# Marco Dion

*A researcher reveals a couple of his favorite strategies and why they tend to work so well.*

### BY DAVID BUKEY

After a nine-year career at trading desks in Europe and Asia, Marco Dion has more market experience than most stock-research analysts. As the European head of equity quantitative research at JP Morgan in London, Dion, 33, develops systematic trading strategies for hedge-fund managers and was on the front lines of the 2008 financial crisis.

That ordeal reinforced Dion's pragmatic approach to designing trading systems for individual stocks. As a trader he quickly learned the difference between being right and making money (or at least not losing it), a skill that helped him navigate last year's turbulent markets.

"I have sympathy for anyone who lost money over the past two or three years," he says. "If you try to be rational in an irrational market, it isn't going to work."

However, Dion owes his success to an objective outlook, and he is skeptical of those who simply trade market opinions. Instead, Dion believes the key is to translate all market information into quantifiable ideas. Unlike most researchers, he doesn't distinguish between technical analysis — the study of historical price patterns — and fundamental analysis, which examines individual companies through their earnings, balance sheet, and cash flow.

"As a quant, I don't care what works as long as I can prove whether a strategy is working or not," he says.

After earning a finance degree from Belgian university Hautes Études Commerciales in Brussels in 1998, Dion worked as a proprietary trader for Mako Global in London, Amsterdam, and Sydney, Australia until 2004. He began trading stock-index futures and stock options, but felt confined by the limited number of optionable stocks on European and Asian markets. Dion then fatefully joined Madoff Investment Securities in London, where he was one of 60 proprietary traders working for the infamous Bernie Madoff — in the legitimate arm of the firm, not in Madoff's private Ponzi-scheme wing. Dion still had no idea his boss was "evil" when he left the firm for JP Morgan in 2007.

At JP Morgan, Dion focuses on developing robust strategies from well-known trading ideas — price momentum, value

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vs. growth, and stock sector rotation. He avoids the common trap of overanalyzing market data by ensuring each technique is intuitive enough for anyone to grasp. Quantitative fund managers often use market-neutral strategies that rank stocks in different ways and then buy the most promising ones and sell others at the bottom of the pack. Dion also favors this approach because it helps limit market exposure.

"Regardless of how you define good and bad stocks — price action, valuation, balance sheet, behavioral analysis — you try to focus on the extremes," he says. "The bad ones should really underperform the good ones."

Like any professional trader, Dion understands that no trading strategy works in all market conditions. His recent work examines how traders can identify market shifts and change their techniques before severe drawdowns occur. Dion's solution is to apply Bollinger Bands to each system's equity curve and adjust the strategy if equity rises or falls two standard deviations to hit either extreme. He specializes in European stocks, although the strategies he describes can also be applied to U.S. markets.

**AT:** *When testing trading strategies, do you favor fundamental data — earnings, cash flow, book value — over technical, or price-based, patterns such as momentum?*
**MD:** Most fundamental managers say they don't believe in technical analysis, and technicians say they don't believe in subjective forecasting and fundamental variables.

It is easier to find profitable strategies with fundamental data than price action. We work a great deal with fundamentals — a lot of data is available regarding when analysts change their earnings forecasts, price targets, and so on. Historically, cheap stocks tend to outperform more expensive stocks. The difference between good and bad quantitative analysts is how they define cheap and expensive stocks.

But we are also keen on price action. A lot of information is embedded in prices, and they give you clues regarding current

and future performance. Some investors say technical analysis doesn't work, but it probably means you need to try a bit harder.

**AT:** *Are fundamental variables more helpful than price?*
**MD:** Yes. And they tend to be favored by quants. If you pick companies based on their balance sheets, the turnover (*trading frequency*) will be very low. You could easily manage up to $20 billion with such a simple strategy. Low turnover means trading a large number of shares isn't an issue.

If you trade very aggressively with a price-based strategy, you tend to have high turnover, which exposes you to illiquidity, adds slippage and commission costs, and requires more infrastructure. That is quite difficult for big funds to manage.

**AT:** *Did you ever focus solely on price when trading?*
**MD:** No. I've never been a pure technical analyst. But I'm always trying to make sure that promising strategies make money when back tested against historical data.

When using fundamentals, it's still good to check historically whether an event such as a merger or revenue increase has affected prices the way you expect.

It's the same with technical analysis. I can understand why technical concepts may work, but you need to look at historical performance. Regardless of the strategy and its logic, you need to go a little bit further and understand how it has performed, what the caveats are, and when you might lose money.

Technicians need to embrace the idea that a stock's fundamentals influence how it behaves. For example, if you compare trade signals in different stocks based on the moving average convergence-divergence (*MACD*) indicator or relative strength index (*RSI*), I can guarantee that cheap and expensive stocks aren't going to react the same way to those trading signals.

You only see those patterns when you really look at the numbers. If you just assume a price pattern will work, then, by definition, you're going to miss a lot. If you test a pattern and it works, then you need to find out when it works the best, when it doesn't work, and why.

**AT:** *So, you're putting price into a fundamental context.*
**MD:** Yes. But there is room for improvement. Quants tend to be either very price-driven or fundamentally driven. The

technicians aren't very sophisticated in the fundamentals, and fundamental analysts understand the concepts of price momentum and mean reversion, but they define them in [crude] ways.

**AT:** *In your reports, you have back-tested several fundamental variables on thousands of stocks. Are there one or two variables that stand out in terms of market performance?*
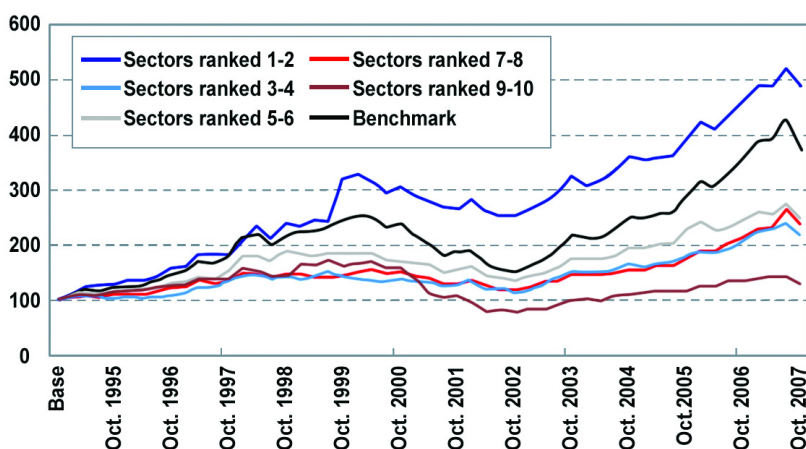**MD:** Earnings momentum — one- and three-month changes in earnings-per-share (*EPS*) forecasts for the first and second fiscal years (*FY1 and FY2*). As soon as analysts change their growth forecasts for a company — based on real issues, not minor ones like currency changes — stocks start flying. This happens after EPS upgrades and downgrades. Other important variables are cash flow yields (*cash flow per-share/price per share*) and their forecasts.

We also look at 12-month price momentum — buying strong stocks and selling weak ones. In addition, we've found that very short-term mean reversion — selling one-month outperformers and buying one-month underperformers — works well. Obviously, this might be risky in individual stocks. But it makes sense if you use a long-short approach and buy the 10 worst performers and sell the 10 best performers in a universe of stocks.

**AT:** *Are there one or two well-known variables that aren't as effective as most people think?*
**MD:** Looking at book value doesn't make sense. Recently, book value was the only variable investors studied, because stock

## TABLE 1: SECTOR MOMENTUM STATISTICS

| Long/short sector price momentum strategy (3-month rebalancing) | |
|---|---|
| Annualized return | 9.60% |
| Sharpe ratio | 0.6 |
| t-Stat | 2.3 |
| Hit rate | 60% |
| Average information coefficient | 10.20% |

*This sector momentum strategy earned nearly 10 percent annually from December 1993 to March 2008. But instead of tracking overall sector performance, the approach ranked each stock according to price momentum in different time periods (i.e., one, three, six, and 12 months) before summarizing results at a sector level.*

*Sources: MSCI, Factset, JP Morgan*

## FIGURE 1: SECTOR MOMENTUM PERFORMANCE

Legend: Sectors ranked 1-2, Sectors ranked 7-8, Sectors ranked 3-4, Sectors ranked 9-10, Sectors ranked 5-6, Benchmark

*Sectors with the highest momentum (dark blue line) consistently beat the sectors with little or no momentum (brown line).*
*Sources: MSCI, Factset, JP Morgan*

analysts didn't have a clue about fore-casts for EPS growth, cash flow, dividend yield, which was a big problem. During the financial crisis, the only variable investors could interpret was price-to-book value. If a company's book value is $10 per share and its stock sells for $2, obviously that's a big discount.

But historically, price-to-book value hasn't identified attractive stocks. Other overrated factors are the consensus recommendations of analysts and their price targets.

**AT:** *Designing a trading system that makes money on paper and in real-time trading is challenging. Do you have any advice?*
**MD:** First, you need to have a very pragmatic idea — it needs to make sense. You also need choose data carefully. Even professionals sometimes find the closing prices in their data sets are completely wrong.

If you study consensus EPS numbers, you need to know where this data comes from. When does the company that distributes the data actually get it? Other important questions — what type of valuations does your data use and what accounting issues are involved? For example, in price-to-book value, what happens to a company's goodwill (*i.e., intangible assets such as brands and patents*)? That can change a price-to-book-value from 2 percent to 2000 percent.

As a quant, you should never rest. If you're making money, you should question how long that streak might last. You should understand why you're making money, because you will lose it at some point — everyone has drawdowns. You need to constantly fine tune your strategy and make sure you're actually improving it, not just [fooling yourself] by curve fitting the rules to historical data.

**AT:** *You mentioned that quantitative fund managers tend to use long-short strategies that buy the strongest stocks and sell the weakest ones among thousands in a group. What is the appeal of this approach?*
**MD:** Quant managers are trying to define good and bad stocks and buy good ones

## TABLE 2: EXPECTED RELATIONSHIP BETWEEN VALUE AND GROWTH STOCKS

| | Value | Growth |
|---|---|---|
| Price dispersion between stocks in universe increases (i.e., the universe includes very cheap and very expensive stocks) | Invest | Avoid |
| Price dispersion between stocks in universe decreases (i.e., the universe includes similarly priced stocks) | Avoid | Invest |

*When there are a lot of cheap and expensive stocks in the market, investors should favor value stocks. However, when the spread between cheap and expensive stocks narrows, investors should favor growth stocks.*
Sources: MSCI, Factset, JP Morgan

and sell bad ones. This approach should generate alpha (*absolute returns that aren't compared to a benchmark index*) regardless of what the market does. A long-short strategy tends to eliminate risk in specific markets and sectors. In the best-case scenario, the long candidates rally and the short candidates drop.

**AT:** *But I heard that most U.S. long-short mutual funds performed much worse than expected in the recent market downturn.*
**MD:** Fund managers who lost money from 2007 to 2009 weren't necessarily bad managers. The big problem for long-short managers was their short legs were hit hard. A lot of traders had shorted banks and overnight U.S. and European governments decided to restrict short selling (*on hundreds of financial stocks on Sept. 19, 2008*), which forced them to

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cover their positions. Those shorted stocks jumped because no one wanted to trade them — they were completely illiquid. For example, one buy order could move a stock up 10 or 15 percent. Trading the extremes was extremely tough.

**AT:** *You've done extensive research on price momentum in stock sectors such as energies, financials, technology, and so on. But the results weren't as straightforward as one might expect — the strongest-performing sectors didn't always continue higher and the weakest-performing groups didn't always continue to sink. Will you explain which conditions led to predictable returns in different stock sectors?*
**MD:** It was difficult to find systematic reasons why a sector might outperform. In theory, sector valuations should drive performance. For example, if the sector was cheap or expensive, that would be a reason to buy or sell. We tested 15 years of stock data and found this idea isn't true. We also examined changes in analysts' stock ratings (*buy to hold, hold to sell, etc.*), but analysts didn't have any insight into the future performance of sectors.

For whatever reason, sectors are leading indicators — they tend to lead the macroeconomic data they are collated with. For example, the energy sector tends to start moving before oil [jumps], because investors tend to have a forward-looking view of the economy.

When a sector's price increases, it lasts for a while. But instead of measuring overall sector performance, we looked closer and tracked performance of individual stocks within a sector. If one sector is up 10 percent, that doesn't really mean the entire sector is moving. It might have moved because a few stocks with the biggest market capitalizations released important news and moved significantly.

Our approach ranked the price momentum of all European stocks over one-, three-, six-, and 12-month periods, gave each stock a score, and added those scores at a sector level. This twist pro-

vides a much smoother picture of performance within a sector. Buying the top-ranked sector and selling the bottom-ranked sector every three months lead to annualized returns of 10 percent, fairly limited drawdowns, and manageable turnover (*Figure 1 and Table 1, p. 53*).

**AT:** *When you mention sectors are you referring to broad groups such as the handful of categories in the S&P 500 index or smaller industries within them?*
**MD:** We used the 10 sectors identified by the Global Industry Classification Standard (*GICS*), and then we checked the results against GICS's 24 industries, which performed about the same.

**AT:** *When you give each stock a score based on price action, does that mean you're weighting each stock equally instead of by market capitalization?*
**MD:** Not completely. But we are standardizing performance. One way to rank an S&P 500 stock is to measure its performance over, say, one month, subtract the average performance of all S&P 500 stocks, and divide it by the standard deviation of all stocks in that time period. That score can be compared among time frames and provides a distribution of returns with a mean of zero and a standard deviation of one. We also capped scores above and below three standard deviations, which means outliers won't have a huge impact. But it also means you're giving less weight to stocks with the largest market capitalizations.

If you build a momentum-based strategy around sector rotation, it works well. But strategies that use price momentum based on all one-, three-, six-, and 12-month periods perform better.

**AT:** *Another theme in your research has been examining differences between growth and value stocks. How have investors and academics traditionally defined growth and value categories and how is your approach different?*
**MD:** The cycles between value and growth stocks tend to be long and persistent. Everyone knows cheap, value stocks tend to outperform expensive, growth stocks, but there are cycles within that rule. For example, since the credit crisis began in 2007, investors haven't really

cared about valuations. In fact, they preferred to sell cheap stocks because they were getting cheaper day by day.

Our approach was slightly different from the academic community, which tends to look at the correlation between macroeconomic data and performance of growth and value stocks. We found that tracking the dispersion of stock valuations makes more sense. In general, investors prefer cheap stocks. But when there are a lot of cheap *and* expensive stocks in the market, investors should favor value stocks. In other words, value stocks performed best when the spread between cheap and expensive stocks widened.

> "As a quant, you should never rest. You should understand why you're making money, because you will lose it at some point — everyone has drawdowns."

On the other hand, when the spread narrowed and many stocks became similarly priced, growth stocks outperformed. It's based on the fairly rational idea that if investors have a choice between an expensive stock or an increasingly cheap stock, then they will favor the cheap one.

It worked extremely well. But when the strategy didn't work, it suffered fairly big drawdowns. Markets aren't always rational, and we developed a way to adapt our model to irrational markets.

**AT:** *How did you define value and growth stocks?*
**MD:** Value and growth are two separate sector-neutral strategies. For the value portfolio, we ranked European stocks by one-year forward, earnings-yield forecasts

(1/[*price/earnings*]). Then we bought the cheapest 10 percent and sold short the most expensive 10 percent of stocks in the universe. For the growth portfolio, we ranked stocks by average one- and three-month change in consensus EPS forecasts. Then we bought the 10 percent with the most positive changes and sold short the 10 percent with the most negative changes.

**AT:** *How did you decide when to switch strategies?*
**MD:** It depends on the spread between cheap and expensive stocks, measured by the median forecasted price-to-earnings (*PE*) ratio each month. When it dropped, we used the growth strategy and when it rose, we used the value strategy (*Table 2, p. 54*).
By contrast, academics haven't really tried to determine when value or growth stocks work better. Academics have always felt more comfortable with value for the simple reason that buying cheap stocks makes the most sense. Investors have always been puzzled with the idea of buying more expensive stocks.

Now investors define value and growth stocks in more sophisticated ways. You can't afford to hold value stocks forever, thinking cheap stocks will always outperform.

**AT:** *What type of stocks did the strategy follow in June?*
**MD:** In March the spread started narrowing, but it has risen to point at value stocks again.

**AT:** *You mentioned ways to avoid large drawdowns. How do you do that?*
**MD:** We track a system's equity curve and make changes when it moves two standard deviations above or below its mean. (*Dion's technique is similar to placing Bollinger Bands around the equity curve and increasing exposure when it rises to the upper band and decreasing exposure when it drops to the lower band.*)
Historically, events such as the financial crisis, earthquakes, and bankruptcies have had a strong impact on markets that don't disappear overnight. During those irrational periods, you shouldn't expect stocks to behave rationally. These shifts sometimes last awhile, which is why we pay attention to them. If value isn't work-

## FIGURE 2: VALUE VS. GROWTH STRATEGIES
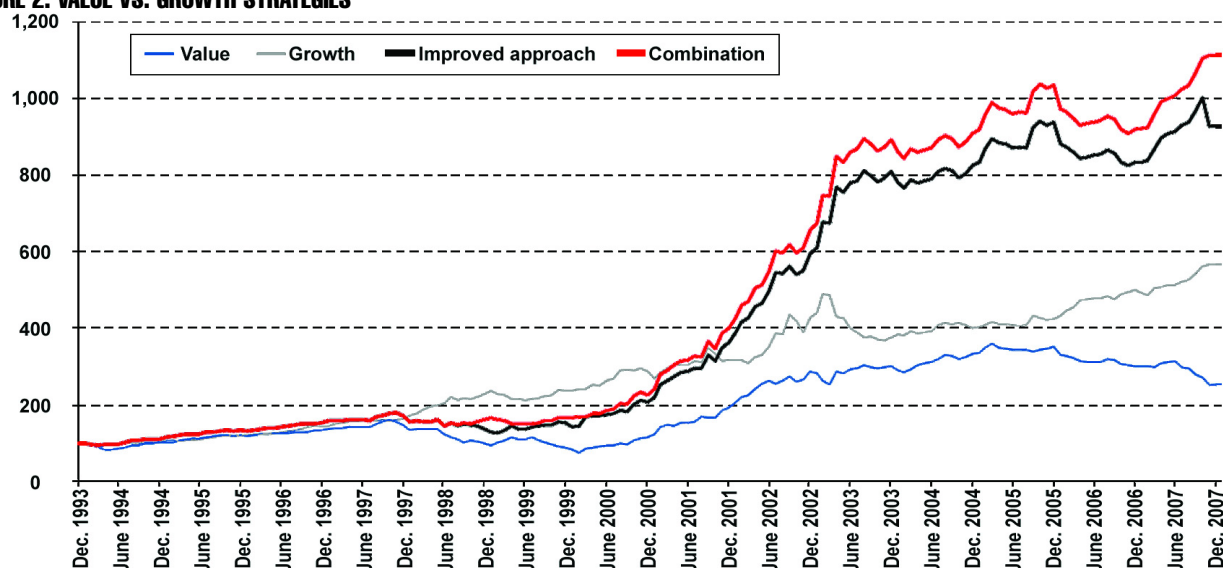


Switching between value and growth strategies each month was more profitable than focusing on only one category. And adjusting for extreme moves in either strategy's equity curve (i.e., the combined approach) boosted returns even further.

*Sources: MSCI, Factset, JP Morgan*

ing (*equity curve drops two standard deviations*) then we switch to growth and vice versa. But if the equity curves of both styles are within two standard deviations, the normal rules still apply.

**AT:** *Is it correct to say the strategy switches between value and growth stocks based on two rules — the original spread in valuations and the equity curve of whichever category (value or growth) you're currently following?*
**MD:** Yes. (*Table 3 and Figure 2 show the performances of different iterations of the strategy — value, growth, monthly switching, and the combined approach, which also adapts to equity-curve moves.*)

**AT:** *What type of strategies are quants trading these days?*
**MD:** Institutional investors are now more interested in very high-frequency strategies. In this highly volatile market, you want to keep positions for a very long time or not at all. More fund managers are exiting trades within a day or hour. There are plenty of arbitrage opportunities there.

In the past, quant strategies have tended to overlap, which became a big problem. In August 2007, some quant strategies suffered as people realized they were highly correlated. Many of these trades were overcrowded. Now fund managers

are trying to find ideas that are difficult to replicate, which has led them to high-frequency trading. It requires a huge infrastructure, which stops 80 to 90 percent of fund managers from trying it.

**AT:** *When Goldman Sachs' quantitative Global Alpha fund ran into trouble in August 2007, was it a wake-up call for the rest of the industry to make sure they're not trading the same strategy?*
**MD:** That was the end of the easy money for quants. Basic long-short strategies had earned double-digit annual returns with low volatility and risk for years. But when large institutions liquidated their portfolios, it had a large impact on everyone else. 🎧

## TABLE 3: VALUE VS. GROWTH STATISTICS

| | Annualized growth (1994-2008) | % of winning months | Average month | Best month | Worst month | Volatility | Sharpe ratio |
|---|---|---|---|---|---|---|---|
| **Value** | 6.90% | 57.40% | 0.60% | 15.80% | 9.90% | 4.20% | 0.13 |
| **Growth** | 13.30% | 66.30% | 1.10% | 12.90% | -11.60% | 3.20% | 0.74 |
| **Value-growth switching strategy** | 17.50% | 68.50% | 1.40% | 15.80% | -9.90% | 3.90% | 0.93 |
| **Combination strategy** | 19.00% | 71% | 1.50% | 15.70% | -6.60% | 3.50% | 1.15% |

By monitoring subtle shifts between value and growth strategies (based on changes in median PE forecasts and equity curves), investors could have earned an average 19 percent annually.

*Sources: MSCI, Factset, JP Morgan*