Marketing Material
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Systematic Market Neutral: The Benefits of Diversifying Frequencies

RAM AI Systematic Equity
Emmanuel Hauptmann, Valentin Betrix, Nicolas Jamet, Tian Guo,
Louis-Alexandre Piquet

Leave the herd behind.

ram ai

Introduction.

Systematic stock-picking strategies generally identify attractive stocks based on several of their features and periodically rebalance the resulting portfolios. Those features are extracted automatically from various sources, including price data, financial statements, stock loan data, insider trades, sell-side analysts' estimates and even textual sources (e.g., news, transcripts, social media). The features are subsequently combined to exploit various market inefficiencies such as momentum (buying winners and shorting losers) and value (buying cheap stocks and shorting expensive ones).

Diversifying the set of captured inefficiencies improves the strategies' risk-return profile. However, this imposes several challenges, such as combining features, and therefore, modelling the - often non-linear - structure of interactions between them. Therefore, at RAM AI, we have developed a deep learning framework to forecast stock returns based on a wide array of time-series inputs.

Such diversification is more beneficial if the inefficiencies are of different nature, i.e., extracted from various sources (to produce highly informed positions), expressing different styles (e.g., momentum, value, low risk, mean reversion) and different investment horizons (low frequency vs. high frequency). The latter is particularly beneficial since common fundamental and behavioural inefficiencies (e.g., price momentum) can be captured with relatively low rebalancing frequencies, whereas other inefficiencies are particularly strong over short-term horizons (e.g., price mean reversion). This paper illustrates how shorter-term strategies have attractive standalone characteristics and benefit lower-frequency books.

Source: AI generated with the Stable Diffusion Model on https://beta.dreamstudio.ai/dream

Risk-Return Profile of Short-Term Strategies

Short is a relative concept. High-frequency trading strategies exploit arbitrage opportunities with very short holding periods ranging from milliseconds to minutes. Short-term strategies, which are discussed in this case study, generally have holding periods of several days, whereas fundamentally driven strategies have much longer holding periods, of several weeks or months – which we will call "low-frequency" strategies for this comparison.

At RAM AI, we employ both low-frequency and short-term systematic stock selection strategies. The low-frequency strategies use over 500 signals based on a wide variety of inputs, including fundamentals, sentiment, positioning and ESG data, and pick stocks across a universe of small-, mid- and large-caps. On the other hand, the short-term strategies have shorter holding periods and focus more on mean-reversion opportunities, which prevail on short horizons on the back of liquidity shocks affecting price relationships. They tend to exhibit higher turnover and trade a more liquid universe of stocks, mainly large- and mid-caps.

We can illustrate this by comparing the risk-return profiles of two long-short portfolios based on strategies developed at RAM AI, applied to a universe of European stocks:

- The low-frequency strategy exploits fundamental and behavioural inefficiencies with a monthly rebalancing schedule. Here we present a track record of a low-frequency European Long-Short strategy developed by RAM (net of all implementation costs).
- The short-term strategy has a daily rebalancing schedule and exploits mean-reverting opportunities among highly co-integrated stocks. Here we present back-tested performance net of all implementation costs.

Both strategies are market neutral and have an average gross exposure of approximately 200%. For confidentiality, reasons we don't disclose the specifics of the strategies but hope that the principles laid out can be of interest to the reader.

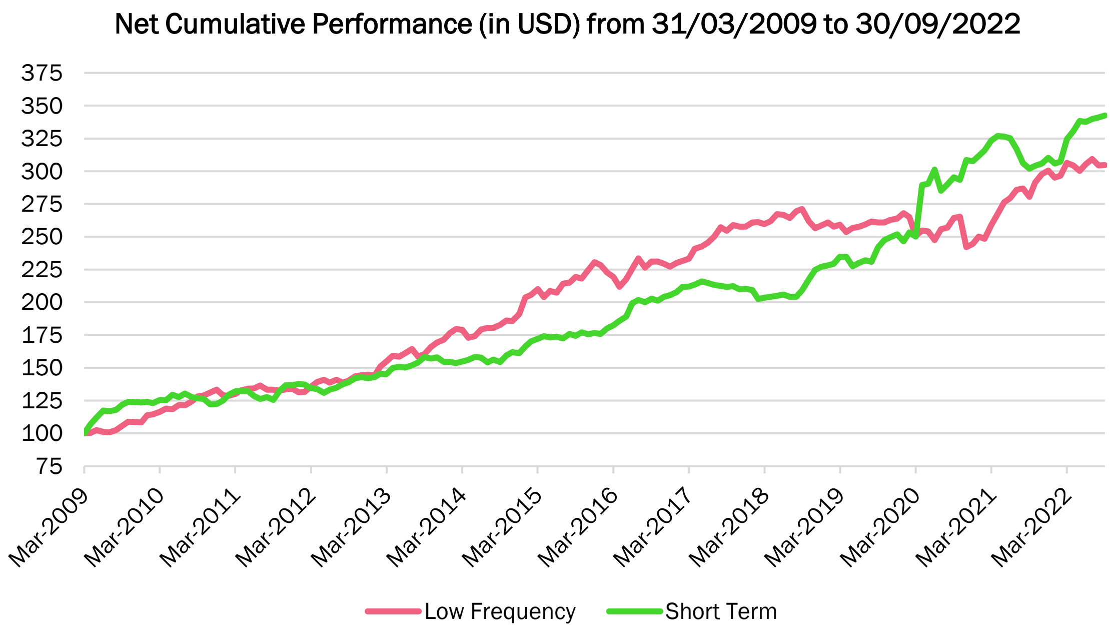

Fig. 1: Net cumulative performance (in USD) of RAM AI's low-frequency and short-term long-short European strategies.

Past performance is not a reliable indicator of future returns.

	Return	Volatility	Sharpe Ratio	Downside Volatility	Sortino Ratio	Max Drawdown	Max Drawdown Trough Date	One-way Monthly Turnover (%/NAV)
Low Frequency	8.53%	7.07%	1.21	7.15%	1.19	-10.73%	11/30/2020	80%
Short Term	9.44%	7.68%	1.23	4.45%	2.12	-7.64%	9/30/2021	370%

Fig. 2: Annualised Descriptive statistics (based on USD returns) of RAM AI's low-frequency and short-term long-short European strategies.

The higher turnover of the short-term strategy emphasises the importance of the quality of execution and the modelling of market impact, as every trade executed carries costs, some of which are visible (such as slippage, commissions, settlement costs and exchange fees) while others are harder to observe (market impact). Tackling those challenges is important given the benefits of short-term strategies, as they generally exhibit a high Sharpe ratio and an even higher Sortino ratio and can react quickly to price changes and market volatility. This allows them to capitalise on sudden market moves and quickly adapt their positioning to a new market regime. The short-term strategy we have developed can be regarded as a 'long volatility' strategy to some extent.

We can also see that the max drawdown trough dates are different. In 2020, in particular, the short-term strategy corrected during the first half of March as most liquidity-providing strategies suffered from the quick deleveraging on the back of the COVID-related lockdowns and the economy's shutdown. However, it had already rebounded significantly when the low-frequency strategy bottomed locally in November 2020, as the COVID-related news flow simultaneously triggered price, earnings, and liquidity momentum breakdowns and factor rotations of an unseen nature. This illustrates that the two strategies do not perform at the same time but complement each other.

Diversification Benefits of Short-Term Engines in Lower-Frequency Books

Now we will combine the two strategies by allocating 80% to the low-frequency strategy and 20% to the short-term strategy. This mix is in line with what has been implemented in RAM AI's long-short strategies.

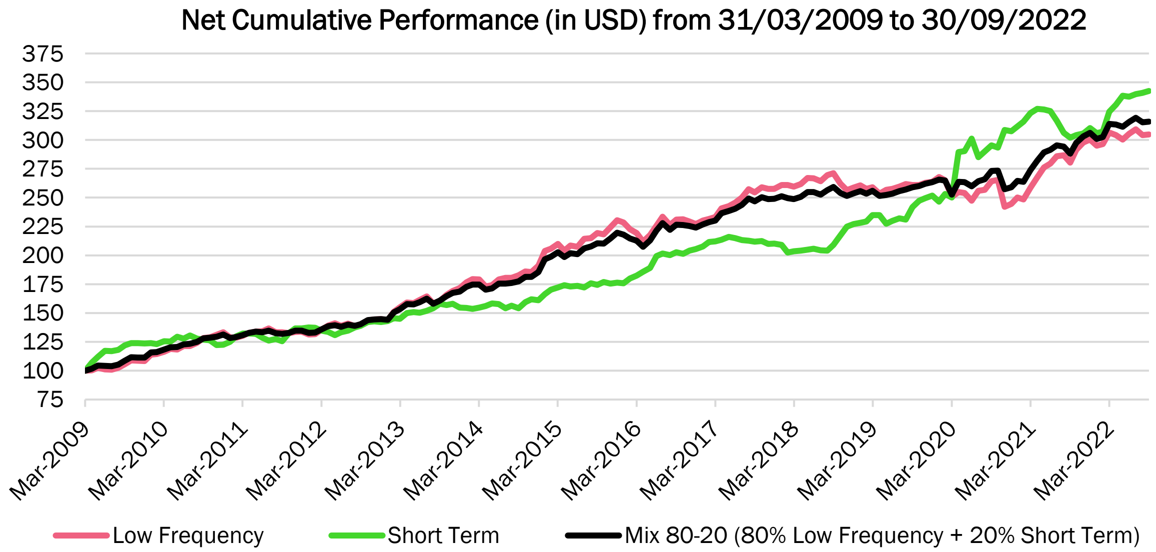

Fig. 3: Net cumulative performance (in USD) of RAM AI's low-frequency, short-term and combined long-short European strategies.

Past performance is not a reliable indicator of future returns.

	Return	Volatility	Sharpe Ratio	Downside Volatility	Sortino Ratio	Max Drawdown	Max Drawdown Trough Date	One-way Monthly Turnover (%/NAV)
Low Frequency	8.53%	7.07%	1.21	7.15%	1.19	-10.73%	11/30/2020	80%
Short Term	9.44%	7.68%	1.23	4.45%	2.12	-7.64%	9/30/2021	370%
Mix 80-20	8.71%	5.69%	1.53	4.95%	1.76	-5.96%	11/30/2020	138%

Fig. 4: Annualised Descriptive statistics (based on USD returns) of RAM AI's low-frequency, short-term and combined long-short European strategies.

The risk-return profile of the mix is particularly attractive, with notable improvements in the risk statistics (volatility and max drawdown) vs. standalone strategies. The Sharpe ratio of the mix is significantly higher than the Sharpe ratio of each of the two strategies. The Sharpe ratio of the 80-20 mix is roughly 1.53, and the Sharpe ratio of a hypothetical 50-50 mix would be 1.82, although it would have less capacity, as the short-term strategy – in its current form – has less capacity than the low-frequency one.

This improvement is a consequence of the low – on average even slightly negative – correlation between the two strategies:

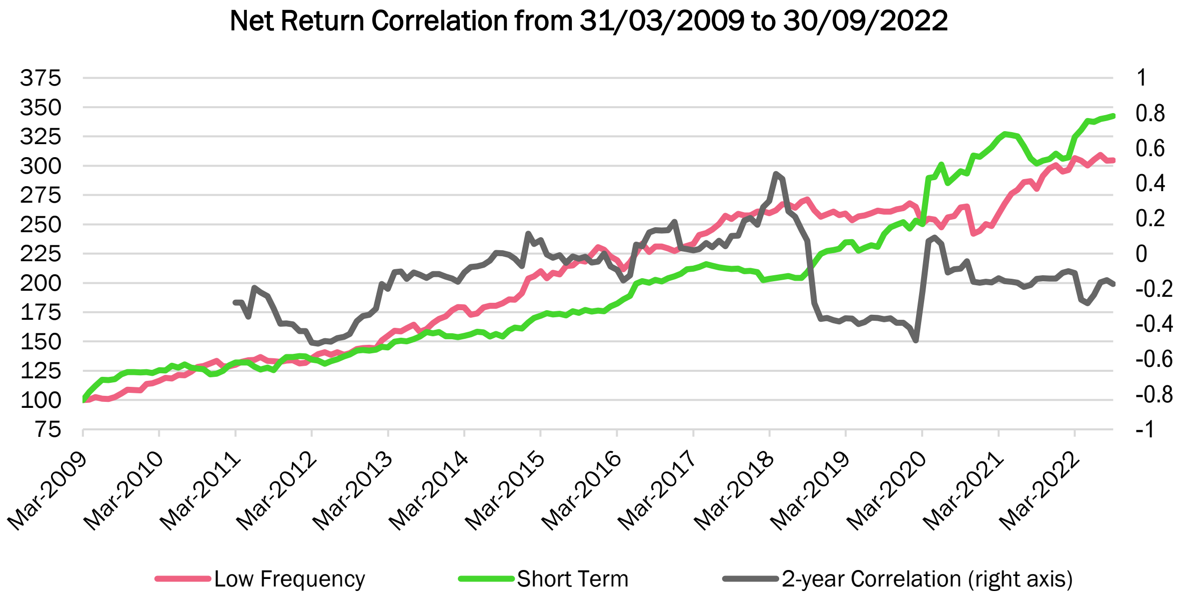

Fig. 5: Two-year rolling correlation of monthly returns for two RAM AI's low-frequency and short-term long-short European strategies.

Mitigation of Style Exposures

Another benefit of frequency diversification is the reduction of the exposure to factor styles, hence the reduction of the portfolio's sensitivity to factor rotations. The short-term strategy presented above is contrarian, i.e., it has a dominant mean-reverting component – which is a common denominator to many short-term strategies. Consequently, it generally has a negative exposure to long-term momentum (e.g., one-year price momentum), contrary to low-frequency books, which tend to load positively on long-term momentum.

Past performance is not a reliable indicator of future returns.

We can verify this by looking at style biases and the broad evolution of estimated risk using a returns-based style analysis (fig. 6). It shows a decrease in the active risk of Momentum (but Value also) in the current portfolios. The Momentum risk is reduced by roughly 15% when adding a 10% allocation to the short-term strategy, while the Value risk is decreased - in favour of a slight increase of the Income (dividend yield) risk.

Factor	100% Low Frequency		Mix 90-10		Mix 80-20	
	Risk (Std)	Exposure (factor beta)	Risk (Std)	Exposure (factor beta)	Risk (Std)	Exposure (factor beta)
Momentum	3.36	0.44	2.78	0.36	2.39	0.31
Value	2.57	0.56	2.41	0.52	2.26	0.49
Profitability	1.51	0.44	1.37	0.40	1.23	0.36
Size	1.50	-0.51	1.16	-0.40	1.06	-0.37
Volatility	1.10	-0.15	0.98	-0.13	0.74	-0.10
Dividend Yield	0.34	0.15	0.42	0.18	0.47	0.20

Fig. 6: Factor risk contributions and exposures of RAM AI's low-frequency, short-term and combined long-short European strategies, using a returns-based style analysis.

This illustrative case study shows the standalone characteristics of short-term stock selection strategies and the benefits of frequency diversification in the context of systematic stock selection.

References

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RAM Active Investments SA
Geneva
Rue du Rhône 8
1204 Geneva – SWITZERLAND
Tel : +41 58 726 87 00

RAM Active Investments (Europe) SA
Luxembourg
51, avenue John F. Kennedy
1855 Luxembourg – LUXEMBOURG
Tel : +352 28 56 14 1

RAM Active Investments (Europe) SA
Succursale Milano
Via Montenapoleone 14
20121 Milan – ITALY
Tel : +39 027 788 4001

contact@ram-ai.com
ram-ai.com