# AURUM

# Quant hedge fund primer: demystifying quantitative strategies

## Contents

## In summary

Quantitative hedge funds are investment firms that use advanced mathematical and statistical models, as well as computer algorithms, to make investment decisions. In this piece we explore quantitative investing and provide insights into the most common quantitative strategies. For each of the quantitative strategies we provide a description, we discuss common signal types and look at how each strategy historically performs in different markets and its historic risk and return profile.

> **Despite talk of automation it is people that conduct the research, decide on the strategy, select the universe of securities to trade, what data to utilise, what hardware and connectivity is needed, among many other things.**

## What are quantitative hedge funds?

The term "quantitative investing" isn't really a description of a uniform strategy, rather it describes how a particular strategy is developed and implemented. The difference between a quantitative ("quant") strategy and a discretionary strategy can be seen in how the strategy is created and how it is implemented.

**Quant strategies use the automated, methodical buy/sell decisions of computer algorithms to trade.**

However, people, not machines are still ultimately responsible for quant trading. It is people that conduct the research, decide on the strategy, select the universe of securities to trade, what data to utilise, what hardware and connectivity is needed, among many other things. The individuals and firms involved are commonly called *"quants"*.

Quant trading strategies are most commonly distinguished by:

- asset class
- signal classification

These two conditions tend to be the primary determinant of 'sub-strategy classification'. For example:

a. If the fund predominantly trades single name equities using short-term, technically based signals with a short average holding period, it would likely be classified as an equity statistical arbitrage fund.

b. By contrast, a fund that traded only 'macro instruments', such as futures, FX and bonds, where predicted prices were a function of both short-term technical and longer-term fundamental indicators, would likely be classified as quant macro.

## Most common quant strategies

- [Equity statistical arbitrage](#)
- [Quantitative equity market neutral](#)
- [Managed futures/CTAs](#)
- [Quant macro](#)
- [Alternative risk premia](#)

The above list is far from exhaustive, but these broad category definitions are used by Aurum's Hedge Fund Data Engine to capture/classify funds in the quant universe. One could also include additional strategy categorisations such as:

- **Multi-strategy quant** – there are not a large number of peer funds that fall into this category, so funds that trade multiple asset classes and/or combinations of short-term equity statistical arbitrage and longer-term models, are currently classified as 'statistical arbitrage'.

- **Quant volatility** – if a fund's investment premise is to capture shifts in volatility, known as trading volatility, even if this is executed using a quantitative process, this is currently classified as 'volatility arbitrage'. If the fund is trading volatility in combination with other quant strategies, we typically would group it with 'statistical arbitrage'.

## Risk return summary

| | Statistical arbitrage | QEMN | CTAs | Quant macro/GAA | Alternative risk premia |
|---|---|---|---|---|---|
| **Typical assets traded** | Equities | Equities | Liquid futures - equity, fixed income, commodities. | Similar to CTAs + cash instruments, bonds, FX, ETFs, derivatives | Primarily equities - may also trade derivatives/instruments similar to quant macro |
| **Typical market directionality / neutrality** | Primarily market neutral | Primarily market neutral | Generally directional | Generally relative value. Some have directional positions | Generally market neutral long-term (some exceptions) |
| **Observed Beta to traditional assets (Equities and Bonds)** | Typically very low | Typically very low | Typically low | Typically low | Typically low to moderate |
| **Long/short bias** | None | None | May be directional but should have no systemic bias to be long or short over the long-term | May be directional but should have no systemic bias to be long or short over the long-term | Typically no bias |
| **Historical volatility** | Lower volatility than typical HF universe | Lower volatility than typical HF universe | Higher volatility than wider HF universe | Higher volatility than wider HF universe | Potential exposure to large factor moves - can be large/long drawdowns |
| **Typical factor exposure** | Tightly hedged to generic factors | May be hedged to generic factors, but tends to take specific exposure to certain equity risk premia | Typically highly exposed to momentum | Varied, may be tightly hedged; could have a momentum or value bias | High factor exposure by design. Typical ARP fund looks to offer diversified exposure to many risk-premia factors |
| **Liquidity** | Generally highly liquid | Generally highly liquid | Generally highly liquid | Generally highly liquid | Generally highly liquid |
| **Leverage** | Can vary significantly: typically 3-8x | Can vary significantly: typically 3-8x | Typical 2-4x (with MTE typically 10-30%) | Typical 2-4x (with MTE typically 15-40%) | Varied (typically 1.5 to 2.0x) |

# Equity statistical arbitrage

## DESCRIPTION

Statistical arbitrage funds generally utilise price data and its derivatives, such as correlation, volatility and other forms of market data, such as volume and order-book information to determine the existence of patterns. Research that identifies repeating patterns and linkages in the data can be used to help the manager forecast the future return of a stock, often over a relatively short timeframe. Relationships are identified through rigorous statistical analysis and back-testing of relationships. The strategy typically targets higher risk adjusted returns (Sharpe ratio) relative to more 'traditional' hedge funds, but the absolute level of returns is highly dependent on the leverage deployed and the volatility tolerance.

## SIGNAL TYPES

The most common signal types are mean reversion, momentum, and event driven.

### Mean reversion

- Mean reversion looks to take advantage of the phenomenon of short-term price movements occurring due to supply/demand imbalances with a view that these will then revert back to an equilibrium level.

### Momentum

- Momentum models look for patterns in price data that suggest that price movements will be more persistent (i.e., trend).

### Event driven

- Other statistical arbitrage funds will look to incorporate more discrete information into their process from events. For example, the publishing of analyst earnings estimates, or systematically incorporating sentiment strength from news flow using techniques such as natural language processing ("NLP"). Announced mergers, share buy-backs, index rebalancing and corporate insider buying/selling of shares are other examples of event-driven data, all of which could be systematically incorporated into a trading system.

Whilst statistical arbitrage funds tend to focus more on 'technical' models driven by price and volume data, some may also incorporate some longer-term models that are driven by fundamental data, which can be both traditional and/or 'alternative' in nature (e.g., stock value models, balance sheet data, predictive sales data, etc.). If these more fundamental oriented models are the dominant driver of risk, then the fund is likely to be classified as 'quantitative equity market neutral' (see below).

## PERFORMANCE IN DIFFERENT MARKETS

- Statistical arbitrage portfolios are expected to generate returns regardless of underlying broad market direction.

- An environment of rapidly spiking correlations between stocks, and for multi-asset managers between asset classes has historically been a challenging period for the strategy, particularly when accompanied by a significant spike in market volatility. Often such an environment of extreme volatility has led to sharp drawdowns. However, the aftermath of such episodes tends to lead to a much more fertile opportunity set, i.e., high but declining volatility, high stock volume, presenting the opportunity to enter into trades at high spreads, but in a period where long-term relationships are re-establishing themselves and markets are normalising. Essentially statistical arbitrage funds have often made excess returns as providers of liquidity under such conditions.

- Episodic 'risk-factors' can also provide challenging conditions to quant managers. This is where an unforeseen risk-factor becomes a key driver of stock volatility. Some of these are more transient, but material risk-factors are less likely to have been incorporated in backtests of the trading model. As such, the ability of a statistical arbitrage fund to adapt to the emergence of significant previously unfactored risk factors and either benefit from, or hedge out, their impact can be a critical differentiator in their performance.

- Environments of low realised stock volatility accompanied with low volumes of trading are typically less favourable for equity statistical arbitrage. Essentially, the strategy tends to do much better when there is a reasonable degree of movement, stock price dispersion and oscillation.

## SAMPLE TRADE

An equity statistical arbitrage fund trades by buying a portfolio of stocks that are perceived to be undervalued and simultaneously selling a portfolio of stocks that are perceived to be overvalued with similar characteristics, such as industry sector, market capitalization, or financial ratios.

For example, the fund would identify two stocks that have a historically strong correlation, such as Coca-Cola and PepsiCo. A large investor in PepsiCo then decides to sell a significant block of stock, likely pushing the price down as a function of the imbalance in the supply and demand of liquidity.

The fund may then simultaneously buy the underpriced stock (PepsiCo) and sell the overpriced stock (Coca-Cola) in a paired trade, with the expectation that the price ratio will converge back to its historical mean, resulting in a profit. Such a trade could be classified as 'mean-reversion', where the fund is looking to be compensated for providing liquidity, in this instance to the large seller. One would not expect the 'alpha' to last long in such an example and the expectation would be that it is crystallised over a relatively short time period. The fund will typically be supplementing such strategies with the use of additional risk management tools, such as stop-loss orders, position size limits, portfolio factor exposure limits, liquidity constraints, etc., to manage the trade's risk.

## RISK/RETURN PROFILE

- Statistical arbitrage funds are nearly always run with a very low level of beta and are typically market neutral, however, this may not always be the case, with some funds able to take significant directional risk; however, given the higher frequency trading nature of such funds, they are not expected to have significant correlation to markets over time or exhibit a systemic long/short bias.

- Funds are typically also tightly hedged to other generic factors such as, value, growth, quantitative market-cap bias, momentum, sector, geography etc. Funds will vary in the degree to which factor exposures are constrained. Some may also look to incorporate some kind of 'factor-timing' element to their trading signals.

# Quantitative equity market neutral ("QEMN")

## DESCRIPTION

Traditional QEMN strategies take fundamental and/or event-oriented data, such as analyst earnings estimates, balance sheet information and cash flow statement statistics, and systematically rank/score stocks against these metrics in varying proportions. The weights of the scores of the different fundamental data sources may be fixed or dynamic.

Managers construct a portfolio that typically comprises hundreds to thousands of positions, long and short. Portfolio construction is done using an optimisation process, or by applying simple rules, combined with risk constraints, to create a portfolio that has netted out its long and short positions to be dollar and/or beta neutral, and with minimal sector exposure.

## SIGNAL TYPES

QEMN fund price prediction models typically use a variety of signals as primary inputs, including:

- Fundamental data: this includes financial data such as earnings, revenue, profit margins, and cash flow, as well as non-financial data such as industry trends and macroeconomic indicators.

- Technical data: this includes information about past market trends and patterns, such as moving averages, relative strength, and trading volume.

- Sentiment data: this includes information about investor sentiment and market sentiment, such as news articles, social media posts, and analyst reports.

- Alternative data: this includes non-traditional data sources, such as satellite imagery, credit card data, and weather patterns, which can provide insight into market trends and consumer behaviour.

QEMN fund price prediction models typically use machine learning algorithms to analyse and process these various signals, looking for patterns and relationships that can help predict future price movements.

## PERFORMANCE IN DIFFERENT MARKETS

QEMN portfolios are usually expected to generate returns regardless of underlying broad market direction. Rapid spikes in market volatility and spiking correlations have been challenging for QEMN strategies.

Environments of low realised stock volatility accompanied with low volumes of trading are less favourable for QEMN. Historically, the strategy tends to do much better when there is a reasonable degree of stock price dispersion and oscillation, where stock price movements are driven more by fundamentals.

## SAMPLE TRADE

Example of a quantitative equity market neutral strategy that incorporates fundamental signals, such as value, growth, price momentum, and quality, while also using alternative unstructured data:

### Data collection and processing:
The hedge fund collects fundamental data for a universe of stocks, including financial statements, earnings reports, and other relevant company-specific information. The fund also gathers alternative unstructured data, such as news articles, social media sentiment, and satellite imagery, which provide additional insights into market trends and consumer behaviour.

### Signal generation:
The quantitative model analyses the fundamental data and applies various algorithms to generate signals for each stock based on value, growth, price momentum, and quality. For example, a value signal may be calculated using metrics such as price-to-earnings ratio, price-to-book ratio, or dividend yield. Similarly, growth signals may be derived from measures like earnings growth rates or revenue growth rates. Price momentum signals can be based on factors like short-term and long-term stock price movements. Quality signals may consider metrics like return on equity, debt levels, or accounting ratios.

## Signal combination and weighting:

The signals generated for each stock are combined using a systematic approach to create a composite score or ranking. The hedge fund assigns weights to each signal based on their perceived significance or historical performance. The combination of signals helps identify attractive long and short opportunities within the universe of stocks.

## Portfolio construction and risk management:

Using the composite scores, the hedge fund could construct a market-neutral portfolio by selecting approximately 100 stocks long and 100 short. The portfolio is designed to be dollar and beta neutral, meaning that the overall exposure to market risk factors is minimised. Risk management techniques, such as stop-loss orders, position size limits, or sector/industry exposure constraints, are employed to manage risk and maintain a balanced portfolio.

## RISK/RETURN PROFILE

- QEMN funds are typically run with a very low level of beta and are market neutral.

- As indicated above, some QEMN funds may have relatively high degrees of exposure to factors such as, value, growth, market-cap bias, momentum, sector, geography etc. However, funds will have varying levels of correlation to the more 'generic' forms of risk premia, e.g., some funds focusing on 'quality' signals, will look to use differentiated indicators and/or supplement those signals with other information (e.g., event driven or technical data).

- Some will also look to incorporate some kind of 'factor-timing' element to their trading signals to emphasise or deemphasise their respective risk-weighting in the aggregated portfolio.

# Managed futures/CTAs

## DESCRIPTION

Commodity trading advisors ("CTAs") take primarily directional positions in index level or macro instruments, such as futures or FX contracts, in a systematic fashion. Technically, a CTA is a trader of futures contracts as defined by the Commodities and Futures Trading Commission ("CFTC") and historically, there were many CTAs who were not systematic; such traders are now more likely to be categorised as pursuing a 'global macro' strategy.

Trend following is the most employed CTA strategy. The rationale behind this is the view that human behavioural biases lead to the formation of trends which, as a result, can be exploited through a systematic strategy that aims to identify and trade such situations.

CTAs are extremely systematised with straight through processing from signal generation to execution. The addition of new and uncorrelated models, market instruments, trading time horizons, updated risk and portfolio construction models etc. can differentiate performance or add alpha over low fee more 'simplistic/generic' trend-following funds.

Today, trend-following quant strategies are very common; the basic concept is now heavily commoditised, and sometimes features within 'alternative risk premia' products. Fees tend to be quite low on more 'generic', trend-following CTAs.

- The vast majority of the managed futures/CTA universe incorporates some kind of trend following (using historical prices to determine predictable 'trending patterns') buying into markets where prices are rising and selling where markets are falling.

- When rising markets slow down/stop rising, trend-followers typically reduce their position and will eventually reverse its position into a short position, which it will hold until the market starts to rally again.

- The strategy is known for running with profits and cutting losses.

- There can also be a 'grey area' in some CTA funds, which employ a mix of trend and non-trend models, incorporating some fundamental data – some of these funds share similarities with quant macro.

- There can be some overlap with areas such as discretionary macro and quant macro funds. This is due to the relationships they exploit being synonymous with some of those also captured by macro funds.

## SIGNAL TYPES

- Price and volume data are the primary inputs to trend following price prediction models. Many trend followers focus their research on time-series analysis of returns of single instruments. This contrasts with an approach of looking at cross-sectional analysis of different instruments and contracts and looking for other predictive relationships based on correlations.

- Other models used in CTAs may incorporate other concepts such as: carry, seasonality, mean reverting or pattern recognition systems, models driven by fundamental data or non-traditional data sources (alt-data). As indicated above, cross-sectional analysis and correlations are integrated into the signal research process.

- Some CTAs can also trade very short-term signals driven by market microstructure anomalies and patterns.

## PERFORMANCE IN DIFFERENT MARKETS

Managed futures CTA hedge funds have historically performed well in volatile or crisis periods, as well as in markets with low correlations between asset classes. However, they have historically underperformed in long-term trending markets or during extended periods of low volatility.

Trend-following CTA hedge funds have tended to perform well during extended market trends but struggled in choppy or range-bound markets. They can also be impacted by sudden market reversals or shifts in

macroeconomic conditions. Overall, their performance is dependent on the strength and consistency of market trends.

## SAMPLE TRADE

Typical trade examples could be:

- Intentionally directional positions (e.g., long or short particular equity futures index contracts). This aligns with the directional nature of typical CTA trend following strategies, where the fund takes positions based on expected price movements in the underlying asset as guided by technical price-based signals such as moving average crossovers, price breakouts, Relative Strength Index ("RSI") indicators, etc.

- Relative value: commodity spread trade playing the spread between West Texas Intermediate ("WTI") and Brent oil contracts:

  – Taking positions in two related contracts and capturing the movements in the price differential. Similar spread plays may involve other commodity spreads such as crack spreads (crude vs. heating oil), dark spreads (power vs. coal), and spark spreads (power vs. gas).

- Relative value: curve trade:

  – CTAs could also trade across the curve, e.g., 1-month Brent vs. 3-month Brent.

  – Curve trading involves taking positions in different maturities of contracts on the same asset to exploit price differentials across the futures curve. This trade can exploit differences in market expectations of future supply and demand dynamics.

## RISK/RETURN PROFILE

- Diversified portfolio, typically holding a large number of futures contracts across various equity indices, government bond futures, commodity futures (primarily energy or agricultural) and currencies.

- Some CTAs have a much higher risk bias towards the most liquid contracts and have average holding periods from weeks to many months. This allows funds to manage very large levels of assets. Consequently, large CTAs can be very correlated with one another.

- Smaller CTAs may look to spread risk over a much wider variety of contracts, however, that will likely lead such funds to be much more capacity constrained given there is far less liquidity in some of these instruments (e.g., certain agricultural products or emerging markets).

- CTAs have historically shown low correlations to equities and bonds, making them attractive as portfolio diversifiers. They can provide long-volatility/long-gamma characteristics and a long-skew profile.

- There should be no systemic bias for the strategy to be overall long or short.

- Ratio of winning to losing trades tends to be very low and the strategy typically does not have a high Sharpe ratio (with many well-known CTAs with long track records exhibiting Sharpe ratios in the region of 0.5-1.0).

- Typically, one would expect CTAs to run with more volatility than most other hedge funds and occasionally have long-periods of low or negative returns and significant drawdown. The primary attraction for holding CTAs is the diversifying characteristics and that they are one of the few strategies with the potential to deliver strong returns during periods where risk-assets struggle.

- The strategy is typically very efficient from a cash perspective, requiring low margin to equity ratios (in the region of 10-25%).

- The strategy trades only the most liquid futures contracts across the main asset classes of equity, fixed income, and commodities. Some CTAs look to differentiate by trading more esoteric contracts (normally

with far less capacity available and/or less liquidity) in less trafficked commodities, credit indices, and emerging markets ("EM") – including EM FX. Some may also trade options.

- Some CTAs are quite mechanical in controlling risk and volatility through dynamic resizing of the portfolio as market dynamics change. Other more sophisticated funds may look to modulate the trading signals (and total risk appetite) using various regime identification measures. Examples could be flow data, weather analytics, volatility of key-indices, shipping rates, rapidly changing cross asset relationships/correlations.

# Quant macro and global asset allocation ("GAA")

## DESCRIPTION

Quant macro aims to generate alpha through large data set analysis and making trading decisions that are based on economic, market and other fundamental indicators as well as statistical models.

Quant macro funds have the potential for overlap between CTAs and quant macro, as they often trade the same/similar instruments, i.e., typically 'macro' instruments such as futures (across all the main asset classes), but also ETFs, bonds, FX and sometimes swaps and options. It is common for terms like quant macro and GAA to be used interchangeably.

There is no single 'correct' definition for quant macro. Funds that are clearly 'quant macro' determine price predictions for macro instruments through long-term fundamental factors like economic data or disparities between countries. But there are also funds with short-term average holding periods which are also defined as quant macro. These funds consider some of the factors listed above, but are driven more by shorter-term technical factors, supplemented with economic data. The economic data can be traditional, and/or derived from alternative data and 'nowcasting'.

'Quant macro' can cover funds trading over a wide degree of time horizons, incorporate a lot of different datasets and can vary massively in complexity. However, the long-term performance of the quant macro strategy suggests an average Sharpe ratio in the region of 0.8-0.9 over the long term (slightly better than CTA), also exhibiting positive skew, but not to the same extent as CTAs on average.

Given the information above, quant macro fund positioning tends to be more relative value based, however, funds may also take directional positions. The asset classes traded are unsurprisingly macro in nature, i.e., futures, FX, ETFs, swaps, and other instruments – which are generally highly liquid. Quant macro/GAA managers are looking to trade repeatable relationships between macro level markets and the signals traded tend to be medium to long-term (i.e., one to several months). However, some managers that could be classified as quant macro can exhibit a much lower average holding period than this.

## SIGNAL TYPES

Quant macro is a highly data and technology intensive strategy. It typically relies upon complex mathematical models to identify key drivers of price formation/relationships and market trends, calibrate portfolio construction, and generate trading signals. The focus tends to be on macroeconomic factors such as GDP, inflation, interest rates, exchange rates, export/imports, growth, capital flows, market data, etc.

Signals are also often classified under a number of familiar factor headings such as value, carry, momentum (trend-following) etc. Some examples of 'classic' longer term quant macro signals could be value signals expressed in currencies, looking at purchasing power parity, equity flows and terms of trade.

## PERFORMANCE IN DIFFERENT MARKETS

Quant macro funds tend to perform well in periods of economic uncertainty, such as recessions or geopolitical crises, when macroeconomic factors are driving market movements. However, they may underperform in stable or slowly changing market conditions. Their performance is also influenced by the accuracy and timeliness of their economic data sources and the robustness of their models to changes in market regimes.

## SAMPLE TRADE

Broad trade-types may be arranged into various categorisations such as: relative value asset class models, cross asset class models and directional trades. In commodities it could relate to buying/selling over/undervalued commodities, taking into account other factors such as inventory levels, elasticity/substitution dynamics and/or other supply/demand information that can be systematically modelled. Macroeconomic indicators (leading indicators, nowcasting, business cycle, monetary policy etc.) would be used to trade a book of global equity indices both long and short, looking for relative mis-pricing opportunities.

## RISK/RETURN PROFILE

- There can be some overlap with areas such as CTAs, although typically quant macro funds have a wider scope and are able to trade a broader investment universe including cash instruments, bonds, currencies and other derivatives such as swaps and options. On the other hand, CTAs tend to focus on futures markets. Quant macro funds typically use a broader array of indicators than CTAs, which rely more on technical analysis and price-based models.

- The strategy is typically used as a diversifier to an overall portfolio. Long-term correlations of quant macro to equities and bonds have typically been low.

- There should be no observable systemic bias for the strategy to be overall long or short.

- Ratio of winning to losing trades tends to be very low and the strategy does not exhibit a high Sharpe ratio, although quant macro funds typically have more potential to offer greater levels of model diversification and instrument exposure than a typical CTA. However, having said this, sometimes well diversified CTAs are akin to quant macro funds.

- One would generally expect quant macro to run with more volatility than most hedge funds and occasionally have long-periods of low or negative returns and significant drawdowns. The primary attraction for holding quant macro is the diversifying characteristics and that the underlying assets tends to be extremely liquid.

- Strategy is very efficient from a cash perspective, requiring low margin to equity ratios (in the region of 10-25%).

- Strategy typically only trades the most liquid futures contracts across the main asset classes of equity, fixed income and commodities and sometimes instruments such as liquid government bonds and swaps. Some quant macro funds will also trade more esoteric (but less liquid/more capacity constrained) futures/commodity contracts.

- In general, one would expect quant macro funds to be quite highly diversified across a large number of instruments.

- Some may also trade macro volatility instruments, either from a directional perspective or from a relative value perspective.

- When comparing quant macro to traditional CTAs, quant macro funds typically consider a broader set of risk factors compared to CTAs. While CTAs predominantly focus on managing market and price risk, quant macro funds typically also assess macroeconomic risks, geopolitical factors, policy changes and systemic risks that can impact their investment thesis. These factors are then incorporated into the models and risk management framework.

- Quant macro funds are quite mechanical in controlling risk and volatility through dynamic resizing of the portfolio as market dynamic change. Other more sophisticated funds may look to modulate the trading signals (and total risk appetite) using various regime identification measures. Examples could be flow data, weather analytics, volatility of key-indices, shipping rates, or rapidly changing cross asset relationships/correlations.

- As indicated above, the 'typical' definition of quant macro comes with an expectation one is trading over a several weeks to multiple month average time horizon. However, some that could be classified as quant macro funds are highly technical in the signal generation process, looking at correlations, shorter-term flow, sentiment, and trading dynamics as well as more frequent macroeconomic data (inferred from alternative data and 'nowcasting').

# Alternative risk premia

## DESCRIPTION

The strategy of alternative risk premia in hedge funds involves leveraging the fundamental principles underlying specific hedge fund strategies. By employing a dynamic yet well-defined process, these funds aim to harness a substantial portion of the anticipated returns associated with those strategies. Specific risk factors, such as equity value, momentum, size, etc. are isolated and their risk premia are harvested in a systematic fashion, hence their inclusion in the quant hedge fund strategy grouping.

The strategies/phenomena or mispricing that alternative risk premia funds look to capture are typically very well understood, backed up by academic research and – importantly – can be implemented systematically using quantitative models and a rules-based process to identify and exploit these potential opportunities. Because of this, risk premia products tend to be very low cost in respect of fees when benchmarked to the rest of the hedge fund industry, with much lower management and performance fees.

Risk premia funds are well understood by the broader investment community and as such there is a very significant allocation of industry capital to these strategies. A key attraction is that they have a lot of capacity and due to their nature, do not command high fees. Often such funds are thought of as a cheap alternative to investing in traditional hedge funds.

The theory behind this strategy is that by offering investors access to a very diversified mix of different and non-correlated alternative risk-premia, you get a robust return stream that is accretive to a traditional portfolio.

Another key characteristic of alternative risk premia funds is the flexibility in implementation. While some investors access these strategies through dedicated funds, others may choose to implement them using customised portfolios or factor-based approaches. This flexibility allows investors to tailor their exposure to specific risk factors based on their preferences and investment objectives.

## SIGNAL TYPES

Funds tend to have exposure to a well-diversified portfolio of hedge fund premia. Premia can cover everything from equity premia (equity market neutral – trading across value, quality, growth and momentum factors, as well as EM premia), macro premia (e.g., trend following, or EM premia), to arbitrage strategies (e.g., risk arbitrage – holding a portfolio of merger targets diversified by sector and deal type; convertible arbitrage, etc.). There can be some crossover with some risk premia products and some QEMN funds as they are looking to benefit from some of the same phenomena.

Some of the most common examples of risk premia signals include:

- Value: this premium refers to the tendency of stocks that are trading at a low price relative to their fundamentals to outperform stocks that are trading at a high price. To harvest the premia, hedge funds look to buy undervalued stocks and short overvalued stocks.

- Momentum: the tendency of stocks that have performed well in the recent past to continue to perform. Risk premia hedge funds may use momentum strategies to invest in assets that have exhibited positive momentum and short assets that have negative momentum.

- Carry: this factor captures the tendency of high-yielding assets to outperform low yielding assets, again – a market neutral approach to capture these premia would be to be long the high yielding assets and short the low yielding assets.

- Volatility: this factor captures the tendency of assets that exhibit low volatility to outperform those with higher volatility, with hedge funds long low vol assets and short high vol assets.

- Quality: the tendency of assets with strong fundamentals (high quality) to outperform low quality assets. Hedge funds would go long strong companies/assets and short the weak companies/assets.

- Liquidity: the tendency of illiquid assets to outperform liquid assets. Some risk premia strategies may use liquidity strategies to invest in illiquid assets vs similar liquid assets to capture this premium.

## PERFORMANCE IN DIFFERENT MARKETS

Alternative risk premia strategies have shown mixed performance during periods of market stress. While these strategies are designed to be more diversified and have lower correlation with traditional asset classes, they can still face challenges during times of heightened market volatility and stress.

During periods of market stress, correlations between asset classes tend to increase, which can reduce the effectiveness of alternative risk premia strategies that rely on exploiting relative price disparities. Additionally, sudden market shocks can lead to significant and rapid price movements, making it difficult for these strategies to capture and profit from market inefficiencies.

However, it is worth noting that the performance of alternative risk premia strategies during market stress can vary depending on the specific approach and implementation. Some alternative risk premia strategies that focus on specific factors or employ robust risk management techniques may be better equipped to navigate turbulent market conditions and potentially generate positive returns.. The performance of alternative risk premia funds is also influenced by the accuracy of their quantitative models, the depth and liquidity of the markets they trade, and the skill of their portfolio managers in managing risk and optimising portfolio allocation.

## SAMPLE TRADE

An alternative risk premia hedge fund may execute a trade by simultaneously buying and selling futures contracts in two closely related asset classes, such as gold and silver or crude oil and natural gas, with the expectation that the price relationship between the two assets will revert to its historical mean. The fund may use a statistical model to identify the deviation from the historical relationship and execute a mean reversion trade, with the expectation of profiting from the convergence of the prices.

Another trade could be where a mispricing between two related assets is identified, such as an index future and its underlying basket of stocks. The fund may use a quantitative model that identifies a discrepancy in the expected risk premia between the two assets and execute a long-short trade that goes long on the undervalued asset and short on the overvalued asset.

Alternatively, the fund may execute a carry trade, where it buys higher-yielding futures contracts in one asset class and sells lower-yielding contracts in another asset class, capturing the difference in interest rates. The fund may also employ additional risk management tools, such as stop-loss orders, position size limits, or diversification across multiple risk premia, to manage the trade's risk.

## RISK/RETURN PROFILE

- Alternative risk premia funds typically (but not always) look to be market neutral over the long term, with low correlation to traditional asset classes.

- By design, risk premia products have exposure to specific risk factors, for which they expect to be compensated, but will drive portfolio volatility. Sometimes movements in some of these risk factors can be large, potentially leading to periods of drawdown and/or long periods where there are low returns.

- Strategy is also typically highly liquid, with liquid investment terms relative to traditional hedge funds. There is a caveat to this in that some alternative risk premia strategies may also incorporate liquidity risk premia strategies, which, by definition, expose to less liquid areas. Some short volatility, or long emerging market strategies can also be less liquid, particularly during times of stress.

- Many alternative risk premia strategies use leverage to amplify returns, but this also increases potential downside risk.

# Glossary

**Computer algorithm** - in the context of quant funds, this is a computer program that works through a pre-defined set of instructions (an algorithm) to place a trade. Trading in this way is faster and more frequent than a human could execute.

**Signals** - Signals in the context of quant hedge funds refer to mathematical models and algorithms that analyse large volumes of financial data to identify patterns and trends. These signals are used to make investment decisions and execute trades.

**Nowcasting** - the practice of using recently published data to update key economic indicators that are published with a significant lag, such as real GDP. The main purpose of nowcasting is forecasting near-term information flow. Unlike traditional economic forecasting, which relies on historical data and assumes stable relationships between variables, nowcasting seeks to capture the latest information on economic conditions and adjust for potential changes in relationships caused by shocks or structural shifts. Specifically, it is an automated process for predicting what forthcoming data reports may show, based on advanced information and an appropriate dynamic model.

# AURUM