Investment Insights

UBS Asset Management

For professional / qualified / institutional clients and investors only | May 2018

The challenge facing all active managers is to deliver sustainable excess returns in a cost-effective way. *Investment Insights* asks Bryan Cross, Head of UBS Asset Management's Quantitative Evidence and Data Science team (QED), about the role of data science in the evolution of active investment processes.

Can data science transform alpha generation?

Erin Browne, Sam Buttrick, Bryan Cross, Dan Heron

Q: What does the QED team actually do?

A: UBS Asset Management's role as investment managers is to deliver the outcomes our clients expect efficiently and effectively. However, this is a dynamic industry. What was considered efficient a decade ago doesn't meet clients' expectations now. Roll forward a decade and our clients' expectations are likely to have further evolved significantly.

Despite these on-going pressures to improve, the basic methodology of investment security selection has remained largely unchanged for the best part of a century. While the advent of computers and dramatic improvements in processing power have allowed some data intensive tasks to be performed more quickly than they were previously, the accuracy of financial forecasts has not improved. Why? Overall the approach still relies heavily on educated guesses, albeit from skilled investment professionals, and on the financial data provided by the company: the income statement, the balance sheet and the cashflow statement. Since the process has remained unchanged for so long, it is hardly controversial to suggest that there might be room for improvement. In particular, the building of individual security-specific models and forecasts is time intensive and subjective. This makes the generation of alpha in a consistent, scalable and predictable manner extremely difficult—yet this is precisely what our clients want and expect.

> We see the combination of country, sector, industry and security expertise with data science as a sustainably powerful alpha engine.

Our job within QED is therefore to partner with our individual investment teams to incorporate data in a more effective way in their investment processes. In our view there are material and long-lasting gains to be made. Using traditional data more intelligently means we are able to cover more ideas than traditional analytical techniques at lower cost. Mining 'alternative' data sets offers a broader range of potential alpha sources as well as a higher quality, lower volatility and more sustainable source of alpha. We therefore exist to support UBS Asset Management's investment teams, to help improve outcomes by increasing the volume and quality of objective insights and by reducing the need to rely on subjective forecasts, however well informed those subjective forecasts are.

If you would like to learn more about the ways we can help you meet your investment challenges, please contact your UBS representative or visit **www.ubs.com/am**.

UBS

Since the skills that data scientists bring to the table are independent of asset class or industrial sector—a centralized approach to data science makes the most sense. More than anything, we are empowering highly skilled analysts across the research space to leverage more effectively their own considerable expertise and experience. Data science serves to enhance not replace analysts' skillsets. We see the combination of country, sector, industry and security expertise with data science as a sustainably powerful alpha engine.

Q: Alternative data: what is it, why use it?

A: 'Alternative' data is any data outside of the normal financial statements released by companies which can provide efficient insights into trends that impact company revenue and profitability over multiple time horizons.

The provision of alternative data is a fast growing specialist industry in itself. We have identified nearly 300 specialist providers of data covering an ever growing array of underlying industries and themes. These include debit and credit card data which provide insights into consumer spending patterns and growth rates, web traffic and mobile app usage data, as well as consumer sentiment indicators based on aggregated data across social and traditional media websites. Other alternative data sources include location data from mobile phone signals, which can be used for behavioral insights, and satellite data which generates real time analysis of shipping cargo, weather patterns, agricultural trends and oil storage patterns, among others. There are also alternative data market places where vendors can seek to proactively monetize their data.

In combination with the data vendors we map this data to individual stocks—providing sales forecasts at the stock level from alternative data rather than from traditional sources. The evidence to-date is that alternative data provides more accurate and timely estimates for revenue as well as gross margins, which can be used for forecasting profitability.

Q: With so much data out there how do you determine what to look at and what not to?

A: Data is data; big or small, alternative or traditional. We are agnostic in this regard and focus on the application of data to potential alpha generation. Ex ante, we have to make judgments on the probable utility of the data. For example, for revenue forecasting, transaction data is much more likely to be useful than location data from mobile phone GPS signals. At the same time, it is not usual to achieve better forecasts by combining datasets—which obviously can only be explored with access to multiple datasets.

The evidence to-date is that alternative data provides more accurate and timely estimates.

The probability that investors have already exhausted or arbitraged away all of the potential information value seems very small.

Q: Is there a risk of crowding in certain data sets?

A: It is hardly a secret that many investment firms are dedicating time and resource to exploring the potential benefits of data science. A common refrain we hear is that any unique alpha potential associated with data science has already been captured by early adopters or is likely to be eroded quickly. Considering the discipline is in its infancy, the growing number and scale of the datasets, multiple investment time horizons, infinite combinations of data, model and human interaction—the probability that investors have already exhausted or arbitraged away all of the potential information value seems very small. This is not high frequency trading where the ability to get an edge through improvements in order execution speed has been all but exhausted. Of course, the burden is justifiably on us to reject the null hypothesis and demonstrate that data science can deliver a sustainable improvement in outcomes. The reality to-date is that excess returns have actually been both significant and stable.

We employ a number of cutting edge statistical modelling techniques that are not widely used by our peers.

Q: What are the other main risks?

A: Clearly the quality of our outputs relies on robust data and modelling. Due diligence on our data providers is therefore integral to the process—and this includes out-of-sample testing to gauge the accuracy of our models utilizing the data. We also build in a cross-validation procedure to further validate what we are doing.

Our approach to the inherent risks in our models is no different to any analyst in that we apply a proper risk-based haircut in order to build in conservatism. After all, no algorithm is perfect—a human writes it. We seek to understand the precise value in a signal or piece of data. This starts with fundamental economic concepts and with understanding the way data is being delivered to you. There are a number of biases to avoid when running simulations—just as there are when modelling any data. Our motto is "Trust but verify".

Perhaps a little surprisingly, issues can arise from lack of data just as much as from too much. We recently looked at some location data from mobile phones to identify patterns and trends in the retail industry. The data was based on the GPS movements and data traffic of some 10 million mobile phone users, pinpointing where each user was located within a couple of feet and their movements over time. As comprehensive as the data was, the provider had only six quarters of such data—i.e. very little with which to make the sort of year-on-year comparisons that tend to drive share prices. In truth there are as many 'small' data problems as 'big' data problems.

That said, where there is risk there is also opportunity. We employ a number of cutting edge statistical modelling techniques that are not widely used by our peers. These can help to develop insights faster and to extract insights even from 'small' data which other investors tend to overlook. We also believe the QED has a strong balance of skillsets—blending decades of fundamental expertise with the core quantitative skills. It is this blend of skillsets that allows us to recognize signals that perhaps a team consisting purely of quantitative skillsets might take longer to identify or might not recognize at all.

Q: Is the opportunity for better use of data equal across asset classes? To what extent have you permeated investment processes within UBS-AM?

A: Logically, the opportunity set increases with risk—so is likely larger for equities. To-date we have focused much of our efforts within equities where internal demand is at its highest. Adoption by our hedge fund teams has been quicker and more comprehensive than the uptake in long-only portfolios thus far. To a degree, that simply reflects that the use of data science is already well established in the hedge fund community—and that our current datasets can better inform the shorter investment time horizons of some equity long/short funds. However, we are already very focused on expanding the duration of our forecasts in order to predict behavior over multiple horizons that will better suit our long-only equity teams.

Outside of equities we see credit investment processes as a particularly data sparse environment that is likely to offer significant opportunities for improved risk-adjusted returns through the use of data. We expect to start work here in 2019.

For fixed income and multi asset there are opportunities in improving the forecasting of key macroeconomic variables and we are already working with the asset allocation team to build macroeconomic nowcasting models that will help to inform their tactical asset allocation positioning and decision making.

Q: How do you currently interact with the individual investment teams across UBS Asset Management?

A: There are two distinct forms of engagement between QED and our investment teams across UBS Asset Management. First, we look at a

Analysts are already beginning to think differently and proactively embracing data science as a core part of their toolkit.

number of different data sets on a regular basis with a particular focus each quarter. We then push out to the investment teams the results of our analysis so that it can be reviewed and incorporated into forecasts. Last quarter we were looking at credit card data with a view to forecasting retail sales. This quarter we are looking specifically at car sales data.

As our investment teams become more familiar and confident with QED's output we are increasingly being asked by analysts across Asset Management's investment teams to corroborate a hypothesis using alternative data. This gives us confidence that analysts are already beginning to think differently and proactively embracing data science as a core part of their toolkit.

Q: How do you see the role of data evolving within the investment process over time?

A: To the extent that data science improves outcomes and demonstrates clearly that it enhances the traditional approach, one would expect the data science skills to become more pervasive and diffused across investment teams in the future.

While relatively new in the context of, for example, security selection—we see the use of data science evolving into a core part of the analytical framework that is embedded seamlessly in investment processes. In much the same way as ESG has gone from being a standalone analytical concept on the periphery of mainstream asset management to being integrated—we see data science becoming a similarly fundamental part of the investment process mosaic, a core and value-adding tool within analysts' armory.

One of the most common misconceptions about QED is that we are trying to replace the traditional investment process. We're not. Data science is not about machine replacing man, but rather about helping investment teams leverage their own expertise more effectively to deliver on clients' expectations in a more efficient way. Where we have integrated our analysis into investment processes we've already had some very powerful results. In our view, this is just the beginning.

Data science is not about machine replacing man, but rather about helping investment teams leverage their own expertise more effectively to deliver on clients' expectations in a more efficient way.

Further reading

If you would like to learn more about the ways we can help you meet your investment challenges, please contact your UBS representative or visit **www.ubs.com/am.**

For marketing and information purposes by UBS. For professional clients / qualified / institutional investors only.

This document does not replace portfolio and fund-specific materials. Commentary is at a macro or strategy level and is not with reference to any registered or other mutual fund.

Americas
The views expressed are a general guide to the views of UBS Asset Management as of May 2018. The information contained herein should not be considered a recommendation to purchase or sell securities or any particular strategy or fund. Commentary is at a macro level and is not with reference to any investment strategy, product or fund offered by UBS Asset Management. The information contained herein does not constitute investment research, has not been prepared in line with the requirements of any jurisdiction designed to promote the independence of investment research and is not subject to any prohibition on dealing ahead of the dissemination of investment research. The information and opinions contained in this document have been compiled or arrived at based upon information obtained from sources believed to be reliable and in good faith. All such information and opinions are subject to change without notice. Care has been taken to ensure its accuracy but no responsibility is accepted for any errors or omissions herein. A number of the comments in this document are based on current expectations and are considered "forward-looking statements". Actual future results, however, may prove to be different from expectations. The opinions expressed are a reflection of UBS Asset Management's best judgment at the time this document was compiled, and any obligation to update or alter forward-looking statements as a result of new information, future events or otherwise is disclaimed. Furthermore, these views are not intended to predict or guarantee the future performance of any individual security, asset class or market generally, nor are they intended to predict the future performance of any UBS Asset Management account, portfolio or fund.

EMEA
The information and opinions contained in this document have been compiled or arrived at based upon information obtained from sources believed to be reliable and in good faith, but is not guaranteed as being accurate, nor is it a complete statement or summary of the securities, markets or developments referred to in the document. UBS AG and / or other members of the UBS Group may have a position in and may make a purchase and / or sale of any of the securities or other financial instruments mentioned in this document.

Before investing in a product please read the latest prospectus carefully and thoroughly. Units of UBS funds mentioned herein may not be eligible for sale in all jurisdictions or to certain categories of investors and may not be offered, sold or delivered in the United States. The information mentioned herein is not intended to be construed as a solicitation or an offer to buy or sell any securities or related financial instruments. Past performance is not a reliable indicator of future results. The performance shown does not take account of any commissions and costs charged when subscribing to and redeeming units. Commissions and costs have a negative impact on performance. If the currency of a financial product or financial service is different from your reference currency, the return can increase or decrease as a result of currency fluctuations. This information pays no regard to the specific or future investment objectives, financial or tax situation or particular needs of any specific recipient.

The details and opinions contained in this document are provided by UBS without any guarantee or warranty and are for the recipient's personal use and information purposes only. This document may not be reproduced, redistributed or republished for any purpose without the written permission of UBS AG.

This document contains statements that constitute "forward-looking statements", including, but not limited to, statements relating to our future business development. While these forward-looking statements represent our judgments and future expectations concerning the development of our business, a number of risks, uncertainties and other important factors could cause actual developments and results to differ materially from our expectations.

UK
Issued in the UK by UBS Asset Management (UK) Ltd. Authorised and regulated by the Financial Conduct Authority.

APAC
This document and its contents have not been reviewed by, delivered to or registered with any regulatory or other relevant authority in APAC. This document is for informational purposes and should not be construed as an offer or invitation to the public, direct or indirect, to buy or sell securities. This document is intended for limited distribution and only to the extent permitted under applicable laws in your jurisdiction. No representations are made with respect to the eligibility of any recipients of this document to acquire interests in securities under the laws of your jurisdiction.

Using, copying, redistributing or republishing any part of this document without prior written permission from UBS Asset Management is prohibited. Any statements made regarding investment performance objectives, risk and/or return targets shall not constitute a representation or warranty that such objectives or expectations will be achieved or risks are fully disclosed. The information and opinions contained in this document is based upon information obtained from sources believed to be reliable and in good faith but no responsibility is accepted for any misrepresentation, errors or omissions. All such information and opinions are subject to change without notice. A number of comments in this document are based on current expectations and are considered "forward-looking statements". Actual future results may prove to be different from expectations and any unforeseen risk or event may arise in the future. The opinions expressed are a reflection of UBS Asset Management's judgment at the time this document is compiled and any obligation to update or alter forward-looking statements as a result of new information, future events, or otherwise is disclaimed.

You are advised to exercise caution in relation to this document. The information in this document does not constitute advice and does not take into consideration your investment objectives, legal, financial or tax situation or particular needs in any other respect. Investors should be aware that past performance of investment is not necessarily indicative of future performance. Potential for profit is accompanied by possibility of loss. If you are in any doubt about any of the contents of this document, you should obtain independent professional advice.

Australia
This document is provided by UBS Asset Management (Australia) Ltd, ABN 31 003 146 290 and AFS License No. 222605.

Source for all data and charts (if not indicated otherwise): UBS Asset Management

The key symbol and UBS are among the registered and unregistered trademarks of UBS.

www.ubs.com/am-linkedin

18-0442 5/18
www.ubs.com/am

For professional / qualified / institutional clients and investors.

UBS