Loss	1,451,426,345	1,626,949,506	3,663,091,404
Ending Market Value	11,316,930,687	11,316,930,687	11,316,930,687

Net Asset Values over Time (\$MM)



Cumulative Return (%)



Rates of Return



	3 Mth	Fiscal Year to Date	YTD	1 Year	3 Year	5 Year	ITD	Dec 31 2018	Dec 31 2019	Dec 31 2020
US EQUITY	14.80	25.28	17.82	17.82	12.96	14.36	11.46	-5.56	29.53	17.82
COMBINED DOMESTIC EQUITY INDEX	14.70	25.28	21.10	21.10	14.68	15.75	11.69	-5.02	31.14	21.10
Excess	0.10	0.00	-3.27	-3.27	-1.73	-1.39	-0.22	-0.54	-1.62	-3.27

ARIZONA STATE RETIREMENT SYSTEM

December 31, 2020

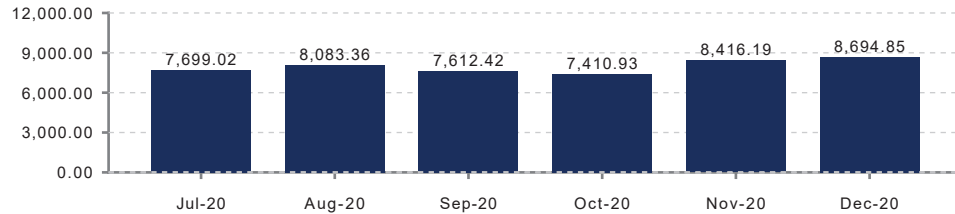
Net All



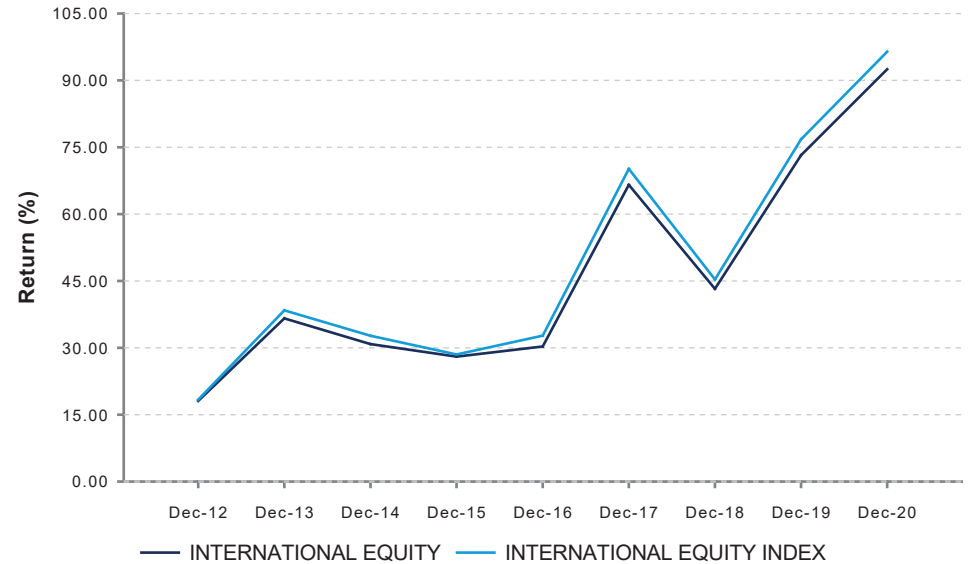
Record of Asset Growth

	One Quarter	One Year	Three Years
INTERNATIONAL EQUITY			
Beginning Market Value	7,612,421,587	8,513,121,963	9,317,680,354
Net Cash Flow	-209,358,634	-624,922,095	-2,080,835,255
Income Received	22,295,839	150,627,085	397,330,293
Gain/Loss	1,269,488,246	656,020,276	1,764,005,982
Ending Market Value	8,694,847,253	8,694,847,253	8,694,847,253

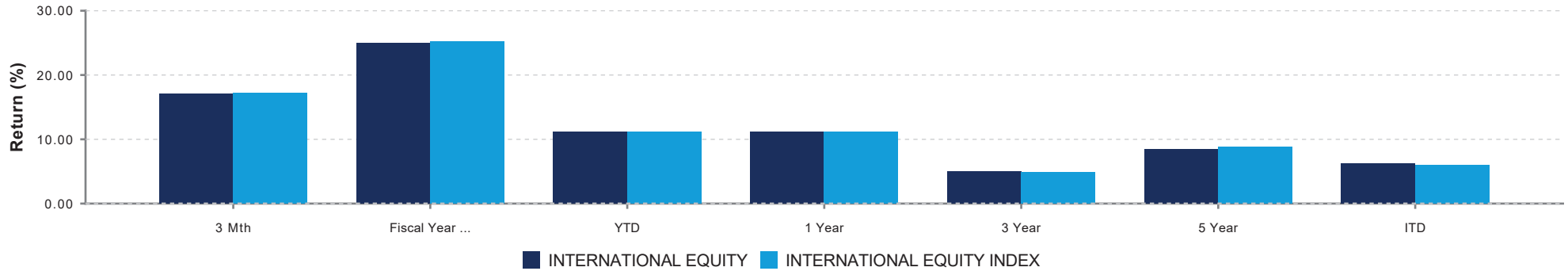
Net Asset Values over Time (\$MM)



Cumulative Return (%)



Rates of Return



	3 Mth	Fiscal Year to Date	YTD	1 Year	3 Year	5 Year	ITD	Dec 31 2018	Dec 31 2019	Dec 31 2020
INTERNATIONAL EQUITY	17.08	24.96	11.14	11.14	4.94	8.50	6.20	-14.00	20.92	11.14
INTERNATIONAL EQUITY INDEX	17.22	25.19	11.12	11.12	4.90	8.86	5.98	-14.58	21.63	11.12
Excess	-0.14	-0.22	0.02	0.02	0.04	-0.36	0.23	0.58	-0.71	0.02

ARIZONA STATE RETIREMENT SYSTEM

December 31, 2020

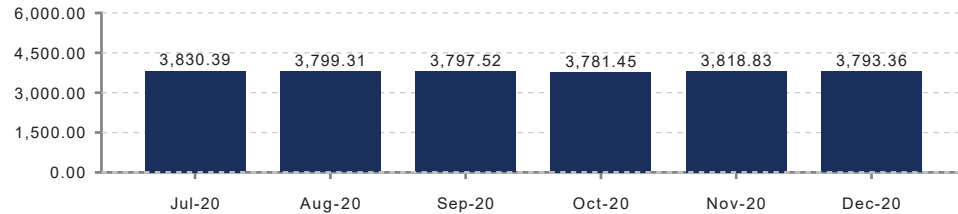
Net All



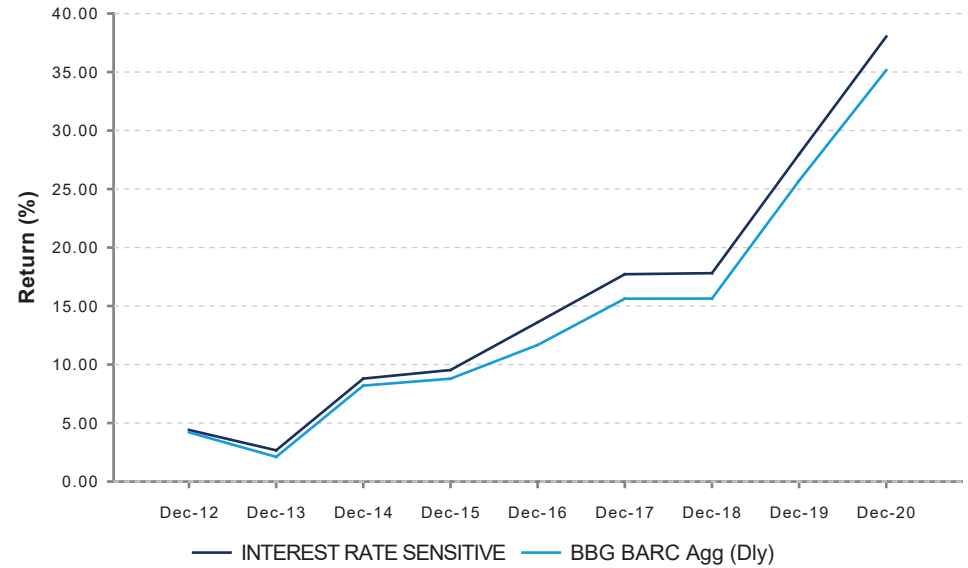
Record of Asset Growth

	One Quarter	One Year	Three Years
INTEREST RATE SENSITIVE			
Beginning Market Value	3,797,515,888	4,259,619,274	3,942,871,074
Net Cash Flow	-30,131,770	-745,117,998	-744,727,271
Income Received	14,273,290	59,001,793	155,765,795
Gain/Loss	11,699,651	219,853,990	519,761,433
Ending Market Value	3,793,357,059	3,793,357,059	3,793,357,059

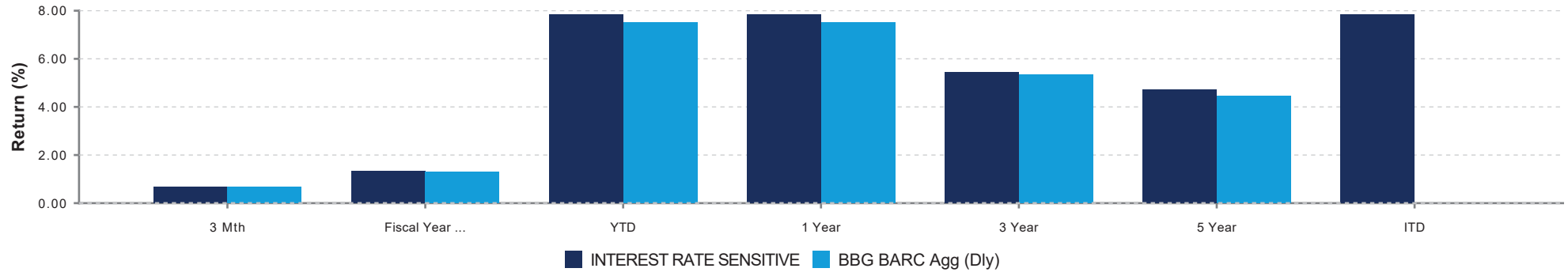
Net Asset Values over Time (\$MM)



Cumulative Return (%)



Rates of Return



	3 Mth	Fiscal Year to Date	YTD	1 Year	3 Year	5 Year	ITD	Dec 31 2018	Dec 31 2019	Dec 31 2020
INTEREST RATE SENSITIVE	0.69	1.33	7.85	7.85	5.45	4.73	7.83	0.08	8.64	7.85
BBG BARC Agg (Dly)	0.67	1.29	7.51	7.51	5.34	4.44	7.51	0.01	8.72	7.51
Excess	0.02	0.04	0.34	0.34	0.11	0.30	0.32	0.06	-0.08	0.34

ARIZONA STATE RETIREMENT SYSTEM

December 31, 2020

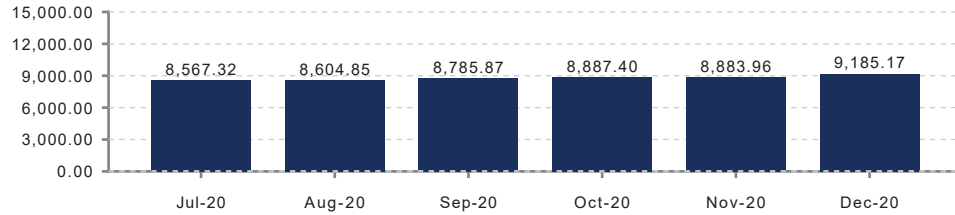
Net All



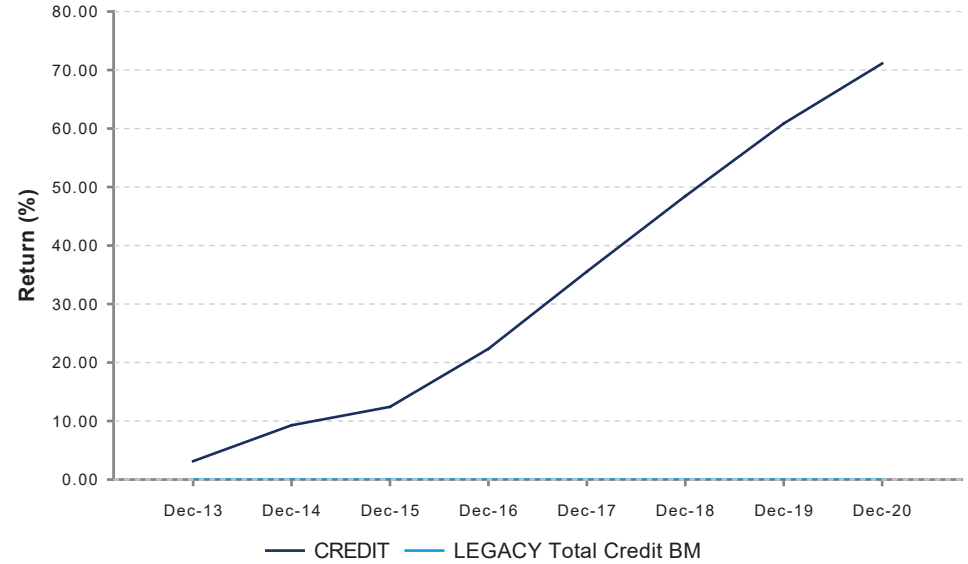
Record of Asset Growth

	One Quarter	One Year	Three Years
CREDIT			
Beginning Market Value	8,785,865,292	8,247,468,410	6,192,140,427
Net Cash Flow	125,181,898	402,357,683	1,258,702,812
Income Received	138,674,085	517,836,746	1,101,429,970
Gain/Loss	135,449,209	17,507,646	366,540,299
Ending Market Value	9,185,170,485	9,185,170,485	9,185,170,485

Net Asset Values over Time (\$MM)



Cumulative Return (%)



Rates of Return



	3 Mth	Fiscal Year to Date	YTD	1 Year	3 Year	5 Year	ITD	Dec 31 2018	Dec 31 2019	Dec 31 2020
CREDIT	3.10	6.37	6.38	6.38	8.08	8.76	7.42	9.52	8.35	6.38
LEGACY Total Credit BM								7.22	5.68	
Excess								2.30	2.67	

ARIZONA STATE RETIREMENT SYSTEM

December 31, 2020

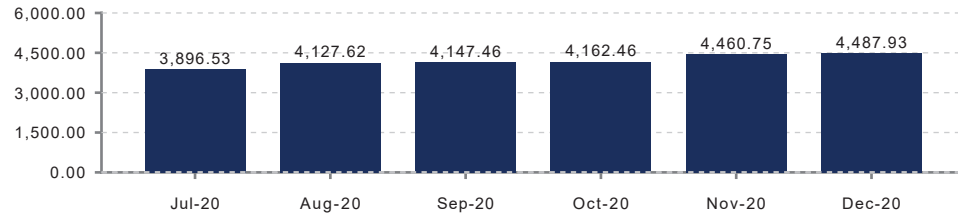
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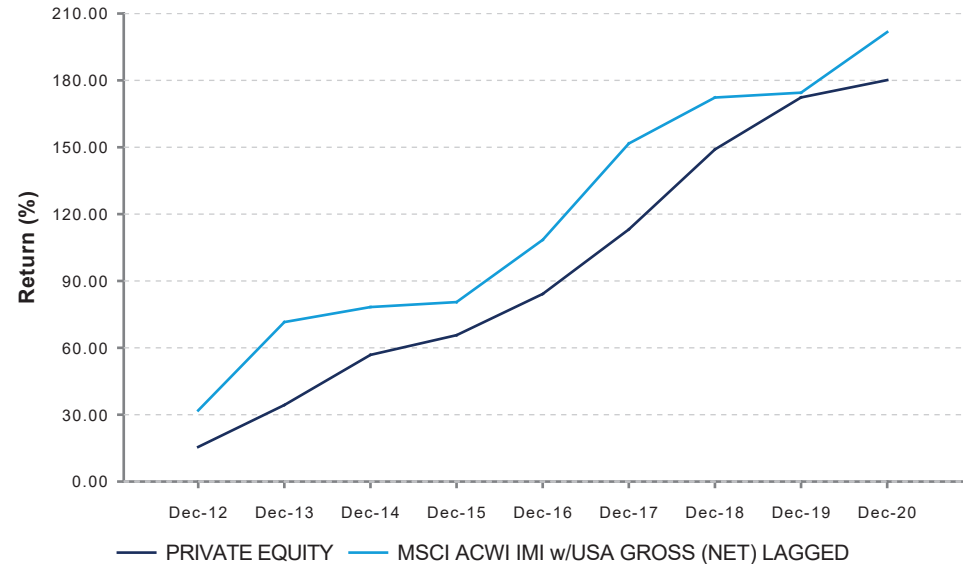
Record of Asset Growth

	One Quarter	One Year	Three Years
PRIVATE EQUITY			
Beginning Market Value	4,147,457,005	4,142,052,530	3,212,600,153
Net Cash Flow	41,965,905	217,174,298	254,352,320
Income Received	168,070,987	373,027,935	1,294,248,490
Gain/Loss	130,439,478	-244,321,281	-458,242,898
Ending Market Value	4,487,934,270	4,487,934,270	4,487,934,270

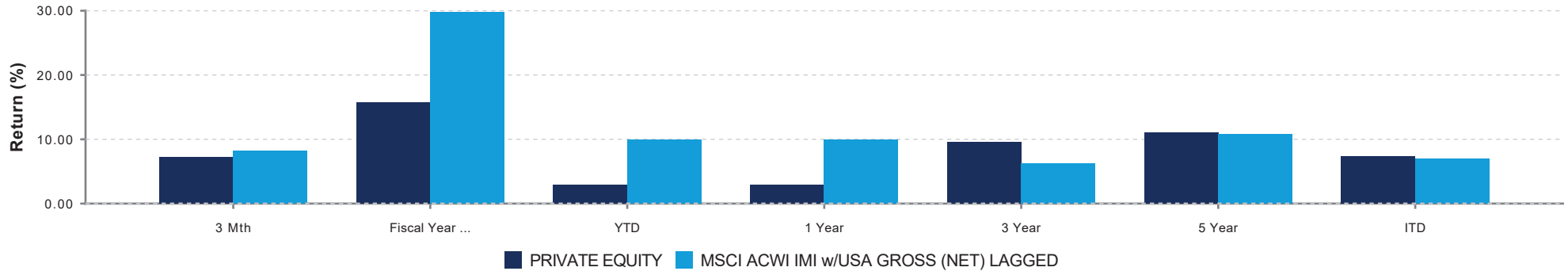
Net Asset Values over Time (\$MM)



Cumulative Return (%)



Rates of Return



	3 Mth	Fiscal Year to Date	YTD	1 Year	3 Year	5 Year	ITD	Dec 31 2018	Dec 31 2019	Dec 31 2020
PRIVATE EQUITY	7.17	15.74	2.86	2.86	9.54	11.08	7.31	16.84	9.37	2.86
MSCI ACWI IMI w/USA GROSS (NET) LAGGED	8.18	29.73	9.91	9.91	6.23	10.82	6.91	8.20	0.80	9.91
Excess	-1.00	-14.00	-7.04	-7.04	3.31	0.26	0.40	8.63	8.57	-7.04

ARIZONA STATE RETIREMENT SYSTEM

December 31, 2020

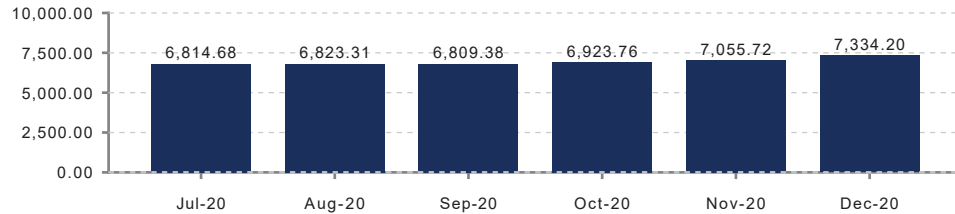
Net All



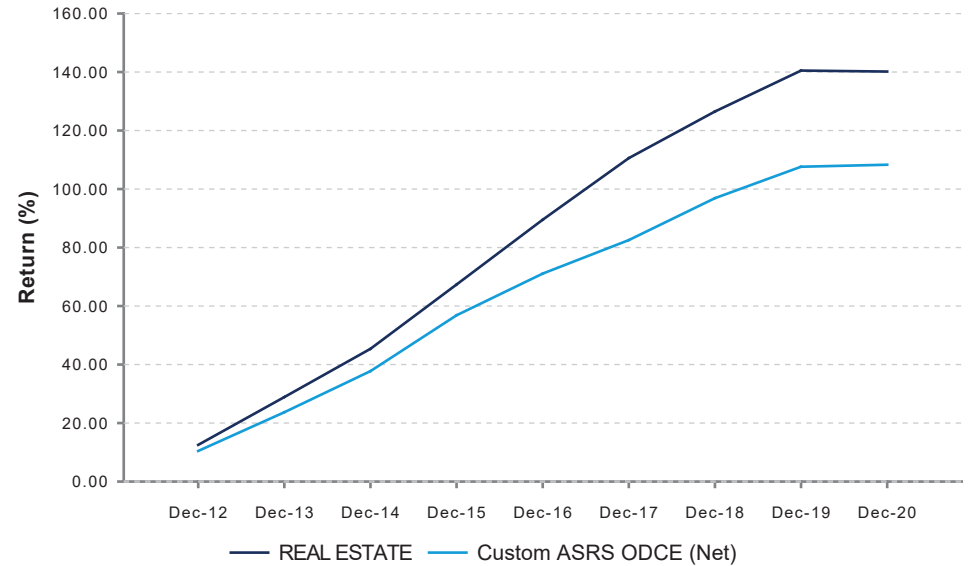
Record of Asset Growth

	One Quarter	One Year	Three Years
REAL ESTATE			
Beginning Market Value	6,809,376,591	6,642,403,165	3,515,926,347
Net Cash Flow	359,518,670	691,825,234	2,022,310,140
Income Received	167,681,932	307,386,717	642,111,332
Gain/Loss	-2,378,324	-307,416,247	-145,729,818
Ending Market Value	7,334,198,869	7,334,198,869	7,334,198,869

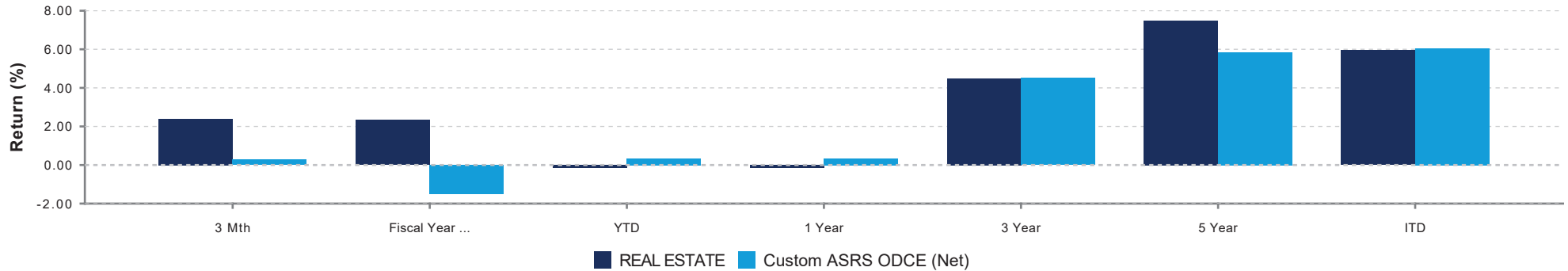
Net Asset Values over Time (\$MM)



Cumulative Return (%)



Rates of Return



	3 Mth	Fiscal Year to Date	YTD	1 Year	3 Year	5 Year	ITD	Dec 31 2018	Dec 31 2019	Dec 31 2020
REAL ESTATE	2.39	2.34	-0.14	-0.14	4.48	7.49	5.95	7.57	6.18	-0.14
Custom ASRS ODCE (Net)	0.27	-1.49	0.33	0.33	4.50	5.84	6.05	7.85	5.46	0.33
Excess	2.12	3.83	-0.47	-0.47	-0.02	1.65	-0.11	-0.28	0.72	-0.47

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Private Assets
Quarterly Internal Rates of Return

ARIZONA STATE RETIREMENT SYSTEM



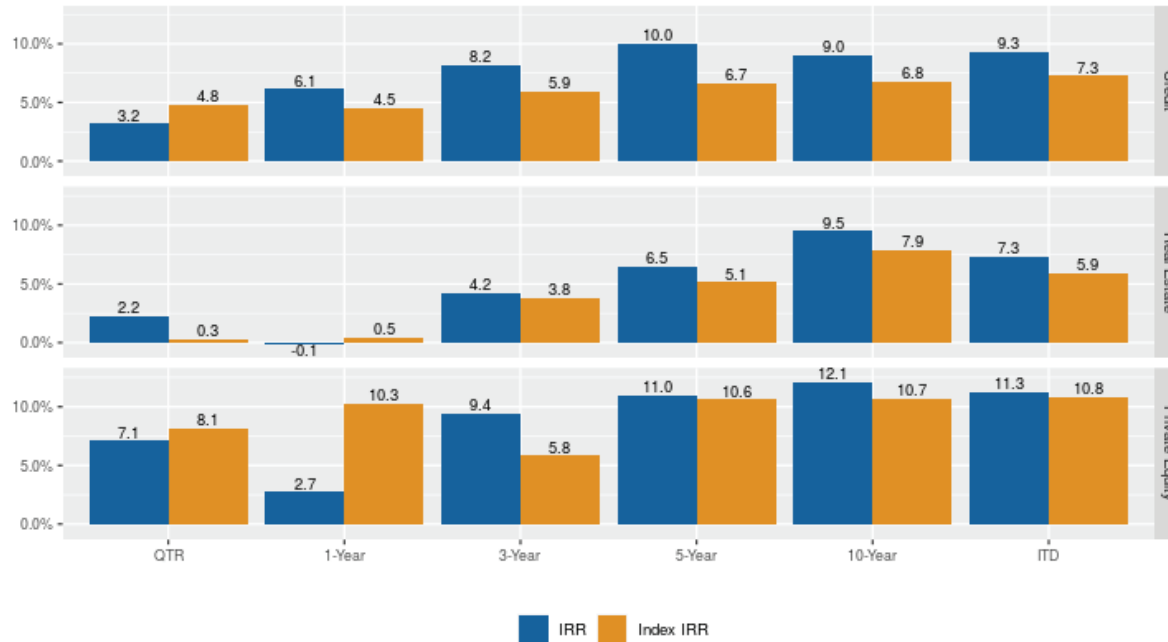
		◆ NAV	◆ QTR	◆ 1-Year	◆ 3-Year	◆ 5-Year	◆ 10-Year
1	Credit	8,984	3.19	6.13	8.19	10.01	8.99
2	Index IRR		4.79	4.53	5.94	6.68	6.79
3	Excess		-1.59	1.60	2.26	3.33	2.21
4	Real Estate	6,955	2.24	-0.10	4.19	6.49	9.49
5	Index IRR		0.27	0.47	3.81	5.13	7.86
6	Excess		1.97	-0.57	0.38	1.36	1.63
7	Private Equity	4,413	7.11	2.72	9.38	11.02	12.08
8	Index IRR		8.13	10.31	5.83	10.62	10.72
9	Excess		-1.02	-7.58	3.55	0.39	1.36



Trailing Period IRRs

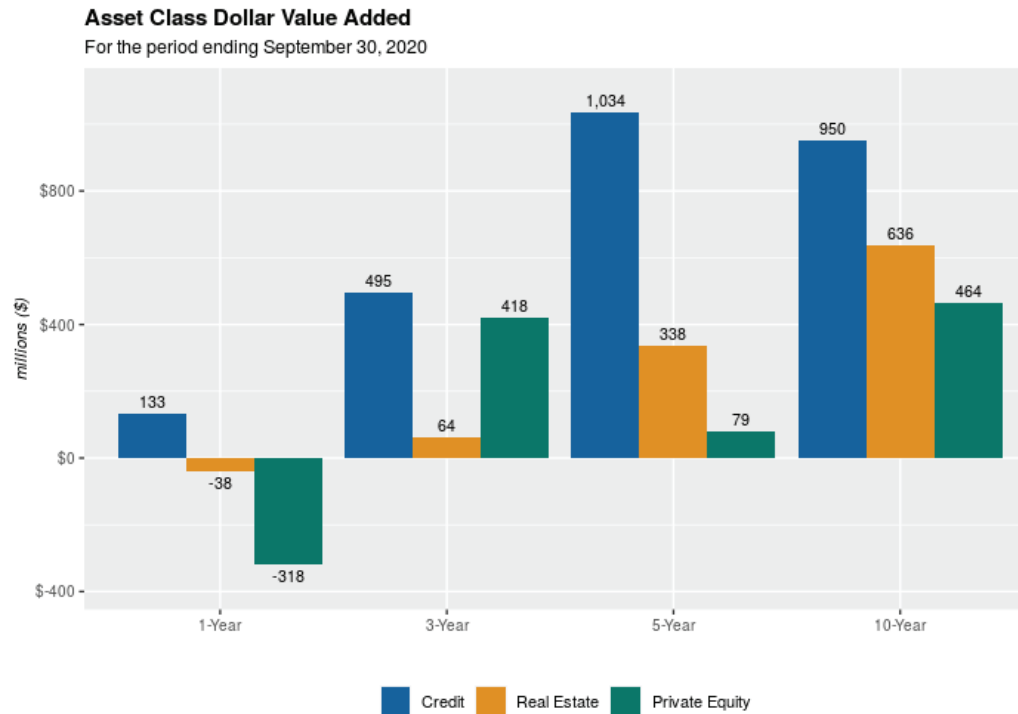
Private Summary Trailing Period IRRs

For the period ending September 30, 2020





Dollar Value Add





External Reports

ASRS INVESTMENT OBJECTIVES

Goal #4: Design, implement, and maintain an investment management program that maximizes rates of return for acceptable of levels of risk.

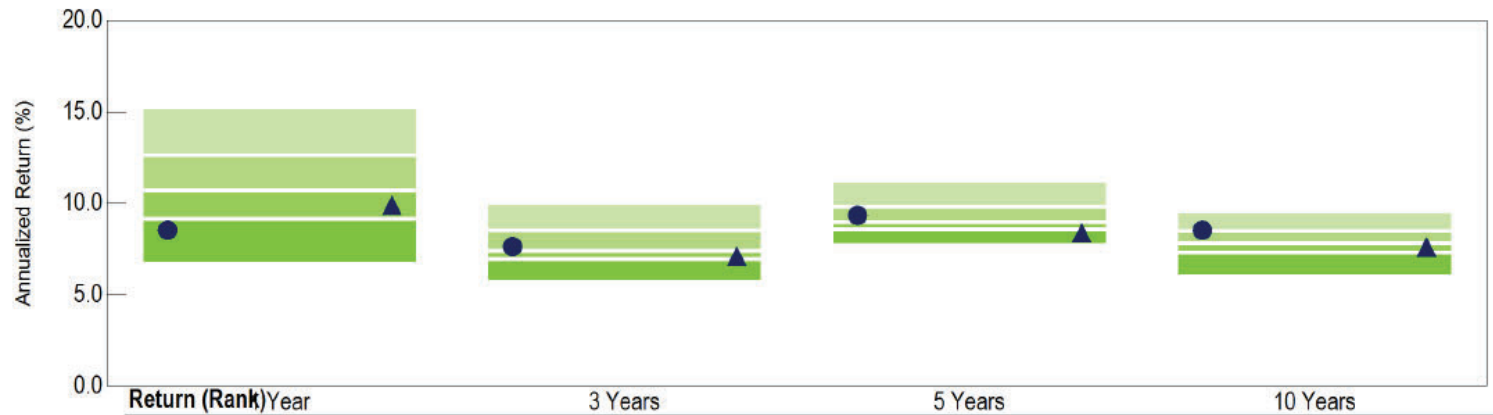
- a) Develop, approve and implement an Asset Allocation program that is expected to achieve a 20-year rolling average annual return at or above the actuarial assumed return
Goal met: Yes
- b) Achieve a total fund net return in the top quartile of the peer universe
Goal met: Partial
- c) Achieve a 1 year total fund net return greater than the Strategic Asset Allocation Benchmark
Goal met: No
- d) Achieve a 3-year total fund net return greater than the Strategic Asset Allocation Benchmark
Goal met: Yes
- e) Achieve 1 year asset class net returns greater than the respective Asset Allocation Benchmarks
Goal met: Partial
- f) Achieve 3 year asset class net returns greater than the respective Asset Allocation Benchmarks
Goal met: Partial
- g) Sufficient cash will be maintained to meet all payment requirements
Goal met: Yes



Source: ASRS Strategic Plan, August 2018

UNIVERSE COMPARISON

InvMetrics Public DB > \$1B Net Return Comparison
Ending December 31, 2020



5th Percentile
25th Percentile
Median
75th Percentile
95th Percentile

Return (Rank)	Year	3 Years	5 Years	10 Years
	15.2	10.0	11.2	9.6
	12.7	8.6	9.9	8.5
	10.8	7.4	9.0	7.9
	9.2	7.0	8.6	7.3
	6.8	5.7	7.7	6.0

	1 Year	3 Years	5 Years	10 Years
● Total Fund	8.5	7.6	9.4	8.5
Total Fund Percentile Rank	86	48	37	24
Total Fund Ordinal Rank	69	38	30	18
Number of Funds In Universe	80	80	80	73
▲ Interim SAA Policy	9.9	7.1	8.4	7.6





RISK Reports

▀ Total Portfolio Value-At-Risk (VAR)

As of December 31st, 2020 Total VaR for ASRS Portfolio was 25.69%, indicating that there is a 5% chance that portfolio could lose ~\$11.33B in a given year. Note that a 5% event is expected to occur every 20 years

