



*City of Bristol
Retirement Board*

INFORMATION TO ACCESS THIS MEETING

<https://bristolct-gov.zoom.us/j/84609765583?pwd=t4wn0ulSsTxK4zp47Nejq3A4buAD40.1>

*Meeting ID: 846 0976 5583
Passcode: 882504*

The regular Retirement Board meeting will be held on Thursday, August 14, 2025, at 5:00 PM. in City Hall Council Chambers, 111 North Main Street, Bristol, CT.

AGENDA

1. Call to Order
2. Public Participation
3. Approval of Minutes
 - a. 25July Minutes
4. Treasurer's Report
 - a. 25July Treasurers Report
5. Consent Agenda
 - a. 25August Retirements
6. Investment Review- Beirne Wealth Consulting, LLC.
 - a. General Fund
7. Any other business proper to come before meeting
8. Adjournment

PER ORDER OF THE CHAIRPERSON
Thomas Barnes, Jr

**MEETING OF THE GENERAL
GOVERNMENT RETIREMENT BOARD**

July 10, 2025

A Regular meeting of the General Government Retirement Board was held on **July 10, 2025 at 5:00 p.m.** in the City Hall Council Chamber, 1st floor, City Hall, 111 North Main Street, Bristol, CT. Members present: Chairman Tom Barnes Jr. (Zoom), Vice Chairman Robert Parenti (Zoom), Comptroller Diane M. Waldron, Mayor Jeffrey Caggiano (Zoom), Council member Jacqueline Olsen, Commissioners Adam Rudolewicz (Zoom), William Veits, Peter Dauphinais, Thomas DeNoto and Mathew Ragaini. Absent: Commissioner David Maikowski.

Also present: John Oliver Beirne, from Beirne Wealth Consulting.

1. Call to Order

Pledge of Allegiance

The meeting was called to order at 5:00 p.m. by Chairman Tom Barnes Jr.

2. Public Participation

None.

3. Approval of the minutes

a. General Government Retirement Board – Regular Meeting on June 12, 2025.

A motion was made by Comptroller Waldron and seconded by Commissioner Veits and it was unanimously voted to:

“Approve the minutes of the General Government Retirement Board Regular Meeting of June 12, 2025 and place them on file.”

4. Treasurers Report

a. June 2025.

A motion was made by Comptroller Waldron, and seconded by Commissioner DeNoto and it was unanimously voted to:

“Accept the Treasurer’s Report for June 2025, and place it on file.”

5. Consent Agenda.

- a. Consideration of a request to approve a Deferred Retirement Option Pension (DROP) for Deputy Chief Mark Martin Fire Department Local 773 effective July 06, 2025.
- b. Consideration of a request to approve a Deferred Retirement Option Pension (DROP) for Captain Brian D’Amato Fire Department Local 773 effective July 05, 2025.
- c. Consideration of a request to approve a Deferred Retirement Option Pension (DROP) for Deputy Chief David Butkus Fire Department Local 773 effective July 18, 2025.
- d. Consideration of a request to approve the Normal Retirement from Gail Carriere, Bristol Board of Education Department, Local 2267 Union effective June 19, 2025 with an annual pension amount of \$19,417.50 or \$1,618.13 monthly

- e. Consideration of a request to approve the Normal Retirement with 100% Contingent Annuitant from Lori Laurencelle, Bristol Burlington Health Department, Local 1303 Union effective June 19, 2025 with an annual pension amount of \$ 30,401.85 or \$2,533.49 monthly.
- f. Consideration of a request to approve the Normal Retirement from Diana Drogosek Thigpen, Bristol Board of Education Department, CAFÉ Union effective June 21, 2025 with an annual pension amount of \$14,383.02 or \$1,198.59 monthly.
- g. Consideration of a request to approve the Early Retirement from Andrew Ingvertsen, Bristol Board of Education Department, Local 818 Union effective May 31, 2025 with an annual pension amount of \$31,710.38 or \$2,642.53 monthly.
- h. Consideration of a request to approve the Early Retirement from Jill MacDonald, Bristol Library Department, Local 233 Union effective June 19, 2025 with an annual pension amount of \$6,134.07 or \$511.17 monthly.
- i. Consideration of a request to approve the Normal Retirement from Deborah Alos, Bristol Board of Education Department, Local 2267 Union effective June 28, 2025 with an annual pension amount of \$44,007.57 or \$3,667.30 monthly.
- j. Consideration of a request to approve the Early Retirement from Susan D'Amato, Bristol Board of Education Department, Local 2267 Union effective June 19, 2025 with an annual pension amount of \$2,911.79 or \$242.65 monthly

A motion was made by Mayor Caggiano and seconded by Council member Olsen and it was unanimously voted to:

“Approve Consent Agenda Items 5a through 5j.”

6. Investment Review – Beirne Wealth Consulting, LLC.

John Oliver gave a brief report on the year-end closing numbers. Regardless of the market volatility, numbers were very favorable. John was very thrilled to see the results. Despite some numbers missing, he was very optimistic about the final outcome. He mentioned that while working on evaluating each manager and their performance, some concerns arose about some managers that are not meeting their goals. John is planning to create an “improved performance list” and watch how these managers continue to perform and recommend any action as needed.

John proceeded to explained the current portfolio market value \$853,348,299.

Credit - market value \$164,635,994 = 19.29% of portfolio.

- High Quality Credit market value \$78,814,183 = 9.24% of portfolio.
- Multi-Credit market value \$85,821,811 = 10.06% of portfolio.

Equity - market value \$429,141,848 = 50.29% of portfolio.

- Public Equity market value \$342,215,902 = 40.10% of portfolio.
- Private Equity market value \$86,925,946 = 10.19% of portfolio.

Alternatives - market value \$253,500,833 = 29.71% of portfolio.

- Real Estate market value \$65,457,014 = 7.67% of portfolio.
- Commodities market value \$6,036,506 = 0.71% of portfolio.
- Differentiated Return Stream market value \$181,980,313= 21.33% of portfolio.

Cash - market value \$6,069,624= 0.71% of portfolio.

7. Any other business proper to come before meeting.

None.

At 5:26 p.m. a motion was made by Commissioner Veits and seconded by Commissioner DeNoto and it was unanimously voted to:

“Adjourn.”

Respectively submitted,

Diane M. Waldron
Comptroller and Secretary, Retirement Board

DRAFT

Treasurer's Report
Police, Firefighters, Retirement System Fund
July 2025

	Police 710	Firefighter 711	Retirement 712/715	Total
<u>Pension Funds in Pension Bank Accounts</u>				
CASH & CASH EQUIVALENTS: 07/01/2025	\$ 124,124.91	\$ 188,830.07	\$ 579,239.72	\$ 892,194.70
<u>RECEIPTS:</u>				
Employee Contributions City/BDA/WPC	43,761.25	21,442.53	79,311.67	144,515.45
Employee Contributions BOE			113,722.60	113,722.60
Employee Contributions Health Dept			14,848.56	14,848.56
Employee Contributions Water Dept			10,745.17	10,745.17
Employer Contributions BOE			-	-
Employer Contributions City/BDA/WPC			-	-
Employer Contributions Water Dept			-	-
Employee Contributions Buy Back			209.80	209.80
Employee Contributions Fire Dept Healthcare 1.00%			7,147.47	7,147.47
Employee Contributions Police Healthcare 1.625%, 1.875%			14,587.06	14,587.06
Employee Contributions Retiree Healthcare -Health Dept - 1.5%			3,928.10	3,928.10
Employee Contributions Retiree Healthcare 233 - 1.5%, 1.75%			10,319.98	10,319.98
Employee Contributions Retiree Healthcare BPSA - 1.5%, 1.75%			7,070.90	7,070.90
Employee Contributions Retiree Healthcare - 1338 -1.5%, 1.75%			10,446.36	10,446.36
Employee Contributions Retiree Healthcare -NBAR - 1.5%, 1.75%			2,006.41	2,006.41
Employee Contributions Retiree Healthcare -BOE NBAR / 818- 1.5%			6,775.65	6,775.65
Miscellaneous Income			-	-
Interest	55.80	76.74	193.50	326.04
Total Receipts, Contributions and Interest	43,817.05	21,519.27	281,313.23	346,649.55
<u>EXPENDITURES:</u>				
Pensions Paid <i>P, F, R total retirees</i>	768,146.96	444,737.02	1,672,193.17	2,885,077.15
Refund of Contributions / Interest	18,592.28	-	94,204.34	112,796.62
Fiduciary Insurance	15,008.66	15,008.67	15,008.67	45,026.00
Legal- Robinson & Cole	-	-	-	-
Actuary- Milliman	-	-	-	-
Accountant/Bookkeeper Salaries (Note 1)	3,238.19	3,238.19	3,238.18	9,714.56
Comptroller/Assistant to Comptroller Salaries (Note 1)	2,915.80	2,915.80	2,915.80	8,747.40
Postage (Note 1)	19.40	17.46	147.66	184.52
Other Expenses / (Revenue) (Tyler Technologies)			-	-
Total Expenditures	807,921.29	465,917.14	1,787,707.82	3,061,546.25
CURRENT MONTH, Surplus/(deficit)	(764,104.24)	(444,397.87)	(1,506,394.59)	(2,714,896.70)
TRSFYR IN-FIDELITY TO PENSION	785,000.00	455,000.00	1,430,000.00	2,670,000.00
CASH & CASH EQUIVALENTS: 7/31/2025	\$ 145,020.67	\$ 199,432.20	\$ 502,845.13	\$ 847,298.00
(Beginning Bal+Current Month+Transfer in)				
<u>Pension Trust Funds</u>				
Market Value at July 1, 2024 (Note 2)				\$ 787,081,248
Actuarial Value at July 1, 2024 (Note 2)				\$ 766,895,958
Accrued Liability				\$ (623,550,579)
Pension Surplus (Unfunded Liability)				\$ (143,345,379)
Funded Ratio= Actuarial Value divided by Accrued Liability				123.0%

Note 1: Amount will be invoiced quarterly by the Comptroller's office to the Pension fund.

Note 2: Source: Milliman Actuarial Valuation as of July 1, 2024 projected for fiscal year 2025-26, final report dated February 7, 2025.

Pension Calculation Worksheet

Disability Retirement- Veteran Reserve

NAME:	Christopher Bird	Employee #:	7072
		Job Class:	3000
		Grade/Rank:	01/07
Effective Date:	7/3/2025	Pension Class:	9001
		Grade/Rank:	61/29
Salary:	95,800.00		

Balance Sick Hours:	1,084.20	
	x 0.45	contract rate
	487.89	
	x 48.9944	hourly rate
	23,903.88	
	x 0.40	per contract
	9,561.55	

Base Salary	95,800.00	
40% sick	9,561.55	
	105,361.55	
	x 0.70	
	73,753.09	
	/ 52.1428	
	1,414.44	
	x 2	bi-weekly
New Bi-weekly Rate	2,828.89	

Prepared By:	Maria Ochoa	7/24/2025
Deputy Treasurer:	<i>Lyn A Boddy</i>	7/24/25
Comptroller/Assist.:	<i>Diane M Walden</i>	7/28/25

Pension Calculation Worksheet

Disability Retirement-Veteran Reserve

NAME:	Alan Clark	Employee #:	6673
		Job Class:	3020
		Grade/Rank:	03/01
Effective Date:	7/16/2025	Pension Class:	9021
		Grade/Rank:	65/12
Salary:	127,686.00		

Balance Sick Hours:	1,600.00		
	x	<u>0.45</u>	contract rate
		720.00	
	x	<u>65.3017</u>	hourly rate
		47,017.22	
	x	<u>0.40</u>	per contract
		18,806.89	

Base Salary	127,686.00		
40% sick	18,806.89		
	146,492.89		
	x	<u>0.70</u>	
	102,545.02		
	/	<u>52.1428</u>	
	1,966.62		
	x	<u>2</u>	bi-weekly
New Bi-weekly Rate	3,933.24		

Prepared By:	Maria Ochoa	7/7/2025	
Deputy Treasurer:	<i>Ryan J. Bellay</i>	7/7/25	
Comptroller/Assist.:	<i>Deanne M. Walsworth</i>	7/28/25	

**CITY OF BRISTOL-GENERAL CITY RETIREMENT
BENEFIT CALCULATION**

Department: Purchasing
Group: BPSA Union

Employee: Roger Rousseau
Soc.Sec: "On File"

Date of Retire: 7/26/2025 86 rule:80/85

Normal Retirement

w/ CA 100.00%

CALENDAR YEAR	GROSS EARNINGS	PENSION CALCULATION
2025	\$ 138,033.63 *	Highest Three Years:
2024	\$ 122,678.43 *	
2023	\$ 119,542.26 *	\$ 138,033.63
2022	\$ 116,712.58 *	\$ 122,678.43
	\$ (65,870.66) *	\$ 119,542.26
2021	\$ 113,054.78	\$ 116,712.58
2020	\$ 112,408.06	\$ (65,870.66)
2019	\$ 107,728.90	
2018	\$ 107,539.26	Calculation: \$ 431,096.24
2017	\$ 102,692.64	
2016	\$ 94,959.82	Sum Of Highest Three Years Divided By 3
		= Average Annual Earnings
		\$ 431,096.24 x 1/3 =
		\$ 143,698.75
		\$ 143,698.75 Average Annual Earnings
		x 0.0240 Percentage Factor
		\$ 3,448.77
		x 23 Years of Service
		\$ 79,321.71 Annual Pension: Normal Retirement
		\$ 6,610.14 Monthly Pension: Normal Retirement
		C.A. 100.00%
		79,321.71
		0.79
		\$ 62,664.15 Annual Pension: Normal Retirement w/ CA
		\$ 5,222.01 Monthly Pension: Normal Retirement w/ CA
		\$ 5,222.01 Spousal Monthly

Comments: City Retirement Benefits are Exclusive of Social Security Benefits.
2025 Gross Wages include a Payout of \$63,777.52

Prepared by: <u>Lindsay Schreffelt</u>	Date: <u>8/6/2025</u>
Reviewed by: <u>Ruben A. Manuele</u>	Date: <u>8/7/2025</u>
Approved by: <u>Diana Manuele</u>	Date: <u>8/7/2025</u>
Board Approved: _____	Date: _____

**CITY OF BRISTOL-GENERAL CITY RETIREMENT
BENEFIT CALCULATION**

Department: Public Works Employee: Donald Tardif
Group: Local #1338 Soc.Sec: "On File" Date of Retire: 8/2/2025 73 rule:80/85

Early Retirement NRD 4/22/2029

66.66% CA Option

CALENDAR YEAR	GROSS EARNINGS	PENSION CALCULATION
2025	\$ 65,764.51 *	Highest Three Years:
2024	\$ 71,483.98 *	
2023	\$ 67,464.26 *	\$ 65,764.51
2022	\$ 67,245.59 *	\$ 71,483.98
	\$ (39,241.95) *	\$ 67,464.26
2021	\$ 64,634.42	\$ 67,245.59
2020	\$ 59,483.91	\$ (39,241.95)
2019	\$ 59,126.68	
2018	\$ 53,844.57	Calculation: \$ 232,716.39
2017	\$ 54,225.46	
2016	\$ 43,758.46	Sum Of Highest Three Years Divided By 3
		= Average Annual Earnings
		\$ 232,716.39 x 1/3 =
		\$ 77,572.13
		\$ 77,572.13 Average Annual Earnings
		x .0240 Percentage Factor
		\$ 1,861.73
		x 10 Years of Service
		\$ 18,617.30 Annual Pension: Normal Retirement
		0.7333 Early Retirement Adjustment Factor
		\$ 13,652.07 Annual Pension: Early Retirement
		C.A. 66.66%
		13,652.07
		0.85
		\$ 11,604.26 Annual Pension: Normal Retirement w/ CA
		\$ 967.02 Monthly Pension: Normal Retirement w/ CA
		\$ 644.68 Spousal Monthly

Comments: City Retirement Benefits are Exclusive of Social Security Benefits.
2025 Gross wages include Payout of \$ 19,034.92

Prepared by: Lindsey Scheffel Date: 8/6/2025
Reviewed by: Robert A. Manuele Date: 8/7/2025
Approved by: Deane M. Waldron Date: 8/7/2025
Board Approved: _____ Date: _____

**CITY OF BRISTOL-GENERAL CITY RETIREMENT
BENEFIT CALCULATION**

Department: WPC Employee: Anthony Coppola
Group: Local #1338 Soc.Sec: "On File" Date of Retire: 8/2/2025 65 rule:80/85

Early Retirement NRD 12/11/2032

CALENDAR YEAR	GROSS EARNINGS	PENSION CALCULATION
2025	\$ 45,471.20 *	Highest Three Years:
2024	\$ 73,027.82 *	
2023	\$ 71,938.40 *	\$ 45,471.20
2022	\$ 67,223.02 *	\$ 73,027.82
	\$ (39,228.78) *	\$ 71,938.40
2021	\$ 67,086.25	\$ 67,223.02
2020	\$ 65,948.43	\$ (39,228.78)
2019	\$ 62,627.35	
2018	\$ 61,617.81	Calculation: \$ 218,431.66
2017	\$ 61,099.42	
2016	\$ 57,513.92	Sum Of Highest Three Years Divided By 3
		= Average Annual Earnings
		\$ 218,431.66 x 1/3 =
		<u>\$ 72,810.55</u>
		\$ 72,810.55 Average Annual Earnings
		x 0.0240 Percentage Factor
		<u>\$ 1,747.45</u>
		x 10 Years of Service
		<u>\$ 17,474.50</u> Annual Pension: Normal Retirement
		0.5667 Early Retirement Adjustment Factor
		\$ 9,902.80 Annual Pension: Early Retirement
		<u>\$ 825.23</u> Monthly Pension: Early Retirement

Comments: City Retirement Benefits are Exclusive of Social Security Benefits.
2025 Gross wages include Payout of \$ 656.00

Prepared by: Lindsey Schaffner Date: 8/7/2025
Reviewed by: Robin A. Manuele Date: 8/7/2025
Approved by: Glenn Walden Date: 8/7/2025
Board Approved: _____ Date: _____

Pension Calculation Worksheet

Disability Retirement- Service Connected

NAME:	ARON CASCONI	Employee #:	6433
		Job Class:	2900
		Grade/Rank:	01/04
Effective Date:	7/21/2025	Pension Class:	9101
		Grade/Rank:	61/
Salary:	81,594.00		

Balance Sick Hours:	2,400.00		
	x	0.45	contract rate
		1,080.00	
	x	37.2581	hourly rate
		40,238.7480	
	x	0.4	per contract
		16,095.50	

Base Salary	81,594.00		
40% sick	16,095.50		
	97,689.50		
	x	0.70	
	68,382.65		
	/	52.1428	
	1,311.45		
	x	2	bi-weekly
New Bi-weekly Rate	2,622.90		

Prepared By:	Maria Ochoa	8/1/2025	
Deputy Treasurer:	<u><i>Ryan D. Bailey</i></u>	8/1/25	
Comptroller:	<u><i>Glenn M. Walcott</i></u>	8/4/25	

CITY OF BRISTOL-GENERAL CITY RETIREMENT
BENEFIT CALCULATION

Department: BOE
Group : Local #2267

Employee: Ronald Sadecki
Soc.Sec: "On File"

Date of Retire: 8/2/2025 91 rule:80/85

Normal Retirement

CALENDAR YEAR	GROSS EARNINGS	PENSION CALCULATION
2025	\$ 82,517.76 *	Highest Three Years:
2024	\$ 82,655.89 *	
2023	\$ 82,503.72 *	\$ 82,517.76
2022	\$ 82,038.44 *	\$ 82,655.89
	\$ (47,874.49) *	\$ 82,503.72
2021	\$ 78,451.40	\$ 82,038.44
2020	\$ 75,600.36	\$ (47,874.49)
2019	\$ 74,025.70	
2018	\$ 72,438.15	Calculation: \$ 281,841.32
2017	\$ 68,415.62	
2016	\$ 63,999.89	Sum Of Highest Three Years Divided By 3
		= Average Annual Earnings
		\$ 281,841.32 x 1/3 =
		<u>\$ 93,947.11</u>
		\$ 93,947.11 Average Annual Earnings
		x .0240 Percentage Factor
		<u>\$ 2,254.73</u>
		x 32 Years of Service
		\$ 72,151.36 Annual Pension: Normal Retirement
		<u>\$ 6,012.61</u> Monthly Pension: Normal Retirement

Comments: City Retirement Benefits are Exclusive of Social Security Benefits.
2025 Gross Wages include an accrual payout of \$ 24,630.55

Prepared by: Lindsey Schiffel Date: 8/11/25
Reviewed by: Robert A. Marable Date: 8-11-25
Approved by: Diane M. Wadsworth Date: 8/12/25
Board Approved: _____ Date: _____

PRELIMINARY REPORT PREPARED FOR:



Your Strategic Partner for Defined Benefit Plans

Month Ending 7/31/2025

John-Oliver Beirne, CRPC®, MBA
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Periods Ending 07/31/25

Name	1 Month	Last 3 Months	YTD	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years
US Equity									
Russell 3000 Index	2.2	14.2	8.1	15.7	16.4	15.2	13.0	14.1	12.3
S&P 500 Index	2.2	14.2	8.6	16.3	17.1	15.9	13.7	14.5	12.5
Russell 1000 Index	2.2	14.3	8.5	16.5	16.9	15.5	13.4	14.4	12.5
Russell 1000 Growth Index	3.8	20.2	10.1	23.7	22.6	17.3	17.1	17.3	11.2
Russell 1000 Value Index	0.6	7.7	6.6	8.8	10.6	13.2	9.2	11.1	13.2
Russell Midcap Index	1.9	11.7	6.8	12.1	11.5	12.2	10.0	12.2	14.0
Russell 2000 Index	1.7	13.0	-0.1	-0.6	7.0	9.8	7.4	10.0	10.7
Russell 2000 Growth Index	1.7	14.6	1.2	3.2	9.1	7.1	7.3	10.7	7.7
Russell 2000 Value Index	1.8	11.3	-1.5	-4.3	4.8	12.4	7.2	9.0	13.3
International Equity									
MSCI AC World Index	1.4	12.1	11.9	16.4	15.8	13.3	10.6	10.7	-
MSCI AC World ex USA	-0.3	8.0	18.0	15.4	13.2	9.7	6.6	6.5	-
MSCI EAFE Index	-1.4	5.6	18.3	13.3	14.2	10.9	6.7	7.3	10.7
MSCI Emerging Markets Index	2.0	12.9	17.9	17.9	11.0	5.8	6.2	4.4	-
Fixed Income									
90 Day U.S. Treasury Bill	0.3	1.0	2.4	4.6	4.7	2.8	2.0	1.4	4.9
Blmbg. U.S. Aggregate	-0.3	0.5	3.7	3.4	1.6	-1.1	1.7	2.2	8.4
Blmbg. U.S. Gov't/Credit	-0.2	0.6	3.7	3.3	1.8	-1.3	1.8	2.4	8.4
Bloomberg U.S. Municipal Bond Index	-0.2	0.5	-0.5	0.0	1.5	0.1	2.1	2.9	7.7
Blmbg. U.S. Corp: High Yield Index	0.5	4.0	5.0	8.7	8.0	5.1	5.5	6.2	9.5
Real Estate									
FTSE NAREIT All REITs Index	-1.0	0.1	0.7	0.3	0.0	5.6	5.7	8.2	10.5
NCREIF Property Index	-	-	-	-	-	-	-	-	-
Alternatives									
Barclay Hedge Fund Index	0.9	6.2	6.0	8.7	8.0	7.4	5.5	5.5	-
Inflation									
CPI - All Urban Consumers (SA)	0.2	0.6	1.4	2.7	3.0	4.5	3.1	2.6	3.0

Total Portfolio

Run Date: August 12, 2025

As of July 31, 2025

	Market Value (\$)	% of Portfolio	Month	Quarter	YTD	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	15 Years	Inception (%)	Inception Date
Total Portfolio	864,015,453	100.00	0.57	6.24	7.85	12.88	10.20	9.59	7.90	7.88	8.75	Jan-92
Policy Index Blended New			0.87	7.98	8.67	11.56	10.69	8.43	7.40	7.94	7.48	
60% MSCI ACWI/40% BC Agg			0.71	7.33	8.46	10.83	9.75	7.22	6.86	7.15	6.91	
Credit	167,955,730	19.44	0.02	3.07	5.90	10.26	7.18	8.43	-	-	6.46	Jan-19
Blmbg. U.S. Aggregate			-0.26	0.54	3.75	3.38	1.64	-1.07	1.66	2.19	1.59	
High Quality Credit	78,439,722	9.08	-0.10	1.37	3.01	3.33	5.23	4.31	-	-	4.32	Jan-19
Blmbg. U.S. Aggregate			-0.26	0.54	3.75	3.38	1.64	-1.07	1.66	2.19	1.59	
Boyd Watterson Fixed Income	29,263,146	3.39	-0.13	0.88	3.92	3.61	2.10	-0.81	1.93	2.50	5.40	Apr-90
Blmbg. U.S. Aggregate			-0.26	0.54	3.75	3.38	1.64	-1.07	1.66	2.19	5.08	
iShares Core US Aggregate Bond ETF(AGG)	16,071,116	1.86	-0.26	0.58	3.77	3.37	-	-	-	-	4.22	Aug-23
Blmbg. U.S. Aggregate			-0.26	0.54	3.75	3.38	1.64	-1.07	1.66	2.19	4.24	
Golub Capital BDC 4, Inc.(\$22 million)	19,030,000	2.20	0.00	0.76	3.64	10.17	-	-	-	-	13.63	Dec-22
Blmbg. U.S. Aggregate			-0.26	0.54	3.75	3.38	1.64	-1.07	1.66	2.19	3.76	
EnTrust Structured Income II-A	14,075,460	1.63	0.00	4.24	-0.03	-1.77	3.36	8.60	-	-	4.89	Jul-17
Blmbg. U.S. Aggregate			-0.26	0.54	3.75	3.38	1.64	-1.07	1.66	2.19	1.45	
Multi-Credit	89,516,008	10.36	0.13	4.61	8.57	17.28	8.73	15.47	-	-	9.30	Jan-19
Blmbg. U.S. Corp: High Yield Index			0.45	4.02	5.04	8.67	8.01	5.09	5.49	6.23	6.09	
Prytania Athena Fund	14,744,606	1.71	0.00	3.61	9.61	20.27	13.82	11.52	4.71	-	4.61	Mar-14
Blmbg. Global High Yield Index			0.38	4.40	7.23	11.29	10.46	4.80	5.09	5.87	4.38	
EnTrust Structured Income Fund	4,286,931	0.50	0.00	4.08	-6.89	-8.02	-4.90	7.74	4.07	-	4.15	Mar-13
Blmbg. U.S. Aggregate			-0.26	0.54	3.75	3.38	1.64	-1.07	1.66	2.19	1.71	
Beach Point TR Offshore Fund II[CE]	11,016,910	1.28	1.06	3.94	4.63	9.19	8.19	8.39	5.47	-	6.10	Jan-12
Blmbg. U.S. Corp: High Yield Index			0.45	4.02	5.04	8.67	8.01	5.09	5.49	6.23	6.03	
Silver Point Specialty Credit Fund III, LP(\$22 million)	8,677,240	1.00	0.00	0.00	2.66	3.88	-	-	-	-	7.75	Apr-23
Blmbg. U.S. Corporate Investment Grade Index			0.07	1.92	4.24	4.49	3.26	-0.49	2.88	3.53	4.82	
GWC Select Opportunities SPC1(\$2.6 million)	2,575,071	0.30	0.00	2.29	4.68	10.59	-	-	-	-	12.04	Sep-23
Blmbg. U.S. Corp: High Yield Index			0.45	4.02	5.04	8.67	8.01	5.09	5.49	6.23	10.15	
Greywolf Opportunities Offshore Fund II, LP(\$24 million)	31,409,008	3.64	0.00	8.54	17.00	30.18	-	-	-	-	14.17	Oct-22
Blmbg. U.S. Corp: High Yield Index			0.45	4.02	5.04	8.67	8.01	5.09	5.49	6.23	10.97	
Greywolf Distressed Opp Fund, LP(\$17 million)	16,806,242	1.95	0.00	1.94	4.41	16.90	6.48	8.91	-	-	8.91	Aug-20
Blmbg. U.S. Universal Index			-0.14	0.90	3.95	4.00	2.38	-0.52	2.04	2.58	-0.52	

	Total Portfolio											
	Market Value (\$)	% of Portfolio	Month	Quarter	YTD	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	15 Years	Inception (%)	Inception Date
Equity	432,037,808	50.00	0.75	9.64	11.13	15.36	14.86	12.39	-	-	14.31	Jan-19
MSCI AC World Index			1.38	12.14	11.85	16.39	15.80	13.31	10.60	10.72	13.89	
Public Equity	345,445,908	39.98	0.94	12.45	13.51	16.77	16.20	12.04	-	-	14.13	Jan-19
MSCI AC World Index			1.38	12.14	11.85	16.39	15.80	13.31	10.60	10.72	13.89	
Neuberger Berman Large Cap Growth	89,473,333	10.36	2.52	20.39	11.90	19.75	22.07	15.68	17.44	16.22	14.69	Feb-79
Russell 1000 Growth Index			3.78	20.16	10.10	23.75	22.60	17.27	17.06	17.29	12.40	
iShares Russell 1000 Growth ETF(IWF)	13,225,089	1.53	3.73	20.19	-	-	-	-	-	-	20.19	May-25
Russell 1000 Growth Index			3.78	20.16	10.10	23.75	22.60	17.27	17.06	17.29	20.16	
iShares Russell 1000 Value ETF(IWD)	7,551,512	0.87	0.61	7.69	6.48	8.64	10.41	12.98	-	-	10.17	Feb-19
Russell 1000 Value Index			0.57	7.66	6.61	8.79	10.59	13.18	9.20	11.13	10.36	
Columbia Dividend Income	20,005,578	2.32	0.63	8.04	7.45	11.10	11.86	13.32	-	-	11.48	May-19
Russell 1000 Value Index			0.57	7.66	6.61	8.79	10.59	13.18	9.20	11.13	9.52	
Eagle Equity	35,415,541	4.10	-1.22	9.11	7.34	13.43	20.25	16.72	-	-	14.43	Apr-19
Russell 1000 Value Index			0.57	7.66	6.61	8.79	10.59	13.18	9.20	11.13	9.99	
Robeco LCV	48,495,984	5.61	1.14	10.21	8.14	9.35	12.66	15.95	10.10	-	10.51	Oct-13
Russell 1000 Value Index			0.57	7.66	6.61	8.79	10.59	13.18	9.20	11.13	9.74	
Patient Opportunity I(LMNOX)	9,891,553	1.14	5.58	28.25	10.64	23.47	19.95	11.30	-	-	11.52	Apr-19
Russell 1000 Value Index			0.57	7.66	6.61	8.79	10.59	13.18	9.20	11.13	9.99	
Fiera SMID Growth	30,611,156	3.54	1.77	9.50	-1.30	1.42	7.74	9.99	9.62	-	9.86	Nov-14
Russell 2500 Growth Index			2.34	14.29	1.62	4.97	8.92	6.85	8.65	11.77	9.22	
iShares Russell 2000 ETF(IWM)	10,999,532	1.27	1.67	12.90	-	-	-	-	-	-	12.90	May-25
Russell 2000 Index			1.73	12.99	-0.08	-0.55	7.03	9.81	7.43	9.98	12.99	
Neuberger Berman International	22,328,045	2.58	-2.24	6.41	16.52	10.20	10.49	7.13	6.16	7.47	6.72	Feb-05
MSCI EAFE Index			-1.39	5.56	18.25	13.35	14.15	10.89	6.66	7.27	6.13	
Vanguard Developed Mkts Ind(VTMNX)	3,302,042	0.38	-1.69	6.72	18.79	13.38	12.81	10.37	-	-	9.93	Mar-20
FTSE Developed x North America Index			-0.87	6.92	19.30	13.41	13.83	10.63	6.72	7.25	10.38	
GAMCO Gold	21,752,535	2.52	-1.36	5.48	52.02	46.77	27.96	5.88	14.47	-	1.66	Feb-12
Philadelphia Gold and Silver Index			-0.68	9.17	50.04	35.64	26.73	8.01	17.36	0.51	1.26	
Sprott Asset Management	16,961,349	1.96	-1.15	5.11	44.58	44.97	27.22	5.59	13.40	-	0.39	Feb-12
Philadelphia Gold and Silver Index			-0.68	9.17	50.04	35.64	26.73	8.01	17.36	0.51	1.26	
iShares MSCI Emerging Markets ETF(EEM)	15,432,657	1.79	0.66	12.04	17.20	16.09	9.43	4.69	-	-	5.46	Feb-17
MSCI Emerging Markets Index			2.02	12.94	17.90	17.87	11.02	5.85	6.19	4.41	6.75	

Total Portfolio												
	Market Value (\$)	% of Portfolio	Month	Quarter	YTD	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	15 Years	Inception (%)	Inception Date
Private Equity	86,591,900	10.02	0.00	-0.38	2.42	10.09	9.68	27.82	13.53	-	9.45	Jan-12
7.5% Annual Return			0.60	1.82	4.31	7.50	7.50	7.50	7.50	7.50	7.50	
Arsenal III, LP(\$15 mill)	31,357,860	3.63	0.00	0.00	4.47	10.92	6.08	30.05	-	-	29.05	Feb-19
Arsenal Growth Equity IV, LP(\$35 mill)	24,580,108	2.84	0.00	0.00	0.21	5.51	-	-	-	-	22.22	Feb-23
Arsenal-Beamer Investors, LLC(\$2.9 million)	3,373,396	0.39	0.00	0.00	0.65	16.93	-	-	-	-	13.84	Jun-24
Arsenal-Cart Investors II, LLC(\$2 million)	5,466,024	0.63	0.00	0.00	19.66	33.69	15.55	-	-	-	30.75	Nov-21
Arsenal-Elevate Investors I, LLC(\$4.6 million)	4,950,397	0.57	0.00	0.00	0.20	-7.84	-	-	-	-	-0.82	Sep-22
Arsenal-Sayari Investors, LLC(\$2 million)	5,198,915	0.60	0.00	0.00	2.31	27.15	32.76	-	-	-	29.01	Nov-21
GWC Select Opportunities SPC(\$2.5 million)	4,638,296	0.54	0.00	-0.36	1.41	42.39	-	-	-	-	25.20	Nov-22
Zephyr Peacock India Fund III Limited (\$5 million)	1,797,446	0.21	0.00	-15.01	-18.70	-27.83	-16.49	-1.43	-0.71	-	-1.58	Jun-12
Zephyr Peacock India Growth Fund US, LP(\$6 million)	5,229,458	0.61	0.00	0.00	-2.00	2.67	9.82	8.35	-	-	1.82	Jul-18
Alternatives	256,701,544	29.71	0.61	3.03	4.10	11.12	6.62	6.04	-	-	5.46	Jan-19
Barclay Hedge Fund Index			0.87	6.15	5.99	8.69	7.96	7.39	5.49	5.49	7.20	
Real Estate	65,597,289	7.59	0.00	1.39	2.37	0.55	-1.40	1.40	-	-	2.73	Jan-19
NCREIF Property Index			0.00	1.20	2.50	4.23	-2.75	3.70	5.22	7.66	3.73	
Boyd Titanium GSA Fund (\$34.5 million)	31,433,704	3.64	0.00	1.21	1.91	-1.35	-1.92	1.70	4.87	-	4.95	Oct-13
Boyd Watterson State Govt Fund, LP(\$10 million)	9,529,082	1.10	0.00	1.24	2.05	-0.69	-1.42	2.46	-	-	4.38	Feb-18
Boyd Diversified Gov't REIT(\$10 million)	24,246,538	2.81	0.00	1.70	3.34	4.72	-	-	-	-	4.69	Jan-23
Invesco Mortgage Recovery Fund II, LP(\$10 million)	374,838	0.04	0.00	0.00	-11.90	-39.01	-53.42	-44.55	-21.69	-	-21.10	Apr-15
Lone Star (\$10 million)	13,127	0.00	0.00	0.00	2.92	14.53	84.27	46.65	23.83	-	20.20	Jun-11
Commodities	5,713,506	0.66	0.00	0.00	0.45	18.78	0.27	0.98	-	-	-3.34	Jan-19
Bloomberg Commodity Index Total Return			-0.45	1.36	5.05	9.71	-1.41	11.33	3.09	-0.48	7.09	
Corrum Capital Real Assets, LP (\$10 million)	5,713,506	0.66	0.00	0.00	0.45	18.78	0.27	0.98	0.57	-	0.62	Jun-15

	Total Portfolio											
	Market Value (\$)	% of Portfolio	Month	Quarter	YTD	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	15 Years	Inception (%)	Inception Date
Differentiated Return Stream	185,390,749	21.46	0.85	3.72	4.86	15.42	10.83	8.54	-	-	6.75	Jan-19
<i>CPI+2%</i>			0.32	1.20	3.55	4.76	4.98	6.60	5.14	4.71	5.97	
Kelly Park Capital	19,177,055	2.22	0.00	1.70	3.49	6.48	4.95	1.68	-	-	2.18	Jan-20
Verition International Multi-Strategy Fund, Ltd.[CE]	47,427,363	5.49	0.67	1.33	1.96	7.81	8.02	9.26	-	-	11.53	Jan-20
OCO Opportunities Offshore Fund, Ltd.	27,557,850	3.19	4.82	25.10	21.84	37.49	13.35	24.45	10.53	-	10.47	Feb-14
Greywolf Containership Opps II, LP(\$6 million)	5,957,580	0.69	0.00	4.72	9.77	45.60	-	-	-	-	23.31	Nov-22
Entrust Blue Ocean Fund, LP(\$17 million)	16,563,658	1.92	0.00	0.00	-1.49	0.96	8.28	16.35	-	-	15.86	Apr-20
Entrust Blue Ocean Fund II, LP (\$30 mill)	28,146,344	3.26	0.00	0.00	1.35	5.13	-	-	-	-	2.74	Dec-23
Longford Capital (\$15 million)	6,620,586	0.77	0.00	0.00	2.41	141.48	49.59	33.04	23.11	-	11.89	Jul-13
Longford Capital Fund II, LP (\$30 million)	14,343,130	1.66	0.00	0.00	1.98	14.00	9.01	7.49	-	-	3.40	Dec-16
Longford Capital Fund III, LP(\$30 million)	19,597,183	2.27	0.00	0.00	5.93	19.14	22.43	14.00	-	-	10.84	Apr-20
Cash	7,320,371	0.85	0.34	0.98	2.34	4.31	4.42	2.68	-	-	2.36	Jan-19
Cash Account	7,320,371	0.85	0.34	0.98	2.34	4.31	4.42	2.68	1.77	-	1.35	Jan-12
<i>90 Day U.S. Treasury Bill</i>			0.35	1.04	2.43	4.57	4.66	2.83	2.00	1.35	1.48	

Approx. 6% of the portfolio is unvalued as of 7/31. Additionally, there is approx. 38% which is only valued quarterly.

Policy Index-Blended New = MSCI ACWI 55% / BBgBarc US Aggregate TR 25% / Barclay Hedge Fund Index 20%.

From 4/30/2022-1/1/2019 the Policy Index Blended New consists of MSCI ACWI 55% / BBgBarc US Aggregate TR 25% / HFRI Fund of Funds Composite Index 20%. Prior to 1/1/2019 the Policy Index Blended New consists of 15% Russell 1000 Growth, 15% Russell 1000 Value, 5% Russell MidCap, 13.6% MSCI EAFE, 7.5% MSCI Emerging Markets, 21.3% BC US Aggregate, 7.6% BofA HY BB-B Rated Constrained Index, 10% HFRX Global Hedge Fund Index, 5% Private Equity Actual.

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A "since inception" return, if reported, begins with the first full month after funding, although actual inception dates (e.g., the middle of a month) and the timing of cash flows are taken into account in Composite return calculations.

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INDEX DEFINITIONS

- Citigroup 3 Month T-Bill measures monthly return equivalents of yield averages that are not marked to market. The Three-Month Treasury Bill Indexes consist of the last three three-month Treasury bill issues.
- Bloomberg Barclays Treasury U.S. T-Bills-1-3 Month Index includes aged U.S. Treasury bills, notes and bonds with a remaining maturity from 1 up to (but not including) 3 months. It excludes zero coupon strips.
- Bloomberg Barclays Capital US Treasury Inflation Protected Securities Index consists of Inflation-Protection securities issued by the U.S. Treasury.
- Bloomberg Barclays Muni Index is a rules-based, market-value-weighted index engineered for the long-term tax-exempt bond market. Bonds must be rated investment-grade by at least two ratings agencies.
- Bloomberg Barclays Muni 1 Year Index is the 1-year (1-2) component of the Municipal Bond index.
- Bloomberg Barclays Muni 3 Year Index is the 3-year (2-4) component of the Municipal Bond index.
- Bloomberg Barclays Muni 5 Year Index is the 5-year (4-6) component of the Municipal Bond index.
- Bloomberg Barclays Muni 7 Year Index is the 7-year (6-8) component of the Municipal Bond index.
- Bloomberg Barclays Intermediate U.S. Gov't/Credit is the Intermediate component of the U.S. Government/Credit index, which includes securities in the Government and Credit Indices. The Government Index includes treasuries and agencies, while the credit index includes publicly issued U.S. corporate and foreign debentures and secured notes that meet specified maturity, liquidity, and quality requirements.
- Bloomberg Barclays U.S. Aggregate Index covers the U.S. investment grade fixed rate bond market, with index components for government and corporate securities, mortgage pass-through securities, and asset backed securities.
- Bloomberg Barclays Global Aggregate ex. USD Indices represent a broad-based measure of the global investment-grade fixed income markets. The two major components of this index are the Pan-European Aggregate and the Asian-Pacific Aggregate Indices. The index also includes Eurodollar and Euro-Yen corporate bonds and Canadian government, agency and corporate securities.
- Bloomberg Barclays U.S. Corporate High Yield Index covers the universe of fixed rate, non-investment grade debt. Eurobonds and debt issues from countries designated as emerging markets (sovereign rating of Baa1/BBB+/BBB+ and below using the middle of Moody's, S&P, and Fitch) are excluded, but Canadian and global bonds (SEC registered) of issuers in non-EMG countries are included.
- JP Morgan Government Bond Index-Emerging Market (GBI-EM) Index is a comprehensive, global local emerging markets index, and consists of regularly traded, liquid fixed-rate, domestic currency government bonds to which international investors can gain exposure.
- The S&P 500 is a capitalization-weighted index of 500 stocks designed to measure performance of the broad domestic economy through changes in the aggregate market value of 500 stocks representing all major industries.
- The Dow Jones Industrial Index is a price-weighted average of 30 blue-chip stocks that are generally the leaders in their industry.
- The NASDAQ is a broad-based capitalization-weighted index of stocks in all three NASDAQ tiers: Global Select, Global Market and Capital Market.
- Russell 3000 is a market-cap-weighted index which consists of roughly 3,000 of the largest companies in the U.S. as determined by market capitalization. It represents nearly 98% of the investable U.S. equity market.
- Russell 1000 consists of the largest 1000 companies in the Russell 3000 Index.
- Russell 1000 Growth measures the performance of those Russell 1000 companies with higher P/B ratios and higher forecasted growth values.
- Russell 1000 Value measures the performance of those Russell 1000 companies with lower P/B ratios and lower forecasted growth values.
- Russell Mid Cap measures the performance of the 800 smallest companies in the Russell 1000 Index.
- Russell Mid Cap Growth measures the performance of those Russell Mid Cap companies with higher P/B ratios and higher forecasted growth values.
- Russell Mid Cap Value measures the performance of those Russell Mid Cap companies with lower P/B ratios and lower forecasted growth values.

- Russell 2000 consists of the 2,000 smallest U.S. companies in the Russell 3000 index.
- Russell 2000 Growth measures the performance of the Russell 2000 companies with higher P/B ratios and higher forecasted growth values.
- Russell 2000 Value measures the performance of those Russell 2000 companies with lower P/B ratios and lower forecasted growth values.
- Russell 2500 consists of the 2,500 smallest U.S. companies in the Russell 3000 index.
- Russell 2500 Growth measures the performance of the Russell 2500 companies with higher P/B ratios and higher forecasted growth values.
- Russell 2500 Value measures the performance of those Russell 2500 companies with lower P/B ratios and lower forecasted growth values.
- MSCI World captures large and mid-cap representation across 23 Developed Markets countries. With 1,645 constituents, the index covers approximately 85% of the free float-adjusted market capitalization in each country.
- MSCI ACWI (All Country World Index) ex. U.S. Index captures large and mid-cap representation across 22 of 23 Developed Markets countries (excluding the United States) and 23 Emerging Markets countries. With 1,859 constituents, the index covers approximately 85% of the global equity opportunity set outside the US.
- MSCI ACWI (All Country World Index) ex. U.S. Small Cap Index captures small cap representation across 22 of 23 Developed Markets countries (excluding the US) and 23 Emerging Markets countries. With 4,368 constituents, the index covers approximately 14% of the global equity opportunity set outside the US.
- MSCI EAFE is an equity index which captures large and mid-cap representation across Developed Markets countries around the world, excluding the US and Canada. With 930 constituents, the index covers approximately 85% of the free float-adjusted market capitalization in each country.
- MSCI EAFE Value captures large and mid-cap securities exhibiting overall value style characteristics across Developed Markets countries around the world, excluding the US and Canada. The value investment style characteristics for index construction are defined using three variables: book value to price, 12-month forward earnings to price and dividend yield. With 507 constituents, the index targets 50% coverage of the free float-adjusted market capitalization of the MSCI EAFE Index.
- MSCI EAFE Growth captures large and mid-cap securities exhibiting overall growth style characteristics across Developed Markets countries around the world, excluding the US and Canada. The growth investment style characteristics for index construction are defined using five variables: long-term forward EPS growth rate, short-term forward EPS growth rate, current internal growth rate and long-term historical EPS growth trend and long term historical sales per share growth trend. With 542 constituents, the index targets 50% coverage of the free float-adjusted market capitalization of the MSCI EAFE Index.
- MSCI Emerging Markets captures large and mid-cap representation across 23 Emerging Markets countries. With 836 constituents, the index covers approximately 85% of the free-float adjusted market capitalization in each country.
- Consumer Price Index is a measure of prices paid by consumers for a market basket of consumer goods and services. The yearly (or monthly) growth rates represent the inflation rate.
- FTSE NAREIT Equity REITs Index contains all Equity REITs not designed as Timber REITs or Infrastructure REITs.
- S&P Developed World Property defines and measures the investable universe of publicly traded property companies domiciled in developed markets. The companies in the index are engaged in real estate related activities, such as property ownership, management, development, rental and investment.
- S&P Developed World Property x U.S. defines and measures the investable universe of publicly traded property companies domiciled in developed countries outside of the U.S. The companies included are engaged in real estate related activities, such as property ownership, management, development, rental and investment.
- Bloomberg Commodity Index is calculated on an excess return basis and reflects commodity futures price movements. The index rebalances annually weighted 2/3 by trading volume and 1/3 by world production and weight-caps are applied at the commodity, sector and group level for diversification.
- HFRI Fund Weighted Composite Index is a global, equal-weighted index of over 2,000 single-manager funds that report to HFR Database. Constituent funds report monthly net of all fees performance in US Dollar and have a minimum of \$50 Million under management or a twelve (12) month track record of active performance. The HFRI Fund Weighted Composite Index does not include Funds of Hedge Funds.
- The Alerian MLP Index is the leading gauge of energy Master Limited Partnerships (MLPs). The float adjusted, capitalization-weighted index, whose constituents represent approximately 85% of total float-adjusted market capitalization, is disseminated real-time on a price-return basis (AMZ) and on a total-return basis.
- The Adjusted Alerian MLP Index is commensurate with 65% of the monthly returns of the Alerian MLP Index to incorporate the effect of deferred tax liabilities incurred by MLP entities.

DEFINITION OF KEY STATISTICS AND TERMS

- Returns: A percentage figure used when reporting historical average compounded rate of investment return. All returns are annualized if the period for which they are calculated exceeds one year.
- Universe Comparison: The universe compares the fund's returns to a group of other investment portfolios with similar investment strategies. The returns for the fund, the index and the universe percentiles are displayed. A percentile ranking of 1 is the best, while a percentile ranking of 100 is the worst. For example, a ranking of 50 indicates the fund outperformed half of the universe. A ranking of 25 indicates the fund was in the top 25% of the universe, outperforming 75%.
- Returns In Up/Down Markets: This measures how the fund performed in both up and down markets. The methodology is to segregate the performance for each time period into the quarters in which the market, as defined by the index, was positive and negative. Quarters with negative index returns are treated as down markets, and quarters with positive index returns are treated as up markets. Thus, in a 3 year or 12 quarter period, there might be 4 down quarters and 8 up quarters. A simple arithmetic average of returns is calculated for the fund and the index based on the up quarters. A simple arithmetic average of returns is calculated for the fund and the index based on the down quarters. The up-market capture ratio is the ratio of the fund's return in up markets to the index. The down-market capture ratio is the ratio of the fund's return in down markets to the index. Ideally, the fund would have a greater up market capture ratio than down market capture ratio.
- Standard Deviation: Standard deviation is a statistical measure of the range of performance within which the total returns of a fund fall. When a fund has a high standard deviation, the range of performance is very wide, meaning there is a greater volatility. Approximately 68% of the time, the total return of any given fund will differ from the average total return by no more than plus or minus the standard deviation figure. Ninety-five percent of the time, a fund's total return will be within a range of plus or minus two times the standard deviation from the average total return. If the quarterly or monthly returns are all the same the standard deviation will be zero. The more they vary from one another, the higher the standard deviation. Standard deviation can be misleading as a risk indicator for funds with high total returns because large positive deviations will increase the standard deviation without a corresponding increase in the risk of the fund. While positive volatility is welcome, negative is not.
- R-Squared: This reflects the percentage of a fund's movements that are explained by movements in its benchmark index. An R-squared of 100 means that all movements of a fund are completely explained by movements in the index. Conversely, a low R-squared indicates very few of the fund's movements are explained by movements in the benchmark index. R-squared can also be used to ascertain the significance of a particular beta. Generally, a higher R-squared will indicate a more reliable beta figure. If the R-squared is lower, then the beta is less relevant to the fund's performance. A measure of diversification, R-squared indicates the extent to which fluctuations in portfolio returns are explained by market. An R-squared = 0.70 implies that 70% of the fluctuation in a portfolio's return is explained by the fluctuation in the market. In this instance, overweighting or underweighting of industry groups or individual securities is responsible for 30% of the fund's movement.
- Beta: This is a measure of a fund's market risk. The beta of the market is 1.00. Accordingly, a fund with a 1.10 beta is expected to perform 10% better than the market in up markets and 10% worse than the market in down markets. It is important to note, however, a low fund beta does not imply the fund has a low level of volatility; rather, a low beta means only that the fund's market-related risk is low. Because beta analyzes the market risk of a fund by showing how responsive the fund is to the market, its usefulness depends on the degree to which the markets determine the fund's total risk (indicated by R-squared).
- Alpha: The Alpha is the nonsystematic return, or the return that cannot be attributed to the market. It can be thought of as how the manager performed if the market's return was zero. A positive alpha implies the manager added value to the return of the portfolio over that of the market. A negative alpha implies the manager did not contribute any value over the performance of the market.
- Sharpe Ratio: The Sharpe ratio is the excess return per unit of total risk as measured by standard deviation. Higher numbers are better, indicating more return for the level of risk experienced. The ratio is a fund's return minus the risk-free rate of return (30-day T-Bill rate) divided by the fund's standard deviation. The higher the Sharpe ratio, the more reward you are receiving per unit of total risk. This measure can be used to rank the performance of mutual funds or other portfolios.
- Treynor Ratio: The Treynor ratio measures returns earned in excess of that which could have been earned on a riskless investment per each unit of market risk. The ratio relates excess return over the risk-free rate to the additional risk taken; however, systematic risk is used instead of total risk. The Treynor ratio is similar to the Sharpe ratio, except in the fact that it uses the beta to evaluate the returns.
- Tracking Error: Tracking error measures the volatility of the difference in annual returns between the manager and the index. This value is calculated by measuring the standard deviation of the difference between the manager and index returns. For example, a tracking error of +/- 5 would mean there is about a 68% chance (1 standard deviation event) that the manager's returns will fall within +/- 5% of the benchmark's annual return.
- Information Ratio: The information ratio is a measure of the consistency of excess return. This value is determined by taking the annualized excess return over a benchmark (style benchmark by default) and dividing it by the standard deviation of excess return.
- Downside Risk: Downside risk is a measure similar to standard deviation but focuses only on the negative movements of the return series. It is calculated by taking the standard deviation of the negative quarterly set of returns. The higher the factor, the riskier the product.