



AlgoGators Investment Fund

“A Better Side Bet”

Main Idea

In the realm of quantitative finance, the pursuit of superior risk-adjusted returns necessitates a fusion of traditional wisdom and innovative methodologies. This report presents a cutting-edge investment strategy designed to navigate the complexities of futures markets globally with precision and agility. At its core, this strategy harmonizes the predictive power of daily trend analysis with the nimbleness of intraday trading, all while leveraging a dynamic optimization process to ensure optimal asset selection and risk management. Our strategy is distinguished by its multi-layered approach, integrating multiple timeframes and strategies to exploit market trends and movements effectively. By synthesizing a robust daily trend model with a tactical intraday trading component, we aim to capitalize on market inefficiencies in a manner that is both methodical and adaptive.

The cornerstone of our strategy is the daily trend model, a fusion of multiple trend strategies that forecasts market directions, thereby informing our asset allocation decisions. This model leverages scaled forecasts to ensure uniform signal comparability across a diversified portfolio of futures contracts, holding assets for days to weeks. Complementing our daily analysis, the intraday trading strategy is activated by the forecast derived from the daily model, adeptly responding to short-term market dynamics. This strategy, refined through genetic optimization and machine learning, targets predetermined trading sessions that capitalize on historical liquidity and volatility patterns across a basket of foreign exchange, commodity, and index futures contracts. The intraday component diversifies our strategy across different time frames and allows for efficient capital utilization by categorizing assets into classes and trading sessions. Central to realizing this strategic vision is a dynamic optimization algorithm that selects securities, aiming for maximal diversification and minimal correlation across holdings. This process enhances our portfolio's resilience and amplifies our potential for alpha generation. Our ensemble of strategies ensures that each trade, from inception to closure, is fortified by market analysis and a risk management framework.

This report delves into the economic rationale, the implementation of our strategies, risk considerations, and liquidity and capital management, culminating in a comprehensive analysis of our strategy's prospects. Through rigorous backtesting, including a significant out-of-sample component, random model comparison, Monte Carlo simulations, and sensitivity analyses, we validate our strategy's performance and reduce the risk of overfitting. Our ambition is to transcend conventional trading paradigms, unlocking new market opportunities through a multifaceted approach that sets a new standard in quantitative trading excellence.

Economic Hypothesis

Our strategy is multi-faceted, leveraging diversification across asset classes as well as long and short positions, maximizing our market presence across various conditions. This diversification is further enriched by operating on dual timeframes – trading on 20-minute bars for intraday movements and utilizing daily bars for market trends and regime identification. Such an approach enables us to exploit a broad spectrum of market inefficiencies and volatility. Additionally, the use of risk parity allows for efficient capital deployment and rigorous risk management. This principle adjusts our position exposure to match a desired risk profile and maintain a balanced and stable portfolio. This strategy adheres not only to sound economic principles, but also exploits the dynamic nature of futures markets, going long or short as dictated by our comprehensive market analysis.

In terms of execution, our intraday strategy revolves around trading peak liquidity windows – 2 am to 7 am for currencies, 8 am to 11 am for commodities, and 12 pm to 3 pm for US indices (CST). The timings aim to capitalize on lower trading costs and enhanced price discovery, optimizing our entry and

exit points (see Figure 1 for an example with crude oil futures). The selection of these windows is grounded in the critical role liquidity plays in minimizing spread costs and maximizing trade efficiency. The one-hour interlude between trading sessions is a critical component of our strategy, dedicated to a comprehensive review and optimization process. During this period, we utilize a diversification optimization process mirroring the dynamic optimization used in our daily trend analysis. This ensures our portfolio remains diversified across asset classes and responsive to changing market conditions. The pause in trading for specific assets also allows us to reassess our stance, integrating human judgment alongside our automated processes to ensure a balanced and risk-aware approach. Additionally, this time is utilized to implement a crucial risk mitigation strategy – a 'kill switch' that is activated if the daily trend forecast falls below our predetermined threshold. On identifying a strong trend, we engage actively, harnessing upward or downward movements to our benefit. Conversely, when the trend strength diminishes, we exercise restraint, stepping back from intraday trading for that asset to avoid uncertain market movements. Through this approach, we can sidestep the risks of volatile or directionless markets, focusing our efforts on clearer opportunities. The selection of strategies during this time is also fine-tuned to current market and volatility regimes, allowing us to deploy the most suitable strategies for the prevailing conditions.

Inspiration from Benoit Mandelbrot's work on the fractal nature of markets reinforces our strategy, emphasizing that significant market trends are an aggregation of smaller intraday movements. By aligning our intraday trading with daily trend forecasts, we focus on capturing these 'mini trends,' thus exploiting the cumulative impact of these smaller movements on broader market dynamics. This strategy enables us to deploy capital efficiently and increase our engagement frequency, employing the law of large numbers. With a win rate of 57% (Figure 17), our intraday strategy anticipates a higher expectancy of profitable trades, reinforcing the resilience and sustainability of our 'better side bet'.

Our strategy is a dynamic blend of innovative technology, rigorous risk management, and a deep understanding of market dynamics. By leveraging the fractal nature of markets as a lens through which to view and interpret market movements, we craft a trading approach that is both adaptive and discerning. This approach ensures that we are not just reacting to market conditions but are proactively anticipating and preparing for them, setting a solid foundation for sustained success in the volatile world of trading.

Implementation

The core component of our strategy aims to extract risk premia through trend forecasting methods. Although trend analysis is generally straightforward, our approach uniquely integrates it with risk analysis and position optimization. We identify general trends in the futures markets using exponential smoothing and crossover calculations. Our raw forecasts are derived by calculating the difference between a faster window and a slower window of exponentially weighted moving averages (EWMA). We then risk-adjust the forecast by dividing it by the standard deviation of daily back-adjusted prices. The price-normalized trend value is then scaled by 10, and then divided by the average absolute value of all previous forecasts, resulting in final scaled values for a single window in the range of -20 to 20. This process is repeated for 6 differently sized windows to identify both short-term and long-term trends within each contract in our investable universe. After determining the normalized trend signals, we aggregate them with equal weights. The combined raw trend strength is then rescaled by the forecast diversification multiplier (FDM), necessitated by the distinct lack of high correlation between slow and fast trends. This correlation is quantified through a matrix of percent returns for each trend window. FDM is derived by finding the inverse of the square root of the dot product of the transposed weights, the correlation matrix, and the weights again. Our rescaled forecast is then employed in our position sizing equation.

For average position sizing, we multiply our total capital by the allocated weight of the specific instrument, our 20% risk target, and an instrument diversification multiplier (IDM). The IDM is determined similarly to the FDM, using the inverse of the square root of the dot product of our transposed weight vector, the instrument returns correlation matrix, and the weight vector again. This product is normalized

by dividing by the product of the instrument-specific contract size, the current price of the instrument, the foreign exchange rate, and the standard deviation of a 32-day EWMA. The resulting position size is then applied to our previously calculated trend signal to determine our trend position for the instrument.

The intraday aspect of our approach is activated based on strong forecast signals from our daily trend model, with activation thresholds set at above 5 or below -5 for most instruments, and a wider range of -12 to 12 for indices to account for their distinct market behaviors. This strategy, refined for each asset class, leverages the unique market drivers – such as interest rates for currencies, safe-haven status for gold, supply-demand for oil, and economic indicators for stocks – to identify and exploit non-correlated opportunities for enhanced portfolio performance. The entry signals for each class are derived through an exhaustive machine learning process, analyzing in-sample and out-of-sample data from 2008 to 2021 with a 50% split, and further validating our model with a blind test using data from 2022 to 2023. We've also accounted for practical trading considerations, including a slippage cost of \$25 for round-trip trades using market orders to ensure our financial models closely mirror actual trading conditions. This rigorous testing approach yielded hundreds of trades across the blind test period, maintaining performance consistency with our out-of-sample backtest results. A signal might indicate a buy if certain conditions are met within specific times, volumes, and technical indicators, such as the Kaufman Efficiency Ratio and RSI, aligning with our broader market analysis. For example, our short gold strategy involves shorting the asset under specific conditions: average true range (ATR) surpasses the ATR from 5 bars ago over 20 periods, the simple moving average (SMA) exceeds its value from 5 periods ago across 200 periods, and present volume tops the 200-period moving average volume. Positions are held until the close of their specific trading session, delineated into distinct periods for FX, commodities, and indices, optimizing our exposure to short-term market movements within a controlled and systematic trading framework.

With the positions determined, we combine the two strategies, allocating 80% to the daily core trend model and 20% to the secondary intraday 'side bet' strategy. When constructing a diversified portfolio of futures contracts, we face a challenge with capital requirements. The theoretical \$10 million capital constrains our diversification levels due to the indivisible nature of futures contract position sizing. To address this, we employ a dynamic optimization process for the daily trend model, minimizing the diversification gap between optimal and achievable portfolios using linear algebra and covariance matrices. Utilizing a greedy algorithm, we iteratively seek solutions that improve upon previous ones until we reach an optimal threshold or iteration limit. We begin with an initial position assumed to be zero and introduce a tracking error vector to measure deviations from the optimal position standard deviation for each instrument. Our objective is to minimize the standard deviation of the tracking error portfolio, calculated as the square root of the product of our transposed tracking error vector, the covariance matrix of percentage returns of an optimal portfolio, and the tracking error vector again. Through iterations conditioned on acceptable convergence and iteration limits, we adjust our position incrementally to reduce the standard deviation of the current best position's tracking error. This iterative process brings us as close as possible to the calculated optimal diversification of our portfolio. We posit that our competitive advantage lies in this dynamic optimization approach to portfolio optimization.

Risks

In navigating the intricate landscape of financial markets, our strategy introduces a multi-faceted approach to risk management that harmonizes long-term trend-following with agile intraday trading. By diversifying across a broad spectrum of assets and economies, we mitigate market-specific volatilities and systemic risks, ensuring resilience against unpredictable shifts. Our dual-strategy framework leverages dynamic optimization for strategic asset allocation and employs stringent operational safeguards, including real-time data validation and comprehensive risk monitoring. This introductory overview sets the stage for an in-depth exploration of our rigorous risk mitigation practices, underpinning our commitment to sustaining robust, risk-adjusted returns.

The long-term trend-following strategy is diversified across varying underlying asset classes to reduce market risk, from equities to commodities, and also across multiple economies, from the United States to emerging economies. This diversification reduces the exposure to any specific geographical region or asset in the event of a market downturn or change in volatility regime. Should investing in a broad scope of underlying assets be unfeasible given limited capital, our dynamic optimization process can be used to maximize the diversification of a portfolio by providing preference to uncorrelated instruments when allocating capital. It is estimated that a portfolio of 50 million USD is sufficient to be diversified across a selection of 100 underlying assets. The short-term intraday strategy is relatively unexposed to long-term market movements due to its limited holding time.

To hedge against the exposure to systemic risk, multiple strategies and time frames are employed. The short-term strategy can capitalize on the sudden change to the market that the long-term strategy could not. Different time frames on moving averages in the daily model prevent sudden or long-term movements from driving the entire position of the portfolio by averaging. To avoid excessive losses, we've implemented an overall stop loss mechanism, derived from the worst trade performance observed in our backtesting period. This approach, coupled with a 'kill switch' activated when forecast thresholds are not met, significantly reduces our time in the market, thereby minimizing exposure to sudden market movements. For the long-term strategy, minimum volatility levels are specified for instruments to prevent excessive leveraging and maintain the desired risk target, and portfolio limits are put in place to limit overall portfolio positions should a sudden change in portfolio risk spike. Moreover, our strategy avoids trading during weekends and leverages backup systems for continuous monitoring, which underscores our proactive stance on risk management. Risk monitoring utilizes real-time data and trade metrics, including Value at Risk and Conditional Value at Risk, to identify and correct risk concerns promptly, ensuring compliance with margin requirements. Operational risks from automating strategies are mitigated through real-time data analysis, extensive unit testing, and manual trade reviews to ensure accuracy in data, calculations, and trade executions.

Our comprehensive risk management strategy is meticulously crafted to navigate the complexities of the financial markets with resilience and adaptability. By integrating advanced diversification, dynamic optimization, and stringent operational protocols, we effectively mitigate a wide array of market and systemic risks. Our approach, emphasizing proactive risk controls including an overall stop-loss mechanism and a 'kill switch,' ensures that our exposure is meticulously calibrated and managed. This robust framework allows us to sustain strong, risk-adjusted returns, demonstrating our unwavering commitment to safeguarding investments while capitalizing on strategic opportunities across global markets. Through continuous monitoring, real-time data analysis, and adherence to stringent risk parameters, we uphold the highest standards of risk management, positioning our strategy for long-term success and stability in the ever-evolving trading landscape.

Liquidity and Capital Constraints

Effective trading strategies hinge on market participation capabilities, where liquidity and capital management play pivotal roles. By focusing on highly liquid instruments and strategic trading windows, we aim to mitigate entry and exit challenges. Our analysis extends beyond the nine instruments showcased for intraday strategy testing, acknowledging the potential to scale capital by exploring additional assets. By applying a 'speed limit' test, we've curated an investable universe of approximately 100 instruments in which trading costs do not exceed a third of our projected pre-cost Sharpe ratio. Our intraday model's flexibility, tested with an average capital of \$5M, demonstrates its potential as a complementary strategy to the common long-term trend portfolio, leveraging capital 3x to optimize investment goals while freeing up resources for diversification into other models. This approach ensures that margin use relative to the \$5M is low, highlighting our strategy's efficiency and adaptability in leveraging liquidity and managing capital constraints effectively. Through dynamic optimization and a focus on liquid markets, our strategy is designed for scalability and resilience, ensuring robustness and compliance amidst evolving market dynamics.

Liquidity concerns are mitigated by our choice to trade highly liquid instruments – crude oil futures, gold futures, and high-volume indices and currencies. Strategic trading periods, identified through historical analysis to coincide with heightened volume, allow our approach to efficiently navigate in and out of positions. Dynamic optimization plays a pivotal role in our capital deployment strategy, allowing a smaller capital base to achieve the diversification of a much larger portfolio. This process not only magnifies our strategy's potential but also underscores its scalability and adaptability to market conditions. Our engagement in futures markets, known for their deep liquidity, allows us to utilize our capital to its fullest potential. We rely on rigorously calculated position sizing and adopt a momentum-driven approach, matching the magnitude of our positions with our confidence in their potential.

Our proactive approach to liquidity and capital management involves maintaining a liquidity reserve and integrating the cost of slippage into our models, bridging the gap between theoretical backtesting and the practicalities of live trading. The operational constraints of trading within specific windows for different asset classes underscore our strategy's sophistication, ensuring capital efficiency and minimizing the risk of liquidity crunches. As we navigate futures markets globally, our strategies are fortified by a comprehensive liquidity risk mitigation protocol and a robust capital management framework.

Analysis of Strategy Prospects

The performance of our trading strategy reflects its robustness and adaptability in the financial markets, achieving solid results across various asset classes. Our approach has demonstrated a substantial number of trades, with a total of 3,776 across the backtesting period for the intraday model indicating active market engagement. The annual mean return stands at a notable 25.55%, with an annualized standard deviation of 9.76%, leading to a calculated Sharpe ratio of 2.62, which indicates a favorable risk-adjusted return profile (Figure 17). In our rigorous testing to prevent overfitting, we've used a 50/50 split for in-sample versus out-of-sample data from 2008 to 2021, optimizing signals for intraday strategy selection. The strategy's robustness was further confirmed using blind data from 2022 to 2023, simulating hundreds of trades with similar performance to our out-of-sample backtests. By incorporating realistic trade elements like a slippage cost of \$25 for round-trip trades using market orders, we've ensured that our strategy remains grounded in practical trading scenarios.

Our intraday strategy's performance showcases remarkable efficiency by achieving a win rate of 57% with limited market exposure. The fact that we operate actively in the market only 58% of the time, yet still deliver substantial risk-adjusted returns, is a testament to the efficacy of our strategic approach (Figure 17). This indicates a high potential for scaling up capital, as the inclusion of more uncorrelated securities beyond the 9 we tested with could amplify our success. The examination of the win rate variance in Figures 6 and 7 reveals a consistency in positive PNL across a growing number of trades, bolstering confidence in the strategy's prospects during varying market conditions. The correlation matrices presented in Figures 18 and 19 reinforce the strength of our strategy, demonstrating that by combining a number of uncorrelated securities, we enhance our risk-adjusted return profile. These matrices provide empirical evidence of the low correlation between the asset classes we trade, from currencies to oil and gold to stocks. This low correlation ensures that our portfolio benefits from diversification, as the performance of one asset class does not dictate the performance of another, creating a robust portfolio construction that is resilient to market volatility.

The price noise test is an evaluation of a strategy's resilience to price fluctuations. Not all price movements are indicative of meaningful trends or shifts, formally known as noise – random, short-term fluctuations that can lead to false signals. This test involves introducing small, random price variations into the historical price data and observing how the strategy responds and changes. If the strategy's signal accuracy deteriorates significantly with minor price adjustments, it may be overly sensitive to noise, leading to a higher rate of false signals and suboptimal trades. This assessment is critical for fine-tuning and evaluating our strategy, ensuring it can distinguish between genuine market movements and noise. In Figures 8 and 9, we present a noise test that exhibits a very high correlation and a strong upward trend

across slight price variations. This shows that the strategy differentiates between signals and noise, performing consistently even against the more random aspects of the markets.

Monte Carlo analysis is a powerful statistical tool used to understand the potential variability of a strategy's performance by simulating a wide range of possible outcomes. It achieves this by randomly reordering the trade entries and exits, effectively stress-testing the strategy against different sequences of market conditions. In Figures 10 and 11 – MC simulations for the long indices and short gold components of the intraday model – the blue line represents the actual performance trajectory of the strategy, which acts as a benchmark against the multitude of simulated performance paths. From the graphs, we can infer several key aspects of the strategy under examination. First, the spread of the simulated paths indicates the range of possible performance outcomes given the same historical inputs. The tight clustering around the 'real' line suggests a higher likelihood of the actual performance being close to historical results under similar conditions. Second, each pathway in the analysis trends towards a similar degree of positive PNL, implying a robust ensemble of signals. Lastly, the drawdown lines appear to stay within a controlled range, indicating that the strategy manages risk effectively and resists sudden downturns.

The robustness tests demonstrated in Figures 12, 13, 14, and 15 provide further insights into the strategy's performance stability. The day-of-the-week robustness tests for the short gold component (Figure 13) display a stable performance across different market days, with only a minor exception on Tuesdays. This general stability is mirrored in the week-of-the-month robustness test shown in Figure 14, where the strategy's performance appears consistent across the weeks, suggesting it is less influenced by short-term market volatilities. The month-of-the-year robustness test displayed in Figure 15 corroborates this consistency, as the strategy's performance maintains a stable trajectory over longer periods, reinforcing the strategy's adaptability and effectiveness. In the seasonality analysis of the short gold test presented in Figure 16, the uniform distribution of performance across different times of the year suggests the strategy is not heavily dependent on seasonal factors, an attribute that supports its reliability and applicability across various market conditions. Equity curve analyses indicate that our intraday strategy's performance is robust and consistent across each of its subcomponents. All asset classes tested, as highlighted in Figures 2, 3, 4, and 5, demonstrate profitability and effectively managed risk, even when subjected to the unpredictability of market fluctuations.

In conclusion, our strategy aptly demonstrates that a discerning approach to financial markets can indeed serve as "a better side bet," not merely in name but in performance. Across varied market conditions, our strategy has maintained a commendable annual mean return of 25.55% and Sharpe ratio of 2.62, indicative of its superior risk-adjusted return profile. The strategic interplay between various asset classes within the portfolio showcases a sophisticated understanding of correlation and diversification. This understanding is not just theoretical but proven under the rigors of robustness testing, price noise testing, and Monte Carlo simulations. Our findings reveal a strategy that is not swayed by market noise but instead navigates through it with an efficiency that underscores its potential for scalability. The correlation matrices emphasize the low interdependence between the asset classes within our portfolio, from currencies to commodities to indices. This ensures that our portfolio is not only shielded against idiosyncratic risks but is also poised to benefit from diversification, enhancing its resilience in the face of market volatility. The culmination of this research is a strategy poised to carve a distinguished presence in the hedge fund industry, marking a departure from conventional trading approaches. It reflects a harmonized balance between quantitative rigor and market intuition, presenting a compelling case for its adoption and future exploration.

Appendix

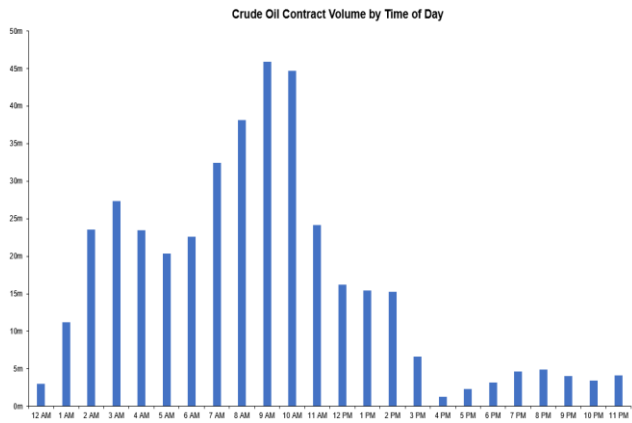


Figure 1: Average crude oil contract volume by time of day since 2008

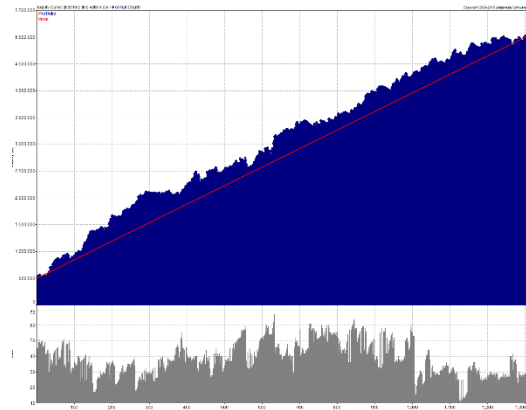


Figure 4: Equity curve since 2008 for intraday commodities

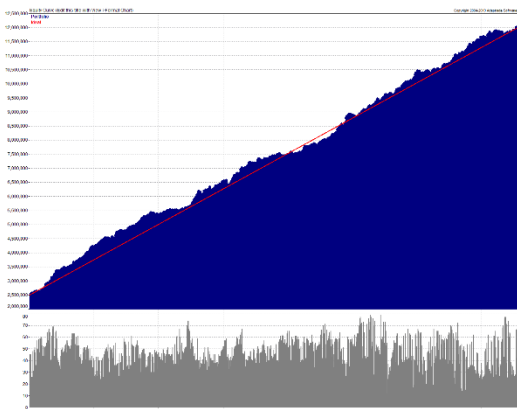


Figure 2: Equity curve since 2008 for intraday strategy

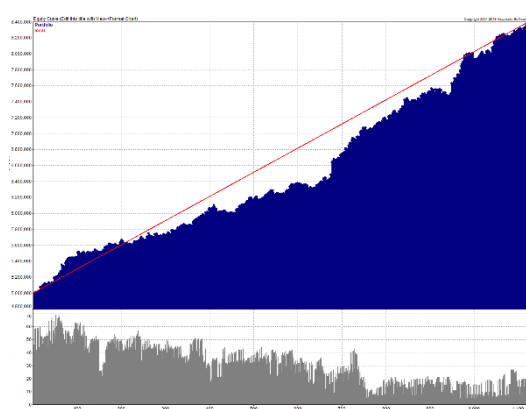


Figure 5: Equity curve since 2008 for intraday indices

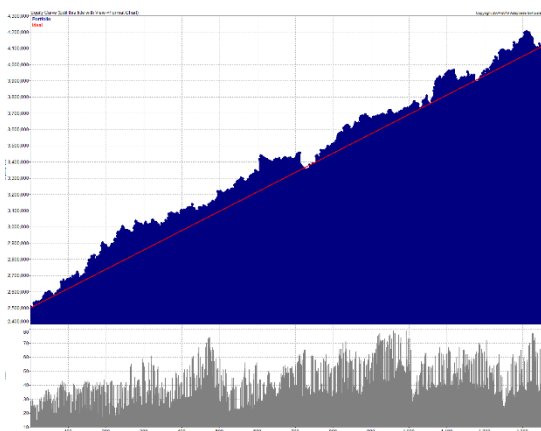


Figure 3: Equity curve since 2008 for intraday currencies

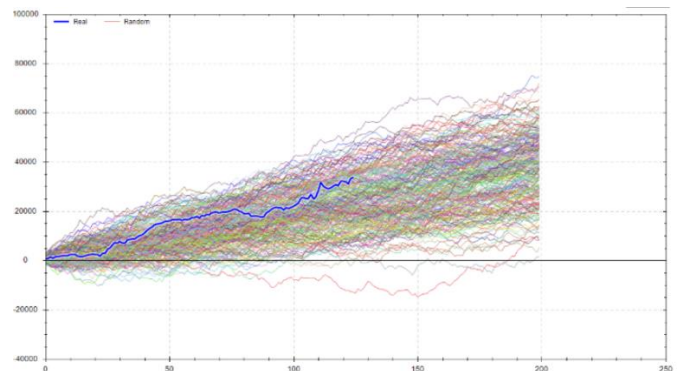


Figure 6: Variance testing PNL curves for short indices component of the strategy

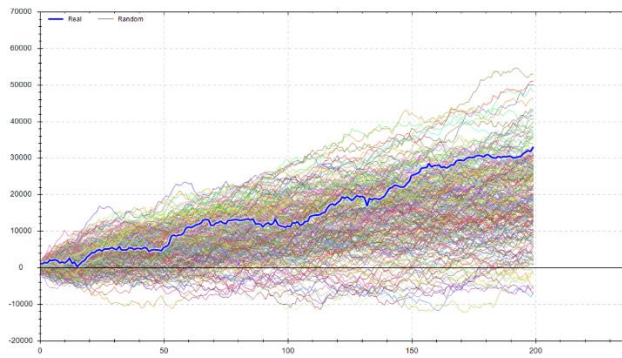


Figure 7: Variance testing PNL curves for long commodities component of the strategy

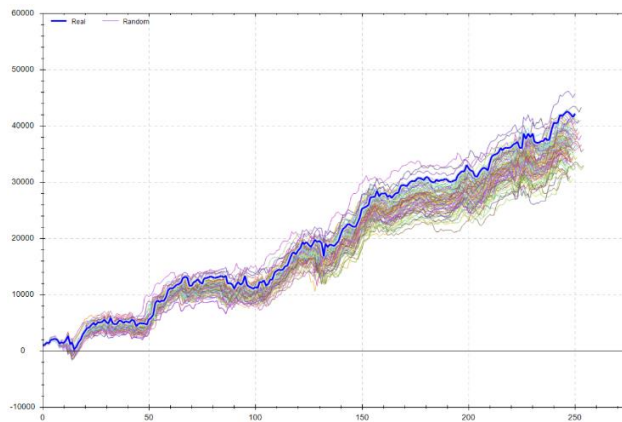


Figure 8: Noise testing PNL curves for long commodities component of the strategy

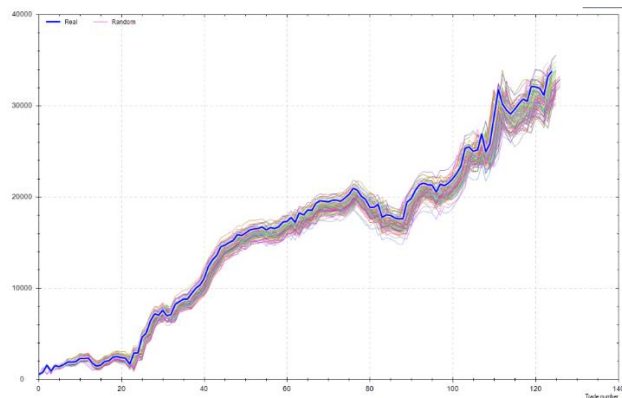


Figure 9: Noise testing PNL curves for long indices component of the strategy

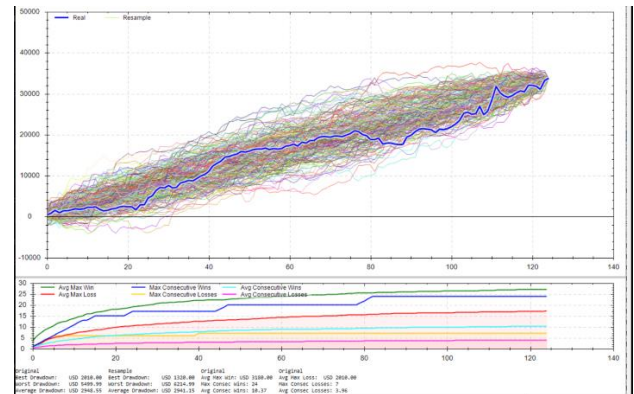


Figure 10: MC Analysis shows the real curve and drawdowns possible for the long indices intraday strategy

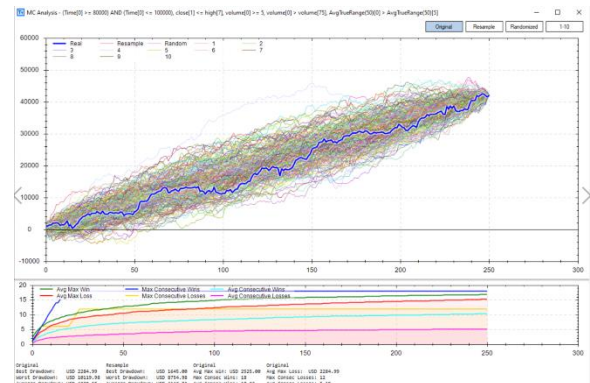


Figure 11: MC Analysis shows the real curve and drawdowns possible for the short gold strategy

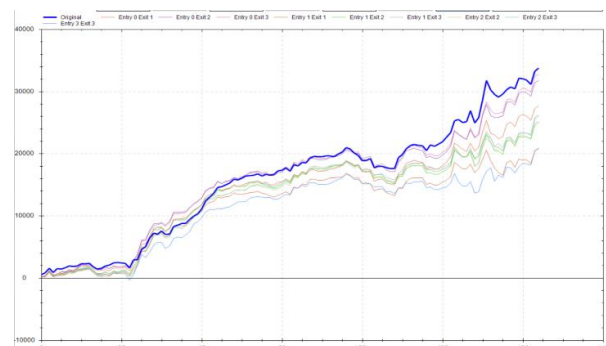


Figure 12: Robustness testing for the long indices component of intraday strategy across full backtesting range

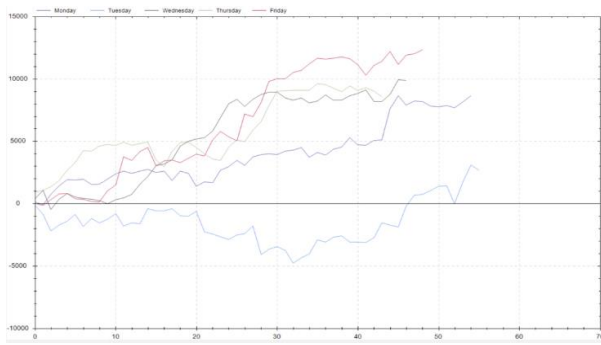


Figure 13: Robustness testing for short gold day of the week performance

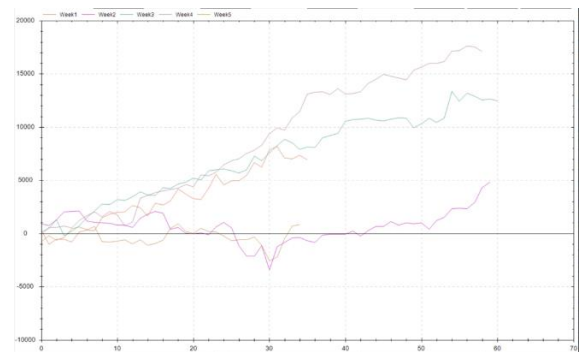


Figure 14: Robustness testing for short gold week of the month performance

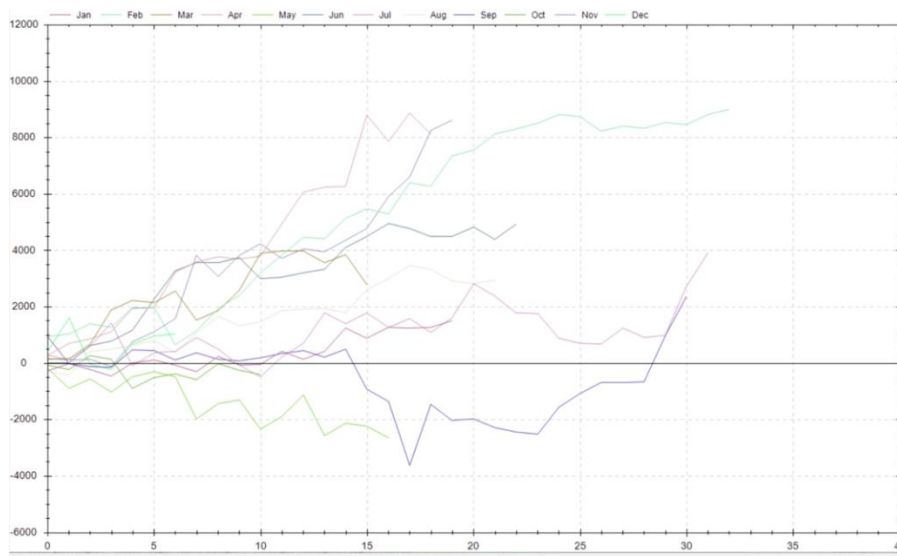


Figure 15: Robustness testing for short gold month of the year performance

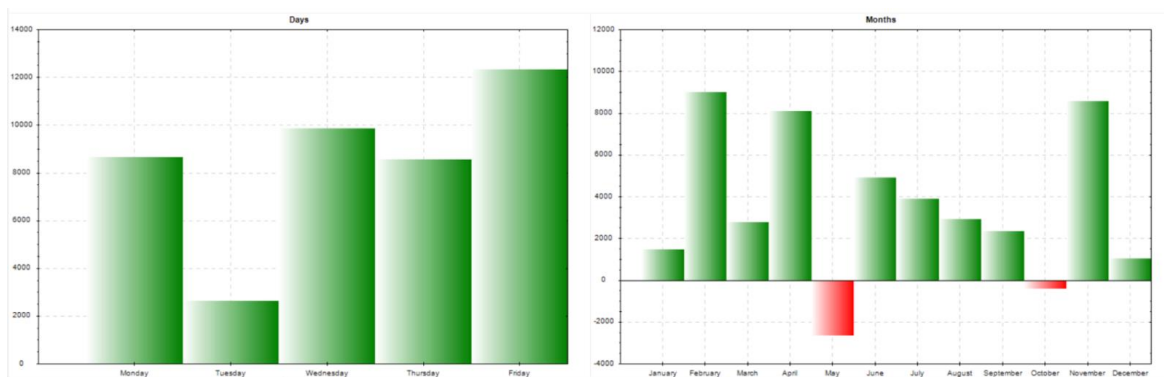


Figure 16: Seasonality testing revealing short gold performance under different time frames

	Overnight Currencies	Morning Oil/Gold	Afternoon Stocks	Long	Short	Total
# of Trades	1,352	1,303	1,121	2,090	1,686	3,776
Annual Mean Return	4.39%	11.99%	9.17%	14.14%	11.42%	25.55%
Annualized STD of Mean Return	5.77%	13.84%	7.50%	8.65%	10.98%	9.76%
Calculated Sharpe	0.76	0.87	1.22	1.63	1.04	2.62
Win rate	53%	56%	63%	59%	55%	57%
Win / Loss Ratio	1.31	1.23	1.21	1.25	1.28	1.26
Profit Factor	1.46	1.59	2.04	1.77	1.55	1.66
Profit Contribution %	17%	47%	36%	57%	43%	100%
Avg. Trade before Slippage	61.2	124.88	198.02	122.28	125.68	123.79
Avg. Trade after Slippage	36.2	99.88	173.02	97.28	100.68	98.79
% of Slippage / Gross Profit	46%	21%	20%	26%	28%	27%
% of Active Days in Market M-F	29%	29%	18%	34%	33%	58%

Figure 17: Performance statistics across components of intraday strategy

CORRELATIONS BASED ON ANNUAL RETURNS																			
	BPSHORT	BPLONG	SFSHORT	SFLONG	EUSHORT	EULONG	NESHORT	NELONG	GCSHORT	GCLONG	CLSHORT	CLLONG	ESLONG	ESSHORT	NQSHORT	NQLONG	YMLONG	RTYSHORT	RTYLONG
BPSHORT	1.00	(0.01)	0.03	(0.04)	0.28	(0.06)	0.01	(0.01)	0.07	0.02	0.16	(0.02)	(0.09)	0.05	(0.06)	(0.07)	(0.01)	(0.00)	(0.02)
BPLONG	(0.01)	1.00	0.01	0.10	(0.07)	0.16	0.04	0.08	(0.01)	0.09	(0.03)	0.09	(0.16)	(0.01)	(0.02)	(0.12)	(0.18)	(0.05)	(0.07)
SFSHORT	0.03	0.01	1.00	(0.06)	0.09	(0.04)	0.03	(0.02)	0.10	(0.00)	(0.04)	(0.08)	(0.03)	(0.00)	0.17	0.06	(0.17)	0.06	(0.02)
SFLONG	(0.04)	0.10	(0.06)	1.00	0.01	0.12	(0.03)	(0.08)	(0.04)	0.04	(0.07)	(0.02)	0.00	(0.00)	(0.02)	0.05	(0.15)	(0.03)	0.06
EUSHORT	0.28	(0.07)	0.09	0.01	1.00	(0.05)	(0.03)	0.05	0.06	0.03	0.08	(0.02)	(0.12)	(0.01)	0.01	(0.22)	0.02	0.07	(0.02)
EULONG	(0.06)	0.16	(0.04)	0.12	(0.05)	1.00	0.02	(0.02)	(0.02)	(0.09)	(0.01)	(0.05)	0.02	(0.01)	(0.04)	0.07	0.03	0.02	0.04
NESHORT	0.01	0.04	0.03	(0.03)	(0.03)	0.02	1.00	(0.04)	0.03	(0.07)	0.01	0.01	(0.07)	(0.03)	0.07	(0.08)	0.05	0.00	(0.04)
NELONG	(0.01)	0.08	(0.02)	(0.08)	0.05	(0.02)	(0.04)	1.00	(0.21)	0.10	(0.03)	0.01	0.06	(0.02)	(0.01)	(0.01)	0.01	0.03	(0.06)
GCSHORT	0.07	(0.01)	0.10	(0.04)	0.06	(0.02)	0.03	(0.21)	1.00	(0.08)	0.13	0.02	(0.02)	(0.14)	(0.12)	(0.05)	(0.03)	0.01	0.05
GCLONG	0.02	0.09	(0.00)	0.04	0.03	(0.09)	(0.07)	0.10	(0.08)	1.00	(0.06)	0.07	0.09	(0.04)	(0.09)	0.13	0.17	(0.09)	(0.12)
CLSHORT	0.16	(0.03)	(0.04)	(0.07)	0.08	(0.01)	0.01	(0.03)	0.13	(0.06)	1.00	(0.03)	(0.03)	0.05	0.26	(0.09)	(0.01)	(0.12)	(0.05)
CLLONG	(0.02)	0.09	(0.08)	(0.02)	(0.02)	(0.05)	0.01	0.01	0.02	0.07	(0.03)	1.00	(0.17)	(0.03)	(0.10)	(0.11)	0.02	0.01	(0.07)
ESLONG	(0.09)	(0.16)	(0.03)	0.00	(0.12)	0.02	(0.07)	0.06	(0.02)	0.09	(0.03)	(0.17)	1.00	(0.03)	(0.10)	0.41	0.42	(0.04)	0.29
ESSHORT	0.05	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)	(0.03)	(0.02)	(0.14)	(0.04)	0.05	(0.03)	(0.03)	1.00	0.38	(0.04)	(0.02)	0.60	(0.02)
NQSHORT	(0.06)	(0.02)	0.17	(0.02)	0.01	(0.04)	0.07	(0.01)	(0.12)	(0.09)	0.26	(0.10)	(0.10)	0.38	1.00	(0.10)	(0.05)	0.32	(0.02)
NQLONG	(0.07)	(0.12)	0.06	0.05	(0.22)	0.07	(0.08)	(0.01)	(0.05)	0.13	(0.09)	(0.11)	0.41	(0.04)	(0.10)	1.00	0.18	(0.08)	0.09
YMLONG	(0.01)	(0.18)	(0.17)	(0.15)	0.02	0.03	0.05	0.01	(0.03)	0.17	(0.01)	0.02	0.42	(0.02)	(0.05)	0.18	1.00	(0.05)	0.16
RTYSHORT	(0.00)	(0.05)	0.06	(0.03)	0.07	0.02	0.00	0.03	0.01	(0.09)	(0.12)	0.01	(0.04)	0.60	0.32	(0.08)	(0.05)	1.00	(0.02)
RTYLONG	(0.02)	(0.07)	(0.02)	0.06	(0.02)	0.04	(0.04)	(0.06)	0.05	(0.12)	(0.05)	(0.07)	0.29	(0.02)	(0.02)	0.09	0.16	(0.02)	1.00

Figure 18: Correlation matrix based on annual returns across securities of intraday strategy

Class	Currencies	Oil - Gold	Stocks
Currencies	1	0.074	-0.104
Oil - Gold	0.074	1	-0.148
Stocks	-0.104	-0.148	1

Figure 19: Correlation matrix based on annual returns across asset classes of intraday strategy

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