# GREENSTAR

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#### Recommended Asset Allocation

-2021-01-13

FRONTIER CURVE OPTIMAL PORTFOLIO ANALYSIS

MONTE CARLO SIMULATION OF RETURNS

CORRELATION MATRIX

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### 1 Statistical Terminology & Asset Class Descriptions

**Expected Return** - Of an investing strategy is the amount of money you are expected to get back from your investment. For example, if 90 dollars is invested for 1 year with an expected return of 100 dollars, then in the average case the investment will yield back 100 dollars.

 $\bf Risk$ - Or standard deviation of an investing strategy is a measure of how much the return of an investment strategy will vary from it's expected return. For example, an investment strategy with an expected return of 20% and a risk of 8% will yield 112% to 128% return with a probability of 68.2%, and 104% to 136% return with a probability of 94.4%

The 18 Asset Classes:

| Index | Description   |
|-------|---|
| BIL   | Currencies, Foreign Currencies.   |
| GSG   | Basic goods used in commerce.   |
| GVI   | Govt. bonds that mature in 5-10 years.  |
| HYG   | Lower credit rating higher return bonds.  |
| IYR   | Land and buildings.   |
| JEDAX | Bonds issued by emerging countries.   |
| JKD   | Undervalued stocks from big companies.  |
| LQD   | Bonds issued by a corporation.  |
| MDY   | Stocks from mid sized companies.  |
| MUB   | Bonds Issued by local government.   |
| PIGLX | Bonds issued in other countries.  |
| VEMAX | Stocks from emerging Mkt. countries.  |
| VFINX | New and innovative companies.   |
| VGTSX | Stocks not traded in U.S.A. exchanges.  |
| VIGRX | Fastly growing stocks from big companies.   |
| VISVX | Undervalued stocks from small companies.  |
| VUSTX | Govt. bonds mature in more than 10 years.   |
| ^RUT  | Fastly growing stocks from small companies.   |
|       | BIL GSG GVI HYG IYR JEDAX JKD LQD MDY MUB PIGLX VEMAX VFINX VGTSX VIGRX VISVX VUSTX |

# 2 Investment Profile

#### General Information

Name:

Birthday:

 ${\bf Time\ Frame:}$ 

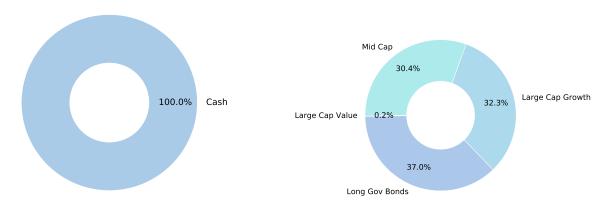
Available Funds : \$10,000

Preferred Risk :  $\pm$  9.76% Yearly

#### Recommended Asset Classes:

| Asset Class      | Index | Description                               |
|------------------|-------|---|
| Large Cap Value  | JKD   | Undervalued stocks from big companies.    |
| Mid Cap          | MDY   | Stocks from mid sized companies.          |
| Large Cap Growth | VIGRX | Fastly growing stocks from big companies. |
| Long Gov Bonds   | VUSTX | Govt. bonds mature in more than 10 years. |

# 3 Prescribed Allocation Changes



(a) Current Portfolio

(b) New Portfolio

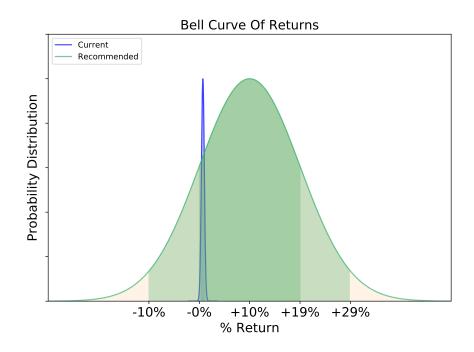
| Asset Class            | Current  | Suggested | Change     |
|------------------------|----------|-----------|------------|
| Cash                   | \$10,000 | \$0       | (\$10,000) |
| Commodities            | \$0      | \$0       | \$0        |
| Intermediate Gov Bonds | \$0      | \$0       | \$0        |
| High Yield Bonds       | \$0      | \$0       | \$0        |
| Real Estate            | \$0      | \$0       | \$0        |
| Emerging Mkt Debt      | \$0      | \$0       | \$0        |
| Large Cap Value        | \$0      | \$23      | \$23       |
| Corporate Bonds        | \$0      | \$0       | \$0        |
| Mid Cap                | \$0      | \$3,044   | \$3,044    |
| Municipal Bonds        | \$0      | \$0       | \$0        |
| Foreign Bonds          | \$0      | \$0       | \$0        |
| Emerging Mkt Stock     | \$0      | \$0       | \$0        |
| International Stock    | \$0      | \$0       | \$0        |
| Large Cap Growth       | \$0      | \$3,234   | \$3,234    |
| Small Cap Value        | \$0      | \$0       | \$0        |
| Long Gov Bonds         | \$0      | \$3,696   | \$3,696    |
| Small Cap Growth       | \$0      | \$0       | \$0        |

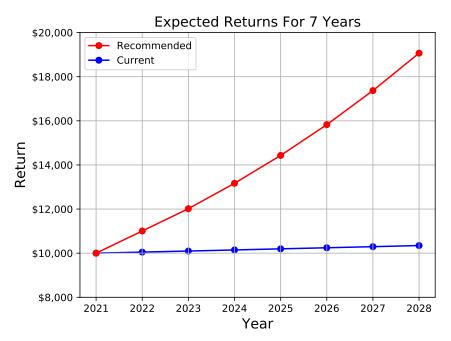
# 4 Performance Improvements Of Prescribed Portfolio

Below are 7 year simulation results of your current investing strategy versus the investment strategy prescribed in this report.

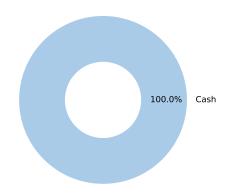
Change In Expected Return : 9.07%

Change in Risk : 9.48%

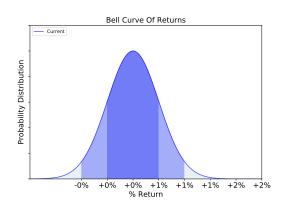




# 5 Current Portfolio Overview - Statistical Analysis

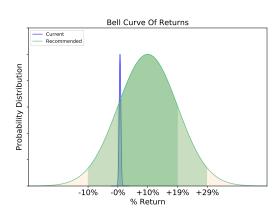


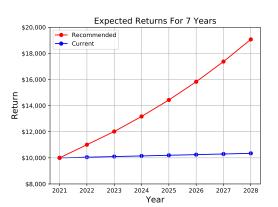
Portfolio Breakdown





(a) Current Portfolio 1 Year Projections





(b) Current Portfolio 7 Year Projections

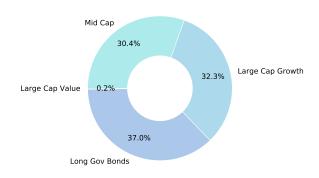
1 Year Expected Return (\$): \$48 0.49%

1 Year Risk (Std Deviation %) :  $\pm~0.28\%$ 

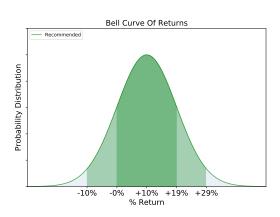
7 Year Expected Return (\$): \$346 3.46%

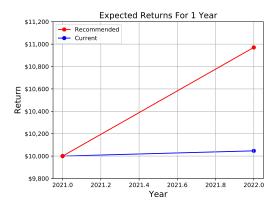
7 Year Risk (Std Deviation %):  $\pm 0.78\%$ 

# 6 Prescribed Portfolio Overview - Statistical Analysis

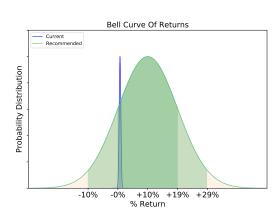


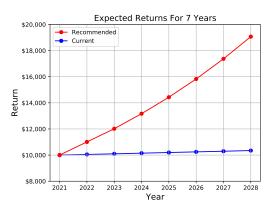
Portfolio Breakdown





(a) Prescribed Portfolio 1 Year Projections





(b) Prescribed Portfolio 7 Year Projections

1 Year Expected Return (\$): \$1,005 10.06%

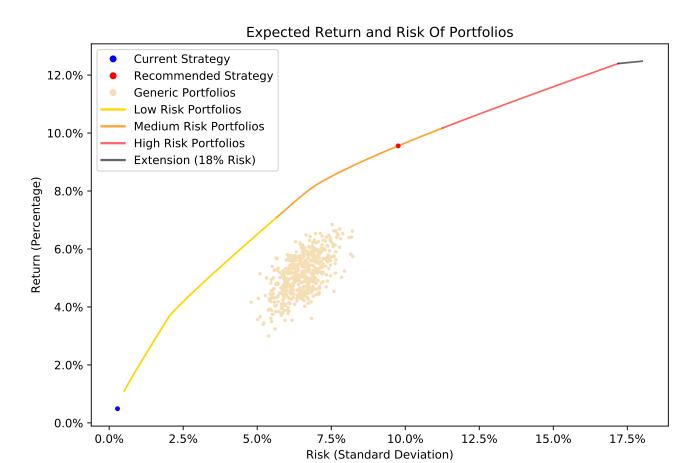
1 Year Risk (Std Deviation %):  $\pm 9.76\%$ 

7 Year Expected Return (\$): \$9,066 90.67%

7 Year Risk (Std Deviation %):  $\pm$  45.31%

#### 7 Frontier Curve

In 1990, Harry Markowitz won a nobel prize for his contributions to portfolio balancing theory. Markowitz discovered that given assets to buy from and funds to buy with, all of the optimal portfolios formed on a curved line called the "Frontier Curve."



Risk (Std. Deviation):  $\pm 9.76\%$ Expected Return (%): 9.56%Adjustment of Risk (%): 9.48%Change in Return (%): 9.07%

# 8 Correlation Matrix

| BIL 1.0 -0.54 0 GSG -0.54 1.0 -( GVI 0.72 -0.8 1 HYG 0.65 -0.72 0 IYR 0.65 -0.68 0 JEDAX 0.59 -0.67 0 JKD 0.75 -0.72 0 LQD 0.73 -0.77 0 MDY 0.65 -0.72 C   |                                     | 0.65<br>-0.72 | 0.65<br>-0.68<br>0.91<br>0.97<br>1.0<br>0.96 | 0.59<br>0.94<br>0.96 | 0.75  | 0.73  | 0.65  | 0.7   | 0.56  | 0.53  | 0.57  | 0.83 | 0.57  | 0.76  | 0.61  |
|--|-------------------------------------|---------------|--|----------------------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|
| -0.54     1.0       0.72     -0.8       0.65     -0.72       0.65     -0.68       0.59     -0.67       0.75     -0.72       0.73     -0.77       0.65     -0.72       0.73     -0.77       0.65     -0.72       0.77     -0.81 |                                     |               | 0.91<br>0.97<br>1.0<br>0.96                  |                      | -0.72 | -0.77 |       |       | 000   |       | 5     |      |       |       |       |
| 0.72 -0.8 0.65 -0.72 0.65 -0.68 0.59 -0.67 0.75 -0.72 0.73 -0.77 0.65 -0.72  | 1.0<br>0.96<br>0.91<br>0.94<br>0.91 |               | 0.91<br>0.97<br>1.0<br>0.96                  | 0.99                 | 0.91  |       | -0.72 | -0.81 | -0.68 | -0.32 | -0.47 | -0.7 | -0.71 | -0.78 | -0.68 |
| 0.65 -0.72<br>0.65 -0.68<br>0.59 -0.67<br>0.75 -0.72<br>0.73 -0.77<br>0.65 -0.72   | 0.96                                |               | 0.97<br>1.0<br>0.96<br>0.96                  | 0.99                 | -     | 0.99  | 6.0   | 86.0  | 0.94  | 0.68  | 0.78  | 0.91 | 0.86  | 0.97  | 0.87  |
| 0.65 -0.68<br>0.59 -0.67<br>0.75 -0.72<br>0.73 -0.77<br>0.65 -0.72   | 0.94                                |               | 0.96   | 96.0                 | 0.95  | 26.0  | 26.0  | 26.0  | 96.0  | 0.79  | 6.0   | 0.91 | 0.95  | 0.89  | 96.0  |
| 0.59 -0.67<br>0.75 -0.72<br>0.73 -0.77<br>0.65 -0.72   | 0.94                                |               | 0.96   |                      | 96.0  | 0.94  | 26.0  | 0.95  | 68.0  | 92.0  | 6.0   | 0.92 | 96.0  | 0.88  | 96.0  |
| 0.75 -0.72<br>0.73 -0.77<br>0.65 -0.72<br>0.7 -0.81  | 0.91                                |               | 96.0   | 1.0                  | 0.91  | 96.0  | 0.94  | 96.0  | 0.97  | 0.81  | 0.89  | 0.87 | 0.93  | 0.88  | 0.93  |
| 0.73 -0.77<br>0.65 -0.72<br>0.7 -0.81  |                                     |               |  | 0.91                 | 1.0   | 0.95  | 86.0  | 0.94  | 0.85  | 0.75  | 0.91  | 66.0 | 0.95  | 6.0   | 96.0  |
| 0.65 -0.72   | 0.99                                | 26.0          | 0.94   | 96.0                 | 0.95  | 1.0   | 0.93  | 66.0  | 0.94  | 0.73  | 0.83  | 0.94 | 6.0   | 0.97  | 0.91  |
| 0.7 -0.81  | 6.0                                 | 26.0          | 0.97   | 0.94                 | 86.0  | 0.93  | 1.0   | 0.94  | 0.88  | 0.77  | 0.93  | 0.94 | 0.99  | 0.86  | 0.99  |
|  | 86.0                                | 26.0          | 0.95   | 96.0                 | 0.94  | 66.0  | 0.94  | 1.0   | 0.93  | 0.69  | 0.81  | 0.92 | 0.91  | 0.96  | 0.91  |
| PIGLX 0.56 -0.68 0   | 0.94                                | 96.0          | 0.89   | 26.0                 | 0.85  | 0.94  | 0.88  | 0.93  | 1.0   | 0.78  | 0.82  | 0.82 | 0.87  | 0.86  | 0.87  |
| VEMAX 0.53 -0.32 0   | 89.0                                | 0.79          | 92.0   | 0.81                 | 0.75  | 0.73  | 0.77  | 69.0  | 0.78  | 1.0   | 0.91  | 0.75 | 0.75  | 9.0   | 0.78  |
| VGTSX 0.57 -0.47 0   | 0.78                                | 6.0           | 6.0  | 0.89                 | 0.91  | 0.83  | 0.93  | 0.81  | 0.82  | 0.91  | 1.0   | 0.88 | 0.92  | 0.72  | 0.94  |
| VIGRX 0.83 -0.7 0  | 0.91                                | 0.91          | 0.92   | 0.87                 | 0.99  | 0.94  | 0.94  | 0.92  | 0.82  | 0.75  | 0.88  | 1.0  | 0.0   | 0.92  | 0.92  |
| VISVX 0.57 -0.71 0   | 98.0                                | 0.95          | 96.0   | 0.93                 | 0.95  | 6.0   | 66.0  | 0.91  | 0.87  | 0.75  | 0.92  | 0.9  | 1.0   | 0.81  | 0.99  |
| 0 82.0- 0.76 VUSTX   | 26.0                                | 68.0          | 0.88   | 0.88                 | 6.0   | 26.0  | 98.0  | 96.0  | 98.0  | 9.0   | 0.72  | 0.92 | 0.81  | 1.0   | 0.82  |
| ^RUT 0.61 -0.68 0  | 0.87                                | 96.0          | 96.0   | 0.93                 | 96.0  | 0.91  | 0.99  | 0.91  | 0.87  | 0.78  | 0.94  | 0.92 | 0.99  | 0.82  | 1.0   |

Above is the Semantic Correlation Matrix of the selected Asset Classes. It shows how each asset class is correlated to one another

9 Risk & Return Rankings

| 17%   | 13% | 13%   | 12% | 12%                 | 11%         | 10%   | %6    | 8%    | 8%  | %2    | %9  | 2%    | 2%  | 3%  | 2%  | %0  |
|-------|-----|-------|-----|---------------------|-------------|-------|-------|-------|-----|-------|-----|-------|-----|-----|-----|-----|
| VIGRX | MDY | VISVX | JKD | ${^{}}\mathrm{RUT}$ | $_{ m IYR}$ | VEMAX | VUSTX | VGTSX | GSG | JEDAX | HYG | PIGLX | LQD | MUB | GVI | BIL |

Above is the ranking of the selected asset classes by risk

| VIGRX                  | 12%   |
|------------------------|-------|
| MDY                    | 10%   |
| JKD                    | 10%   |
| VISVX                  | %6    |
| $^{\circ}\mathrm{RUT}$ | %8    |
| VUSTX                  | %2    |
| $\Gamma$               | %9    |
| $_{ m IYR}$            | %9    |
| PIGLX                  | 2%    |
| JEDAX                  | 2%    |
| HYG                    | 2%    |
| MUB                    | 4%    |
| VEMAX                  | 3%    |
| VGTSX                  | 3%    |
| GVI                    | 3%    |
| BIL                    | %0    |
| CSG                    | (10%) |

Above is the ranking of the selected asset classes by return

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