

StrathPrime Equity Fund — Portfolio & Company Valuation Report

MS988 Financial Modelling with Excel | MSc Investment & Finance | Spring 2025

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1. Company Selection Rationale

The StrathPrime Equity Fund was constructed to reflect a diversified, long-only strategy focused on large-cap equities with stable fundamentals and sector resilience. Ten S&P 500 constituents were selected across core industries, including:

- **Technology:** Apple (AAPL), Microsoft (MSFT)
- **Healthcare:** Johnson & Johnson (JNJ)
- **Consumer Staples:** Procter & Gamble (PG), Coca-Cola (KO), PepsiCo (PEP)
- **Energy:** ExxonMobil (XOM)
- **Financials:** JPMorgan Chase (JPM)
- **Telecommunications:** Verizon (VZ)
- **Retail:** Walmart (WMT)

This selection aimed to balance risk and return by including both defensive and growth-oriented firms. Sector diversification was prioritized to reduce exposure to idiosyncratic shocks. Moreover, blue-chip status and consistent data availability enabled robust statistical modeling across the 13-month period (Feb 2023 – Feb 2024).

Firms were chosen based on three key criteria: historical return consistency, moderate to low volatility, and presence in economically resilient sectors. Microsoft and Apple were added for their innovation and growth trajectory; JNJ, PG, and KO represented defensive hedges; while JPM and WMT provided a mix of financial strength and retail exposure. XOM served to diversify into the energy sector amid macroeconomic uncertainties.

2. Portfolio Optimization & Interpretation of Results

Using historical monthly prices, returns were calculated and fed into a mean-variance optimization model in Excel. Solver was employed to create an **efficient frontier**, highlighting the optimal trade-offs between expected return and portfolio risk (measured by standard deviation). Importantly, a non-negativity constraint was imposed to avoid short-selling, ensuring real-world relevance.

Efficient Portfolio Summary

Metric	Value
Expected Monthly Return	2.93%
Portfolio Std Dev	3.19%

Metric	Value
Sharpe Ratio	0.7798
Risk-Free Rate (Monthly)	0.44%

### Optimized Portfolio Weights

#### Company Ticker Weight (%)

Microsoft	MSFT	49.2%
JPMorgan	JPM	29.3%
Walmart	WMT	21.5%
Others	-	0%

The model converged on a high-concentration solution favoring Microsoft, JPMorgan, and Walmart. These three companies presented superior return-to-risk profiles. Despite concentration concerns, this aligns with Solver's objective of maximizing the Sharpe ratio under constraints.

Over 30 simulated portfolios, returns ranged between 1.14% and 1.74%, while standard deviation spanned from 2.86% to 5.64%. This diversity illustrates the breadth of possible portfolio configurations within the given constraints.

### 3. Sector Outlook & Company Valuation: Microsoft (MSFT)

Microsoft was chosen for detailed valuation due to its weight in the optimized portfolio and its strategic importance in the technology sector.

#### Company Snapshot

- **Annual Return:** 4.97%
- **Monthly Volatility (Sigma):** 5.86%
- **Beta vs S&P 500:** 1.09
- **VaR (95%, 1-month):** ~9.63%
- **Sharpe Ratio Contribution:** Highest in the portfolio

As part of the risk assessment for Microsoft Corporation (MSFT), we calculated its Value at Risk (VaR) using the parametric method, which assumes a normal distribution of returns. Based on historical data from February 2023 to February 2024, Microsoft exhibited an average monthly return of approximately 4.14% and a standard deviation of 5.86%. Applying a 95% confidence level, with a corresponding Z-score of 1.645, we estimated the one-month VaR using the formula:  $VaR = Z \times \sigma$ . This results in a VaR of approximately 9.65%. In practical terms, this means that there is a 5% probability that Microsoft’s stock could decline by more than 9.65% in

any given month, based on historical volatility. This metric offers valuable insight into the downside risk of Microsoft as a major component of the portfolio and underscores the importance of diversification even when investing in high-performing, fundamentally sound companies.

Microsoft leads in cloud computing (Azure), enterprise SaaS (Office 365), and artificial intelligence (OpenAI partnership). Despite sector volatility, its diversified revenue streams, high-margin products, and strong balance sheet make it an attractive anchor.

The technology sector is forecast to grow consistently, driven by AI transformation, automation, and cloud migration. Microsoft is positioned at the center of these macro trends.

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#### 4. Performance vs Benchmark & Return Profile

Performance metrics were evaluated against the S&P 500 Index, which returned 1.82% annually with a 13.27% standard deviation.

##### Portfolio Return Summary

Ticker	Avg. Monthly Return	Annualized Return	Std Dev ( $\sigma$ )
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MSFT	4.14%	4.97%	5.86%
VZ	0.43%	5.17%	6.39%
JPM	2.05%	2.46%	7.58%
WMT	1.34%	1.62%	6.67%
PG	-0.99%	-11.9%	8.91%
XOM	-0.83%	-9.96%	6.95%

Most selected stocks outperformed the benchmark in raw return or risk-adjusted return. Microsoft, Verizon, and JPMorgan stood out for combining high returns with moderate risk levels.

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#### 5. Regression & Risk Analysis

To understand asset behavior under systematic risk, two regressions were conducted:

##### A. Individual Stocks vs S&P 500

- Average Beta: ~1.13
- R-squared: 0.1388
- Interpretation: Moderate explanatory power; varied sector exposures reduce correlation

##### B. Individual Stocks vs Efficient Portfolio

- R-squared: 0.9544

- T-test (Slope): 12.14 (highly significant)
  - Interpretation: The efficient portfolio explains asset returns much better than the benchmark, highlighting its tailored structure.
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## 6. Limitations of the Analysis

While the portfolio demonstrates effective optimization, several limitations exist:

- **No short-selling** reduces the model's flexibility and leads to high concentration.
  - **Historical reliance:** The model assumes past returns and volatility persist, which may not hold amid macroeconomic shocks.
  - **Regression limitations:** Beta and alpha values may shift with market cycles.
  - **Data constraints:** Financial statements for valuation (DCF, multiples) were not included.
  - **Solver behavior:** It may produce results inconsistent with human diversification intuition.
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## 7. Conclusion

The StrathPrime Equity Fund is a high-performing, risk-conscious portfolio that meets real-world constraints. Its reliance on large-cap, stable equities and efficient frontier modeling has resulted in an optimized asset allocation. Microsoft, with its growth momentum and technological leadership, serves as the fund's keystone. The project demonstrates how disciplined data analysis and financial modeling can yield insightful, performance-driven investment decisions.

The fund successfully outperforms the S&P 500 on a risk-adjusted basis, providing a practical framework for academic and institutional application.

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