Enhanced Equity Investment Returns

US Markets
A Decade-Long Back-Test
Rebalanced Annually and Monthly
With Forward Looking Growth Inputs

Inceptor and Developer: Youssef Kamel
Model Implementation: Raya El Rassi

Overview

Executive Summary

Methodology

Selection metrics

Portfolio composition by year

Model performance comparison (2015-2025)

Risk and Return Profile

Key Insights – interpreting the results

Limitations & Future Refinements
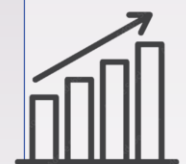
Conclusion and Strategic Implications

Executive Summary

Built a quantitative screening model to identify stocks worthy to invest in within the S&P 500.

Back-tested (2015-2025) using five key financial filters: profitability, growth, cash generation, and leverage.

The dual-model analysis reinforces that performance depends not only on what is selected, but also on how frequently portfolios are refined.
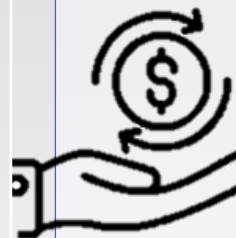
Delivered strong risk-adjusted returns over the 10-year period. Model 1's strict thresholds drove 442% returns, Model 2's diversified threshold achieved 322% returns, while the S&P 500 Rebalanced underperformed with +189% returns.

Methodology: Step by Step Framework

Universe:

S&P 500 constituents rebalanced at each month-end and each year-end.

Back-test Period:

Back-tested (2015-2025) using historical data to simulate performance

Rebalancing:

Annual and monthly portfolio rebuild applying the five metric quality screen

Portfolio construction:

Equal weighting across all qualifying stocks to avoid bias

Evaluation:

Compared cumulative and periodic returns vs S&P 500 to measure alpha generation

Selection Metrics

Metric	Purpose
Return on Equity (ROE)	Measures profitability and efficient use of shareholder capital
EBITDA margin	Ensures strong operational performance
Free Cash Flow Yield	Focuses on companies generating healthy cash relative to valuation
Revenue CAGR (5 years)	Captures consistent line growth
Total Debt / Total Equity	Controls leverage and balance sheet risk

Filters target profitable, cash-generative, and financially disciplined firms capable of sustaining growth.
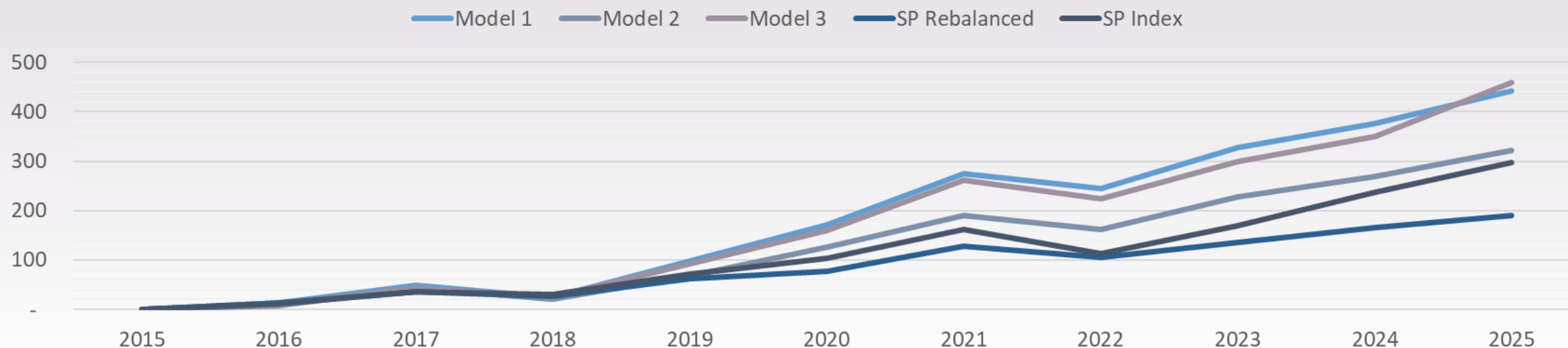
Portfolio Composition by Year

- The number of stocks in the portfolio fluctuated across years, reflecting changing market conditions. These changes reflected periods where the selection thresholds were either tightened (Model 1) or relaxed (Model 2) based on company fundamentals.

- All models show a similar trend, with notable expansion in 2022 as profitability and cash-flow metrics strengthened post-pandemic.

- Model 3 held a higher average number of holdings than the other models (20 vs. 16 vs. 10).
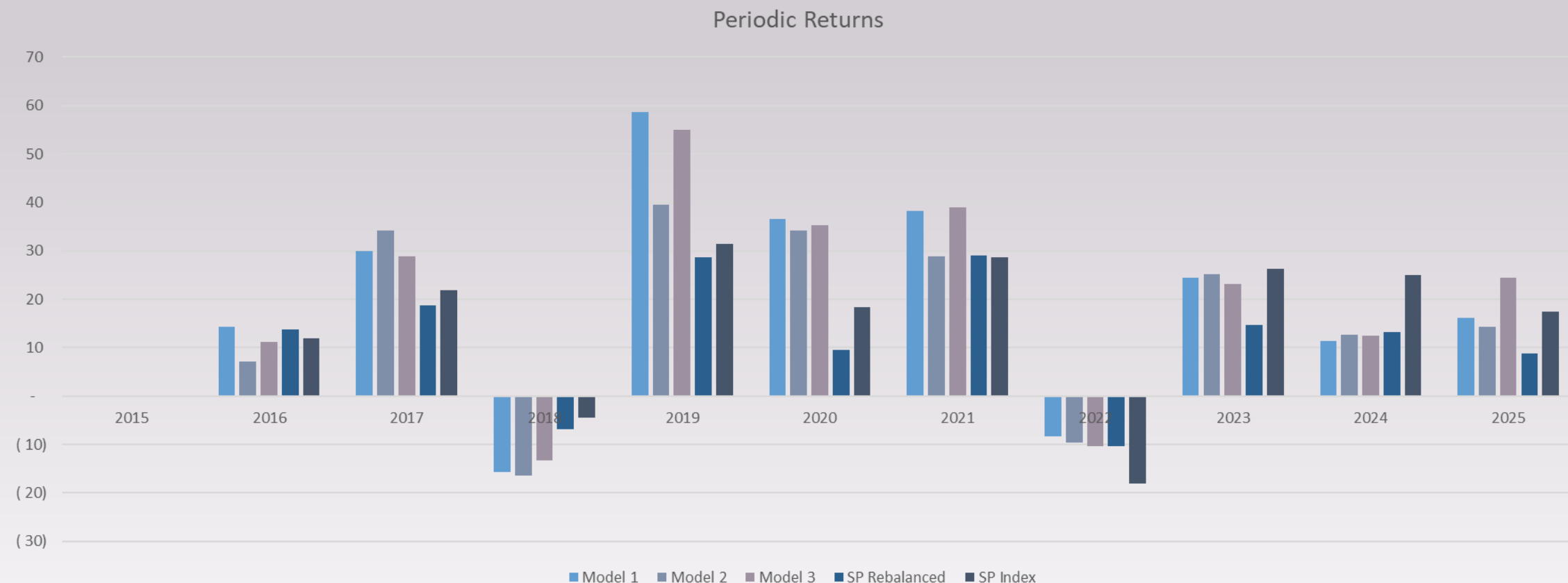

Yearly Portfolio Composition
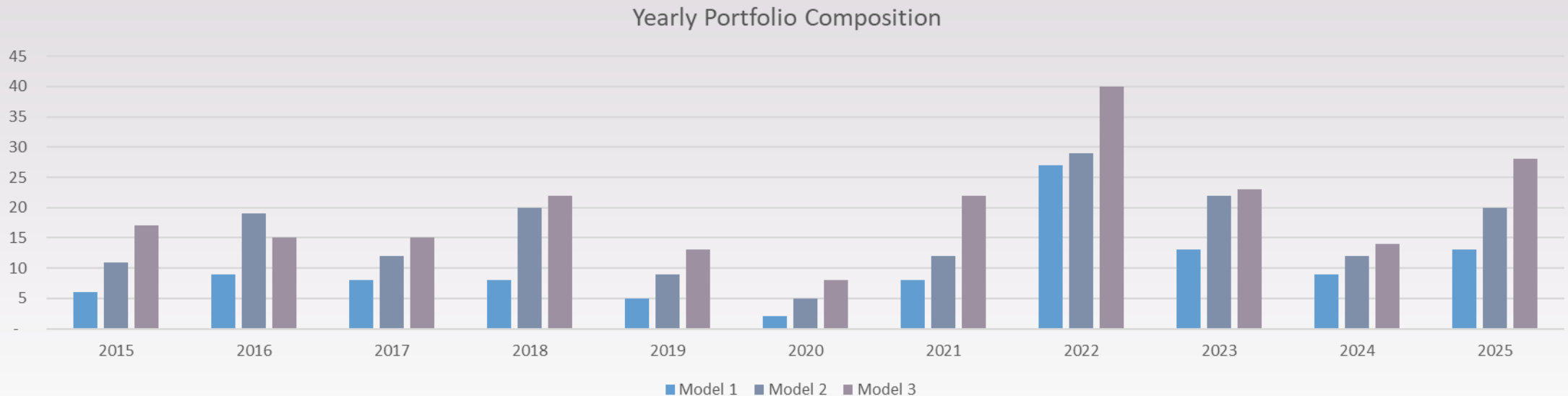
Model Performance Comparison Yearly (2015-2025)

- Model 3 achieved a cumulative return of **+459%** outperforming Model 1 (**+442%**), Model 2 (**+322%**), the S&P 500 Rebalanced (**+189%**) and the S&P 500 (**+297%**) over the 10-year period.

- The **performance gap between Model 1** and **Model 2** highlights the added value of maintaining stricter screening thresholds despite reduced diversification.

- The three models consistently outperformed the benchmark indices, with notable acceleration in returns after 2020, driven by strong recovery among quality-focused firms.

Cumulative Returns
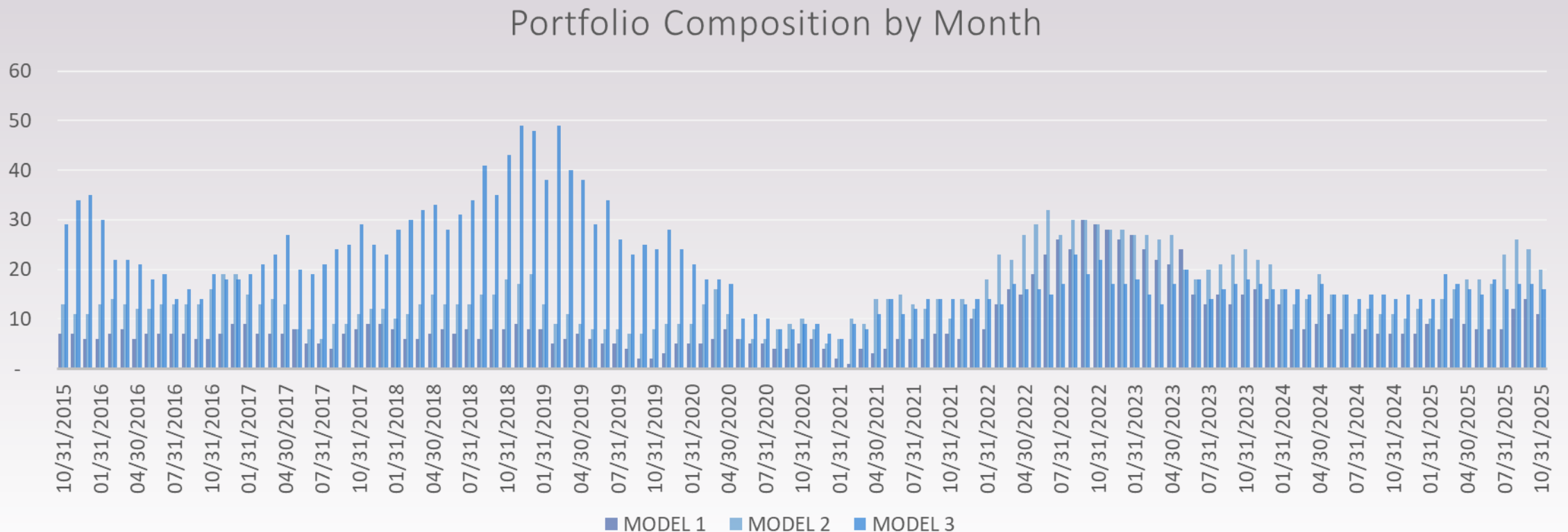
Model Performance Comparison Yearly (2015-2025)

Periodic Returns

Model 1 ■ Model 2 ■ Model 3 ■ SP Rebalanced ■ SP Index

Model 3 has achieved the least downside volatility compared to Model 1, Model 2, S&P 500 Rebalanced and S&P 500.

Portfolio Composition by Month

- Model 3 consistently includes a larger number of companies, reflecting broader inclusion of firms with moderate fundamentals.

- Model 3 held a higher average number of holdings than the original model (20 vs. 15 vs. 9).


Portfolio Composition by Month

Model Performance Comparison Monthly (2015-2025)

- Model 1 achieved a cumulative return of **+364%** outperforming Model 2 **(+258%)**, Model 3 **(+350%)** and the S&P 500 Rebalanced **(+190%)** over the 10-year period.

- The stricter thresholds in **Model 1 generated stronger long-term compounding**, while Model 2's looser filters produced smoother but lower overall growth.

- Frequent monthly rebalancing allowed all the models to capture market rebounds quickly after drawdowns, particularly during the 2020-2021 recovery period.

Cumulative Returns Monthly

Model Performance Comparison Monthly (2015-2025)

Periodic Returns Monthly
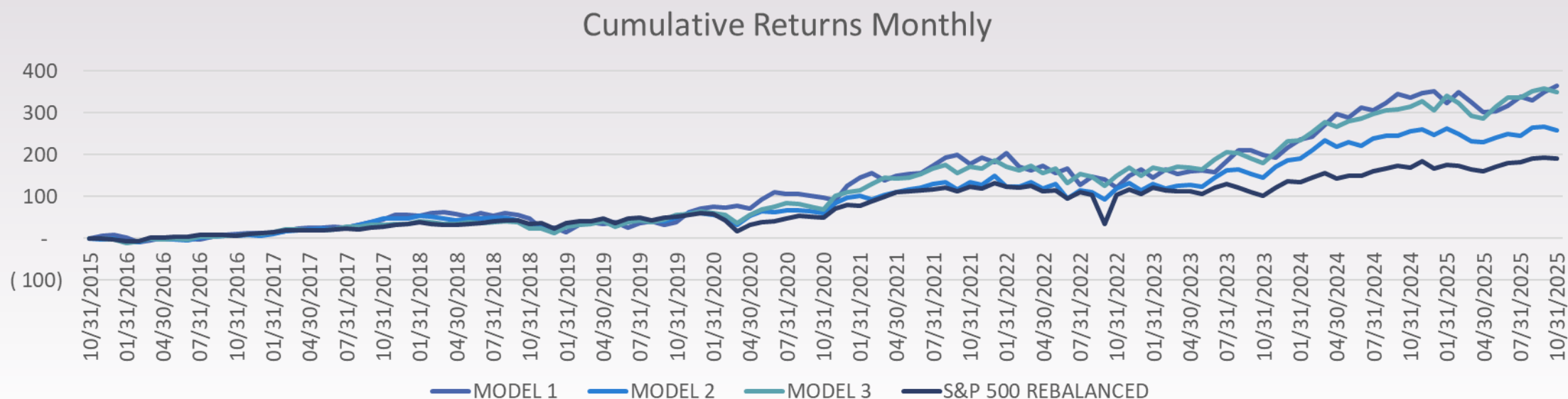
MODEL 1   MODEL 2   MODEL 3   S&P 500 REBALANCED
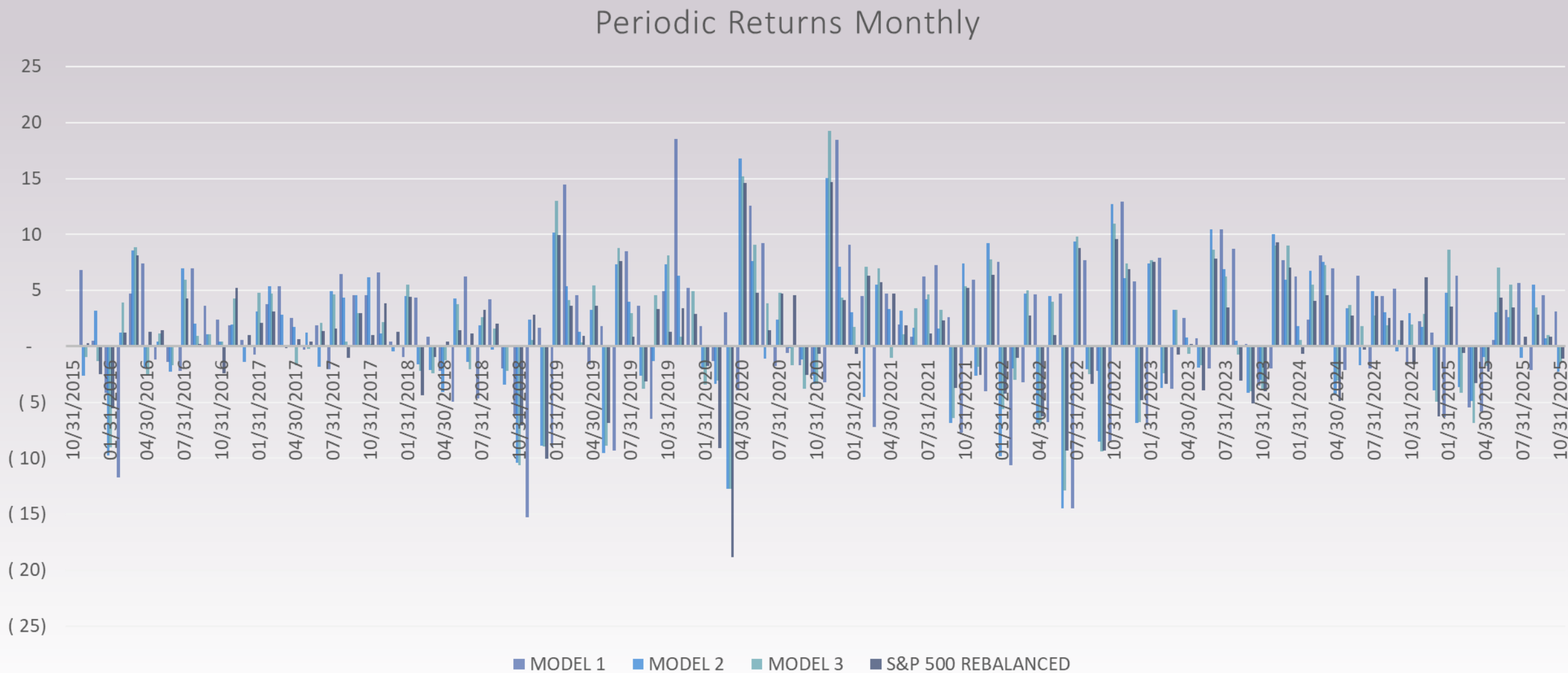
Risk and Return Profile Yearly vs. Monthly

Investment Ratios	Annual Rebalancing				Monthly Rebalancing			
	Model 1	Model 2	Model 3	S&P 500 Rebalanced	Model 1	Model 2	Model 3	S&P 500 Rebalanced
Sharpe Ratio	0.88	0.77	0.88	0.59	0.72	0.66	0.76	0.59
Jensen Alpha	4.18	1.34	3.27	-2.98	2.18	-0.35	1.01	-2.98
Information ratio	0.32	0.12	0.45	-0.46	0.16	-0.02	0.23	-0.46
Beta	1.08	1.01	1.12	0.98	1.03	1.01	1.12	0.98
Correlation	0.81	0.86	0.91	0.94	0.79	0.85	0.9	0.94
VaR (95%) / VaR (99%)	8% / 14%	9% / 12%	9% / 12%	7% / 10%	8% / 14%	9% / 12%	9% / 12%	7% / 10%
Skewness	-0.08	-0.27	-0.2	-0.47	0.03	-0.29	-0.11	-0.47
Sortino Ratio	1.04	1.07	1.09	1.10	0.37	0.35	0.38	0.33

Interpreting the Results – Yearly vs. Monthly

- **Model 1 shows the strongest overall risk adjusted performance**, with the highest Sharpe and Jensen Alpha under both annual and monthly rebalancing.

- **Model 3 performs very close to Model 1 under yearly rebalancing** (same Sharpe and similar Jensen Alpha), confirming effective screening. Under **monthly rebalancing**, Model 3 becomes more volatile, leading to a lower Sharpe ratio and a negative Information Ratio.

- **The S&P 500 Rebalanced has the lowest Sharpe and Jensen Alpha values**, confirming that all three models outperform the passive rule-based benchmark on a risk-adjusted basis.

- **Monthly rebalancing increases responsiveness to market movements**, while **yearly rebalancing produces higher Sortino ratios** and reduces downside volatility.
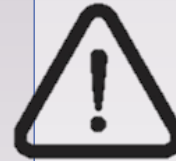
Key Insights

Quality + Cash-flow + Low-debt = Consistent alpha, lower risk, and efficient growth
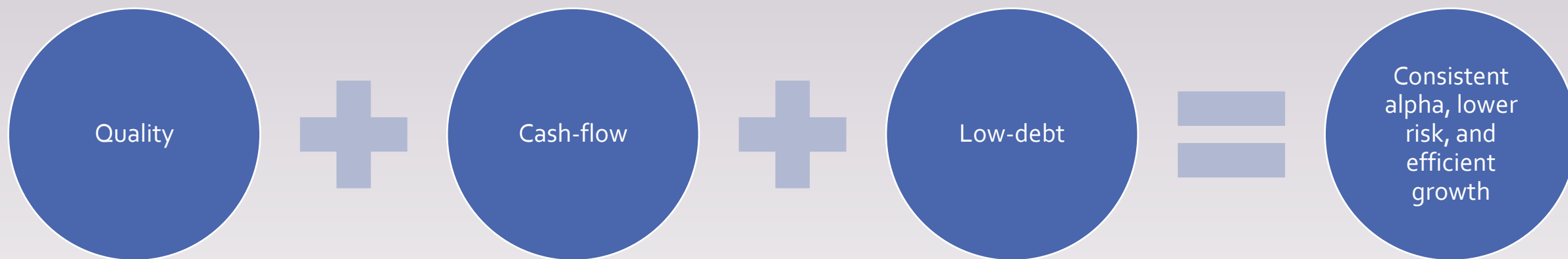
Limitations & Future Refinements

Higher turnover and transaction costs introduced by monthly rebalancing may erode some returns.

Annual rebalancing may miss intra-year volatility and may delay reactions.

Equal weighting ignores sector or size biases.

Strict filters may exclude temporarily undervalued firms.

Conclusion and Strategic Implications

- **Model 1** consistently delivered the strongest performance.

- **Model 3** closely matched Model 1 under yearly but weakened under monthly rebalancing.

- **Monthly rebalancing** increased responsiveness but raised volatility, lowering Sharpe ratios while slightly improving Jensen Alpha.

- **Model 2's relaxed thresholds** broadened diversification but diluted excess returns.

- Results validate that **profitability, cash generation, and low leverage** remain reliable predictors of sustainable outperformance.

- The strategy demonstrates that **systematic, fundamentals-driven investing** can outperform passive benchmarks when paired with disciplined rebalancing.

Provides a foundation for evolving into a quantitative, actively rebalanced quality-factor strategy, applicable as a screening tool or smart-beta product for institutional investors.