

PORTFOLIO DIVERSIFICATION TOOLBOX©

This legacy portfolio is representative of many and illustrates the *procedural process* of Optimizing Portfolio Diversification utilizing Artificial Intelligence to Enhance Human Customizing of Asset Allocation & Rebalancing

Risk Assets Only

(70% of Uncompensated Risk is in Risk Assets)

100% Legacy Portfolio

Code: CY201 optimized May 2022

The Portfolio Diversification Institute

<https://DivToolbox.com/>

J. Ben Vernazza CPA/PFS TEP emeritus, Managing Director

Aptos CA – Ben@BenVCPA.com

and

Stewart Frank CPA/PFS AIFA. Pres. Precision Fiduciary Analytics, & SME “Fiduciary” AICPA

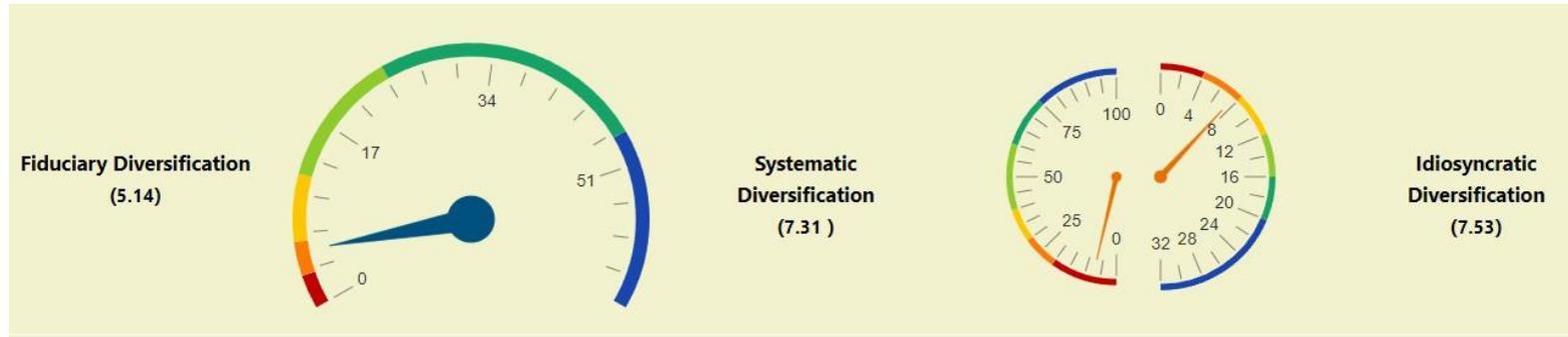
Bingham Farms MI -- SFrank@PrecisionFiduciary.com

Legacy Portfolio Excel Upload Today's Allocation

16 Constituent Legacy Portfolio			
Positions	Symbol	Company Name	Allocation
1	BBEU	JPMorgan BetaBuilders Europe ETF	1.30%
2	AGOZX	ALGER SMALL CAP FOCUS FUND CLASS Z	1.20%
3	VOO	VANGUARD 500 INDEX FUND ETF SHARES	22.60%
4	IEMG	iShares Core MSCI Emerging Markets ETF	0.60%
5	IVOO	Vanguard S&P Mid-Cap 400 ETF	9.60%
6	FSAIX	Fidelity Select Air Transportation Portfolio	11.00%
7	VIOO	Vanguard S&P Small-Cap 600 ETF	6.30%
8	BBJP	JPMorgan BetaBuilders Japan ETF	1.20%
9	GSIMX	GOLDMAN SACHS GQG PARTNERS INTERNATIONAL OPP FD I SH	4.00%
10	BBAX	JPMorgan BetaBuilders Developed Asia Pacific ex-Japan ETF	0.70%
11	TWEIX	EQUITY INCOME FUND INVESTOR CLASS	14.30%
12	FSPSX	FIDELITY INTERNATIONAL INDEX FUND	0.40%
13	VGPMX	VANGUARD GLOBAL CAPITAL CYCLES FUND INVESTOR SHARES	1.30%
14	VV	VANGUARD LARGE-CAP INDEX FUND ETF SHARES	8.00%
15	MFEIX	MFS GROWTH FUND I	16.50%
16	BBCA	JPMorgan BetaBuilders Canada ETF	1.00%
			100.00%

A portfolio's constituent holdings are easily uploaded to the system's analytics platform function from an Excel worksheet. In this case IGF was substituted for another Infrastructure ETF that was issued only 15 months ago. The Algorithm needs data going back at least 6 years to produce meaningful suggestions.

Legacy Portfolio Diversification Dashboard Explanation of Scores & Dials



With a single mouse click, the system analyzes the legacy portfolio's constituent holdings and their weightings to the quantitative diversification components described in the Restatement 3rd of Trusts. It publishes its numeric findings scaled to 3-dials, all presented in a Diversification Dashboard.

The two facing dials on the right side of the dashboard are color coded to broadly indicate where that specific 3rd Restatement component falls.

The larger single, stand-alone dial entitled Fiduciary Diversification appears on the left side of the dashboard. Its value is a mathematically calculated number of equivalently, equally weighted, and sufficiently asymmetric portfolio

constituents. The number's position on the color coded dial is scaled for general guidance purposes to broadly indicate how well diversified the portfolio is. It is not an official formula defined in the 3rd Restatement. The UPIA states:

"There is no automatic rule for identifying how much diversification is enough", it then goes onto quote The 1992 Restatement: "... Broader diversification is usually ... preferred in trust investing,".

Although our proprietary Fiduciary Diversification number is not officially recognized in law, using comparative Fiduciary Diversification numbers can be a useful tool for documenting that a prudent process was followed in the performance of risk and diversification monitoring. See Glossary

Legacy Portfolio Correlation Matrix 3-Years Trailing



	BBEU	AGOZX	VOO	IEMG	IVOO	FSAIX	VIOO	BBJP	GSIMX	BBAX	TWEIX	FSPSX	VGPMX	VV	MFEIX	BBCA	
1	BBEU	1	0.65	0.87	0.84	0.87	0.74	0.82	0.83	0.89	0.86	0.87	0.98	0.87	0.87	0.78	0.87
2	AGOZX	0.65	1	0.76	0.67	0.73	0.46	0.67	0.59	0.70	0.60	0.61	0.66	0.60	0.78	0.85	0.64
3	VOO	0.87	0.76	1	0.81	0.92	0.73	0.85	0.79	0.86	0.83	0.94	0.88	0.84	0.99	0.93	0.88
4	IEMG	0.84	0.67	0.81	1	0.79	0.65	0.72	0.76	0.85	0.85	0.76	0.87	0.82	0.82	0.77	0.80
5	IVOO	0.87	0.73	0.92	0.79	1	0.83	0.97	0.78	0.79	0.82	0.92	0.87	0.86	0.92	0.79	0.88
6	FSAIX	0.74	0.46	0.73	0.65	0.83	1	0.84	0.64	0.62	0.71	0.79	0.75	0.75	0.72	0.54	0.77
7	VIOO	0.82	0.67	0.85	0.72	0.97	0.84	1	0.74	0.71	0.78	0.87	0.82	0.82	0.85	0.69	0.83
8	BBJP	0.83	0.59	0.79	0.76	0.78	0.64	0.74	1	0.76	0.78	0.77	0.89	0.77	0.79	0.71	0.74
9	GSIMX	0.89	0.70	0.86	0.85	0.79	0.62	0.71	0.76	1	0.81	0.82	0.90	0.85	0.87	0.84	0.83
10	BBAX	0.86	0.60	0.83	0.85	0.82	0.71	0.78	0.78	0.81	1	0.83	0.89	0.86	0.83	0.73	0.84
11	TWEIX	0.87	0.61	0.94	0.76	0.92	0.79	0.87	0.77	0.82	0.83	1	0.88	0.86	0.93	0.78	0.88
12	FSPSX	0.98	0.66	0.88	0.87	0.87	0.75	0.82	0.89	0.90	0.89	0.88	1	0.89	0.88	0.79	0.88
13	VGPMX	0.87	0.60	0.84	0.82	0.86	0.75	0.82	0.77	0.85	0.86	0.86	0.89	1	0.84	0.72	0.89
14	VV	0.87	0.78	0.99	0.82	0.92	0.72	0.85	0.79	0.87	0.83	0.93	0.88	0.84	1	0.94	0.88
15	MFEIX	0.78	0.85	0.93	0.77	0.79	0.54	0.69	0.71	0.84	0.73	0.78	0.79	0.72	0.94	1	0.77
16	BBCA	0.87	0.64	0.88	0.80	0.88	0.77	0.83	0.74	0.83	0.84	0.88	0.88	0.89	0.88	0.77	1
	Weight	1.30%	1.20%	22.60%	0.60%	9.60%	11.00%	6.30%	1.20%	4.00%	0.70%	14.30%	0.40%	1.30%	8.00%	16.50%	1.00%
	Sharpe	0.21	-0.19	0.57	0.13	0.36	0.08	0.32	0.19	0.54	0.20	0.44	0.22	0.82	0.59	0.46	0.46

Correlation values in the 90s, 80s, and 70s are color coded red, orange, and yellow, respectively to more easily identify securities that exhibited highly correlated price movements over the past 3-years. The matrix's entire color impact visually indicates how highly correlated and under-diversified the overall portfolio is. Each constituent's allocation percentage and corresponding Sharpe Ratio metrics are useful tools for customization when deciding which existing securities should be weighted differently or eliminated from the portfolio, all together.

Your Artificial Intelligent Assistant Creates Portfolio Diversification Alternatives For Your Review

The system automatically creates six new simulated portfolios from the original legacy portfolio, decreasing the legacy's allocation in increments of 10%, 20%, 30% 40%, 50% and 60%, respectively. The original portfolio's asset weightings are maintained within each portfolio's declining legacy position. Their reciprocal percentages are filled with selected sector and/or industry proxies at weightings calculated by the system's forward looking modeling algorithms to improve diversification outcomes. *(Note: The Institute's algorithm makes its allocation based on data known only at the beginning of the period studied with no knowledge of what happened during the period.)*

The six newly created portfolios undergo the same quantitative risk factor analysis as the original legacy portfolio received in its stand-alone analysis, and all seven portfolios are also subjected to a qualitative risk factor analysis

6 – Portfolios & Benchmark Comparative Performance Metrics



Performance Metrics								
Indices and Portfolios	FTSE WORLD STOCK INDEX	100 % Original Portfolio	90 % Original Portfolio / 10 % SECTOR PROXIES	80 % Original Portfolio / 20 % SECTOR PROXIES	70 % Original Portfolio / 30 % SECTOR PROXIES	60 % Original Portfolio / 40 % SECTOR PROXIES	50 % Original Portfolio / 50 % SECTOR PROXIES	40 % Original Portfolio / 60 % SECTOR PROXIES
Return	9.64 %	9.12 %	11.83 %	13.20 %	8.38 %	16.20 %	15.43 %	11.92 %
Yield	2.87 %	4.34 %	9.37 %	8.59 %	8.00 %	7.40 %	7.36 %	6.23 %
Sharpe Ratios	0.49	0.40	0.52	0.58	0.37	0.74	0.71	0.50
Risk Statistics								
Indices and Portfolios	FTSE WORLD STOCK INDEX	100 % Original Portfolio	90 % Original Portfolio / 10 % SECTOR PROXIES	80 % Original Portfolio / 20 % SECTOR PROXIES	70 % Original Portfolio / 30 % SECTOR PROXIES	60 % Original Portfolio / 40 % SECTOR PROXIES	50 % Original Portfolio / 50 % SECTOR PROXIES	40 % Original Portfolio / 60 % SECTOR PROXIES
Standard Deviation	19.61 %	22.59 %	22.71 %	22.85 %	22.82 %	22.01 %	21.73 %	23.85 %
Semi Deviation	14.49 %	16.80 %	16.78 %	16.89 %	17.02 %	16.06 %	16.00 %	17.78 %
MaxDrawDown	32.04 %	35.97 %	35.30 %	34.94 %	36.88 %	32.77 %	33.82 %	36.48 %
Ulcer	6.17 %	7.69 %	7.45 %	7.17 %	8.14 %	5.79 %	6.72 %	9.82 %
Benchmark Data								
Indices and Portfolios	FTSE WORLD STOCK INDEX	100 % Original Portfolio	90 % Original Portfolio / 10 % SECTOR PROXIES	80 % Original Portfolio / 20 % SECTOR PROXIES	70 % Original Portfolio / 30 % SECTOR PROXIES	60 % Original Portfolio / 40 % SECTOR PROXIES	50 % Original Portfolio / 50 % SECTOR PROXIES	40 % Original Portfolio / 60 % SECTOR PROXIES
R-square	0.74	0.82	0.79	0.67	1.20	0.51	0.70	0.77
Beta	1.00	0.95	1.05	1.19	0.93	1.35	1.25	1.06
Alpha	0.04 %	-2.71 %	2.32 %	2.98 %	-7.77 %	7.75 %	9.61 %	1.13 %
Up Capture	100.00 %	120.89 %	121.96 %	125.92 %	119.78 %	107.51 %	114.59 %	125.84 %
Down Capture	100.00 %	108.46 %	107.62 %	108.17 %	108.91 %	100.20 %	103.16 %	108.98 %

6 – Portfolios & Benchmark Comparative Diversification Metrics

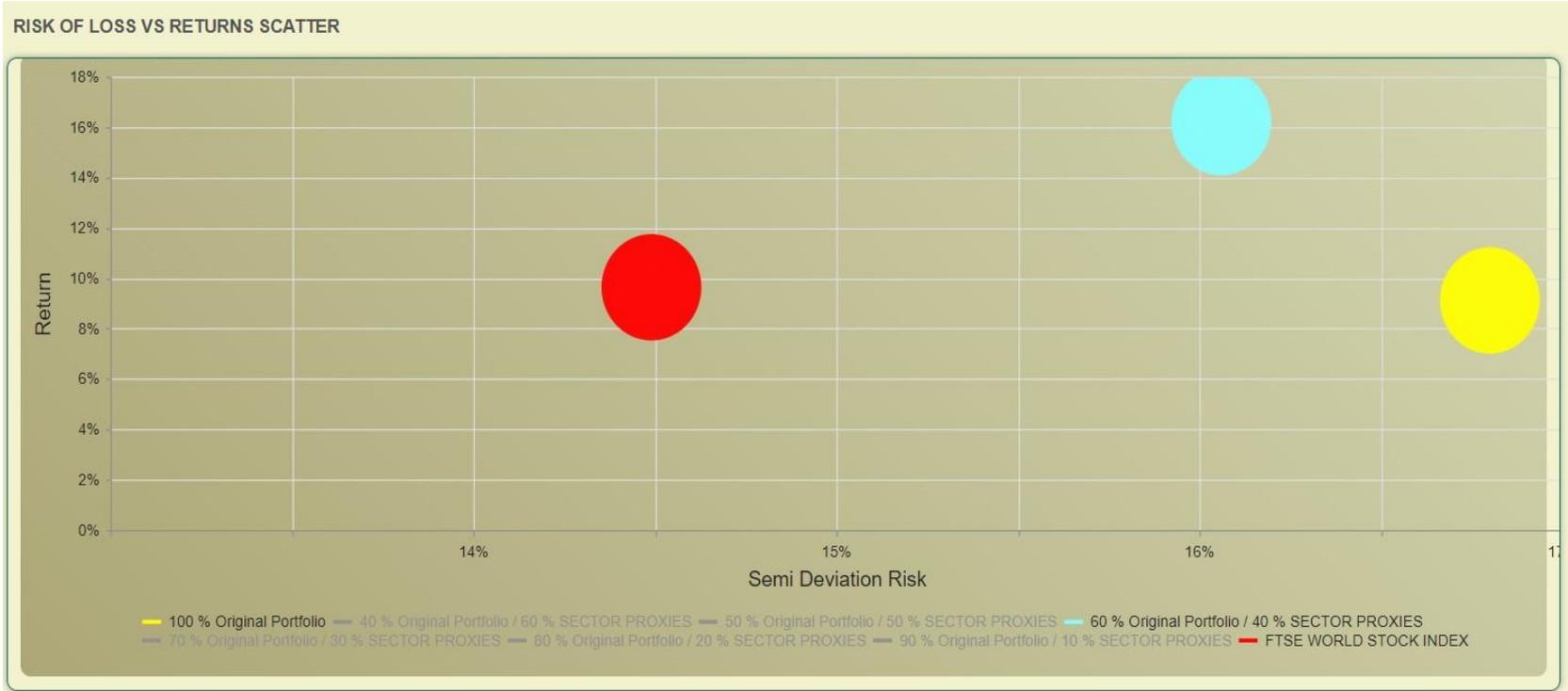
Diversification Measurements								
Quantitative Diversification Metrics								
Indices and Portfolios	FTSE WORLD STOCK INDEX	100 % Original Portfolio	90 % Original Portfolio / 10 % SECTOR PROXIES	80 % Original Portfolio / 20 % SECTOR PROXIES	70 % Original Portfolio / 30 % SECTOR PROXIES	60 % Original Portfolio / 40 % SECTOR PROXIES	50 % Original Portfolio / 50 % SECTOR PROXIES	40 % Original Portfolio / 60 % SECTOR PROXIES
Total Number of Portfolio Holdings	1	16	21	26	29	32	34	37
Idiosyncratic Concentration Coefficient	1.0	7.5	9.1	11.2	13.8	17.0	19.8	22.7
Fiduciary Diversification Score	1.0	5.1	6.9	9.4	10.8	12.4	13.2	14.9
Qualitative Diversification Metrics								
Sum of Weighted Position Variances	3.85 %	6.26 %	7.07 %	7.77 %	8.06 %	8.15 %	8.33 %	9.92 %
Portfolio Variance	3.85 %	5.10 %	5.16 %	5.22 %	5.21 %	4.84 %	4.72 %	5.69 %
Variance Gap	0.00 %	1.15 %	1.91 %	2.55 %	2.85 %	3.30 %	3.61 %	4.23 %
Estimated Diversification "Alpha"	0 bps	57.6 bps	95.5 bps	127.4 bps	142.6 bps	165.2 bps	180.3 bps	211.4 bps
Diversifiable Risk Remaining in Portfolio								
Quantitatively - Based on Fiduciary Scores	100 %	83 %	77 %	69 %	64 %	59 %	56 %	50 %
Qualitatively - Based on Variance Gaps	100 %	79 %	65 %	54 %	48 %	40 %	34 %	23 %

60% - 40% Portfolio Analysis

This is the starting point where in this case the user can confidently build and implement his/her own customized risk return tradeoff solution and document the prudent process that was followed.

Note – If there are any restrictions limiting the fiduciary's ability to invest in certain securities specified in a Financial Plan, Investment Policy Statement, Trust Document, or other expression of investment constraint, the fiduciary would be well advised to fully document those restrictions.

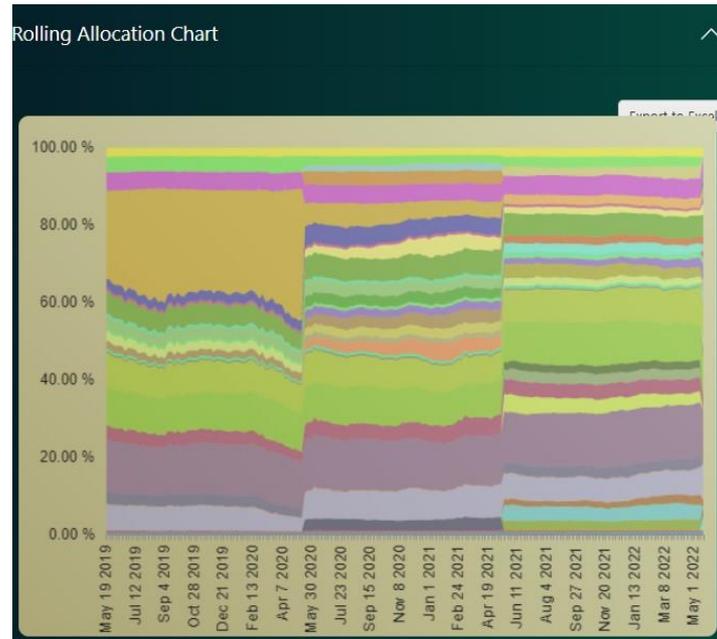
7- Portfolio Risk/Reward Scatter Chart



7- Portfolio Comparative P & L Chart



60%-40% Portfolio Rolling Allocation Chart



Annually, on the anniversary date, the system rebalances the legacy constituents and re-optimizes the non-legacy portion of each one of the six new portfolios. On each of the three annual anniversary dates (of portfolio input) the system rebalances the portfolio's initial legacy weightings to their originally entered percentages reduced to the total percentage allocated to the portfolio's legacy portion, and concurrently optimizes for best fit diversification outcomes the non-legacy portion from a list of 61 curated sectors and sub-sectors.

The above chart graphically illustrates the combined re-balancing /re-optimization of the selected portfolio, and the following two pages present the value changes and their respective allocations resulting from the re-balancing/re-optimization activity. Forward Forecasting of Recommended sectors or sub-sectors is done by the algorithm based only on information available before the date of each forecast.

60%-40% Portfolio Rolling Allocation Table



	Date	05/19/2019	05/13/2020		05/18/2020	05/13/2021		05/18/2021	05/13/2022		05/14/2022
1	AGOZK	0.72%	0.73%		0.71%	0.58%		0.72%	0.46%		0.72%
2	BBAX	0.43%	0.31%		0.41%	0.42%		0.42%	0.40%		0.42%
3	BBCA	0.60%	0.47%		0.60%	0.62%		0.62%	0.65%		0.60%
4	BBEU	0.78%	0.60%		0.77%	0.77%		0.80%	0.73%		0.78%
5	BBJP	0.72%	0.64%		0.69%	0.61%		0.73%	0.67%		0.72%
6	FSAIX	6.60%	3.37%		6.82%	8.29%		6.57%	6.90%		6.60%
7	FSPSX	0.24%	0.19%		0.23%	0.23%		0.24%	0.23%		0.24%
8	GSIMX	2.43%	2.29%		2.33%	2.09%		2.44%	2.45%		2.40%
9	IEMG	0.35%	0.29%		0.35%	0.35%		0.37%	0.31%		0.36%
10	IVOO	5.71%	4.28%		5.91%	6.61%		5.79%	5.64%		5.76%
11	MFEIX	9.97%	10.24%		9.75%	8.77%		10.05%	9.38%		9.90%
12	TWEIX	8.63%	7.08%		8.45%	7.54%		8.45%	9.39%		8.58%
13	VGPMX	0.78%	0.65%		0.78%	0.84%		0.79%	0.89%		0.78%
14	VIOO	3.72%	2.54%		3.92%	4.76%		3.83%	3.66%		3.78%
15	VOO	13.60%	12.27%		13.49%	13.19%		13.27%	14.02%		13.56%
16	VV	4.82%	4.37%		4.78%	4.70%		4.83%	4.99%		4.80%
17	AAAXJ	0.00%	0.00%		0.00%	0.00%		0.00%	0.00%		2.00%
18	DBA	0.00%	0.00%		1.43%	1.35%		0.00%	0.00%		3.00%
19	EWC	0.00%	0.00%		0.00%	0.00%		0.00%	0.00%		2.50%
20	GDX	22.84%	33.83%		6.01%	4.29%		0.00%	0.00%		2.00%
21	GLD	0.00%	0.00%		0.00%	0.00%		0.00%	0.00%		2.50%
22	GSG	0.00%	0.00%		2.06%	2.27%		1.49%	2.49%		4.50%
23	IGE	0.00%	0.00%		0.00%	0.00%		0.00%	0.00%		3.00%
24	KBE	0.00%	0.00%		0.00%	0.00%		2.45%	2.29%		1.50%
25	PPH	0.00%	0.00%		0.00%	0.00%		0.00%	0.00%		1.50%
26	TAN	0.00%	0.00%		2.01%	2.92%		1.53%	1.33%		3.00%
27	UNG	0.00%	0.00%		0.00%	0.00%		0.00%	0.00%		2.00%
28	USO	0.00%	0.00%		2.80%	3.49%		0.00%	0.00%		2.00%
29	XHB	0.00%	0.00%		0.00%	0.00%		0.00%	0.00%		2.50%
30	XLC	0.00%	0.00%		0.00%	0.00%		0.00%	0.00%		2.00%
31	XLE	0.00%	0.00%		0.00%	0.00%		1.51%	2.52%		2.00%
32	XLP	0.00%	0.00%		0.00%	0.00%		0.00%	0.00%		4.00%
33	EWV	0.00%	0.00%		0.00%	0.00%		2.51%	2.81%		0.00%
34	EZA	0.00%	0.00%		0.00%	0.00%		4.07%	3.87%		0.00%
35	IBUY	1.98%	2.25%		2.44%	2.96%		0.00%	0.00%		0.00%
36	IGN	0.00%	0.00%		0.00%	0.00%		1.96%	1.98%		0.00%
37	IHI	3.98%	4.16%		2.45%	2.17%		2.47%	2.45%		0.00%
38	ITA	0.00%	0.00%		0.00%	0.00%		2.44%	2.51%		0.00%
39	IYR	2.99%	2.19%		0.00%	0.00%		2.49%	2.67%		0.00%
40	IYZ	2.56%	2.07%		0.00%	0.00%		1.95%	1.69%		0.00%
41	IZRL	0.00%	0.00%		0.00%	0.00%		3.61%	2.40%		0.00%
42	MCHI	0.00%	0.00%		0.00%	0.00%		4.58%	2.93%		0.00%
43	OIH	0.00%	0.00%		0.00%	0.00%		2.53%	3.21%		0.00%
44	PEJ	0.00%	0.00%		0.00%	0.00%		2.52%	2.46%		0.00%
45	PSP	0.00%	0.00%		0.00%	0.00%		1.98%	1.63%		0.00%
46	QCLN	0.00%	0.00%		2.05%	2.98%		0.00%	0.00%		0.00%
47	SMH	0.00%	0.00%		1.49%	1.72%		0.00%	0.00%		0.00%
48	SOCL	0.00%	0.00%		2.00%	2.30%		0.00%	0.00%		0.00%
49	XBI	0.00%	0.00%		3.01%	2.42%		0.00%	0.00%		0.00%
50	XLK	0.00%	0.00%		3.47%	3.36%		0.00%	0.00%		0.00%
51	XLU	3.04%	2.62%		3.45%	2.83%		0.00%	0.00%		0.00%
52	XLV	2.52%	2.57%		5.37%	4.57%		0.00%	0.00%		0.00%
	Total	100.00%	100.00%		100.00%	100.00%		100.00%	100.00%		100.00%

60%-40% Portfolio Rolling Value Table

		05/19/2019	05/13/2020	05/18/2020	05/13/2021	05/18/2021	05/13/2022	05/14/2022
1	AGOZX	4,538	5,177	5,255	6,265	7,898	4,565	7,200
2	BBAX	2,686	2,208	3,082	4,526	4,641	4,037	4,200
3	BBCA	3,811	3,293	4,433	6,681	6,740	6,498	6,000
4	BBEU	4,928	4,263	5,717	8,330	8,701	7,332	7,800
5	BBJP	4,535	4,529	5,152	6,529	7,985	6,682	7,200
6	FSAIX	41,661	23,808	50,760	89,351	71,794	69,006	66,000
7	FSPSX	1,521	1,360	1,743	2,435	2,678	2,265	2,400
8	GSIMX	15,328	16,172	17,322	22,561	26,642	24,529	24,000
9	IEMG	2,218	2,057	2,616	3,783	4,058	3,126	3,600
10	IVOO	36,012	30,275	43,996	71,245	63,323	56,444	57,600
11	MFEIX	62,899	72,393	72,613	94,547	109,901	93,776	99,000
12	TWEIX	54,469	50,036	62,919	81,229	92,372	93,939	85,800
13	VGPMX	4,904	4,596	5,821	9,054	8,683	8,859	7,800
14	VIOO	23,462	17,985	29,157	51,309	41,848	36,623	37,800
15	VOO	85,774	86,762	100,441	142,147	145,084	140,169	135,600
16	VV	30,382	30,869	35,562	50,623	52,787	49,872	48,000
17	AAXJ	0	0	0	0	0	0	20,000
18	DBA	0	0	10,652	14,503	0	0	30,000
19	EWC	0	0	0	0	0	0	25,000
20	GDX	144,066	239,144	44,722	46,207	0	0	20,000
21	GLD	0	0	0	0	0	0	25,000
22	GSG	0	0	15,316	24,511	16,319	24,938	45,000
23	IGE	0	0	0	0	0	0	30,000
24	KBE	0	0	0	0	26,791	22,886	15,000
25	PPH	0	0	0	0	0	0	15,000
26	TAN	0	0	14,940	31,427	16,692	13,331	30,000
27	UNG	0	0	0	0	0	0	20,000
28	USO	0	0	20,858	37,589	0	0	20,000
29	XHB	0	0	0	0	0	0	25,000
30	XLC	0	0	0	0	0	0	20,000
31	XLE	0	0	0	0	16,552	25,181	20,000
32	XLP	0	0	0	0	0	0	40,000
33	EWV	0	0	0	0	27,481	28,123	0
34	EZA	0	0	0	0	44,514	38,663	0
35	IBUY	12,484	15,909	18,158	31,906	0	0	0
36	IGN	0	0	0	0	21,402	19,754	0
37	IHI	25,131	29,399	18,226	23,342	27,055	24,454	0
38	ITA	0	0	0	0	26,688	25,081	0
39	IYR	18,837	15,507	0	0	27,209	26,678	0
40	IYZ	16,170	14,602	0	0	21,285	16,860	0
41	IZRL	0	0	0	0	39,476	24,020	0
42	MCHI	0	0	0	0	50,047	29,340	0
43	OIH	0	0	0	0	27,648	32,120	0
44	PEJ	0	0	0	0	27,551	24,566	0
45	PSP	0	0	0	0	21,623	16,285	0
46	QCLN	0	0	15,226	32,110	0	0	0
47	SMH	0	0	11,112	18,493	0	0	0
48	SOCL	0	0	14,867	24,824	0	0	0
49	XBI	0	0	22,401	26,030	0	0	0
50	XLK	0	0	25,804	36,190	0	0	0
51	XLU	19,155	18,493	25,690	30,513	0	0	0
52	XLV	15,910	18,156	39,970	49,260	0	0	0
	Total	630,879	706,994	744,528	1,077,519	1,093,465	1,000,000	1,000,000

60% - 40% Forward Looking Allocation Based On 3-Year Trailing Correlation Matrix



	BBEU	AGOZX	VOO	IEMG	IVOO	FSAIX	VIOO	BBJP	GSIMX	BBAX	TWEIX	FSPSX	VGPMX	VV	MFEIX	BBCA	AAJX	DBA	EWC	GDX	GLD	GSG	IGE	KBE	PPH	TAN	UNG	USO	XHB	XLC	XLE	XLP	
1	BBEU	1	0.65	0.87	0.84	0.87	0.74	0.82	0.83	0.89	0.86	0.87	0.98	0.87	0.78	0.87	0.79	0.27	0.85	0.21	0.12	0.34	0.73	0.73	0.79	0.57	0.09	0.31	0.76	0.75	0.66	0.69	
2	AGOZX	0.65	1	0.76	0.67	0.73	0.46	0.67	0.59	0.70	0.60	0.61	0.66	0.60	0.78	0.85	0.64	0.66	0.21	0.63	0.19	0.12	0.26	0.46	0.45	0.63	0.70	0.11	0.21	0.66	0.74	0.37	0.46
3	VOO	0.87	0.76	1	0.81	0.92	0.73	0.85	0.79	0.86	0.83	0.94	0.88	0.84	0.99	0.93	0.88	0.77	0.27	0.86	0.17	0.08	0.39	0.72	0.74	0.84	0.61	0.13	0.34	0.82	0.89	0.67	0.81
4	IEMG	0.84	0.67	0.81	1	0.79	0.65	0.72	0.76	0.85	0.85	0.76	0.87	0.82	0.82	0.77	0.80	0.98	0.27	0.77	0.21	0.14	0.37	0.66	0.61	0.68	0.66	0.12	0.33	0.67	0.72	0.61	0.58
5	IVOO	0.87	0.73	0.92	0.79	1	0.83	0.97	0.78	0.79	0.82	0.92	0.87	0.86	0.92	0.79	0.88	0.73	0.29	0.86	0.18	0.06	0.40	0.80	0.87	0.78	0.63	0.12	0.36	0.88	0.77	0.75	0.71
6	FSAIX	0.74	0.46	0.73	0.65	0.83	1	0.84	0.64	0.62	0.71	0.79	0.75	0.75	0.72	0.54	0.77	0.58	0.32	0.76	0.14	0.04	0.39	0.77	0.81	0.62	0.48	0.10	0.36	0.74	0.58	0.75	0.56
7	VIOO	0.82	0.67	0.85	0.72	0.97	0.84	1	0.74	0.71	0.78	0.87	0.82	0.82	0.85	0.69	0.83	0.67	0.29	0.81	0.16	0.05	0.41	0.80	0.89	0.72	0.59	0.11	0.36	0.84	0.72	0.76	0.65
8	BBJP	0.83	0.59	0.79	0.76	0.78	0.64	0.74	1	0.76	0.78	0.77	0.89	0.77	0.79	0.71	0.74	0.73	0.23	0.73	0.17	0.10	0.28	0.62	0.65	0.69	0.52	0.09	0.21	0.68	0.69	0.57	0.64
9	GSIMX	0.89	0.70	0.86	0.85	0.79	0.62	0.71	0.76	1	0.81	0.82	0.80	0.85	0.87	0.84	0.83	0.81	0.27	0.81	0.29	0.24	0.36	0.66	0.57	0.79	0.59	0.13	0.31	0.70	0.76	0.58	0.71
10	BBAX	0.86	0.60	0.83	0.85	0.82	0.71	0.78	0.78	0.81	1	0.83	0.89	0.86	0.83	0.73	0.84	0.81	0.28	0.82	0.33	0.16	0.41	0.76	0.69	0.72	0.57	0.11	0.36	0.69	0.69	0.69	0.65
11	TWEIX	0.87	0.61	0.94	0.76	0.92	0.79	0.87	0.77	0.82	0.83	1	0.88	0.86	0.93	0.78	0.88	0.69	0.26	0.85	0.19	0.08	0.40	0.79	0.81	0.86	0.51	0.12	0.37	0.80	0.76	0.74	0.86
12	FSPSX	0.98	0.66	0.88	0.87	0.87	0.75	0.82	0.89	0.90	0.89	0.88	1	0.89	0.88	0.79	0.88	0.82	0.28	0.86	0.22	0.13	0.36	0.73	0.73	0.79	0.59	0.09	0.32	0.76	0.75	0.67	0.70
13	VGPMX	0.87	0.60	0.84	0.82	0.86	0.75	0.82	0.77	0.85	0.86	0.86	0.89	1	0.84	0.72	0.89	0.76	0.36	0.87	0.44	0.31	0.49	0.85	0.73	0.74	0.59	0.12	0.42	0.72	0.70	0.77	0.69
14	VV	0.87	0.78	0.99	0.82	0.92	0.72	0.85	0.79	0.87	0.83	0.93	0.88	0.84	1	0.94	0.88	0.77	0.26	0.85	0.18	0.08	0.38	0.71	0.73	0.83	0.63	0.13	0.34	0.82	0.90	0.65	0.80
15	MFEIX	0.78	0.85	0.93	0.77	0.79	0.54	0.69	0.71	0.84	0.73	0.78	0.79	0.72	0.94	1	0.77	0.74	0.21	0.75	0.18	0.11	0.31	0.54	0.52	0.74	0.63	0.12	0.27	0.73	0.91	0.46	0.68
16	BBCA	0.87	0.64	0.88	0.80	0.88	0.77	0.83	0.74	0.83	0.84	0.88	0.88	0.89	0.88	0.77	1	0.73	0.34	0.98	0.26	0.15	0.49	0.85	0.75	0.75	0.59	0.13	0.44	0.77	0.74	0.78	0.67
17	AAJX	0.79	0.66	0.77	0.98	0.73	0.58	0.67	0.73	0.81	0.81	0.69	0.82	0.76	0.77	0.74	0.73	1	0.24	0.72	0.18	0.13	0.33	0.59	0.55	0.64	0.66	0.12	0.28	0.63	0.70	0.54	0.52
18	DBA	0.27	0.21	0.27	0.27	0.29	0.32	0.29	0.23	0.27	0.28	0.26	0.28	0.36	0.26	0.21	0.34	0.24	1	0.34	0.11	0.15	0.50	0.37	0.24	0.20	0.21	0.12	0.31	0.24	0.24	0.35	0.16
19	EWC	0.85	0.63	0.86	0.77	0.86	0.76	0.81	0.73	0.81	0.82	0.85	0.86	0.87	0.85	0.75	0.98	0.72	0.34	1	0.25	0.14	0.48	0.86	0.74	0.74	0.58	0.12	0.43	0.77	0.74	0.77	0.65
20	GDX	0.21	0.19	0.17	0.21	0.18	0.14	0.16	0.17	0.29	0.33	0.19	0.22	0.44	0.18	0.18	0.26	0.18	0.11	0.25	1	0.71	0.19	0.33	0.06	0.18	0.23	0.01	0.15	0.19	0.14	0.17	0.19
21	GLD	0.12	0.12	0.08	0.14	0.06	0.04	0.05	0.10	0.24	0.16	0.08	0.13	0.31	0.08	0.11	0.15	0.13	0.15	0.14	0.71	1	0.16	0.16	-0.10	0.09	0.16	0.01	0.06	0.11	0.08	0.05	0.13
22	GSG	0.34	0.26	0.39	0.37	0.40	0.39	0.41	0.28	0.36	0.41	0.40	0.36	0.49	0.38	0.31	0.49	0.33	0.50	0.48	0.19	0.16	1	0.62	0.35	0.30	0.28	0.22	0.92	0.31	0.33	0.63	0.26
23	IGE	0.73	0.46	0.72	0.66	0.80	0.77	0.80	0.62	0.66	0.76	0.79	0.73	0.85	0.71	0.54	0.85	0.59	0.37	0.86	0.33	0.16	0.62	1	0.78	0.64	0.48	0.13	0.57	0.65	0.58	0.96	0.54
24	KBE	0.73	0.45	0.74	0.61	0.87	0.81	0.89	0.65	0.57	0.69	0.81	0.73	0.73	0.52	0.75	0.55	0.24	0.74	0.74	0.06	-0.10	0.35	0.78	1	0.62	0.43	0.11	0.33	0.70	0.57	0.77	0.56
25	PPH	0.79	0.63	0.84	0.68	0.78	0.62	0.72	0.69	0.79	0.72	0.86	0.79	0.74	0.83	0.74	0.75	0.64	0.20	0.74	0.18	0.09	0.30	0.64	0.62	1	0.46	0.13	0.28	0.66	0.70	0.58	0.77
26	TAN	0.57	0.70	0.61	0.66	0.63	0.48	0.59	0.52	0.59	0.57	0.51	0.59	0.59	0.63	0.63	0.59	0.66	0.21	0.58	0.23	0.16	0.28	0.48	0.43	0.46	1	0.07	0.23	0.57	0.57	0.42	0.33
27	UNG	0.09	0.11	0.13	0.12	0.12	0.10	0.11	0.09	0.13	0.11	0.12	0.09	0.12	0.13	0.12	0.13	0.12	0.12	0.12	0.01	0.01	0.22	0.13	0.11	0.13	0.07	1	0.13	0.09	0.12	0.13	0.08
28	USO	0.31	0.21	0.34	0.33	0.36	0.36	0.36	0.21	0.31	0.36	0.37	0.32	0.42	0.34	0.27	0.44	0.28	0.31	0.43	0.15	0.06	0.92	0.57	0.33	0.28	0.23	0.13	1	0.27	0.29	0.59	0.24
29	XHB	0.76	0.66	0.82	0.67	0.88	0.74	0.84	0.68	0.70	0.69	0.80	0.76	0.72	0.82	0.73	0.77	0.63	0.24	0.77	0.19	0.11	0.31	0.65	0.70	0.66	0.57	0.09	0.27	1	0.69	0.58	0.62
30	XLC	0.75	0.74	0.89	0.72	0.77	0.58	0.72	0.69	0.76	0.69	0.76	0.75	0.70	0.90	0.91	0.74	0.70	0.24	0.74	0.14	0.08	0.33	0.58	0.57	0.70	0.57	0.12	0.29	0.69	1	0.51	0.67
31	XLE	0.66	0.37	0.67	0.61	0.75	0.75	0.76	0.57	0.58	0.69	0.74	0.67	0.77	0.65	0.46	0.78	0.54	0.35	0.77	0.17	0.05	0.63	0.96	0.77	0.58	0.42	0.13	0.59	0.58	0.51	1	0.48
32	XLP	0.69	0.46	0.81	0.58	0.71	0.56	0.65	0.64	0.71	0.65	0.86	0.70	0.69	0.80	0.68	0.67	0.52	0.16	0.65	0.19	0.13	0.26	0.54	0.56	0.77	0.33	0.08	0.24	0.62	0.67	0.48	1

Visually this matrix shows the importance of identifying non-correlation of price movements between different securities. It is the most important part of Diversification.

Note that the legacy portfolio comprises the first 16 constituents and contains almost all of the highly correlated holdings.

The system improved diversification by replacing the legacy's overall weighting with a number of less correlated assets.

The following slide provides additional information that allows the user to easily customize portfolios.

60% - 40% Portfolio

Table of Correlation Scores, Allocations, & Sharpe Ratios



#	Symbol	Correlation Score in			Total Score	Allocation	Sharpe Ratio
		90s	80s	70s			
1	BBEU	3	24	8	35	0.78%	0.21
2	AGOZK	0	2	6	8	0.72%	-0.19
3	VOO	12	26	6	44	13.56%	0.57
4	IEMG	3	16	7	26	0.36%	0.13
5	IVOO	12	20	10	42	5.76%	0.36
6	FSAIX	0	6	12	18	6.60%	0.08
7	VIOO	3	24	7	34	3.78%	0.32
8	BBJP	0	4	13	17	0.72%	0.19
9	GSIMX	3	22	8	33	2.40%	0.54
10	BBAX	0	24	6	30	0.42%	0.20
11	TWEIX	9	24	7	40	8.58%	0.44
12	FSPSX	6	24	8	38	0.24%	0.22
13	VGPMX	0	26	9	35	0.78%	0.82
14	MFEIX	9	4	13	26	9.90%	0.46
15	BBCA	3	24	9	36	0.60%	0.46
16	VV	15	24	6	45	4.80%	0.59
17	AAXJ	3	6	10	19	2.00%	0.05
18	DBA	0	0	0	0	3.00%	0.87
19	EWC	3	22	10	35	2.50%	0.41
20	GDX	0	0	1	1	2.00%	0.33
21	GLD	0	0	1	1	2.50%	0.73
22	GSG	3	0	0	3	4.50%	0.50
23	IGE	3	10	8	21	3.00%	0.40
24	KBE	0	8	10	18	1.50%	0.11
25	PPH	0	6	12	18	1.50%	0.58
26	TAN	0	0	1	1	3.00%	0.69
27	UNG	0	0	0	0	2.00%	0.09
28	USO	3	0	0	3	2.00%	-0.17
29	XHB	0	10	9	19	2.50%	0.45
30	XLC	6	2	13	21	2.00%	0.29
31	XLE	3	0	8	11	2.00%	0.33
32	XLP	0	6	4	10	4.00%	0.68
						100.00%	

Look at this table as an Artificial Intelligent Assistant suggesting a course of action and really enhancing your ability to customize. Look for a high total score (too correlated) with a low Sharpe Ratio (less return or more risk) especially when it involves one the securities exhibiting higher allocation. See any here?

Sometimes these three-year figures show a negative Sharpe Ratio. So, look at shorter periods., which can be done easily while on the platform)

Finally, go back and choose the portfolios with higher and lower legacy portion of your chosen portfolio. In the instant case, perhaps 70-30.

If good results only occurred at 50-50 or 40-60 then that, by itself, is an indication that you should consider all the suggestions noted and rethink the starting allocation applying the information provided..

Omitted from this analysis is when to re-establish the compensated risk element to the portfolio by re-introducing a fixed income portion. Expect no large benefit from reducing **uncompensated** risk since these mixed portfolios replace the risk asset **compensated** risk with fixed income **compensated** risk (which has its own unique risks added).