CANADIAN ASSOCIATION OF ALTERNATIVE STRATEGIES & ASSETS

THE EVOLUTION OF QUANT

How these managers...

...are finding their place...

...in a dynamic global investment landscape.

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About CAASA

Inclusive, Active, and Pan-Alternative

The Canadian Association of Alternative Strategies & Assets (CAASA) was created in response to industry requests for a national group to represent the Canadian alternative investment participants, including investors, asset managers, and service providers. CAASA is inclusive in that it welcomes participation from all companies active in the space as well as select individuals (such as those employed by investors) who might want to participate in committees and working groups — or simply attend member events — without their employer being a member of the association.

CAASA is very active, organizing about 50 podcasts and 200 webinars, either as stand-alone or as part of our seven conferences each year. Pan-alternative, for CAASA, encompasses all alternative strategies and assets including hedge funds/alternative trading strategies, private and public real estate (funds and direct), private lending, private equity, infrastructure, development and project finance, digital assets/crypto-assets, weather derivatives and cat bonds, and all aspects of diligence, trading, structuring, dealing, and monitoring alternatives in a stand-alone portfolio and as part of a larger investment strategy.

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Thanks to Hill + Knowlton Strategies for their part in interviewing our participating members and drafting this primer.

Hill+Knowlton Strategies

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Foreword

Ask an average person about quantitative trading, or "quants", and you'll hear words like 'algorithm', 'artificial intelligence' or 'machine learning'. They might speak about black boxes, price-action, alternative datasets, and server racks plugged directly into markets using high-frequency trading based on complex calculations to squeeze every last drop of alpha out of a given trading strategy.

To be sure, this part of what quantitative trading is. But as a category, quantitative trading is less a class of assets and more of a technique, or a philosophy: one that involves using data, and rules, to make decisions in an objective and systematic manner.

In doing so, those that design and use a quants approach hope to capture value – repeatedly.

Rules on which the algorithms are based can often be quite simple. Index funds – a product commonly traded on capital markets, and loved by every category of investor for their instant diversification and predictable returns – are themselves a category of quant fund, as they are religiously rebalanced against a set of rules, so that their value very closely tracks a given index.

But quants can also be more complex, with funds looking to fill various roles – everything from fundamentals-based 'factor investing', where funds look to capture fundamental value in a systematic manner, to more specialized products looking to capture value through arbitrage, to products that look to secure crisis alpha and perform during periods of market stress, to funds' models of companies' future earnings based on data as varied as weather patterns and labour market forecasts, and making investments on the assumption of future earnings potential.

While these funds use different quantitative tools, what they all have in common is their philosophy: by using data, a pre-determined set of rules, and with the aid of computing power, they believe they will outperform their competitors in the battle for gains.

James Burron, CAIA

President, CAASA

The Advantage of Quantitative Trading Over Discretionary

The primary advantages of quantitative trading are consistency, discipline, and objectivity.

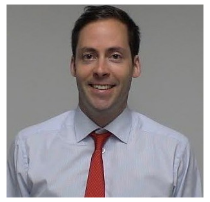
Discretionary managers – managers that do not use quantitative techniques or models to inform their investment decisions – also have a set of rules that inform their trades. But because they are human, human error can creep into the decision-making process – discretionary managers can get emotionally invested in individual assets or trends, stress and uncertainty can lead to poor decision making, and cultural fluency can cause investors to choose from a narrower selection of products, with flows into funds with 'foreign-sounding names' lower than otherwise identical more familiar investment opportunities.

"Quantitative investment is the ability to apply the scientific method – building models – to extract and utilize information from markets. By contrast, a discretionary manager makes decision based on their subjective judgement. A quantitative approach takes the emotion out of investment decisions. Aspect does things in a systematic way: we research and design models to repeatably react to data inputs, and build rules around decision making in advance. We then look at the data to validate or falsify our hypotheses."

Razvan Remsing
Director of Investment Solutions
Aspect Capital

The study of the ways in which human psychological errors can creep into investment decisions is called 'behavioural finance'. Quantitative trading, as a primary objective, looks to eliminate the effects of these errors on investment decisions, and thereby improve performance.

Quantitative fund managers also enjoy an additional advantage over discretionary managers: by leveraging computers, and using algorithms to guide decision making, they are able to process much more information – and therefore make better decisions – than their counterparts who use human brainpower alone. Better yet, they can do it consistently over time.



"I think what you're buying into when you look at quantitative investment methods is a repeatable recipe [for returns] and a repeatable risk management process. The human brain can change from week one to week two. The quantitative method that you're buying – although it may evolve, it is still, at its core, the same recipe that you bought even ten or twenty years ago."

Jean-Olivier Caron
Executive Director
FORT LP

It is commonly understood, in the personal finance space, that although an actively managed fund may beat the overall market for a year or two, it will never beat the market long-term, because eventually the fund manager will miss something important, or make a mistake, and underperform. By contrast, a quantitative fund – based as it is in objective rules and data inputs – is not vulnerable to this sort of error, making it appealing to the sort of investor that has fled mutual funds for index funds and ETFs, but wants to more actively search for growth.

"When you opt to go down the path of factor investing, you're changing your investment strategy from an opinion game to a math game. And generally speaking, math usually wins."

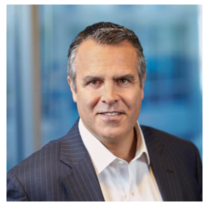
Jay Barrett
Managing Director
SmartBe Wealth

There are additional advantages to taking a quantitative approach over a discretionary approach – even when taking the same approach of identifying market trends and attempting to capture value from them. One such advantage is market timing: a quantitative fund manager can rely on their algorithms to identify a pattern before a narrative has taken hold and exit after the market movement (that informed the narrative) has exited the discourse. In so doing, that fund manager can extract as much return as possible from that movement, and deliver superior performance.

"When it comes to systematic decision-making, our experience is that you're in trades before the narrative develops and you are out of trades long after the narrative continues on. If you're taking a systematic approach where you're not worried about the narrative and you're just looking at what's manifesting in the portfolio today, you can take advantage of supply-demand dynamics under the surface that you're not aware of that you don't have a narrative for. The inverse is also true – when the trend starts to degrade, but the group that is guarding the narrative hasn't given it up yet, if your models are saying get out, you should be out."

Mike Philbrick
CEO
ReSolve Asset Management Global

The systematic and rules-based nature of quantitative investment also has an additional advantage: transparency. Detractors of quant funds sometimes describe them as a so-called 'black box': a system that takes data and produces buy and sell orders that are very difficult to understand and whose advice must be taken on trust. But from a quantitative perspective, the same can be said of discretionary fund managers, who employ their own systems and methods – just not with the reliability of a rules-based approach.



"As a quant manager, I think we can provide a more precise explanation of our strategy than a discretionary manager. I can write down the algorithms and show how our systematic decision-making framework will react to any scenario, why it sends every trade to the execution team, and exactly what to expect. If you ask a discretionary manager to explain their process, it can sometimes be difficult for them to explain or know how they will react if the future doesn't unfold as they expect it to."

Roland Austrup
Chairman & Managing Principal
WaveFront Global Asset Management

This is an important distinction. The removal of active human decision-making from the investment process does not eliminate bias – because humans build the algorithms, and humans review them. However, quantitative fund management, by its nature, allows more transparency – and more understanding – than discretionary management.

"It is 100% true that our algorithms and our rules have bias. The difference is, we publish our bias, and we let you know that bias up-front. And our discipline doesn't allow us to change that bias. So we can't make an intuitive decision halfway through a cycle – it's against our prospectus."

Ron Heard
Founder & CEO
SmartBe Wealth

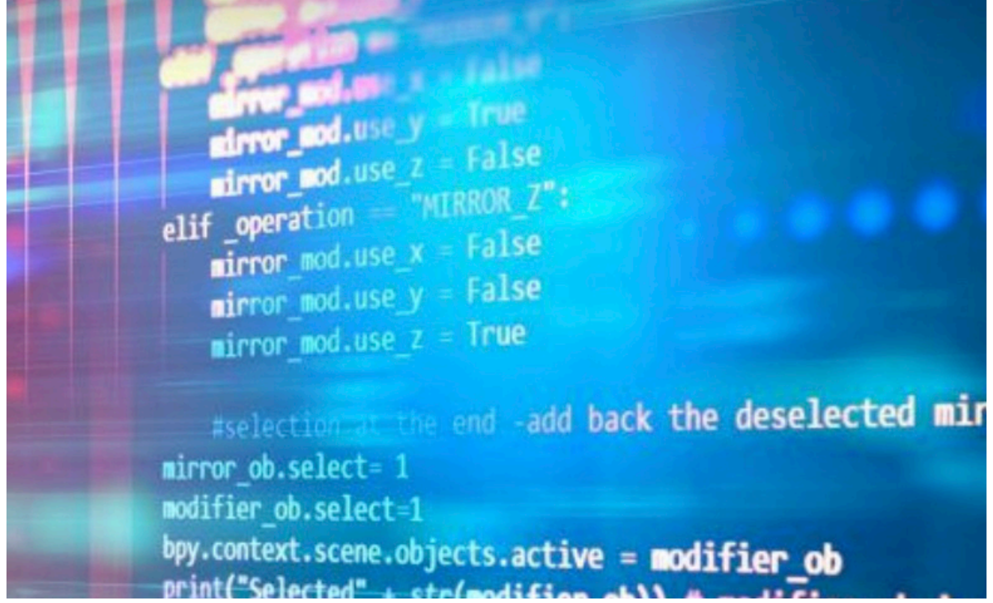
Differential Analysis

While not every quant fund uses sophisticated algorithms to capture value from unexpected places, some do – and each tool has a different use in an investor's portfolio. A very simple quantitative investment vehicle – like an index fund – has a very simple and obvious purpose: capture the value generated by the equity market as a whole, while providing instant diversification across sectors.

But for the investor that is hungrier for returns – or who wants to hedge against unexpected events – different quant funds may have different uses. For example, certain funds may look to find irrational market movements that deviate from fundamental value – and capture value from that market movement, on either the long or short side. In these cases, a quantitative approach gives the investor the flexibility to adapt to changing circumstances.

These different uses call for different approaches to quantitative analysis. For a simple quantitative fund, like an index ETF, the approach is really quite simple – rebalance in proportion to a given index. But for a more complex fund, that seeks to perform in a manner that is uncorrelated to the stock market, more sophisticated types of analysis can be called for – including cutting-edge technologies like machine learning and artificial intelligence.

There are varied ways of implementing these technologies. For some firms, they are implemented with a human hand at the wheel – because while machine learning and AI algorithms are excellent pattern recognition engines, sometimes patterns – whether detected by a human or a machine – are not contingent relationships to any understandable phenomenon or trend at all. In these instances, human intervention can help distinguish signal from noise.

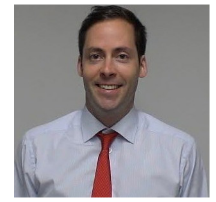


"Some of WaveFront's research is exploratory, and driven entirely by data and technology, however there are many characteristics of our strategies can be explained in terms of market fundamentals and behavioural biases. For WaveFront to evaluate the effectiveness of an algorithm that fits with a fundamental inference, a tremendous quantity of data needs to be analyzed in as much granularity as possible. If we can get 100 years of historical data, we want to throw 100 years at it, to see where the fundamentals start to break down."

Rob Koloshuk
Managing Principal
WaveFront Global Asset Management

The key, according to Koloshuk, is to understand why the algorithms are making the buy and sell recommendations that they are – if the pattern is not ultimately reducible to an understandable market phenomenon, then the recommendation is subjected to a very different type of validation.

In other instances, investment funds might be built to remove the human element from the process. In these cases, the model and method can be monitored and updated to evolve as market conditions, and economic regimes, evolve.



"You can define a very specific method of quantitative investing that works well under specific conditions – and in that case, you need human discretion to assess if you are experiencing those conditions. The possibility of over-optimization or over-fitting is real given you are mapping the outcome of a quantitative method to a specific period in history. What we've decided to implement is focused on generic methods which are self-adaptive in accordance with the evolution of economic regimes. Our models are rather simple in nature, but nimble, for them to adapt and work across different decades and economic cycles. This self-adaptive characteristic will be responsible for the tweaks and changes in trading behavior ultimately linked to the evolution of markets and economic cycles."

Jean-Olivier Caron
Executive Director
FORT LP

Artificial Intelligence (or AI) and machine learning can help the hungry investor find alpha in unlikely places but ultimately they are overseen by people, who provide both oversight and quality control. That is a critical component because investors need to trust the philosophy against which their money is invested.

Trust Issues

Despite the fact that human behavioural quirks are well-understood, there is still hesitation to invest in quant funds. To some extent, this hesitation is understandable. People trust other people – whether a financial advisor or a fund manager and algorithms, and data, can feel impersonal and impenetrable. In this context, it is reasonable to ask: what if something goes wrong?

What is true of algorithms for self-driving cars and facial recognition is also true of algorithms for trading: the quality of the output is determined by the quality of the input, and of the algorithm itself.

"People tend to believe that quantitative managers are a black box that is plugged in directly to the markets and this black box AI is doing all the trading and we're just letting things happen. For instance, they fear that we will wake up with a massive short position because the system did trades without us knowing. But that's not how it works in the space of managing large assets. In this space, none of us are plugged in directly to the market. There are signals that we then send to a group of traders to help us work the trades. A human element is there. There's a quant element where the human traders are using algorithms to get in and out throughout the day, but they're monitoring them … there is an insane amount of oversight and reconciliation involved in the actual execution of those trades."

Rodrigo Gordillo
President & Portfolio Manager
ReSolve Asset Management Global

Quantitative fund managers put in place safety measures – and stress tests – to ensure that their models and systems function under even

the most stressful conditions. Where they do not – where the fund is entirely managed algorithmically, to entirely eliminate human error – they disclose their algorithms, and assumptions, to ensure that investors whose assets they manage are informed of both the upside and downside of their investment approach.

"I think what helps is to really explain beforehand, the investment philosophy that went into the strategy, and then to confirm that philosophy by the parameters and the risk approach that you've set for it. One can provide a few specific examples, how the system implemented it, and how it was successful e.g. to identify a changing market sentiment by utilizing something like our Flow Insight analytics. Once you do that, you usually generate a better understanding and a higher comfort level for the investors. Then, it's about sticking to it – or if you are changing something, to be transparent and open."

Thomas Belkin
Senior Specialist
Deutsche Börse

How can quant funds be used in a portfolio?

The use of quant funds in a portfolio is dependent on the nature of the fund itself. However, quant funds can be segregated into a few major categories:

1. *Simple quant funds, like ETFs that track an index,*
2. *More complex quant funds, which look at historical data to discover sources of fundamental value, and*
3. *Quant funds which look to build a model of companies' future earnings and look to invest based on those models.*

Quant funds in the first category will provide a very different sort of return from funds in the second and third category. The first category provides a return that is highly correlated with market performance. However, funds in the second and third categories often look to provide returns that are uncorrelated with market performance, and this can be an important source of diversification in a portfolio – and of risk management.

An uncorrelated portion of a portfolio provides a critical service to an investor: a way to smooth volatility. Traditionally, this is the reasoning behind the 60/40 portfolio – there has been a historically observed inverse correlation between equity and bonds, so holding some amount of both is a way to manage your risk and provide balance. Yet that inverse correlation is only an observed property of markets – it may not continue forever, especially as markets enter a period with an unprecedented level of persistently low interest rates and proactive central bank activity. In an environment like this – with persistently low interest rates – the 60/40 portfolio may not deliver as it has historically.

In this case, investors may want additional areas of risk management or additional areas where they seek growth. This is an area where uncorrelated quant funds – or funds with an uncorrelated component – can deliver.

"The last 5 years have been as tremendous (in terms of performance) as the last 30 years for 60/40 and risk parity approaches, at least in the U.S. Even in 2020, equity markets delivered wonderful performance overall for the year. The same was true for bonds which delivered performance while also playing their buffer role. But, going forward, given current levels of equity yields and valuations, sustaining this performance will clearly be much harder. If you look at markets that saw lower rates earlier – like Europe and Japan – 60/40 and risk parity portfolios have delivered much lower performance over the last 5 years. If we extrapolate this scenario to the U.S., a quantitative approach to equity and credit investing – one that nimbly invests across instruments to extract the most carry per unit of risk over time – could be a real alternative to traditional 60/40 portfolios."

Edouard Laurent-Bellue
Deputy Chief Investment Officer
LFIS Capital

In an environment where the traditional 60/40 portfolio underperforms, investors seeking returns will have to cast a broader net. This is a core strength of quantitative funds: by removing human biases, such as the tendency to under-invest in funds which are culturally unfamiliar, quants can find returns in places that discretionary managers may not think to look, while guarding against volatility and the risk of a crash.

"In a carry-focused strategy, being able to quantitively assess the carry to risk across various instruments and asset classes that are exposed to similar risks (for example credit default swaps versus downside put options), allows us to allocate in a very different manner to traditional discretionary asset allocators. We focus less on predicting returns and more on predicting risks and assessing them in the context of how assets and instruments are priced across various markets."

Edouard Laurent-Bellue
Deputy Chief Investment Officer
LFIS Capital

Quant funds that look to either deliver uncorrelated returns, or which include uncorrelated strategies as part of their asset allocation, provide that risk management. Should equity or bond markets take a turn for the worse, they provide a part of the portfolio from which an investor can rebalance.

Investors looking to begin investing in quant funds should first research and understand the fund's investment approach and philosophy and confirm that it fits with both their investment objectives and their risk tolerance. When it comes to reallocating that wealth, however, that investor should allocate a sufficient percentage of their wealth such that they will be able to achieve their investment objective.

Performing Under Pressure

Investors who may otherwise be interested in a quantitative approach – who understand the rules-based pitch behind it, and who appreciate the objectivity and removal from human cognitive bias and error that it provides – may understandably be hesitant in March of 2021.

After all, a system's rules are written for the market as it exists – but what happens when the entire global economy locks down, and those rules change?

For quantitative fund managers, situations like the Covid 19 pandemic that took hold in March of 2020 are when you need rules more than ever.

"You can set your systems up to have certain risk parameters and specific minimum diversification criteria – and they work 99% of the time. But if you have an extreme event where correlations converge, and where everyone is running to the exit and is trying to get out of those positions, it's going to behave very differently than in your back test ... and in those scenarios, the advantage that quantitative funds possess over discretionary ones is that usually, they're faster – faster at processing and analyzing the market data and faster in executing their trades. While not all quantitative funds make use of the most granular market data, they can be 50,000 times faster than human trading reaction time. Some even use subscription services such as our High Precision Timestamps that can accurately calculate the time delta to winning orders with nanoseconds accuracy."

Thomas Belkin
Senior Specialist
Deutsche Börse

As The COVID market crisis of March 2020 might have been driven by an event unprecedented in modern history, but the way markets reacted was not unique – and in some ways, despite being unprecedented, it was not unforeseen. A discretionary fund manager might have known about the new disease and had a plan to execute in the case of a crash – but, being human, they are subject to human behavioural errors and emotional investment in plans.

"While the COVID crash was exogenous, and its overall effects unforeseen, the equity crash wasn't much of a surprise to our trend or macro because they look at information from other asset classes. We utilize multiple data sources and techniques. That is one way to navigate events like the COVID crash – alternative data sets can make things more dynamic and adaptable."

Razvan Remsing
Director of Investment Solutions
Aspect Capital

The Future Is Now

Quantitative investment techniques may be cutting-edge – but they are also very familiar, particularly with respect to a generation that grew up with smartphones, learned to code in elementary school, and is regularly served algorithmic advertisements on social media.

Quantitative investment is less a class of investment than it is a technique: a way to execute an investment strategy in an objective, rules-based fashion.

These rules can frequently be quite simple – such as in an ETF – or they can be complex, with machine learning algorithms applied against the factors that drive market performance. They can look to squeeze the maximum return from market movements, or they can look to hedge against market crashes like the crash we saw in March 2020.

In each of these circumstances, the way that they will be used in a portfolio will vary. But what they all have in common is that they look to eliminate human decision-making errors, and behavioural biases, from the investment process.

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To learn more about CAASA, please contact us:

James Burron, CAIA
President & Co-Founder
james@caasa.ca

Caroline Chow
Vice President & Co-Founder
caroline@caasa.ca

Paul Koonar
Senior Associate
paul@caasa.ca

Suite 2500, 120 Adelaide Street West
Toronto, Ontario
M5H 1T1
Canada

caasa.ca