M&G (Lux) Global Maxima Fund

Investment review

Marc Beckenstrater and Gautam Samarth, Co-fund mangers

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- The M&G (Lux) Global Maxima Fund is a long-only, bottom-up stockpicking equity fund, with at least 80% of the fund invested in the shares of companies from across the world. But unlike the traditional stock selection process employed by other M&G equity funds, the investment engine for this product is 'machine learning'.
- The fund is managed by Marc Beckenstrater and Gautam Samarth, co-heads of the Systematic Investment Strategies team at M&G.
- Against a particularly volatile period for stockmarkets, we are pleased with the fund's performance since its launch in December 2019.

The value and income from the fund's assets will go down as well as up. This will cause the value of your investment to fall as well as rise. There is no guarantee that the fund will achieve its objective and you may get back less than you originally invested.

We launched the M&G (Lux) Global Maxima Fund ("Maxima"), a long-only global equity fund, on 11 December 2019. Maxima is a bottom-up stockpicking fund, but unlike the traditional stock selection process employed by other M&G equity funds, the investment engine for this product is 'machine learning'.

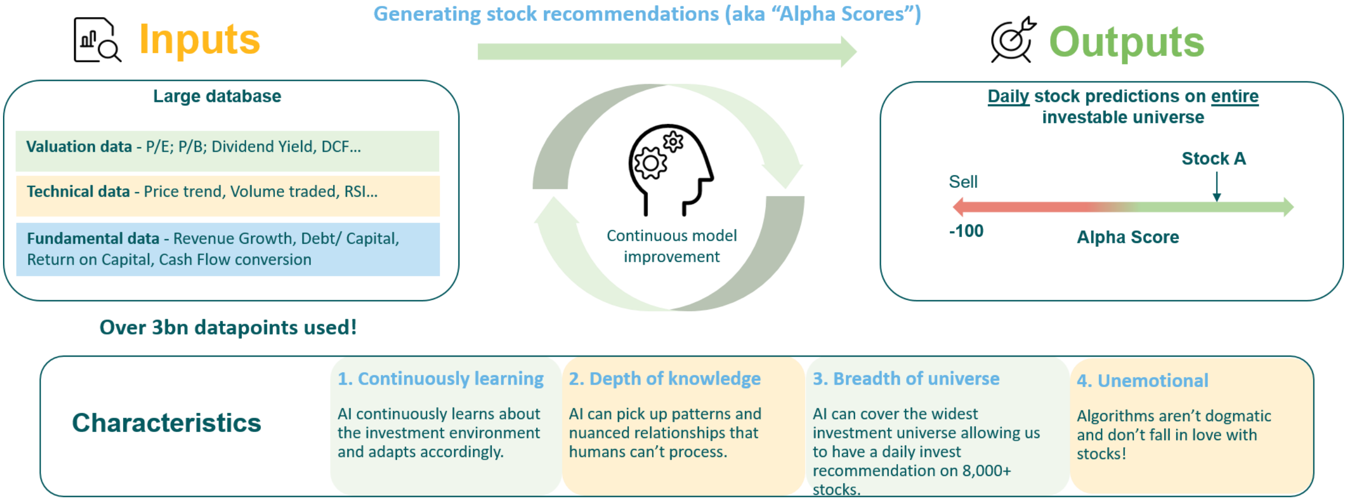
The fund is managed by Marc Beckenstrater and Gautam Samarth, co-heads of the Systematic Investment Strategies team at M&G. Between them, the managers have around 20 years of experience managing quantitative investment strategies.

Teaching machines to pick stocks

Machine learning is a subset of artificial intelligence – the broad study of developing algorithms to imitate human cognitive functions (such as pattern recognition). Machine learning does not rely on a pre-defined set of rules developed by humans in order to make decisions or predictions. Rather, machine-learning techniques learn these rules from historic data and apply them to the real world to assist decision-making.

Training Maxima's machine-learning models involves analysing vast amounts of historic data about each company in the fund's investment universe and detecting which characteristics have typically resulted in a stock's outperformance. By scouring this vast amount of data, the model seeks to uncover patterns that might not be easily identified by the human eye. But as always, investors should keep in mind that past performance is not a guide to future performance.

Figure 1. Applying artificial intelligence to stockpicking



Source: M&G, January 2022.

P/E = price-to-earnings; P/B = price-to-book, DCF = discounted cashflow

Once the machine-learning models have been taught, they are given live data to select stocks for inclusion in the portfolio (see Figure 1). Stocks shortlisted for inclusion are reviewed by the Systematic Investment Strategies team, who use their own judgement, along with feedback from the M&G research analyst team, to determine which stocks are included in the portfolio. This sense check is to ensure that there are no issues that are not reflected in the data, which could have a material impact on the stock.

Good data is essential

The integrity of the quantitative database we use is a crucial part of the fund's investment process. We have constructed a proprietary database, which brings together information from several established sources of data for investment analysis. Value is added by combining relevant sources of information into a single source, identifying and removing data errors and by performing transformations on the datasets to improve their usefulness to the statistical model.

We have input more than 400 data points – fundamental (earnings per share, sales growth, etc), valuation (price-to-book, price-to-earnings ratio, dividend yield, etc) and technical (eg, momentum) – on each stock in the universe at weekly intervals going back more than 25 years. The database covers more than 10,000 companies and has more than three billion data points. The development is ongoing, given the dataset continues to build with every passing day.

Tilting the odds in our favour

Over time, the success of the model is determined by the percentage of stocks it picks that outperform, along with the magnitude of the outperformance.

The model has been trained using a probabilistic framework with the objective of tilting the odds of investing in its favour. (A probabilistic framework describes how to represent and manipulate uncertainty about models and predictions. It plays a central role in machine learning.)

A good analogy might be using a slightly weighted coin in a game of 'flipping a coin', with the added bonus of having a better payoff on winning versus losing flips. Such an approach allows for two ways of 'winning':

Picking more winners than losers

The 'hit rate' refers to the percentage of stock bets that outperform the fund's benchmark (the MSCI ACWI Net Return Index). All else being equal, a hit rate above 50% will result in the portfolio outperforming its benchmark.

Since inception and up until the end of 2021, Maxima placed 8,976 stock bets, winning (ie, outperforming its benchmark) 4,488 of them, thus generating a hit rate of 50%. (Going forward we would aim for a hit rate greater than 50%.)

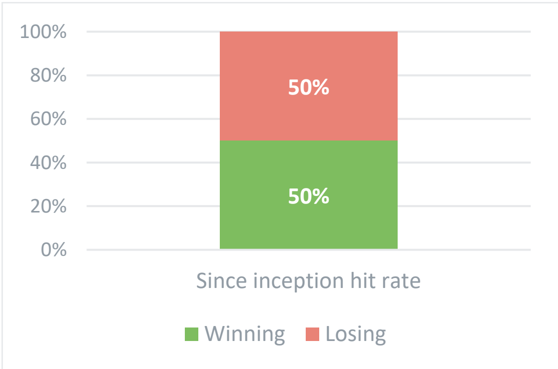
Winning by more

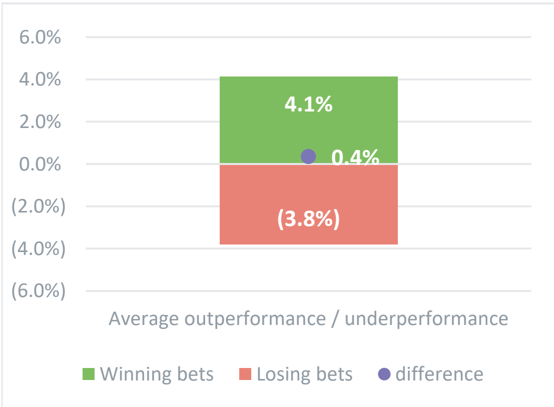
The 'skew' in returns refers to the difference in performance of the winning and losing stock bets. All else being equal, a positive skew (better performance of winners versus losers) will result in superior portfolio level returns.

Since inception, the average winning stock bet outperformed the benchmark by 4.1% per week while the losing stock bets underperformed by -3.8% per week, offering a positive skew of 0.4% on winning versus losing bets (Figure 2). (The figure of 0.4% reflects the effects of rounding.)

What's clear from the above analysis is that the key driver of returns for the portfolio since inception has been the positive skew. However, over time, we would expect both hit rate as well as skew to contribute to performance.

Figure 2. Portfolio hit rate and skew since inception





Past performance is not a guide to future performance.

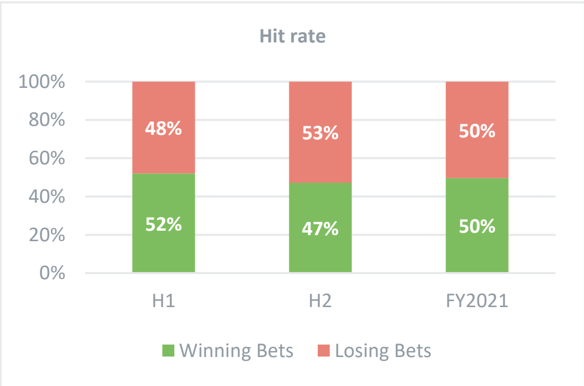
Skew is the difference in performance of the winning and losing stock bets.

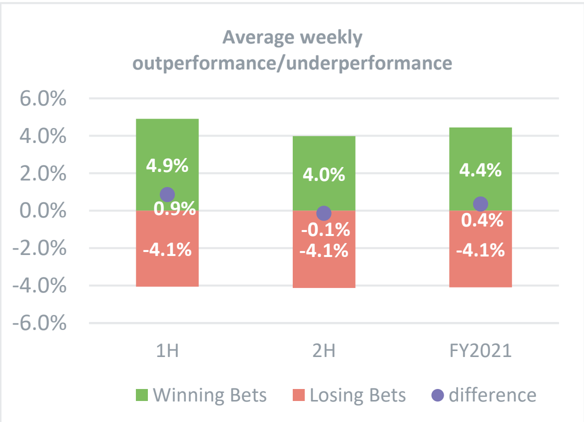
Source: M&G, January 2022.

2021 – a tale of two halves

Similar to the weighted coin analogy, the bigger the sample of flips (or in our case, investment bets), the better the odds of outperforming. Over the long term, we would expect the portfolio statistics to converge to our expectations of a hit rate greater than 50% and a positive skew.

Figure 3. Portfolio hit rate and skew in 2021





Past performance is not a guide to future performance.
Source: M&G, January 2022.

These statistics (hit rate and skew) can deviate significantly over shorter periods of time. This is evident when we break down 2021 into two calendar halves (Figure 3). Both hit rate as well as skew were very positive in the first half of the year, but these statistics reversed over the second half, hurting performance. However, over the course of the entire year, the hit rate was around 50% with a positive skew which resulted in outperformance.

We therefore advocate patience when viewing the portfolio in this light, acknowledging that large samples are required for statistics to converge to their expected values. This is especially important when applying such a probabilistic framework to understand investment portfolio returns because stock bets, unlike coin flips, are not completely independent (external factors such as macro and market regime can impact multiple stocks in the portfolio at the same time) and thus require a larger sample (flips) for proper measurement.

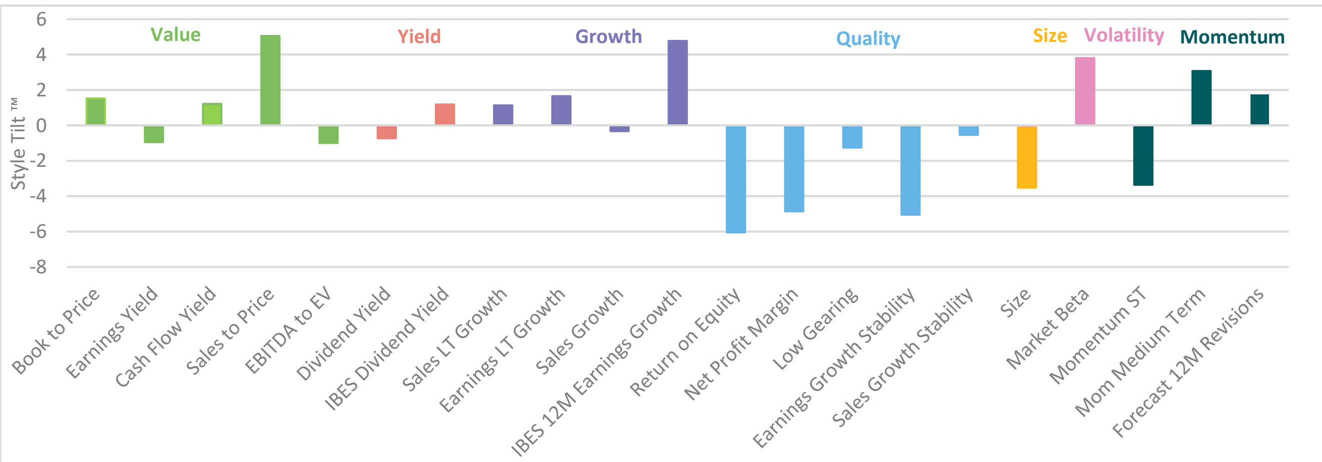
High-conviction portfolio of equally weighted stocks

The fund does not simply include the stocks that get the highest rankings – portfolio construction is an important consideration. We seek to optimise the portfolio in order to maximise the allocation to those companies with the highest probability of outperformance, while controlling for other factors such as sector and country positions.

The whole ethos behind this approach is that the fund is not about having one or two dominant stocks driving the entire portfolio – it is about selecting more winners than losers. The result is a high-conviction portfolio of 50 to 100 equally-weighted stocks. Typically, three or four stocks per week join or leave the portfolio.

Unlike sector and currency exposures that are controlled at the portfolio construction level, the fund's style exposures are not set in stone. Maxima's machine-

Figure 4. Style exposure



Source: Investment Metrics, 31 December 2021.

The terms below the horizontal axis reflect different investment valuation metrics.

learning models are constantly being trained to identify which stocks are most likely to outperform, with the investment style a by-product of the best opportunities identified by the models. For much of 2020, the portfolio has had a bias towards growth stocks, quality stocks and stocks with positive momentum. At the end of 2021, the portfolio's bias was more towards value and growth stocks, while being underweight quality (see Figure 4).

Fund performance

Against a particularly volatile period for stockmarkets, we are pleased with the fund's performance since inception in December 2019 (see Figure 5).

Figure 5. Five-year fund performance (% pa)

	2021	2020	2019	2018	2017
Fund USD (A)	22.2	19.3	n/a	n/a	n/a
BM* (USD)	18.5	16.3	n/a	n/a	n/a

Past performance is not a guide to future performance.

The fund launched on 11 December 2019 so we are unable to show 10-year performance data.

* Benchmark (BM) is the MSCI ACWI Net Return Index. The benchmark is a comparator against which the fund's performance can be measured. It is a net return index which includes dividends after the deduction of withholding taxes. The index has been chosen as the fund's benchmark as it best reflects the scope of the fund's investment policy. The benchmark is used solely to measure the fund's performance and does not constrain the fund's portfolio construction. The fund is actively managed. The investment manager has complete freedom in choosing which investments to buy, hold and sell in the fund. The fund's holdings may deviate significantly from the benchmark's constituents.

Source: Morningstar, Inc., as at 31 December 2021, USD Class A Acc shares, income reinvested, price-to-price basis.

Since launch, the M&G (Lux) Global Maxima Fund has outperformed its benchmark, the MSCI ACWI Net Return Index (21.7% pa versus 18.7% pa) and is in the 26th percentile versus its peer group, the Morningstar Global Flex-Cap Blend Equity Sector.

The fund can be exposed to different currencies. Movements in currency exchange rates may adversely affect the value of your investment.

An evolving process with humans at its core

We are reassured to see that the successful track record built up prior to launching the fund (Maxima's investment process was tested for almost two years before launch) has continued over the past two years. Our focus remains the same – continuing to fine-tune the investment engine and monitor the behaviour of the portfolio – in much the same way that the other equity fund managers do at M&G.

As the model is always learning and evolving, the characteristics of the stocks chosen for inclusion into the portfolio might change over time. However, the process for developing the model remains the same, whereby experienced fund managers and analysts are responsible for guiding its evolution and implementation.

Such an approach ensures that while the machine-learning capabilities and models continue to improve, it is still humans that ultimately make sure they are applied appropriately. This oversight gives us confidence that the fund is well-placed to navigate markets going forward – whatever they throw at us.

Other important information

- The fund invests mainly in company shares and is therefore likely to experience larger price fluctuations than funds that invest in bonds and/or cash.
- Investing in this fund means acquiring units or shares in a fund, and not in a given underlying asset such as a building or shares of a company, as these are only the underlying assets owned by the fund.
- Further risks associated with the fund can be found in the fund's Key Investor Information Document.

M&G
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UCITS HAVE NO GUARANTEED RETURN, AND PAST PERFORMANCE IS NOT A GUIDE TO FUTURE PERFORMANCE

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