

Introduction

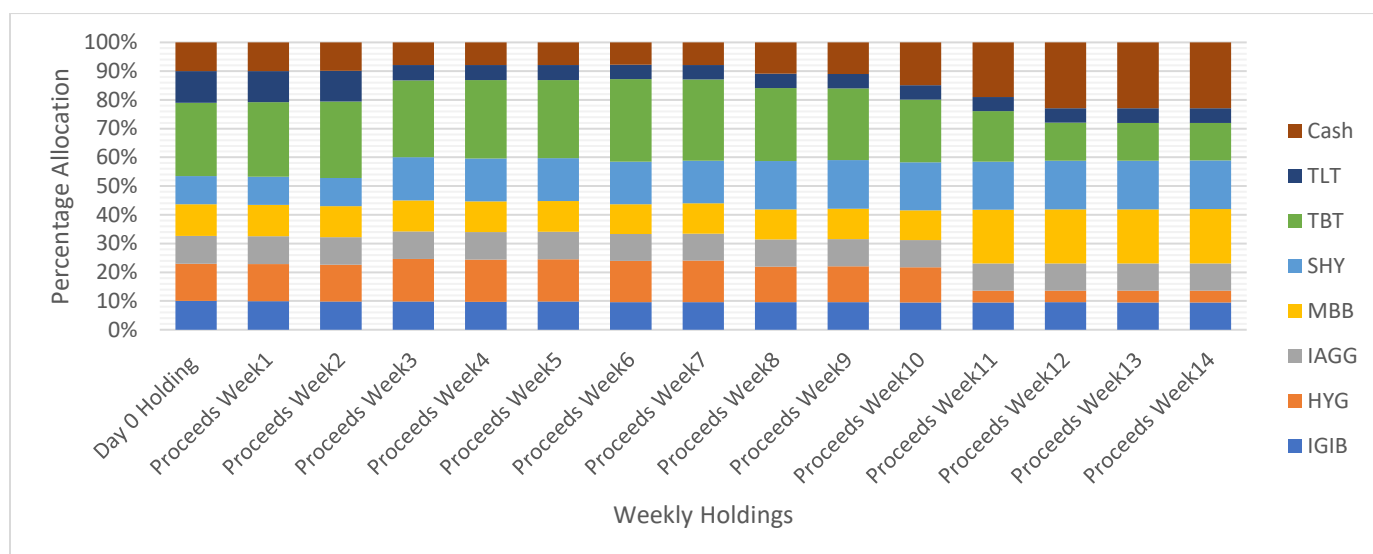
Report intends to provide overall performance along with last month performance of the portfolio held from Aug 24th to Nov 30th, 2018 (14 weeks).

Holding Period Return (last 1 month)	0.30%
Total Portfolio Return (last Qtr)	2.17%
Total Portfolio Return(Annualized)	8.30%

The achieved TPR 8.30% is below the set target of 10%, which can be attributed to high uncertainty in the market but if this is compared against the benchmark (NASDAQ and S&P 500), performance had been excellent.

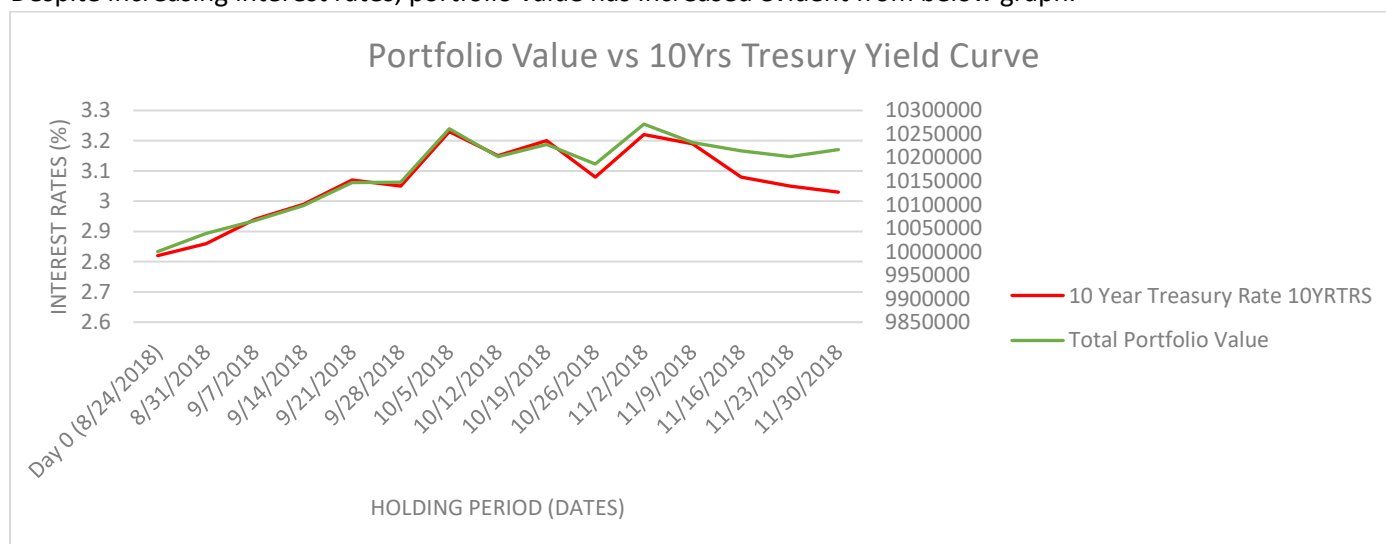
Portfolio Levels

Investment of \$10million grew to **\$10.22million**, with passive investment strategy in 7 ETFs (as agreed on Day 0). Investments were rebalanced on a regular basis and holdings during the period has been showcased as below, highlighting that agenda was to keep booking profit from TBT and increasing cash.



Portfolio vs Interest Rates

Despite increasing interest rates, portfolio value has increased evident from below graph.



FINAL REPORT

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Portfolio Performance

Portfolio has shown growth of **0.30% over 5 last weeks**, **2.17% over quarter** or **8.30% annualized return**. As demonstrated below:-

Details	ETF Name	Day 0 Holding	Proceeds Week 10	HPR Week 10(%)	Proceeds Week 11	HPR Week 11(%)	Proceeds Week 12	HPR Week 12(%)	Proceeds Week 13	HPR Week 13(%)	Proceeds Week 14	HPR Week 14(%)	M1 Return (%)	M2 Return (%)	M3 Return (%)	Qtrly Return (%)
Intermediate-Term Corporate Bond ETF (IGIB)	IGIB	1001946	974831	-0.91	976514	0.17	975953	-0.06	974457	-0.15	975205	0.08	-0.9	-0.92	-0.87	-2.67
iBoxx \$ High Yield Corporate Bond Fund ETF (HYG)	HYG	1293541	1261943	0.05	421800	-66.58	416350	-1.29	413550	-0.67	418000	1.08	15.64	-15.68	-66.86	-67.69
International Aggregate Bond Fund (IAGG)	IAGG	972360	964035	-0.17	963850	-0.02	965700	0.19	966440	0.08	967716.5	0.13	-0.55	-0.13	0.21	-0.48
MBS ETF (MBB)	MBB	1095570	1068795	-0.91	1911612	78.86	1927179	0.81	1925491	-0.09	1935432	0.52	-0.97	-0.59	79.45	76.66
1-3 Year Treasury Bond ETF (SHY)	SHY	987461	1714870	-0.3	1715077	0.01	1719836	0.28	1720457	0.04	1722526	0.12	53.99	13.12	0.14	74.44
UltraShort Lehman 20+ Year Treasury ProShares (TBT)	TBT	2548800	2247480	-11.54	1790800	-20.32	1352860	-24.45	1343340	-0.7	1339260	-0.3	8.28	-7.93	-47.29	-47.46
20+ Year Treasury Bond ETF (TLT)	TLT	1100610	504000	-2.6	510075	1.21	516150	1.19	518130	0.38	518985	0.17	-52.05	-1.94	0.3	-52.85
Cash/ Cash Equivalents	Cash	999713	1534954	37.2	1941954	26.52	2339854	20.49	2339854	0	2339854	0	-20.12	40.1	109.15	134.05
Total (USD)	Total	1E+07	10270908		10231682		10213882		10201719		10216978					

Total Portfolio Return (last 1 Month)	0.30%
Total Portfolio Return (last Quarter)	2.17%
Total Portfolio Return(Annualized)	8.30%

Key Portfolio Changes

During the last one month, following key changes were made:-

- **Decrease in Allocation TBT:** In order to realize notional profit from TBT, allocation was decrease gradually over weeks (i.e. reducing 10,000 units) each week.
- **Increase in Cash:** Because of selling TBT, cash reserves went up. This was also realization of profit. Strategy was to seat on cash hedging against volatile market
- **Decrease in HYG and Increase in allocation to MBB:** Since there was upward push to MBB ETF in last few weeks thereby HYG (non-performing) seed was diverted to MBB with expectation of growth.

What went Good?

During the total holding period of 3 months, following went well:-

- **TBT Kept Rising:** TBT being -2X, i.e. short on the performance 20+Yr Treasury, with increase in interest rates, long maturity fixed income products experienced the maximum beating and because of design, TBT went opposite to the markets. Thereby, TBT acted as hedge instrument for the portfolio.
- **SHY Performance was not worst:** Short term maturity ETFs were not much impacted because of the increasing interest rates, thereby investments to SHY didn't turn soar rather, during the holding period allocation was diverted to this.
- **Rebalancing:** Continuous rebalancing did help, especially during the uncertain market. Since, initial allocation was based on spreading risk with equal weights.

What went Bad?

3 months of holding period was not the best period for investment, evident from following key points:-

- **Increase in Interest Rates:** Fed hiked the interest rates by 25 bps that too twice during the holding period, 6 out 7 ETFs were directly affected, as we know price goes down with rise in interest rates.
- **Long Term ETFs affected most (MBB, TLT):** Initial allocation to long term maturity was to diversify but these ETFs were the affected most.
- **Low on Volumes:** Markets were pretty much flat on the trading volume, evident from the minimum displacement around the mean each day.

All these factors combined brought down the performance of the portfolio, which could have been different otherwise.

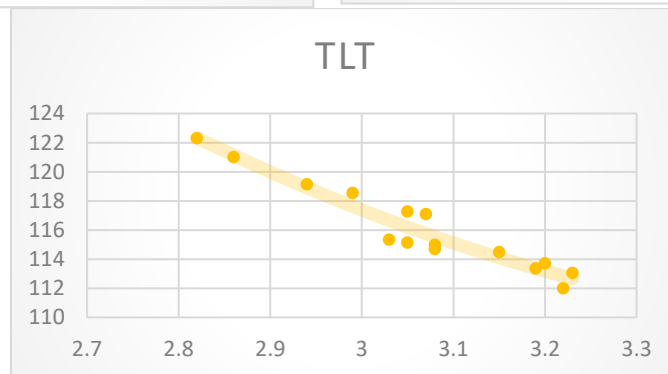
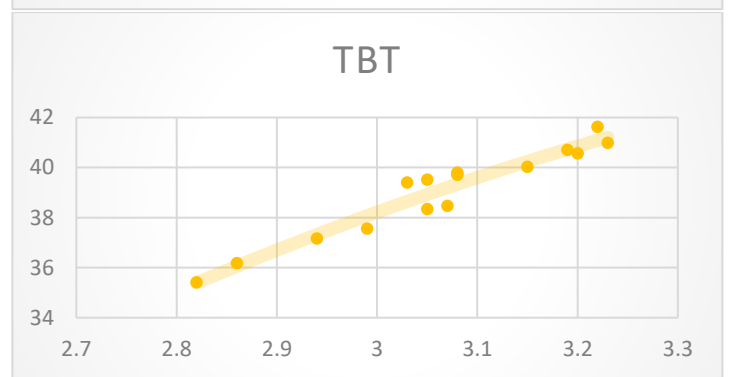
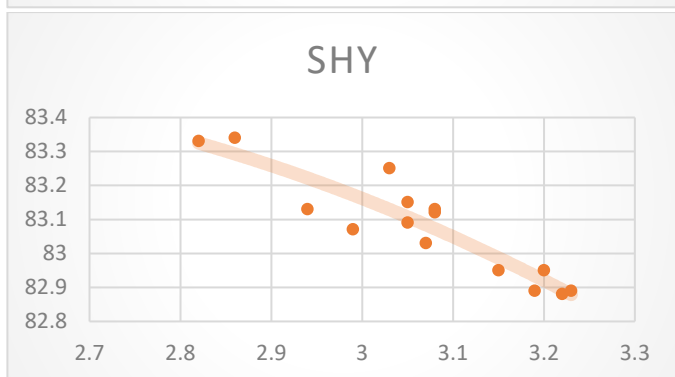
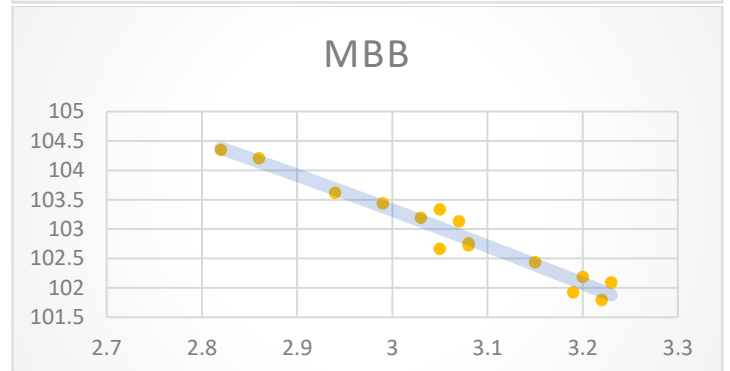
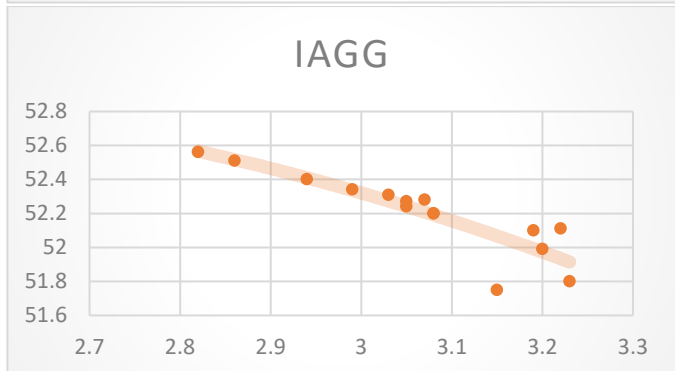
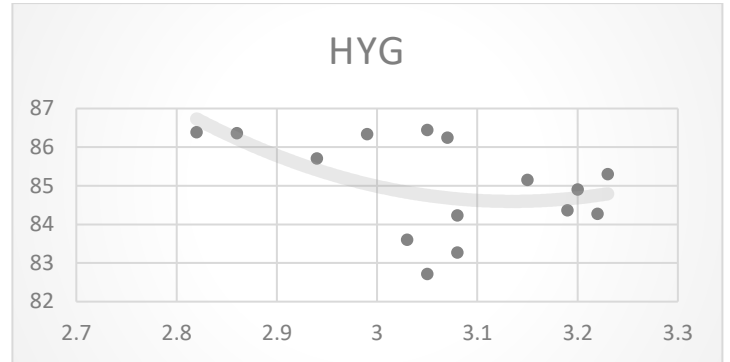
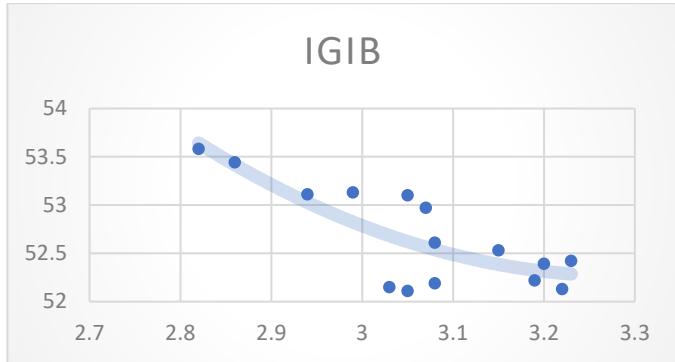
Could have done better?

Following are my key learnings or

- **Investment Horizon:** Considering evaluation period was only 3 months, i.e. short term I should have aggressively shorted against the falling prices through allocation in TBT. Learning to set the horizon and invest accordingly.
- **In an increasing interest rates regime, sell Long Term Maturity ETFs and buy Short Term Maturity ETFs:** With the current market conditions, I should have simply zeroed my investments on TLT and diverted funds to short or intermediate maturity ETFs.
- **Profit Booking:** If ETFs performance is in line with target profits estimate even during mid of the investment horizon, it's better to book profits because of highs are not always sustainable. I could have done this better.

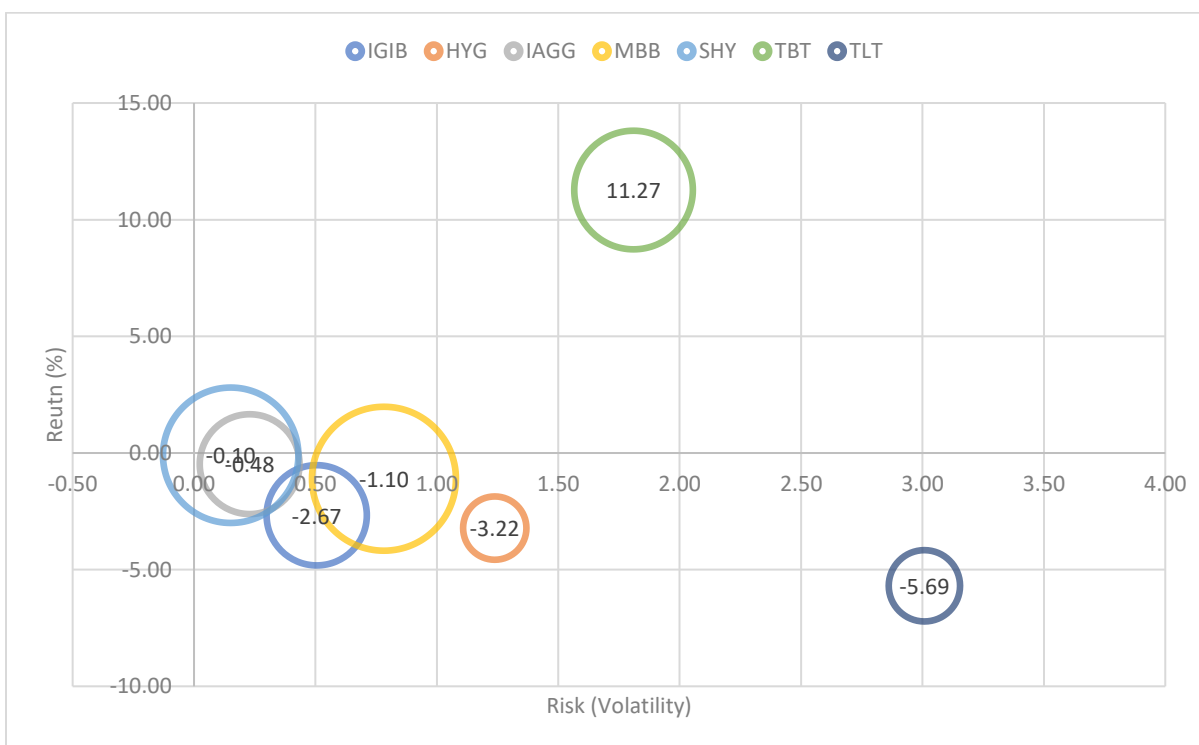
ETF Prices vs. 10 Year Treasury Yield

Following scatter plot aims to showcase the relationship of **Prices vs Yield** movement for all the 7 ETFs during the period, in line with theory taught in the class, exception being TBT here.



Return vs Risk

For the total holding period, following bubble chart has been prepared to place ETFs based upon their risk vs return. Here risk has been calculated as the standard deviation in the price movement during the period of observation. Also, size of the bubble is based upon the portfolio allocation on the last day before liquidation.



Details	ETF Name	Return (%)	Risk (Std Deviation)
Intermediate-Term Corporate Bond ETF (IGIB)	IGIB	-2.67	0.51
iBoxx \$ High Yield Corporate Bond Fund ETF (HYG)	HYG	-3.22	1.24
International Aggregate Bond Fund (IAGG)	IAGG	-0.48	0.23
MBS ETF (MBB)	MBB	-1.10	0.78
1-3 Year Treasury Bond ETF (SHY)	SHY	-0.10	0.15
UltraShort Lehman 20+ Year Treasury ProShares (TBT)	TBT	11.27	1.81
20+ Year Treasury Bond ETF (TLT)	TLT	-5.69	3.01

Portfolio Performance Measures

A. Duration: Duration of the portfolio was increased to **-1.02** in comparison to earlier duration of **-5.32**, this was calculated through asset-weighted formula, as illustrated below. Kindly note, negative duration means total value of portfolio will increase with further rise in interest rates.

ETF Name	Week14 Holdings	Duration	Weights	Effective Duration
IGIB	975205	6.2	0.10	0.59
HYG	418000	3.65	0.04	0.15
IAGG	967716.5	7.2	0.09	0.68
MBB	1935431.64	4.94	0.19	0.94
SHY	1722525.75	1.85	0.17	0.31
TBT	1339260	-35.28	0.13	-4.62
TLT	518985	17.35	0.05	0.88
Cash/ Cash Equivalents	2339854.15	0.25 (assumption)	0.23	0.06
	10216978.04		Total Duration	-1.02

B. Vis-a-Vis major indices: In comparison to major indices current portfolio holdings have outperformed the market as demonstrated below.

	My Portfolio	Nasdaq Composite Index	S&P 500 Index
Day 0	10000000	7945.98	2874.69
Week 14	10216978.04	7330.54	2760.17
% Change	2.17%	-7.75%	-3.98%

References

- ETF Prices: <https://www.historicalstockprice.com/>
- Index Levels: <https://www.marketwatch.com/investing/index/comp/historical>
- Effective Duration: <https://www.ishares.com/us/>
- Economic Data : <https://fred.stlouisfed.org/series/DGS10/>

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