MGF 633: INVESTMENT MANAGEMENT

By:

Team 10

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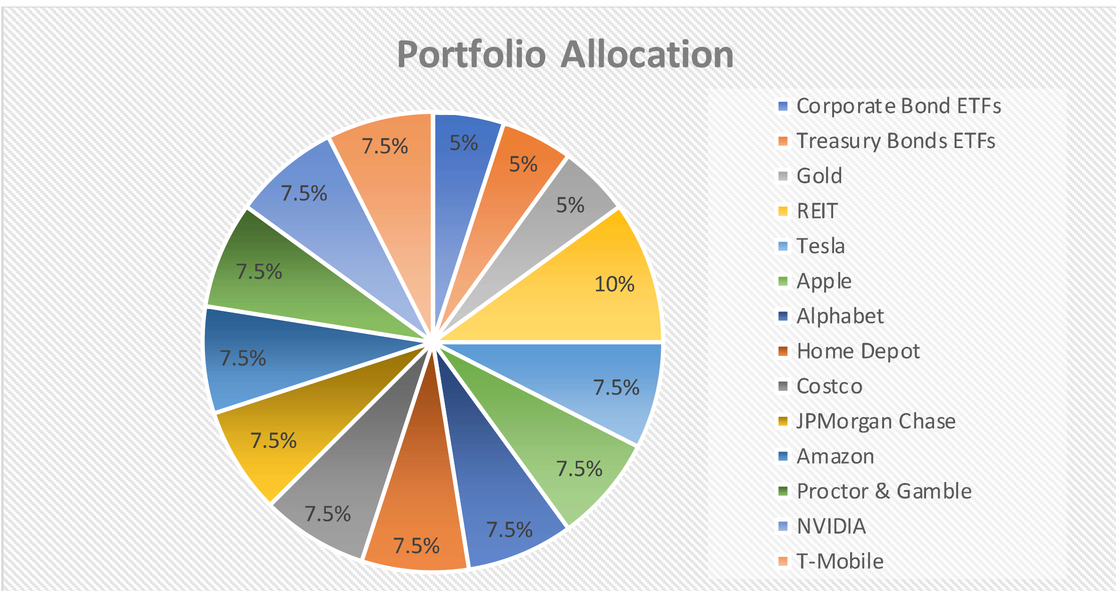
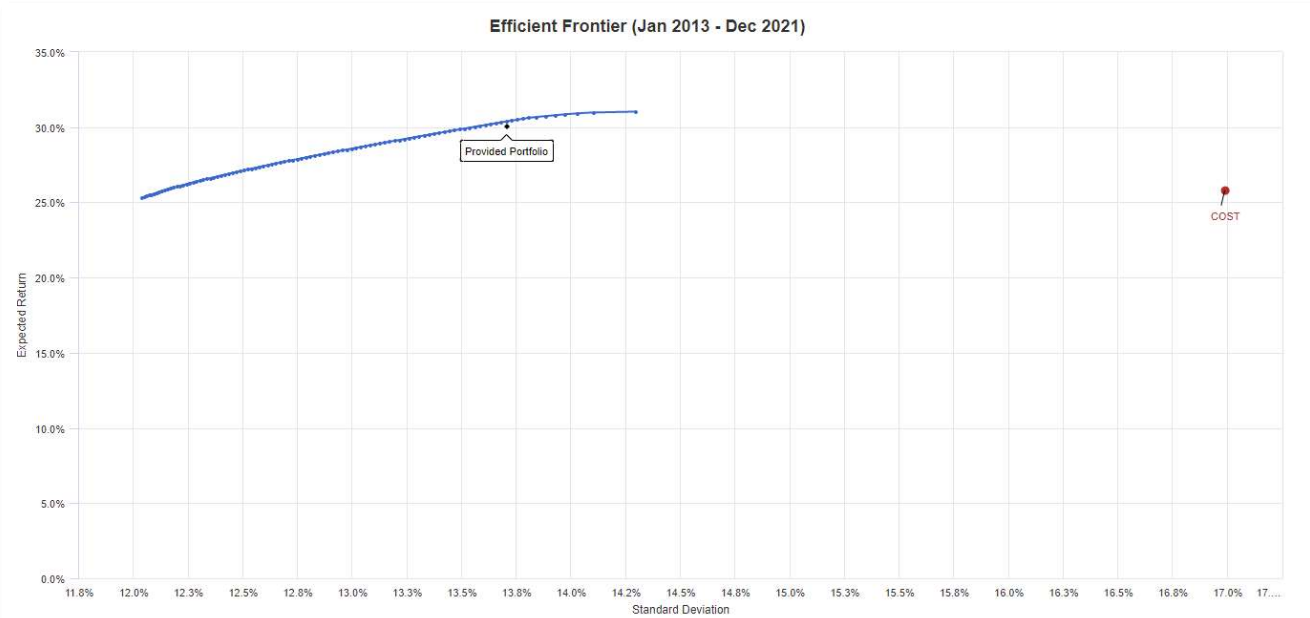
Overview

The World today is amid volatility considering the rise of Covid 19 cases in Asia, Ukraine and Russia war, recession risks, supply chain disruption and Fed interest rate hikes. Every asset, from riskless to the riskiest ones, have experienced unstable environment factors in 2022. Considering the uncertainty about the future, we have decided to allocate a total of 5% to Corporate Bond ETFs and 5% to Treasury Bond ETFs. Further, keeping our time horizon in mind, we have decided to allocate 75% of our investment in the US Equity Market. The stocks in the equity portfolio have equal weights and are picked up from different sectors to mitigate the unsystematic risks of the market. Gold has been allocated a weightage of 5% in the investment while the remaining portion of the investment will be allocated to Real Estate Investment Trust (REIT).



Understanding the global economic risks and the volatility that we are going through; a longer horizon would fetch better returns. Our vision for the investment is a time horizon of 10 years.

We have finalized our portfolio to one corporate bond ETF (exchange traded funds), one treasury bond ETF, REIT, Gold and ten stocks. Each stock shall have an equal weightage of 7 percent in the portfolio. We construct an Efficient Frontier to understand the volatility and maximum returns of stocks or a bond ETF, REIT, or Gold against a particular level of risk.



Efficient portfolio is the optimum portfolio where weights are optimally allocated considering the risk every investment offers against the returns it offers. In the efficient portfolio, the lowest weightage is given to Gold while the equity is given the highest weightage. The Treasury and corporate bonds ETF are also included in the optimal portfolio.

We plot the efficient portfolio by graphing the standard deviation on the x-axis and the expected return on the y-axis. We see a varied relationship between the return and the risk associated with it. Based on the graph above, the Efficient point is the point on the efficient frontier with optimal portfolio, that has an expected returns of 30.38% and a standard deviation of 13.7. The Sharpe ratio is 1.911. Our portfolio has an expected return of 30.08% and Standard Deviation of 13.7 with a Sharpe ratio of 1.893. In the optimal portfolio there is a decrease in the allocation of Gold. Given the instability in the global economy, we believe that the allocation of 5% of gold is necessary to cover the risks of the current market.

Introduction

The World today is amid volatility considering the increase in inflation rates, rise of Covid 19 cases in Asia, Ukraine and Russia war, recession risks, supply chain disruption and Fed interest rate hikes. There is uncertainty in every economy, whether global or domestic. The market has seen a correction in the past 5 months of 2022. The S&P 500 was around 4800 and in the first week of May it closed at 4125. A year back the Index was trading at 4200. This shows the volatility in the stock market around a brief period, that is a year.

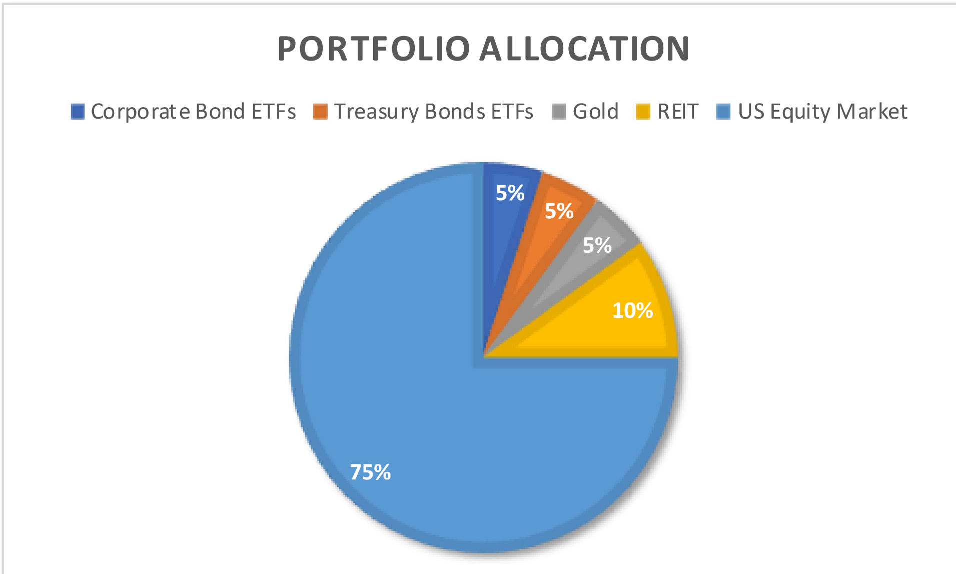
Understanding the current scenario and being unsure of what the future holds ahead, choosing the time horizon was not the easiest decision to take. Allocation of $1 million in various classes of assets and further in different sectors of securities and deciding the proportions of the riskless versus the risky assets gave us an insight of maintaining the investment for 10 years.

Every decade the stock market goes through a steep correction, be it the tech bubble, 2008 mortgage crisis or the Covid 19 pandemic. But even post these, the market bounces back. Below is the chart of S&P 500 over the decades.

Every fall gave an opportunity to buy in more and hold for a longer term. According to us, this standstill holds and thus we decided to invest 75% of our investment in the US Equity Market.

Portfolio Allocation

As discussed earlier, the global markets are currently under turmoil. This pushed us to invest in both treasury as well as corporate bond ETFs in our portfolio. This helps us in diversifying the risks associated with the stock market. Further we decided to choose to invest in ETFs instead of direct bonds as it shall help in diversification which the bonds over the time horizon. As the interest rates increase in the future, we expect the yields also to increase.



As we see in the above chart, we decided to allocate 5% of the investment in the Corporate Bonds ETF and 5% in the Treasury Bonds ETF. Gold has been allocated 5% as well to mitigate any risks if the stock markets were to decline as gold can be considered as safe investment during such times. Further we have decided to allocate 10% of the investment to Real Estate Investment Trusts. We believe that real estate can provide diversification as it is usually considered a stable asset.

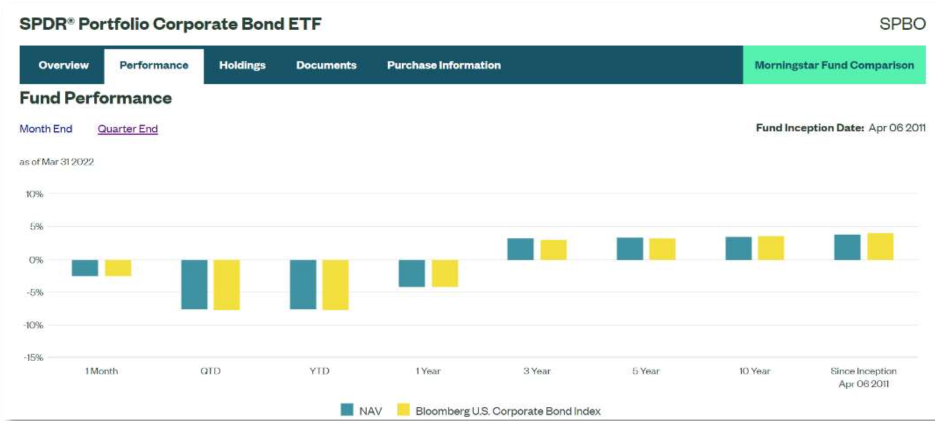
Investment Horizon

We realize that volatility is a bigger risk in the shorter term than in the longer term. For example, if we have 30-40 years to reach an investment goal for our retirement, a market moves which causes plunges in our investment shall not really be a problem, given that we have 3 to 4 decades to recover. But if we experience the same volatility say a year before we retire then it can seriously damage our future. Thus, we felt that a time horizon of 10 years is the most appropriate as post a decade we could reallocate our assets if necessary.

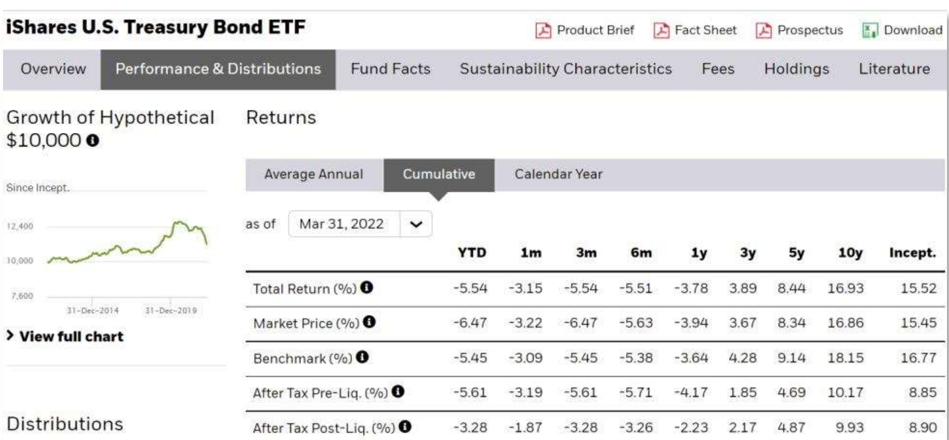
Bonds

We have decided to invest in the following bonds:

i. Corporate Bond: SPDR Portfolio Corporate Bond ETF
ii. Treasury Bond: iShares US Treasury Bond ETF



The SPDR Portfolio Corporate bond ETF tracks an index that offers exposure to investment grade corporate bonds with a remaining maturity ranging from one to three years. This index includes U.S. dollar denominated, fixed rate debt.



	YTD	1m	3m	6m	1y	3y	5y	10y	Incept.
Total Return (%)	-5.54	-3.15	-5.54	-5.51	-3.78	3.89	8.44	16.93	15.52
Market Price (%)	-6.47	-3.22	-6.47	-5.63	-3.94	3.67	8.34	16.86	15.45
Benchmark (%)	-5.45	-3.09	-5.45	-5.38	-3.64	4.28	9.14	18.15	16.77
After Tax Pre-Liq. (%)	-5.61	-3.19	-5.61	-5.71	-4.17	1.85	4.69	10.17	8.85
After Tax Post-Liq. (%)	-3.28	-1.87	-3.28	-3.26	-2.23	2.17	4.87	9.93	8.90

iShares US Treasury bond ETF is a solid option for exposure to full US treasury yield curve. It boasts a market-value-weighted portfolio that is representative of this investment opportunity set with minimal costs.

ETF Financials

	SPDR Portfolio Corporate Bond ETF	IShares US Treasury Bond ETF
Ticker	SPBO	GOVT
CUSIP	78464A144	46429B267
Overall Rating	BBB-	A
Expenses Ratio	0.03	0.05%
Current yield	3.86%	2.81%
Coupon Rate	3.70%	1.74%
Number of Holdings	2607	193
Standard Deviation	5.45%	4.94%
Beta	1.59	-0.09
Convexity	-	0.88
Effective Duration	8.10 years	6.36 years

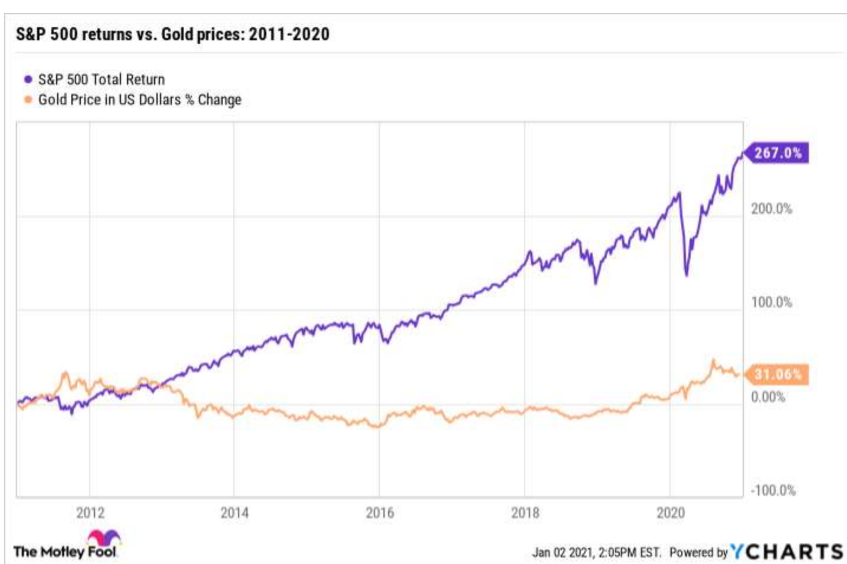
Gold

We have decided to allocate 5% of our funds to the commodity market. We have decided to purchase gold as our commodity. Thus, we shall use $50,000 to invest in Gold at the cost of 1,883.86/ounce (as on 05/06/2022)

The reason we have decided to invest in Gold is as follows:

People tend to invest in gold when there is some crisis or when there is a steep correction in the stock market. The risks are not associated with the markets. Commodities usually have a lower correlation with a stock. In fact, gold prices often rise when there is an increase in inflation and the stock market falls. Gold has always been a safe asset and has proven its value

S&P 500 returns vs gold Price change

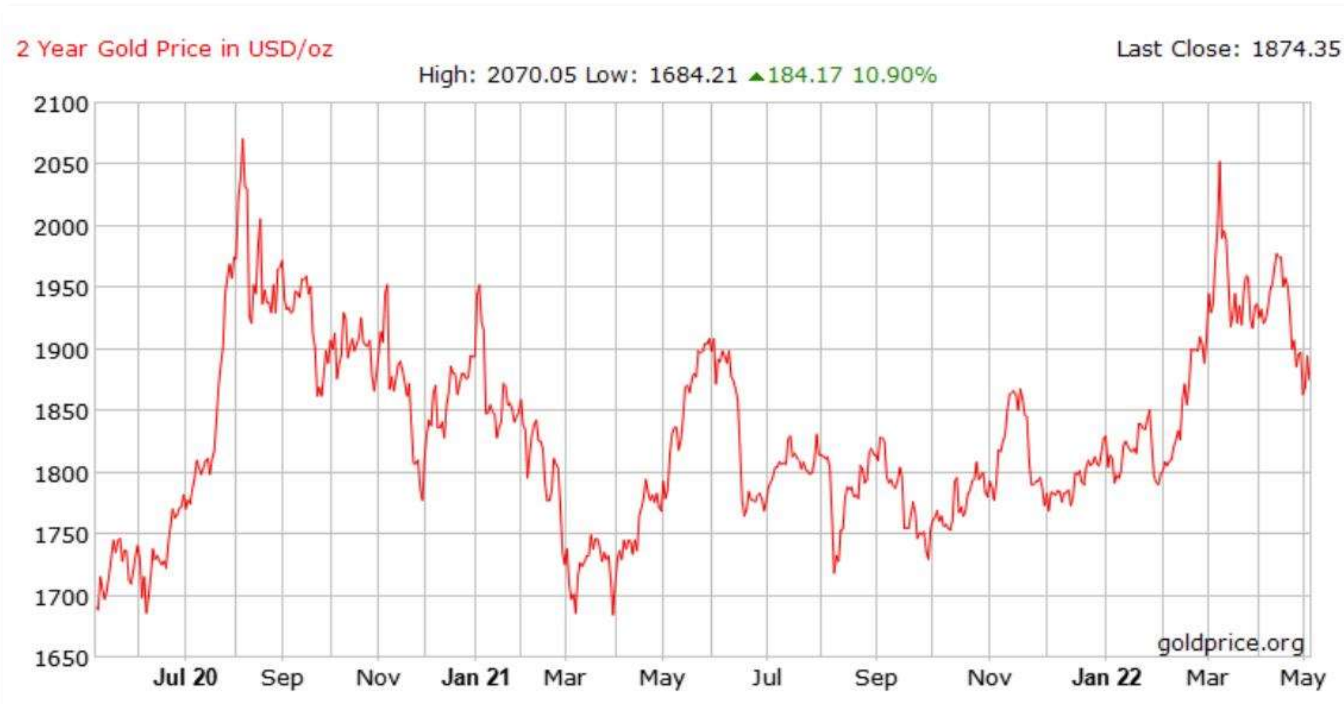


Covid 19 Crisis:

The year 2020 was marked by the global Covid 19 pandemic. As with the past crisis, gold again proved itself to be a haven investment compared to more traditional asset classes, like stocks and bonds. In 2020, gold delivered robust performance gaining 25.12%, compared to 8% for bonds and 18.40% for stocks.

During the last 30 years, that is from 1990 to 2020, the Dow Jones increased by 991% whereas the gold increased by 360% in that period, but during the last one and a half decade, the Dow Jones increased by 153% only as compared to gold which increased by 330% during 2005 to 2020.

Gold and its performance since 2020.



Gold has its all-time high at $2075/oz achieved on August 7th, 2020. The gold price touched $2050/oz in March 2022 at the beginning of Russia-Ukraine war. There has been a drop of 8.5% in the gold prices since then.

Stocks

Covid 19 brought the world to a standstill and as a result many businesses were struggling to stay afloat. However, some industries did see an increase in profits, and shall most likely continue to do so, while other industries struggled, and some still do. To minimize the risk in our portfolio, we have picked up the equity of companies from different sectors – Finance, IT, Consumer Staples, Automobile, Communication.

The consumer staples sector includes goods and services that are viewed as necessities such as groceries and nondurable household goods, which typically perform well during recessions. Also, there is an overall rise in the IT sector as most of the offices moved from in person to work from home or hybrid mode. Impacts due to the Covid 19 have increased the consumer demands for PCs, gaming hardware, software, personal devices, and online payment services.

The companies that we have selected for our portfolio are as follows:

- Tesla
- Apple
- Alphabet
- Home Depot
- Costco
- JPMorgan Chase
- Amazon
- Procter & Gamble
- NVIDIA
- T-Mobile

Methodology

We have looked at different sectors in the equity market. We have selected 10 stocks from different sectors. We looked into 4 to 6 stocks from each sector and analyzed the returns and the standard deviation over the years from each stock. Let us walk through the steps on how we finalized each stock into our portfolio:

We picked up 4 to 6 stocks from every sector and checked their past 10 years data. We picked up the Return on Equity (ROE) of each of these stocks and compared the average of each one. The data was freely available at Yahoo Finance.

Further we read up the different recommendations from analysts from websites such as Bloomberg and Kiplinger.

Real Estate Investment Trust (REIT)

REIT stands for real estate investment trust, and it is popularity is growing for investors who seek to expand their portfolio beyond publicly traded company stocks or mutual funds.

REITs are companies that own (and often operate) income producing real estate, such as apartments, warehouses, self-storage facilities, malls, and hotels. The most reliable REITS have a record of paying large and growing dividends.

Why should an investor invest in REITs?

REITs historically have delivered competitive total returns, based on high, steady dividend income and long-term capital appreciation. Their comparatively low correlation with other assets also makes them an excellent portfolio diversifier that can help reduce overall portfolio risk and increase returns. These are the characteristics of real estate investment.

REITs average return

NAREIT (National Association of Real Estate Investment Trust) notes that during the 20-year period ending December 2019, the FTSE NAREIT All Equity REITs index — which collects data on all publicly traded equity REITs — outperformed the Russell 1000, a stock market index of large-cap stocks.

The REIT indexed investments showed total returns of 11.6% annually versus the Russell 1000's 6.29%.

Currently approximately 145 million Americans, live in households that are invested in REITs directly or access them through REIT mutual funds or exchange-traded funds (ETFs)

We have decided to invest in the below REIT:

Bluerock Residential Growth (BRG)

Bluerock Residential Growth REIT, Inc. operates as a real estate investment trust. It engages in acquiring apartment properties. Its investment objective is to maximize long-term stockholder value by investing in properties that show substantial growth. The company was founded by Jordan B. Ruddy on July 25, 2008, and is headquartered in New York, NY.

Market Capitalization	938.24 million
Beta	1.02
PE Ratio (TTM)	379.71
EPS (TTM)	0.07
Earnings Date	May 09, 2022 – May 13, 2022
Forward Dividend & Yield	0.65 (2.43%)
Volume	262,185
Average Volume	239,560
Fair Value	Overvalued

Stock Price Forecast

The 1 analyst offering 12-month price forecasts for Bluerock Residential Growth REIT Inc have a median target of 27.00, with a high estimate of 27.00 and a low estimate of 27.00. The median estimate represents a +1.50% increase from the last price of 26.60.

Analyst Recommendations

The current consensus among 1 polled investment analyst is to **BUY** stock in Bluerock Residential Growth REIT Inc. This rating has held steady since March, when it was unchanged from a buy rating.

Asset Correlation

AAPL	0.5397	0.175	0.4747	0.0694	0.5959	-0.2161	0.5151	0.44	0.5431	0.3911	0.7192	0.1054	0.3739	0.3981
0.5397	AMZN	0.1038	0.404	0.0604	0.636	-0.1292	0.3939	0.2892	0.4872	0.2482	0.6558	0.0669	0.3613	0.3694
0.175	0.1038	BRG	0.1646	0.0813	0.1988	-0.0943	0.2851	0.2874	0.1638	0.1654	0.4577	0.063	0.2129	0.1488
0.4747	0.404	0.1646	COST	0.0427	0.4424	-0.1413	0.5331	0.3351	0.3808	0.4726	0.5761	0.0829	0.33	0.237
0.0694	0.0604	0.0813	0.0427	GOLD	0.0498	0.2061	0.0551	-0.0445	0.0548	0.1145	0.2282	0.1726	0.0616	0.0876
0.5959	0.636	0.1988	0.4424	0.0498	GOOG	-0.1812	0.5049	0.4558	0.5299	0.365	0.7096	0.1044	0.415	0.3638
-0.2161	-0.1292	-0.0943	-0.1413	0.2061	-0.1812	GOVT	-0.2069	-0.4635	-0.1634	-0.1419	-0.2006	0.4927	-0.1559	-0.1335
0.5151	0.3939	0.2851	0.5331	0.0551	0.5049	-0.2069	HD	0.5366	0.454	0.4524	0.671	0.1676	0.4243	0.3115
0.44	0.2892	0.2874	0.3351	-0.0445	0.4558	-0.4635	0.5366	JPM	0.3506	0.3738	0.5471	0.0135	0.3716	0.2551
0.5431	0.4872	0.1638	0.3808	0.0548	0.5299	-0.1634	0.454	0.3506	NVDA	0.2634	0.7073	0.0957	0.3575	0.388
0.3911	0.2482	0.1654	0.4726	0.1145	0.365	-0.1419	0.4524	0.3738	0.2634	PG	0.4821	0.1078	0.2995	0.1367
0.7192	0.6558	0.4577	0.5761	0.2282	0.7096	-0.2006	0.671	0.5471	0.7073	0.4821	Portfolio	0.1712	0.5664	0.6546
0.1054	0.0669	0.063	0.0829	0.1726	0.1044	0.4927	0.1676	0.0135	0.0957	0.1078	0.1712	SPBO	0.0735	0.0584
0.3739	0.3613	0.2129	0.33	0.0616	0.415	-0.1559	0.4243	0.3716	0.3575	0.2995	0.5664	0.0735	TMUS	0.2619
0.3981	0.3694	0.1488	0.237	0.0876	0.3638	-0.1335	0.3115	0.2551	0.388	0.1367	0.6546	0.0584	0.2619	TSLA

The above table shows asset correlation as a measure of how the investments move relative to one another, stating the sensitivity of the stocks to each other.

This table helps us in identifying the correlated and uncorrelated assets. Which helps in creating a diversified portfolio. The table also provides the correlation of the asset with the portfolio.

A correlation of 1 indicates that there is a perfect correlation between two assets, whereas a negative number, states that two assets do not move together and thus are called negatively correlated. A positive correlation shows that the assets usually move together and are called positively correlated.

Amazon (AMZN) and Google (GOOG) have a correlation of 0.636, which shows that both these stocks tend to move together and are strongly correlated.

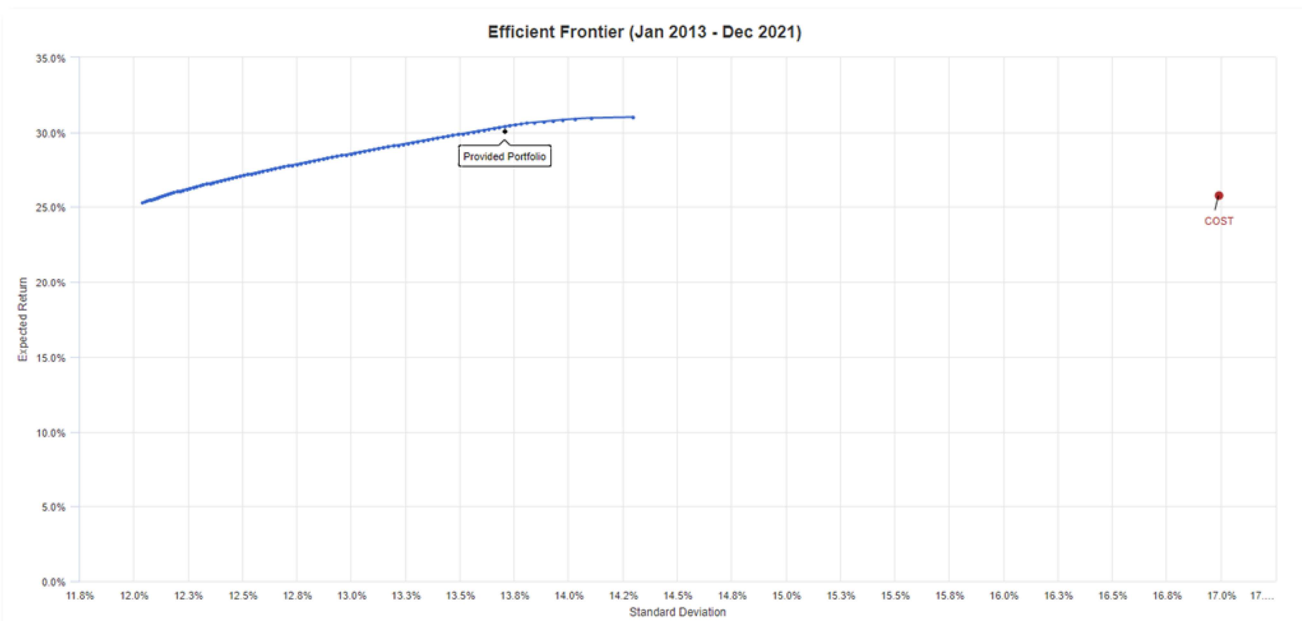
JPMorgan Chase (JPM) and Government Bond ETF (GOVT) have a correlation of –0.4635, indicating that both assets move in opposite direction.

One of the major reasons for choosing bonds and gold was to reduce the overall variance of our portfolio as stocks with bonds or gold have low to negative correlation.

Efficient Frontier

The efficient frontier is portfolio analysis concept designed to assess the returns versus the risks of the portfolio. Key to efficient frontier is that it represents highest levels of returns for a given level of risk. It applies to financial as well as physical assets.

We have come down to ten stocks, one corporate bond ETF, one US Treasury bond ETF, Gold, and REIT. Our aim was to achieve the highest returns, with the best risk levels possible.



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