

# Portfolio Theory and Stocks in the Modern Energy Sector

Charles M. Becker, Wheaten duP. Jones, Caroline G. Winslow  
Sewanee: The University of the South



## Motivation and Investment Strategy Process

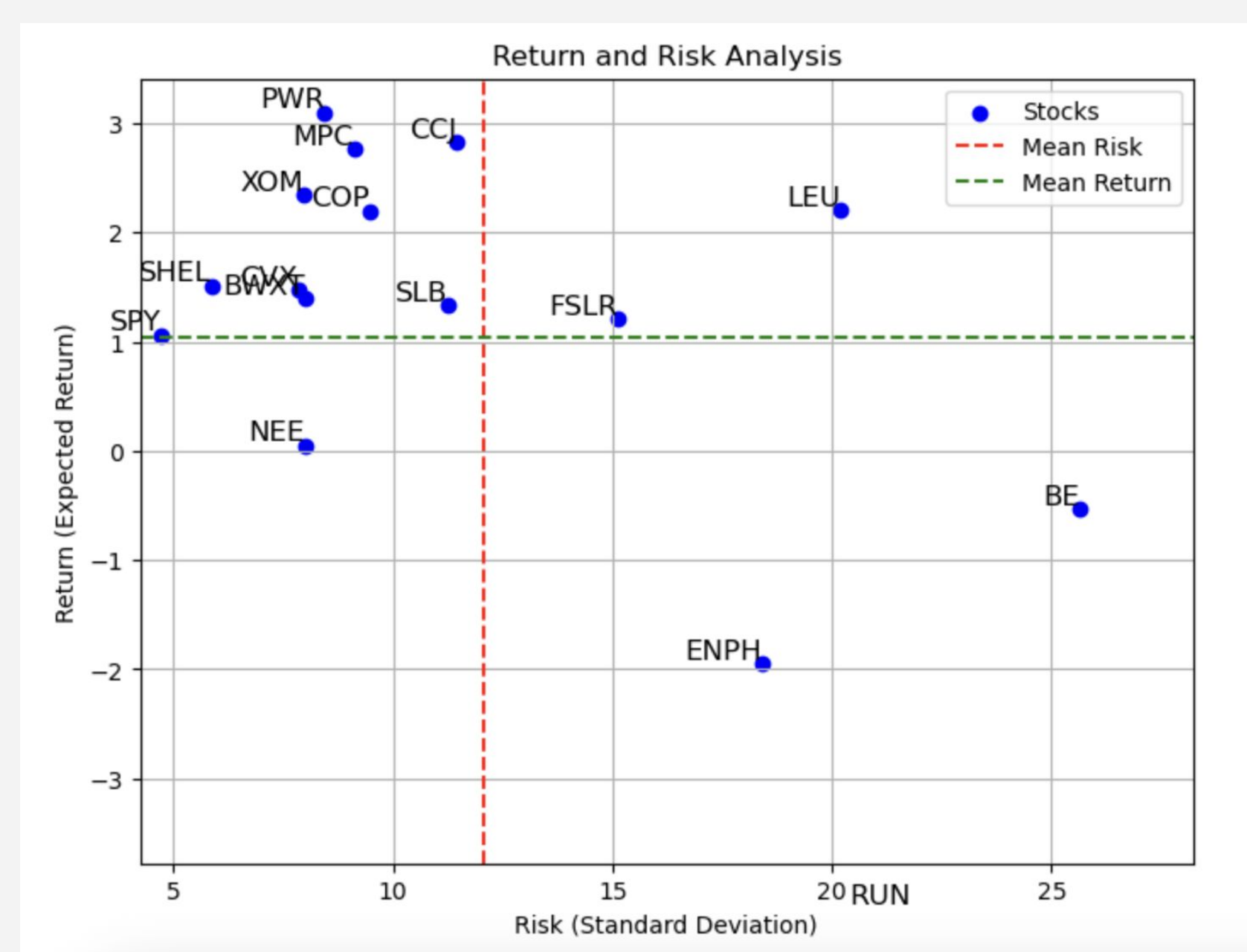
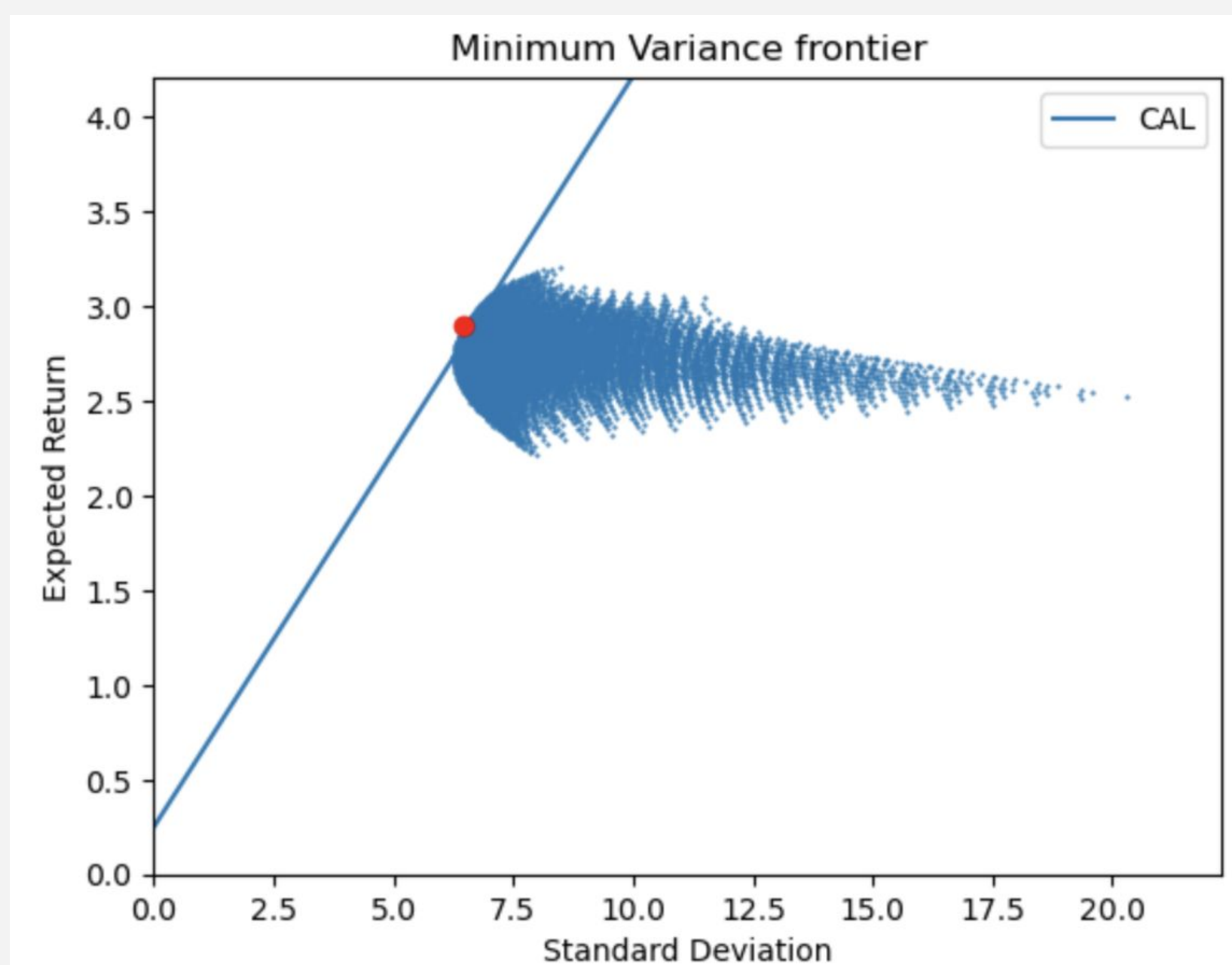


## Stock selection process

### Investing Across Energy Sub-Sectors



## Analysis



### Portfolio Theory and CAPM

- CAPM shows low R-squared for LEU (0.013) & XOM (0.066)
- PWR highest beta (1.05); most market-sensitive
- Maximum Sharpe Ratio of 20.197

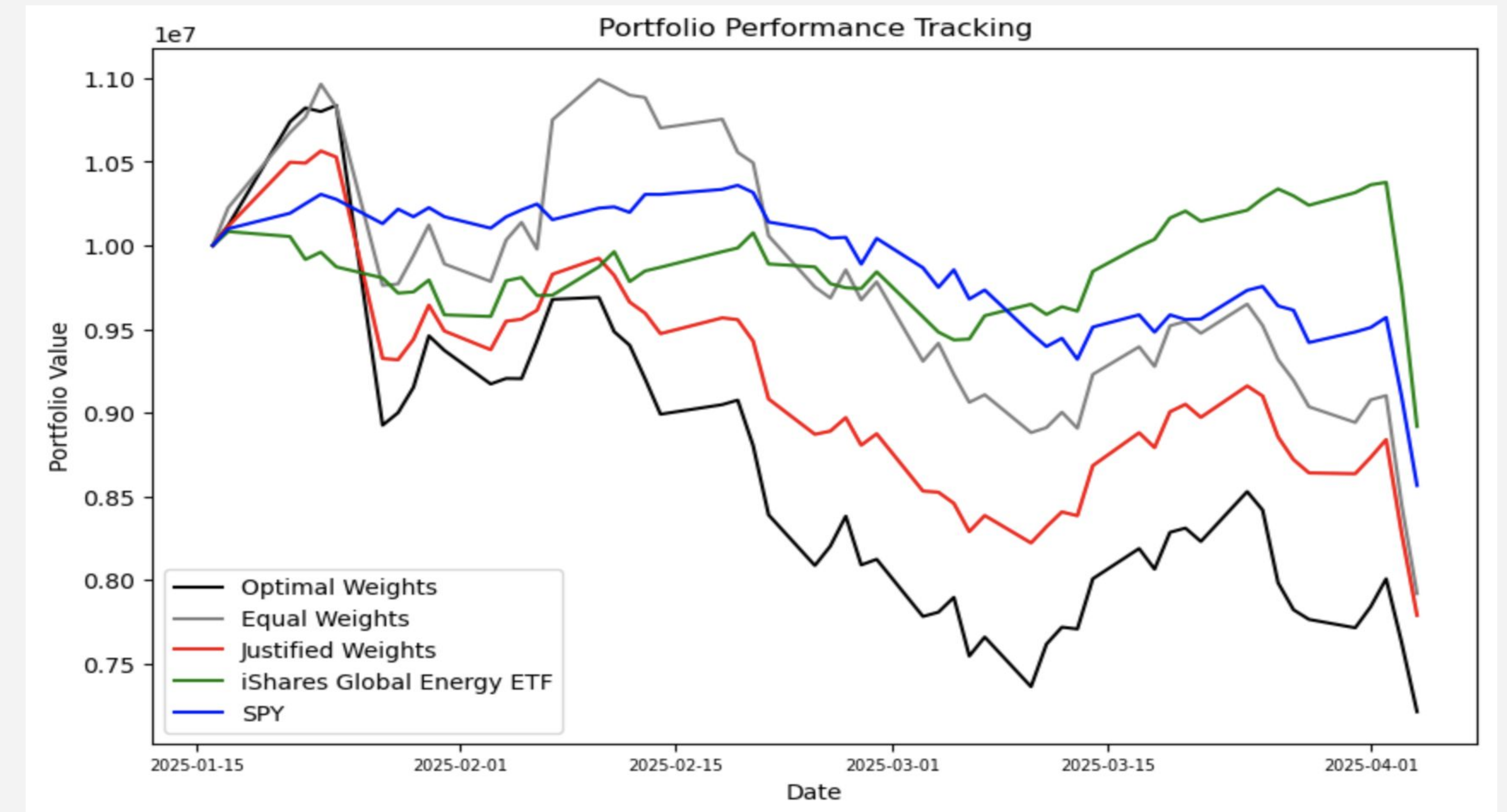
#### Optimal Weights

Ticker	Weight
XOM	0.10
LEU	0.00
PWR	0.15
CCJ	0.50
MPC	0.25

#### Justified Weights

Ticker	Weight
XOM	0.10
LEU	0.05
PWR	0.15
CCJ	0.50
MPC	0.20

## Portfolio Performance Tracking



- Justified Weights performed better than Optimal Weights in the short-term
- Energy Sector ETF outperformed the S&P 500 towards the end of the investment period: this suggests that further diversification would help our portfolio performance

## Quantitative Model

- Expected Returns: PWR (3.10%), CCJ (2.82%)
- Highest Variance: LEU (407.9)
- Best Diversification: MPC & LEU (low covariance)
- ETF Benchmark: IXC chosen for international and uranium inclusion

### Variance-Covariance Matrix

	CCJ	LEU	MPC	PWR	XOM
CCJ	131.015690	118.029154	38.869623	35.221402	17.985175
LEU	407.920314	10.346853	35.918516	27.941855	—
MPC	83.018301	18.310700	49.122321	—	—
PWR	71.214196	12.956762	—	—	—
XOM	63.266927	—	—	—	—

## Reflection Takeaways

- Portfolio Theory is better than CAPM for sector-driven portfolios
- Long-term nuclear expansion favors LEU & CCJ
- ETF comparison reinforces value of cross-sector balance

Full Paper:



SCAN ME