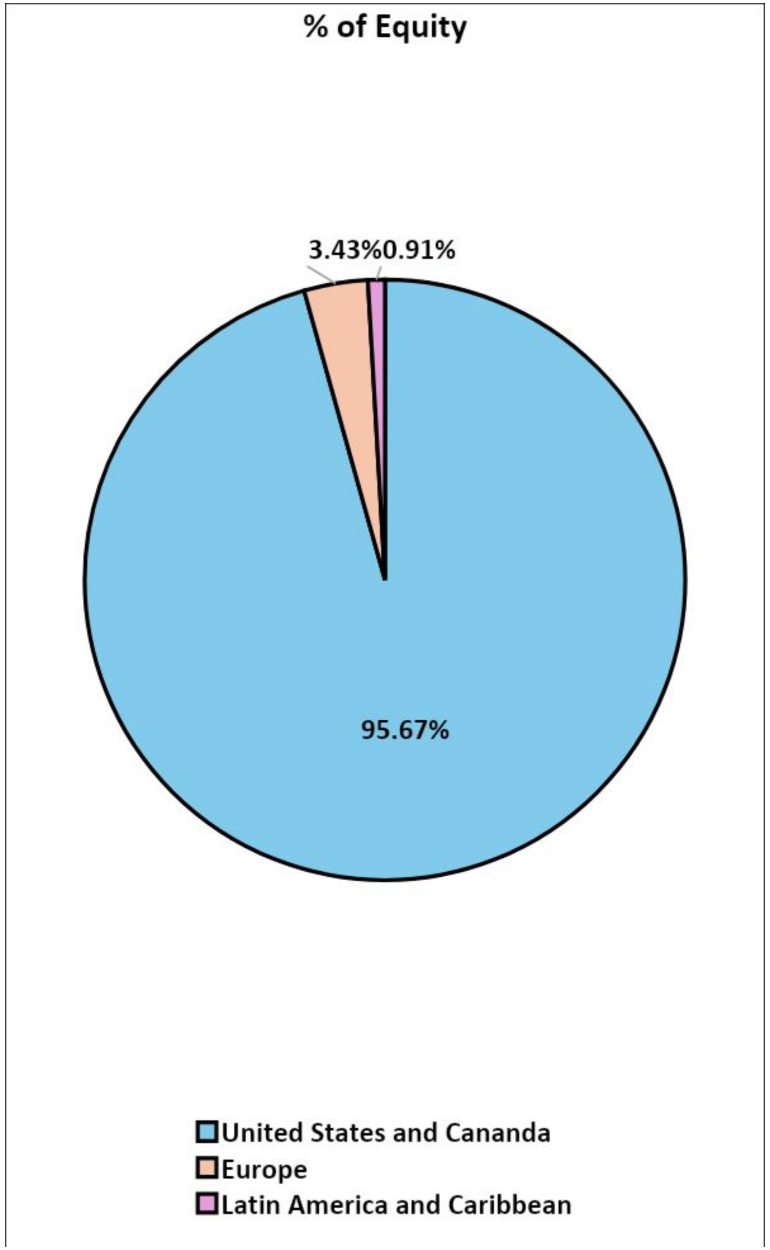
Computer Simulation and Risk Assessment

By Riya Ohri

ETF INDEX

XLF SECTOR

- Emphasis on Financial Sector
- The financial services sector comprises 20-25% of the world economy
- Predominately operates in the United States and Canada (95.67% of Equity), followed by Europe (3.43%), and Latin America and the Caribbean (0.91%)
- Concentrated in large banks
- 72 underlying holdings



TOP 10 HOLDINGS

Sr.No	Name of the Company	Symbol	Weight	Price
1	Berkshire Hathaway Inc.	BRK-B	13.26	4,901.2
2	JPMorgan Chase & Co.	JPM	10.1	3,733.9
3	Visa Inc.	V	7.8	2,881.5
4	Mastercard Incorporated	MA	6.91	2,553.4
5	Bank of America Corporation	BAC	4.48	1,654.0
6	Wells Fargo & Company	WFC	3.65	1,349.0
7	S&P Global Inc.	SPGI	2.43	898.5
8	The Goldman Sachs Group, Inc.	GS	2.32	857.1
9	American Express Company	AXP	2.23	825.1
10	The Progressive Corporation	PGR	2.12	782.8

BENCHMARK PERFORMANCE

Financial Select Sector SPDR Fund (XLF)

☆ Follow

39.69 +0.10 (+0.25%) **39.72** +0.03 (+0.08%)

At close: 4:00 PM EDT After hours: 7:59 PM EDT

1D 5D 3M 6M YTD 1Y 5Y **All**

Mountain Advanced Chart

Previous Close	39.59	Day's Range	39.53 - 39.94	Net Assets	38.44B	YTD Daily Total Return	5.69%
Open	39.77	52 Week Range	31.26 - 42.22	NAV	39.62	Beta (5Y Monthly)	1.03
Bid	39.65 x 39400	Volume	41,414,787	PE Ratio (TTM)	18.01	Expense Ratio (net)	0.09%
Ask	39.73 x 1400	Avg. Volume	47,722,100	Yield	1.52%		

Source: Yahoo Finance

INVESTMENT INSIGHTS

HIGHLY VOLATILE INDEX

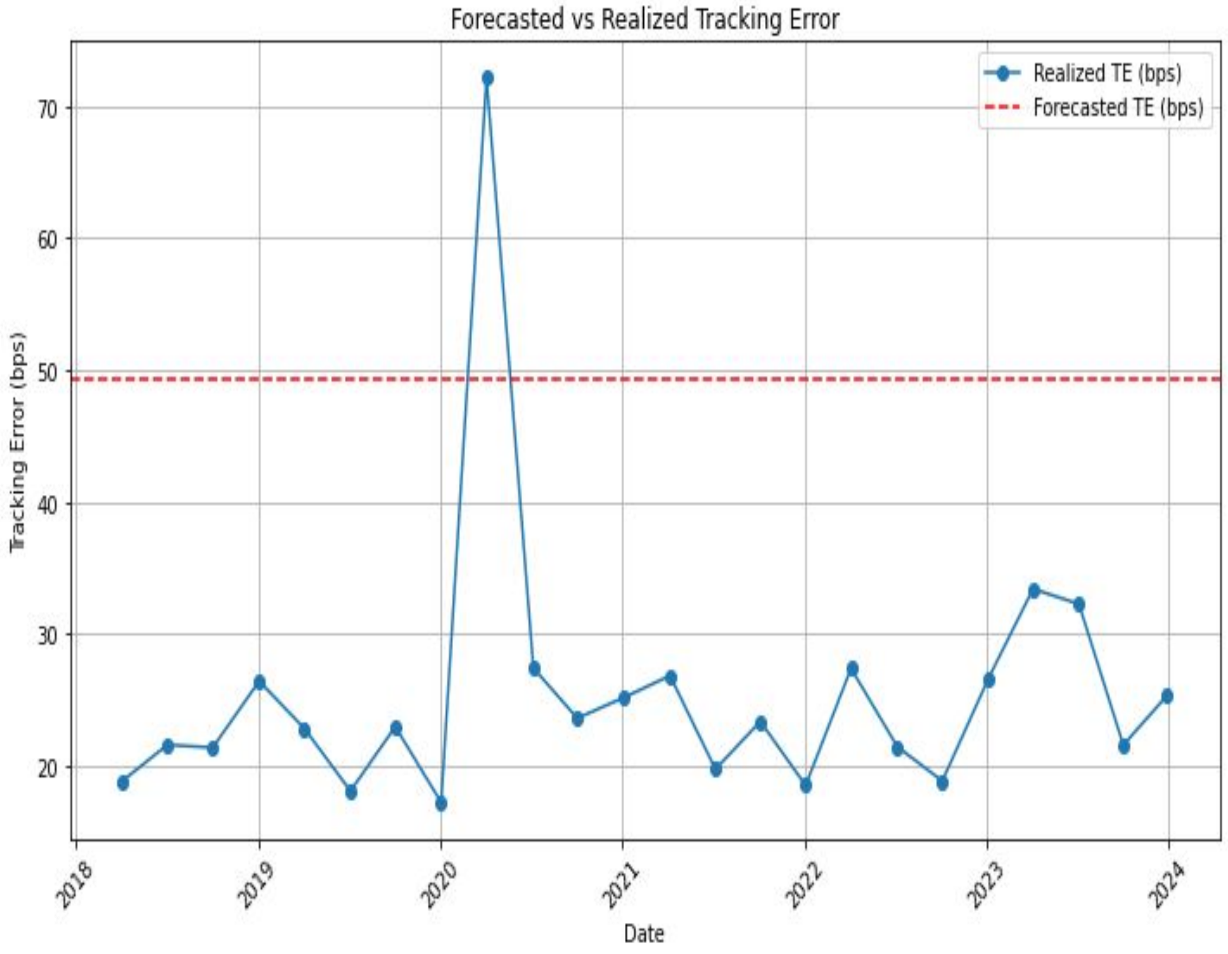
HIGH RISK, HIGH RETURN AND VICE-VERSA

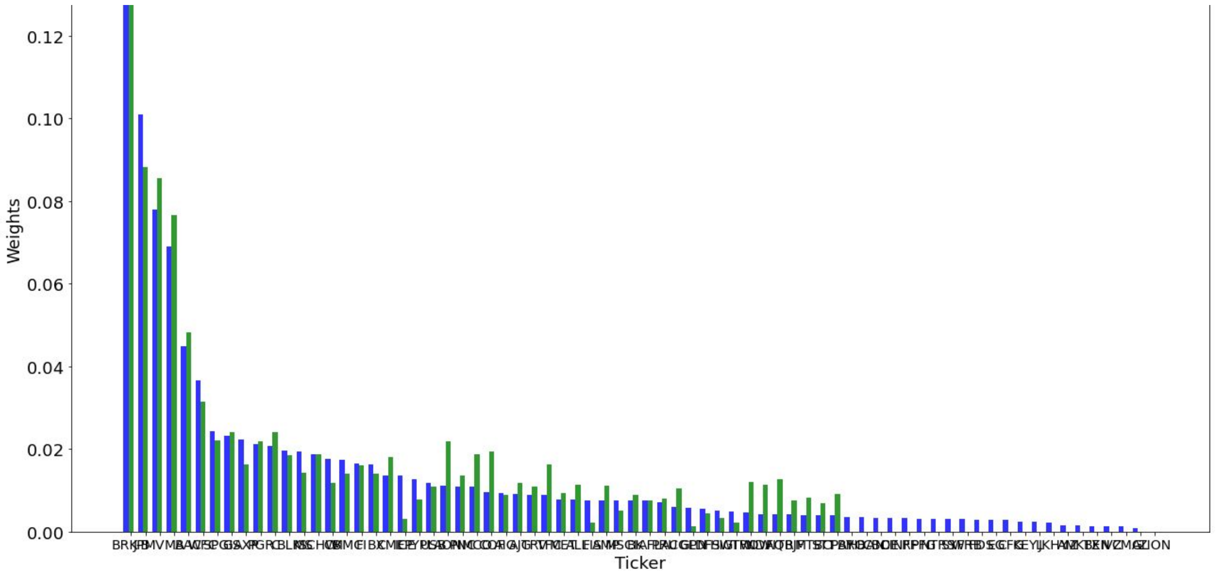
RISK DIVERSIFIED

SOARING PRICE

LOW BETA

RESULTS OBTAINED






```
full replication TE = 0.00002 bps
50 top weighted stock replication TE =  6.99 bps
<Figure size 432x288 with 0 Axes>
0.006985205361785068
0.0016227635427369165
     End Date   TE Realized Quarterly
0   2018-04-04               0.001888
1   2018-07-03               0.002161
2   2018-10-02               0.002140
3   2019-01-03               0.002644
4   2019-04-04               0.002284
5   2019-07-05               0.001811
6   2019-10-03               0.002298
7   2020-01-03               0.001726
8   2020-04-03               0.007218
9   2020-07-06               0.002743
10  2020-10-02               0.002363
11  2021-01-04               0.002520
12  2021-04-06               0.002685
13  2021-07-06               0.001976
14  2021-10-04               0.002338
15  2022-01-03               0.001854
16  2022-04-04               0.002740
17  2022-07-06               0.002146
18  2022-10-04               0.001887
19  2023-01-04               0.002660
20  2023-04-04               0.003342
21  2023-07-05               0.003228
22  2023-10-02               0.002160
23  2023-12-29               0.002536
<Figure size 432x288 with 0 Axes>

In [24]: TE_forecast
Out[24]: 0.006985205361785068

In [25]: TE_realized
Out[25]: 0.0016227635427369165
```

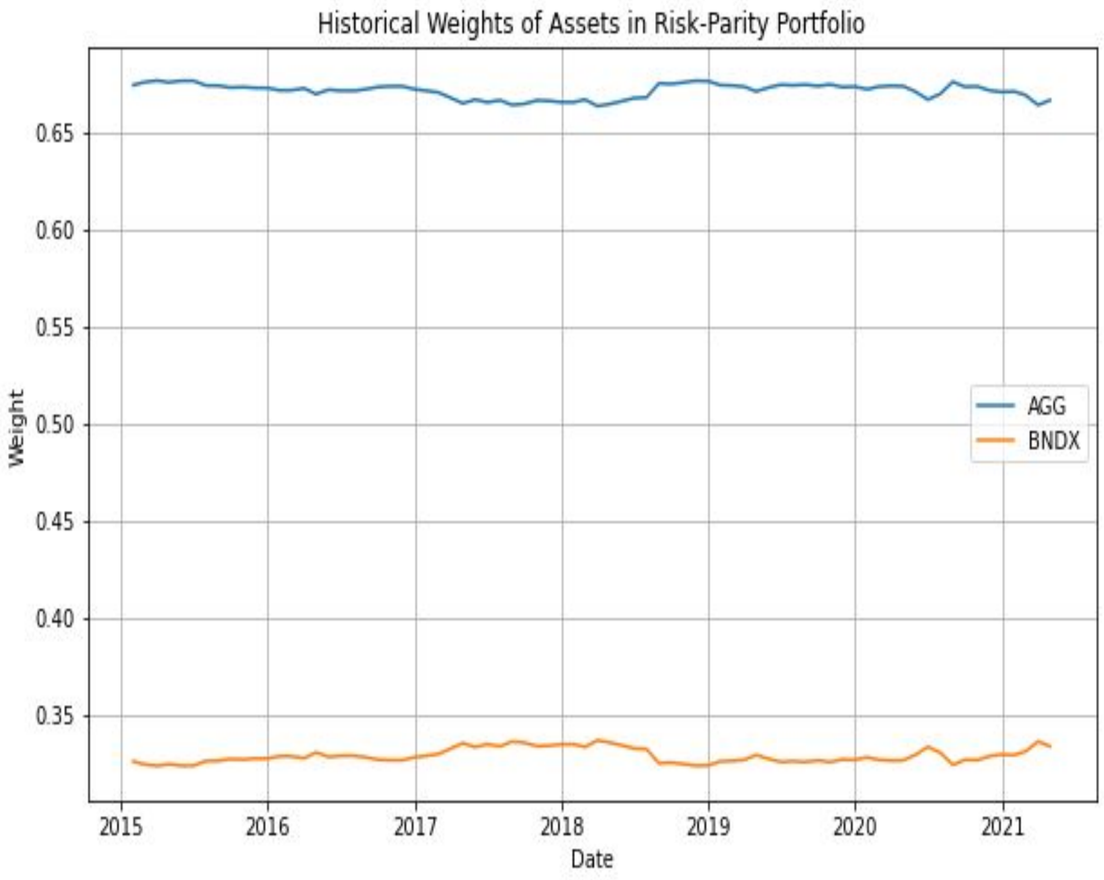
OPTIMIZATION OF RISK-PARITY PORTFOLIO

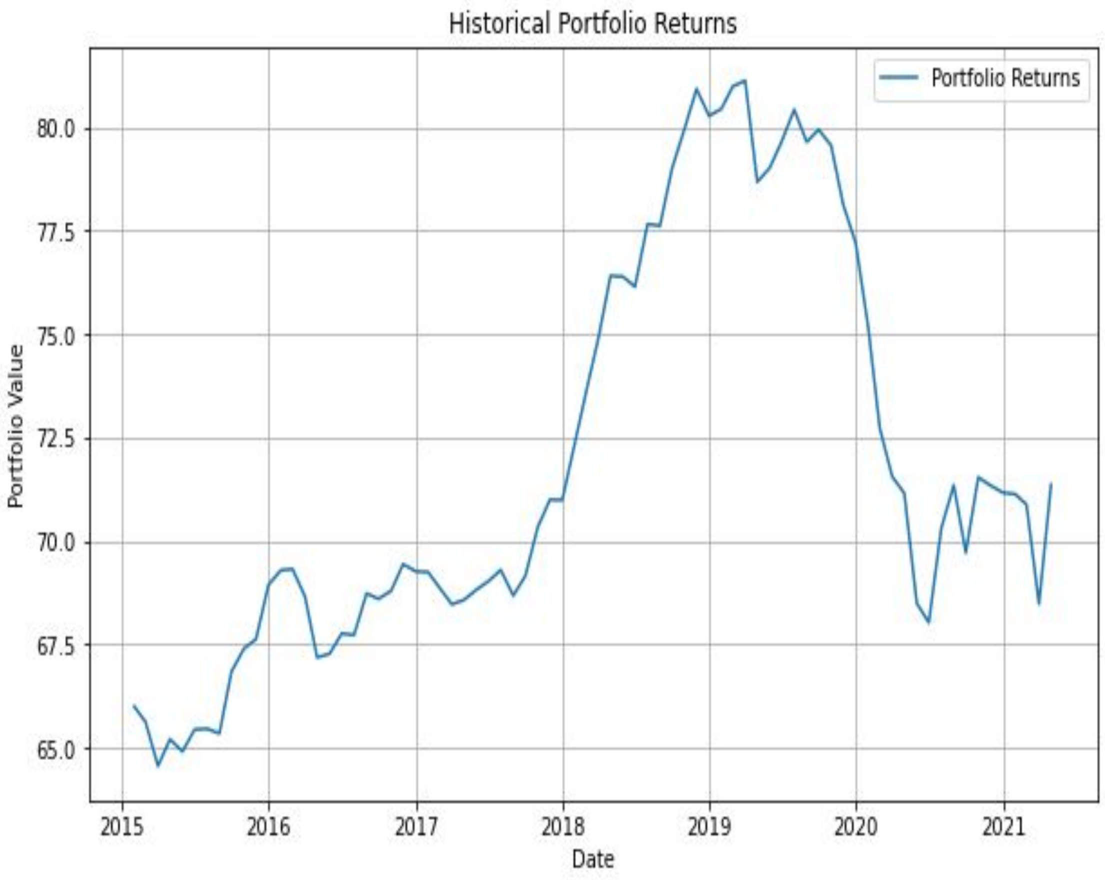
- Data Gathering
- Volatility Calculation
- Covariance Matrix Calculation
- Portfolio weight optimization
- Portfolio Re-balancing
- Results obtained

PORTFOLIO PERFORMANCE & ANALYSIS

- Portfolio Returns
- Insights
- Evaluation Metrics
- Implications

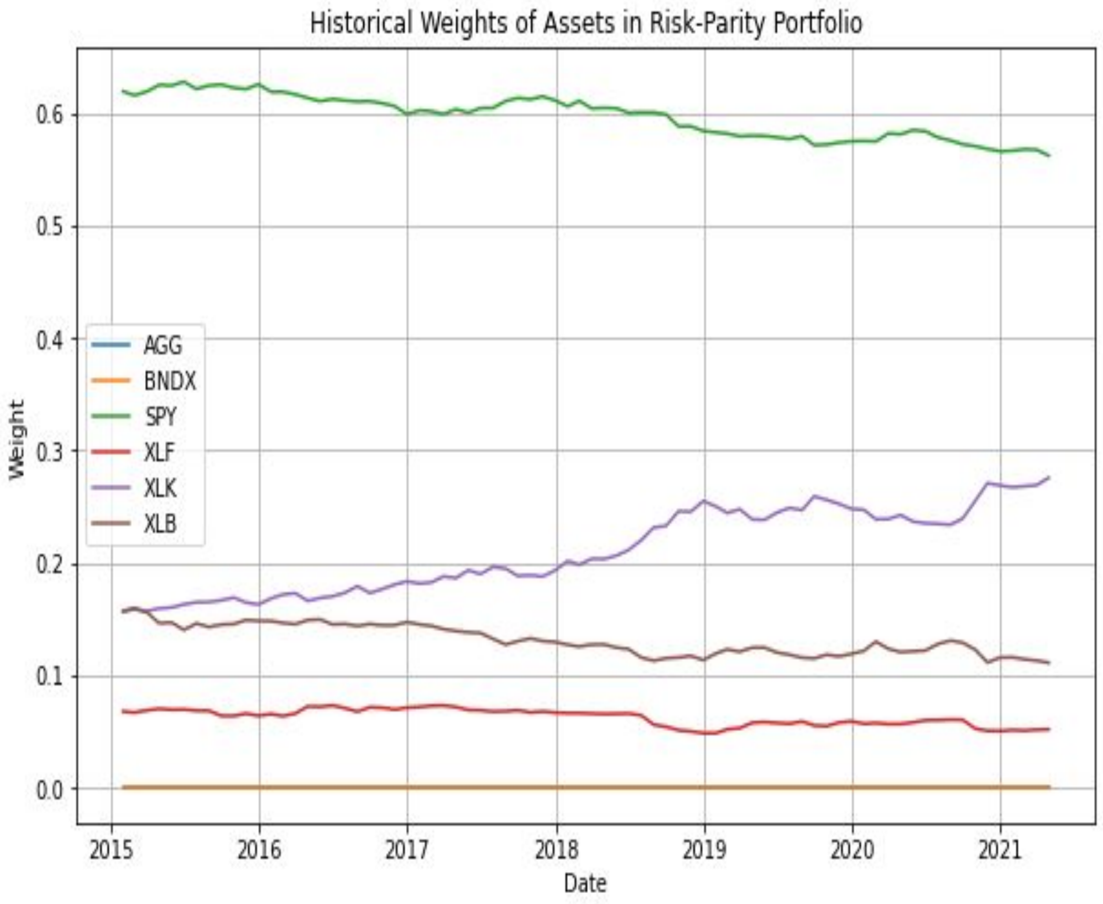
ANNEXURE 1

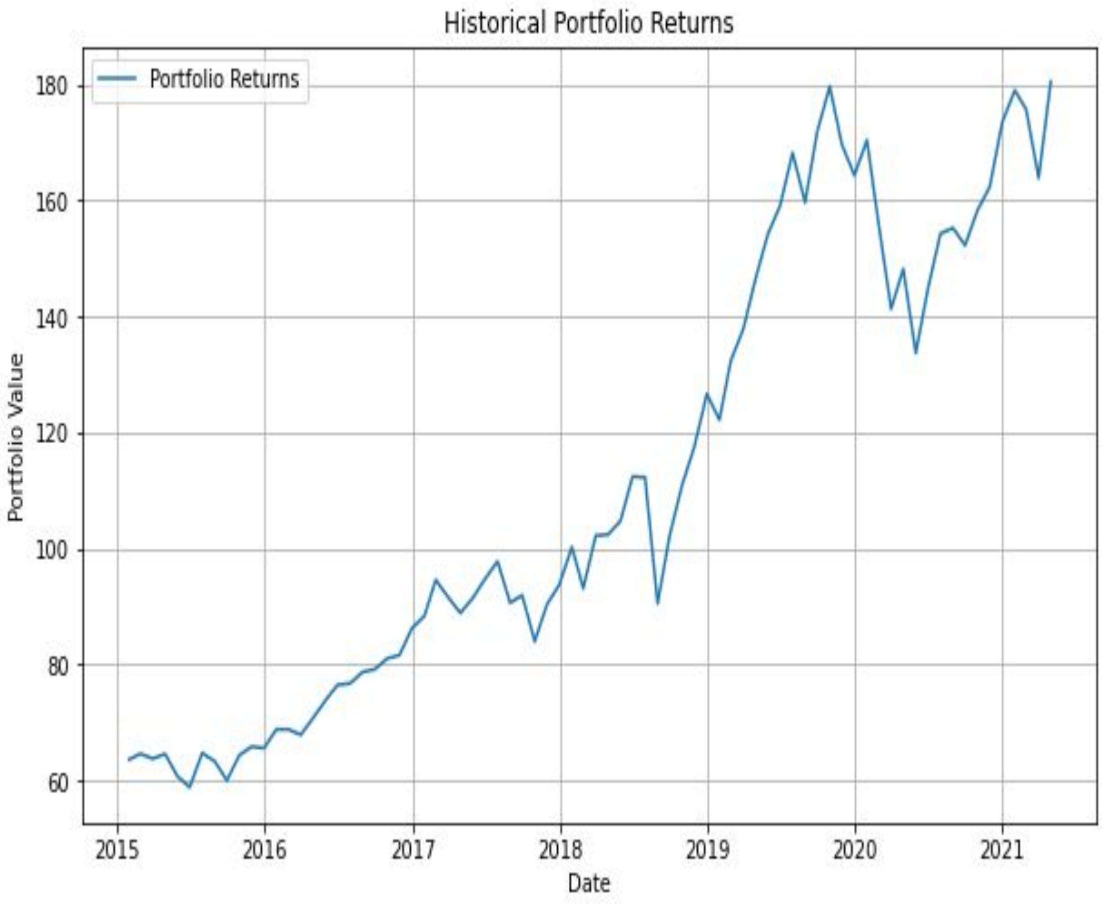




SHARPE RATIO: 14.619

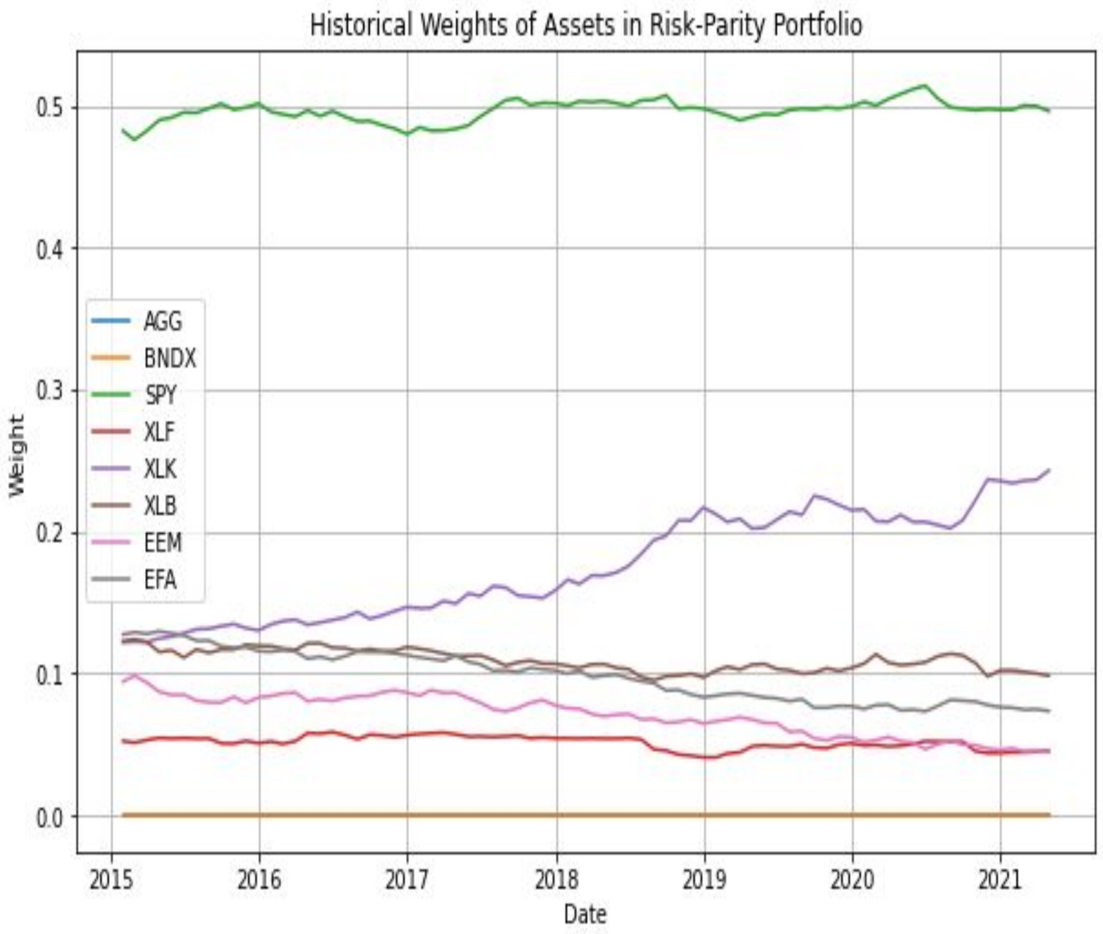
ANNEXURE 2

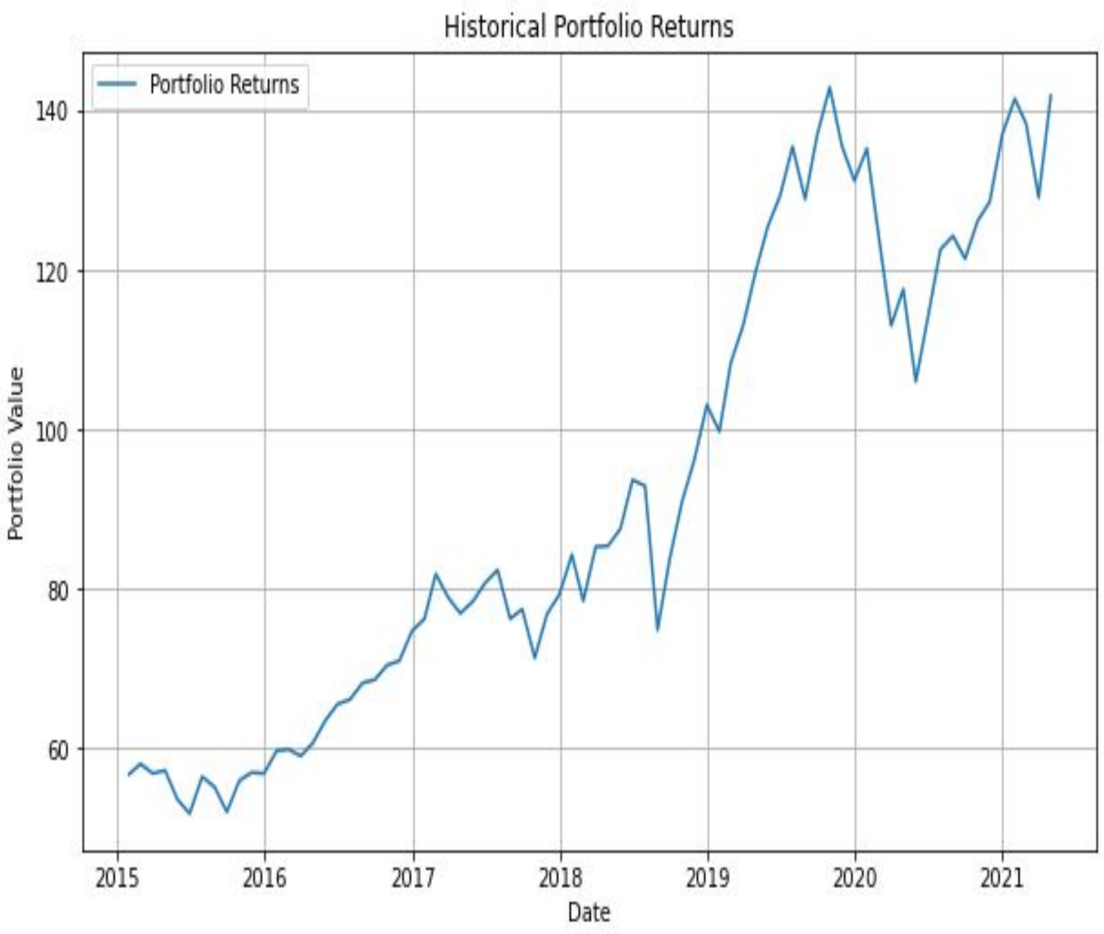




SHARPE RATIO: 2.846

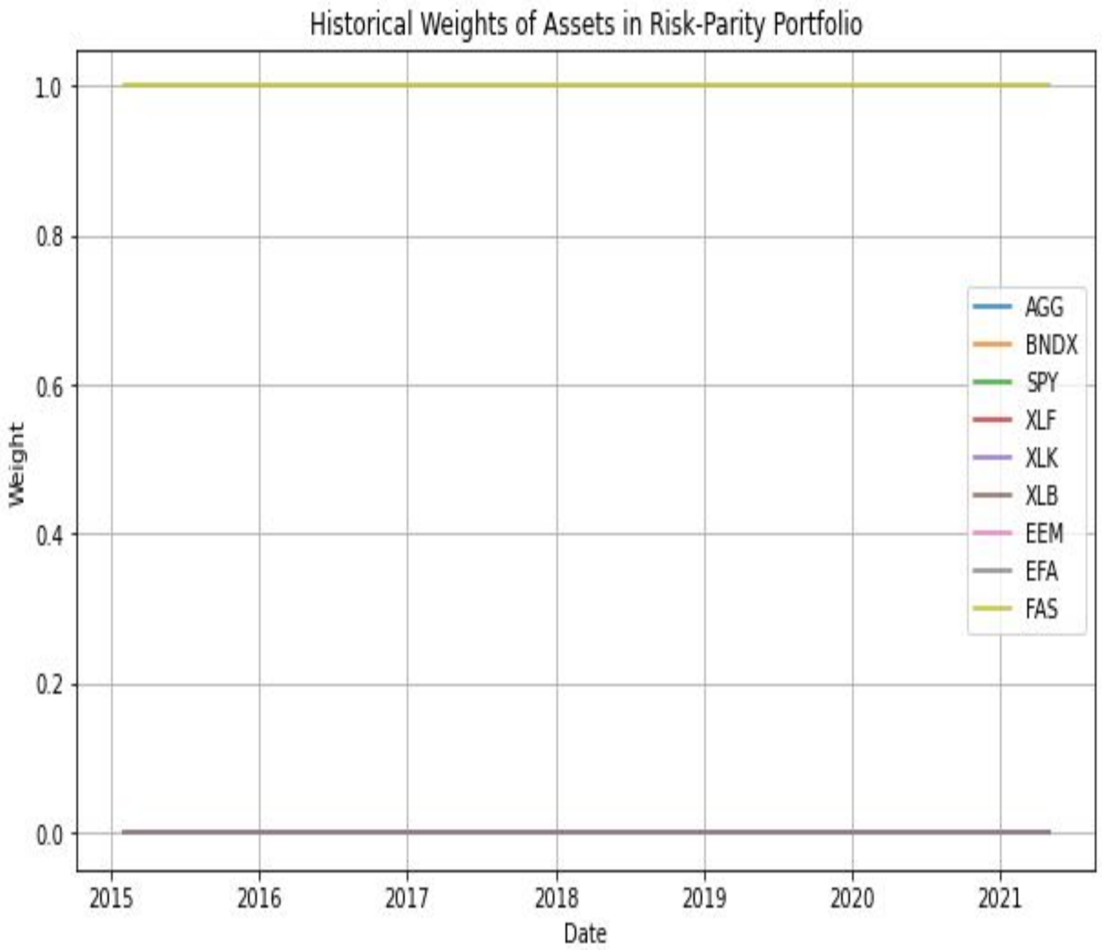
ANNEXURE 3

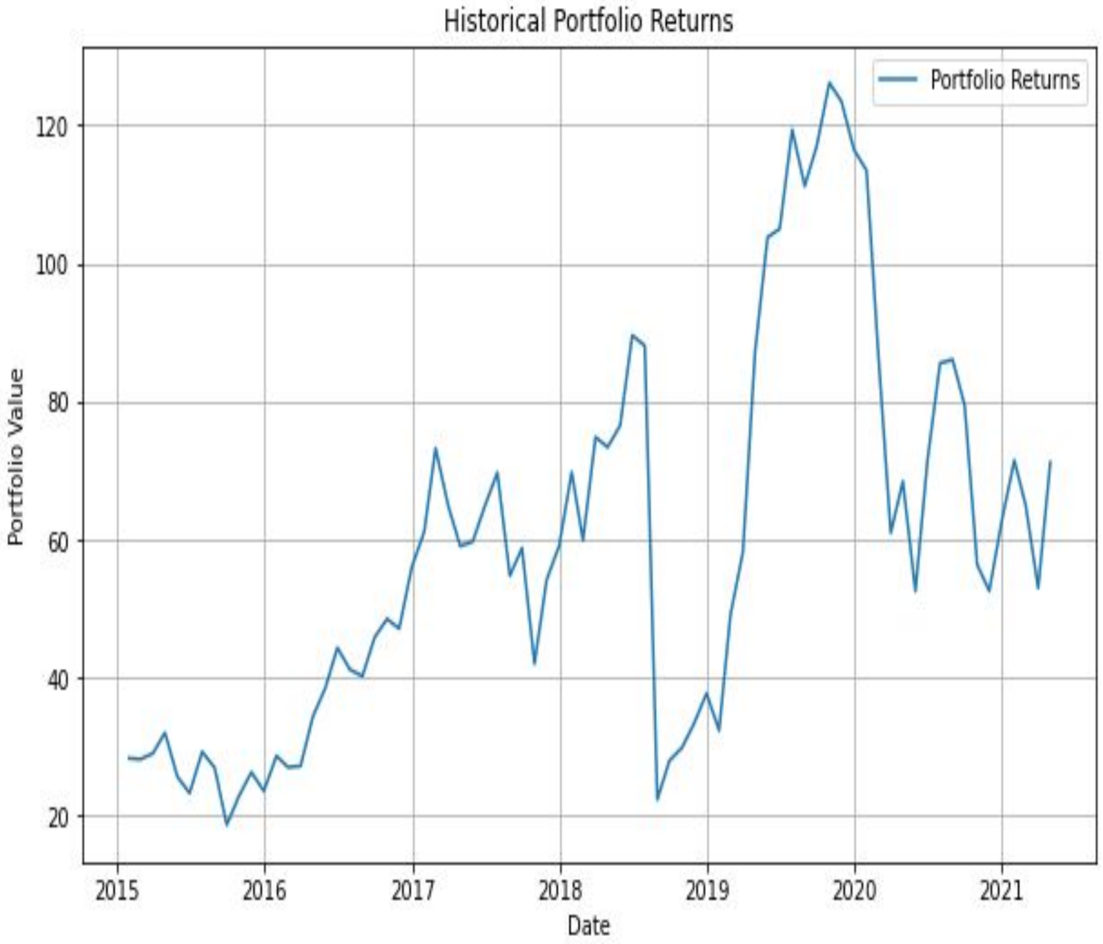




SHARPE RATIO: 3.163

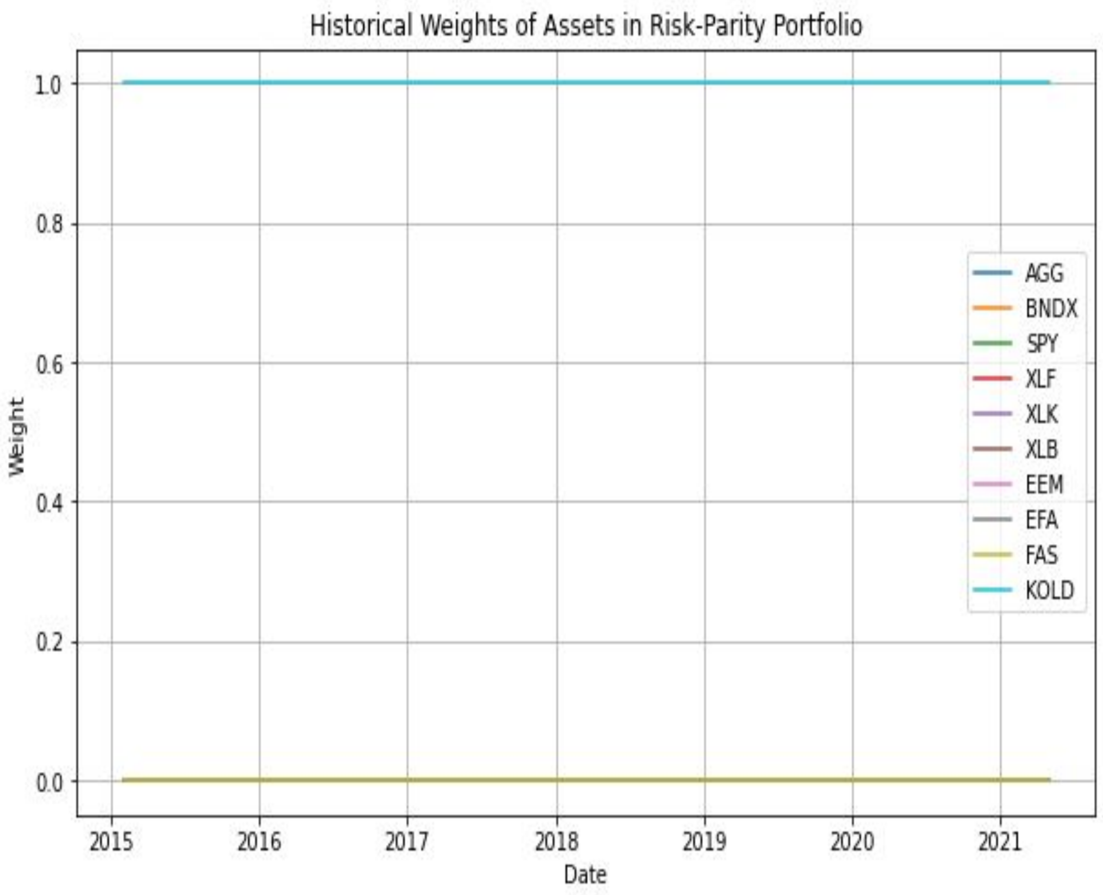
ANNEXURE 4

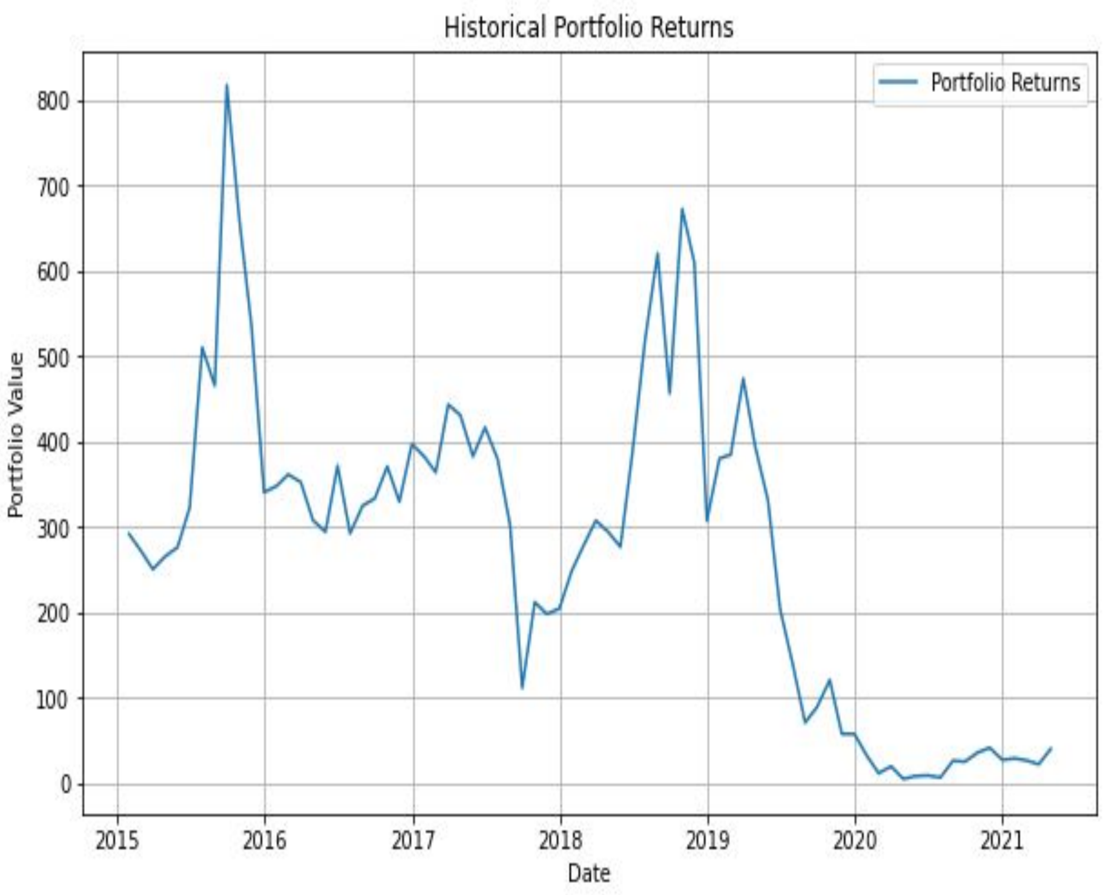




SHARPE RATIO: 2.104

ANNEXURE 5





SHARPE RATIO: 1.481

THANK YOU