

**Q**uantitative investing – the use of models that monitor economic and financial data and output investment decisions – is a globally well-established asset class that is steadily making a place in Indian asset management.

In the Indian equity markets, where asset managers have traditionally relied on bottom-up stock picking based on an analysis of company fundamentals and meetings with management, the quant approach is a definite shift in paradigm. It represents a tremendous opportunity to offer equity investors a style that is disciplined, globally well tested and unique.

Quantitative investing in India has historically been limited to the sell-side where simple technical analysis, arbitrage, and then pairs trading techniques have been used to manage proprietary capital. While these strategies may have also been run by brokers informally for individual clients, an organised buy-side quant market is relatively nascent.

While high frequency strategies are not a good fit with India's tax and liquidity environment, low-frequency factor-based quant has found its way into asset management products on all three major buy-side platforms – mutual funds, ETFs and portfolio management (PMS or the Indian equivalent of managed accounts).

The first quant mutual fund was launched in early 2007, but quant products really developed a presence in the market in mid-2009 when a couple of quant offerings were introduced for high net worth individuals by PMS providers. Today, additional quant products are being introduced on ETF and mutual fund platforms, and large wealth managers are beginning to recognise quant as an important asset class of its own.

### Opportunities and challenges

Quant represents a tremendous paradigm shift in a market where buy-side fund management has been limited to traditional stock picking. Moreover, in a market that is predominantly long only, beating the benchmark is the primary objective. A quant style, which takes measured deviations from the benchmark, to outperform, is well suited to delivering consistent outperformance over the benchmark. Compare this to traditional fundamental investing, which does not have as tight a concept of risk to the benchmark.

Moreover, in a country where asset management margins are shrinking, quant is one of the

most scalable business models. A few experienced quantitative professionals can manage 500+ stock portfolios worth billions of dollars, without the large research teams a fundamental desk would require.

At the same time, implementing and trading quant strategies in India is a challenge, and it is not because the markets are unusually volatile. The difficulty comes from the fact that many quant asset managers are trading quant strategies for the first time, and are learning the style as they go. An academic exercise can produce good-looking back-tests but quantitative fund management is a completely different beast.



**RADHIKA GUPTA**  
director, Forefront  
Capital Management

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**-Radhika Gupta**

A back-test is as good as the data and assumptions underneath it, and back-tests are not meaningful until they cover a substantial length (15+ years for equities) that encompasses various market cycles. While data on Indian equities is available since the NSE start-

### Quant strategies decoded

Quant investing is essentially any strategy that is rule-based and involves no form of manager bias or subjectivity. Rules vary in complexity and can be based on any kind of dataset, such as financial, statistical, economic or accounting data. A very simple model could, for instance, take the P/E ratios of all companies in the NIFTY and output a buy recommendation for the ten companies with the lowest P/E ratios. Quant strategies have been applied across most liquid asset classes in nearly all developed markets and most major emerging markets, including India. They are broadly classified into categories based on the holding period of the investment – high frequency quant and factor-based quant (see box overleaf).

Back-testing is the foundation of all quant strategies. Each rule or factor is tested with large data sets over long histories to make sure that the rule is robust across market cycles, geographies, asset-class regimes and sectors. In developed markets, factors for basic asset classes like US equities and bonds are back tested from as early as the 1960s and 1970s. Quant as an asset class, moreover, works on a very thin edge. Managers take small bets in a large number of securities – often thousands of stocks in a portfolio – as opposed to the large bets fundamental managers take in a few securities.

Internationally, portfolios managed using quant strategies account for around 10% of sophisticated investors' asset allocation. Born in the early 1990s, global quant managers like Renaissance Technologies, Goldman Sachs Asset Management, AQR Capital Management, D E Shaw, and Bridgewater manage billions of dollars in quant portfolios.



ed in 1994, it needs extensive cleaning, tabulation and checking – something very few managers are willing to do, particularly if they want to just dabble in quant.

A simple back-test that aims to beat the NIFTY for instance, needs to take into account the index weights in the NIFTY for the last 15 years, a data set that is extremely complex to construct. As a result many quant products sell on back-tests of two, three or five years, which is hardly a period to test the robustness of a strategy.

More dangerously, back-tests can be datamined to show what the asset manager wants and what a wealth manager thinks will sell. Back-tests are being viewed as a tool to give a new product 'track record', a very danger-

Both managers and investors need to realise that quant strategies are not magic – they will deliver comparable performance to long-only fundamental strategies. Their value is their consistency and low alpha correlation to existing equity strategies – the diversification value.

A further challenge for quant managers is that very few distributors and wealth managers are adept at evaluating quant strategies. Evaluators will try to fit quant strategies into the existing fundamental or technical frameworks. Quant portfolios have a different architecture and concepts like stop losses and price targets don't exist. Wealth managers expect every bet in a quant portfolio to make money, but quant managers take a large number of bets, knowing that only a percentage will do well.

Evaluators often want to know all the factors behind a model, something no quant manager likes to share, and want to tweak the model to their comfort. Moreover, in the absence of auditable live track record, wealth managers try to compare quant models on their back-tested numbers, a comparison that is not meaningful if back-testing standards are poor.

## “Quant in India is likely to become dominated by specialists”

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ous idea. Products can be sold on unrealistic expectations, only to leave clients and distributors disappointed with the product, and sceptical about the field.

Quant managers in India have shown long-only equity back-tests that outperform the benchmark by over 20% a year. Globally, no long-only manager has consistently delivered 20% alpha and the best mutual fund manager in India over the last 15 years has not touched anything near 20% outperformance.

### India's quant outlook

The growth of quant strategies in sophisticated investors' portfolio is inevitable as India becomes a more developed investment market, and is more closely aligned with global markets. As wealth management becomes more sophisticated, high-net worth investors will demand strategies that are not correlated to existing equity products and quant addresses this need.

Moreover, as institutional investment into equities grows and treasuries become important profit centres firms, the market for enhanced long-only strategies, that deliver a few percent over the benchmark with very controlled tracking error, will grow. Quant managers have a tremendous role to play here, as well as in the development of long-short products, which will grow as regulations on shorting and leverage in asset management evolve.

As a market, quant in India is likely to become dominated by specialists as poor performance wipes out those who are only dabbling in the field or doing quant as a flavour of the season asset class. In addition to domestic managers in this space, large global quant managers like a Goldman Sachs Asset Management or a GMO are likely to tap the potential in the Indian markets.

### High frequency v factor-based

High frequency quant investing is the use of complex mathematical models to find repeatable patterns in financial data, such as buying stocks with the highest open 'gaps' and selling them at the end of the day. These strategies employ a short holding period, ranging from minutes to a few days at most, with the focus on price level and market level data, rather than fundamental data. Often referred to as 'black box' strategies because the rules are complex and closely guarded, unknown to the investor, high frequency strategies are the domain of both proprietary trading desks as well as hedge funds like Renaissance Technologies.

Factor-based quant involves identifying and quantifying economic factors that drive prices, and modelling investment decisions on these factors – quantifying the art of fundamental investing into a science by instilling discipline into a subjective process. Value is one of the most fundamental quant factors – a simple strategy would be to buy stocks with low P/B ratios and sell stocks with high P/B ratios. The inputs are typically fundamental data points about a company, and because company fundamentals don't change frequently the style is low frequency. Typical holding periods range from three months to even years depending on the factors. Factor-based quant was a style introduced in asset management by Cliff Asness at Goldman Sachs Asset Management, and has been adopted by major asset managers like AQR Capital Management, Bridgewater Associates, BGI, and GMO.