



Martin Zweig

Investment Strategy with Portfolio Optimization

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Outline

- About Martin Zweig
- Idea behind Martin Zweig's Strategy
- Selected Stocks
- Additional Element
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- Portfolio Optimization Results
- Monthly & Yearly Returns (Investment Strategy)
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Who is Martin Zweig ?

- An American investor whose investment strategy involved selecting growth stocks using fundamental analysis
- He used to write newsletters about investments, called **The Zweig Forecast**, which from 1970-1985 returned on average 15.9% per year (**risk-adjusted return**)
- He later founded Zweig-DiMenna with his mentee, which is a long/short investment firm (**emphasizing on US Stocks**)
- However, during his time as chairman he passed away, but his investment strategy still lives on



His Strategy

Zweig's Key Investing Criteria

- Look for a reasonable P/E ratio—not too high and not too low.
- Make sure revenue is growing comparably to the 3-year EPS growth rate.
- Look for rising sales growth over the past year.
- Look for positive earnings growth in the current quarter.
- Look for earnings growth in the past several quarters to be at least half of the long-term growth rate.
- Compare EPS growth in the current quarter with the prior three quarters; avoid slowing growth.
- Compare EPS growth in the current quarter with historical growth.
- Look for earnings persistence over the past five years.
- Look for the long-term EPS growth rate to be at least 15 percent.
- Look for no debt or a low debt-equity ratio compared to a stock's industry.



Source: *The Guru Investor: How to Beat the Market Using History's Best Investment Strategies*

Selected Stocks

Stock/Company	Ticker	Industry	Sector
First American Financial	FAF	Financial Services	Insurance
Whirlpool Corporation	CLFD	Consumer Cyclical	Home Appliances
Clearfield Incorporated	WHR	Technology	Communications Equipment
Atlas Air Worldwide Holdings	AAWW	Industrials	Airports & Air Services
Meritage Homes	MTH	Consumer Cyclical	Residential Construction
Quest Diagnostics Incorporated	DGX	Healthcare	Diagnostics & Research



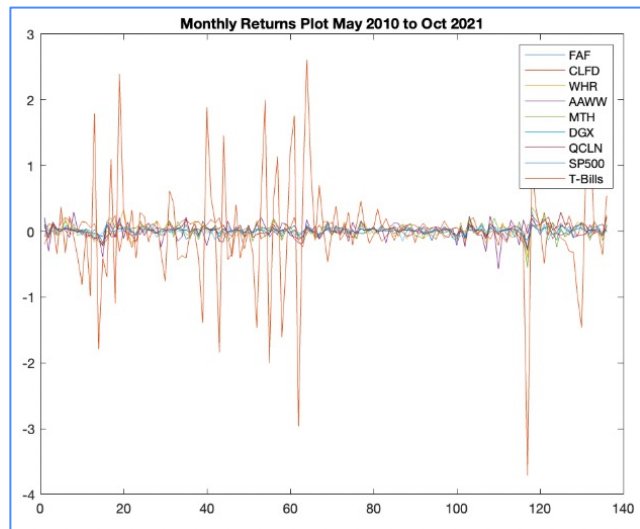
- Selected a diverse group of stocks that satisfy Martin Zweig's investment strategy criteria
- Challenge finding stocks that satisfy all the criteria → Some minor violations were allowed
- *Benchmark* → S&P500 market index (Why? → Diverse and consists of 500 largest companies in the U.S – good representation of the market)
- *Risk-free* → 13-week treasury bills

Additional Element

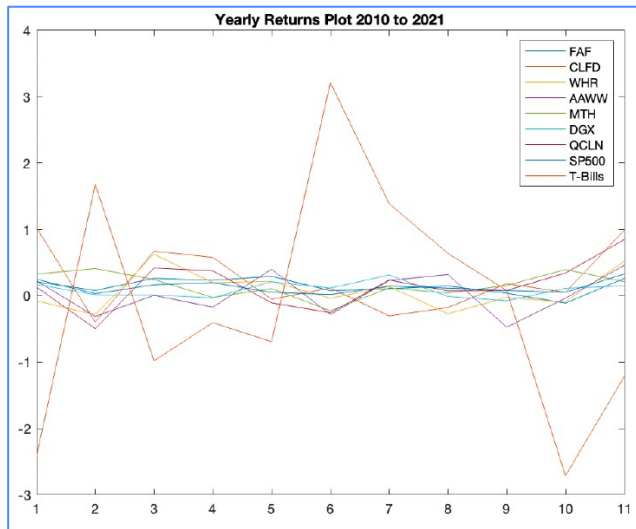
- Chose to include an additional asset into the strategy : First Trust NASDAQ Clean Edge Green Energy Index Fund ETF (**QCLN**)
- As the name suggests, it invests in **clean energy** companies in the United States
- Why ?
 - Environmentally friendly stocks are growing in popularity due to increased environmental concerns
 - Slowly becoming a key element of consideration before choosing an investment
 - Future prospects are high



Monthly & Yearly Plots



- Excluding the T-bills, the individual stocks have constant/stable monthly returns
- Monthly returns of T-bills seem to be extremely volatile



- Excluding the T-bills, the individual stocks have constant/stable yearly returns as well (**CLFD and QCLN seem to be performing well**)
- Yearly returns of T-bills also seem to be extremely volatile

Monthly & Yearly Data Summary

	Mean	Max	Min	Std	Skewness	Kurtosis
FAF	0.0129	0.1567	-0.2974	0.0684	-0.9849	5.4819
CLFD	0.0227	0.2891	-0.3819	0.1224	-0.5546	3.3249
WHR	0.0064	0.3302	-0.3989	0.1023	-0.0584	4.5837
AAWW	0.0039	0.2955	-0.5687	0.1305	-0.8353	5.2612
MTH	0.0140	0.3644	-0.5528	0.1098	-0.6827	7.7325
DGX	0.0080	0.3157	-0.2782	0.0659	-0.0897	7.7718
QCLN	0.0129	0.2911	-0.2675	0.0807	0.0945	4.4643
^GSPC	0.0110	0.1194	-0.1337	0.0392	-0.5175	4.4172
^IRX	-0.0093	2.6101	-3.7136	0.8270	-0.5182	7.6042

	Mean	Max	Min	STD	Skewness	Kurtosis
FAF	0.1448	0.2919	-0.1118	0.1218	-0.6645	2.7113
CLFD	0.2436	1.0260	-0.3992	0.4996	0.3917	1.8154
WHR	0.0827	0.6259	-0.2849	0.2940	0.5865	2.3577
AAWW	0.0328	0.4592	-0.4739	0.3159	-0.1552	1.6873
MTH	0.1595	0.4084	-0.2267	0.1890	-0.5008	2.7041
DGX	0.0887	0.3115	-0.0768	0.1183	0.3519	2.1836
QCLN	0.1493	0.8457	-0.4961	0.3618	0.0513	2.8822
^GSPC	0.1298	0.3265	0.0172	0.0981	0.6840	2.4366
^IRX	-0.1315	3.2108	-2.7130	1.7776	0.2950	2.3719

- Monthly returns of the assets are generally higher than the **S&P500**, except **DGX**, **IRX** and **AAWW**
- **IRX** is the only one with negative average monthly returns

- All assets except **WHR**, **AAWW**, **DGX** & **IRX** have yearly returns greater than **S&P500**
- Once again, **IRX** is the only one with negative yearly returns

Quantile Payoffs

	One percent	Five percent	Fifty percent	Ninety-Five percent
FAF	88.8205	89.5673	114.6095	129.0406
CLFD	60.0791	60.5551	111.7294	202.4040
WHR	71.5101	71.5830	97.3178	162.0599
AAWW	52.6140	53.4175	100.5729	145.6253
MTH	77.3346	78.3335	115.5418	140.7687
DGX	92.3174	92.5389	111.2739	130.6479
QCLN	50.3890	51.5893	113.1944	182.4239
^GSPC	101.7180	101.7869	111.4857	132.2604
^IRX	-171.2976	-169.8715	59.4535	413.4000

- Looking at the 1% and 95% quantiles, we can get a better idea of the amount that an investor could have had if they invested \$100
- Most investments have some chance of losing money
- The only investment with no chance of losing any money is the S&P500 market index (**lowest volatility**)

Monthly & Yearly Sharpe Ratios

Monthly

	Sharpe Ratio	P Value	Target P value
FAF	0.0274	0.3746	0.0073
CLFD	0.0383	0.3275	0.0073
WHR	0.0193	0.4106	0.0073
AAWW	0.0160	0.4261	0.0073
MTH	0.0288	0.3681	0.0073
DGX	0.0211	0.4025	0.0073
QCLN	0.0274	0.3746	0.0073
SP500	0.0249	0.3857	0.0073

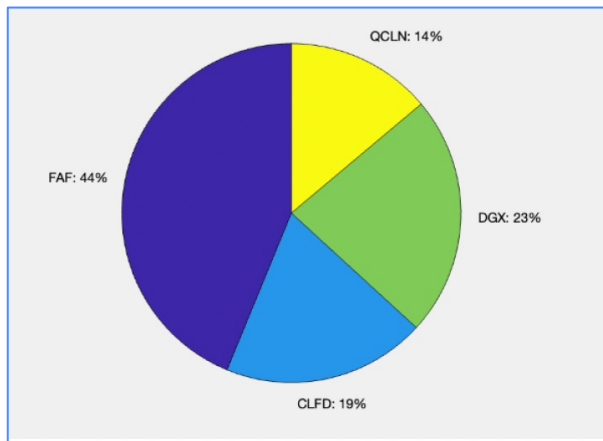
Annualized

	Annualized Sharpe Ratio	P Value	Target P value
FAF	0.0948	0.3744	0.0100
CLFD	0.1325	0.3276	0.0100
WHR	0.0670	0.4104	0.0100
AAWW	0.0553	0.4258	0.0100
MTH	0.0999	0.3679	0.0100
DGX	0.0732	0.4022	0.0100
QCLN	0.0948	0.3744	0.0100
SP500	0.0862	0.3854	0.0100

- Mostly above 2%, with the exceptional case of **CLFD** at 3.83%
- However, all are **insignificant**. From a statistical point of view, they are all not different from 0
- Mostly above 8%, with **CLFD** performing very well again (13.25%)
- Same as the the monthly returns, all are **insignificant**

Portfolio Optimization

Stock/Company	Ticker	Industry	Sector
First American Financial	FAF	Financial Services	Insurance
Whirlpool Corporation	CLFD	Consumer Cyclical	Home Appliances
Clearfield Incorporated	WHR	Technology	Communications Equipment
Atlas Air Worldwide Holdings	AAWW	Industrials	Airports & Air Services
Meritage Homes	MTH	Consumer Cyclical	Residential Construction
Quest Diagnostics Incorporated	DGX	Healthcare	Diagnostics & Research



- The portfolio is optimized by finding the combination of assets that **maximizes** the Sharpe ratio
- Optimization suggests that the portfolio maximizing the Sharpe ratio is with **FAF**, **CLFD**, **DGX** & the **QCLN** (clean energy ETF) in the proportions above

Monthly & Yearly Returns (Investment Strategy)

	Final Portfolio	S&P 500
Mean	1.37 %	1.10 %
Standard Deviation	5.42 %	3.92 %

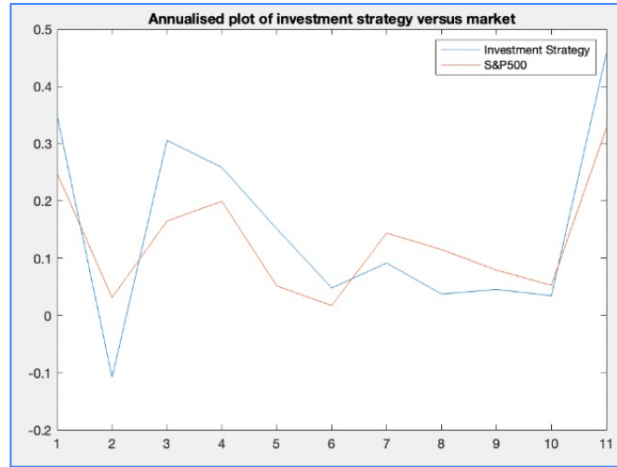
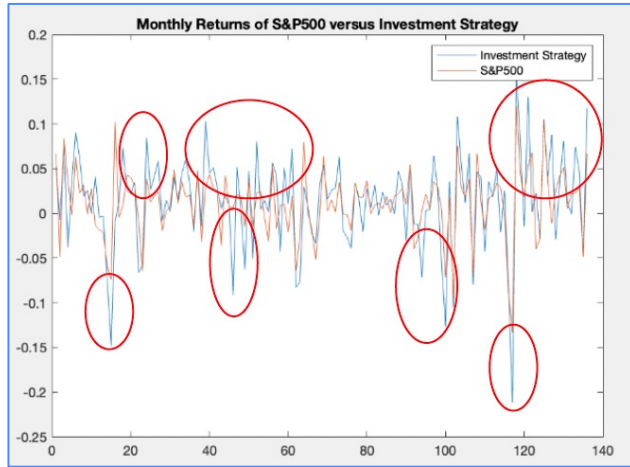
➡ Monthly

	Final Portfolio	S&P 500
Mean	16.40 %	13.21 %
Standard Deviation	18.78 %	13.60 %

➡ Yearly

- **General conclusion:** Investment strategy provides **higher returns** than the S&P500 market index however, it has **higher volatility**

Monthly & Yearly Plots (Investment Strategy)



- Excess volatility of the investment strategy can be seen in the graph above
- Overall, they seem to follow a similar pattern
- For the most part, the investment strategy has yields returns that are higher on a yearly basis
- Large spikes most likely contribute to the higher volatility

Monthly & Yearly Sharpe Ratios (Investment Strategy)

Sharpe Ratio	P-Value	Target P-value
0.0282	0.3710	0.0073

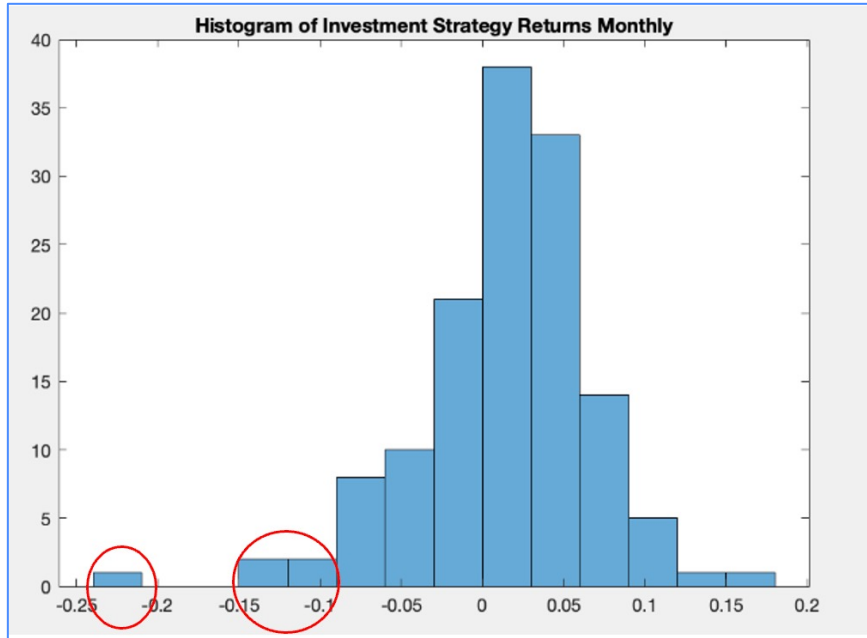
- Statistically **insignificant**
- Excess return of 2.82% for each unit of additional risk that is taken on

Annualized Sharpe Ratio	P-Value	Target P-value
0.0976	0.3708	0.0100

- Statistically **insignificant**
- Excess return of 9.76% for each unit of additional risk that is taken on

- Without considering the significance, the Sharpe ratios of the investment strategy are **higher** than that of the benchmark (**S&P500**)

Distribution of Investment Strategy Returns



- Some tail risk that is circled in the graph, however, returns in the right tail
- Overall, the positive returns and returns on the right tail outweigh the negative returns
- Can expect more positive than negative returns from this strategy

Advice

- Whether or not the investment is attractive depends on the investors risk preferences
- Investment strategy offers higher returns but also has higher volatility
- Investing solely in the S&P 500 market index provides lower returns but a more stable returns (**less volatility**)
- Risk averse person who is contempt with fairly good returns would prefer the S&P 500
- Risk loving person might prefer the investment strategy because it provides higher returns with slightly more volatility – “*higher risk and higher reward*” element

Thank you for your attention