MSCI

Technology and Generational Change For Investors

By Peter Zangari

Looking at the technological advancements **revolutionizing our industry**

Regardless of what type of investor you are – a fundamental manager, a "quant" or anywhere in between – your decisions around building, maintaining and measuring performance of portfolios depends on analytics and data. For much of the investment industry's history, the obstacle was either an absence of data or the difficulty of obtaining it; in other words, there was not enough, or the computing speed to perform the requisite calculations. This led to some degree of "trusting your gut," a reputation of a "clubby" industry where relationships were key and the rise of star managers such as Warren Buffett and Peter Lynch.

Today, managers face the opposite problem – an abundance of data – and not just from traditional sources. There has been a huge rise in so-called "alternative data," such as metrics drawn from online behavior and analyzing earnings calls. Data, however, is not insight. Collecting the data, sorting and processing it and delivering the analysis in an easy-to-consume format is key for investors to make informed decisions. So much more is possible now, especially given advancements in machine learning and artificial intelligence.

Technology is everywhere

To begin our exploration of these developments, let's take a step back from the investment world and consider how our day-to-day lives have changed, even if many of our activities have not. For example, for centuries, human beings have enjoyed listening to music. It brings us together, allowing us to share common experiences. It causes us to dance or sing, soothes and inspires us. In those respects, listening to music has not changed.

So, what has changed? There was a time, of course, when the only way to listen to music was to be in the room when the music was being played. Over time, we developed the technology to record music, which allowed individual listeners to hear it when they chose so long as they also had the means by which to play it. Next, we were introduced to the idea of broadcasting music, which allowed even larger numbers to listen at the same time. The pace of the technology advanced, moving us from records to 8-tracks, and to cassette tapes and compact discs, which also allowed for portability so we could listen on the go. And now music is digital. Yet, it didn't stop there. Over the course of less than a generation, we've gone from marveling at the wonder of iPods, which allowed us to access a full home catalog's worth of music on a small, hand-held device with just a few clicks, to thinking nothing of our ability to hear nearly any song we can think of simply by speaking aloud using everyday language to tell a smart speaker to play it. It's truly quite remarkable.

As it is with listening to music, the basic tenets of investing have not changed. The difference is... technology has evolved. As a result, views can be incorporated faster and more efficiently.

Financial slowdown?

While many investment professionals have adapted to such advancements in their personal lives, as a group, we have been slower to adopt technological advances that can help us do our jobs better. On the one hand, we're all becoming data scientists now, putting to use at least some of what's possible from technology in one form or another, be it an asset owner selecting managers, an asset manager determining how to allocate a portfolio or a wealth manager weighing different scenarios for their client. But it's taken us a while to come even as far as we have and many in our industry have not fully let go and embraced it in a way that allows us to benefit from one of the main advantages of technology. Namely, that the faster you can do something, the more informed questions you can ask and answer, and the better you're able to get at it and potentially gain from your overall process. Advances in technology have removed the time and effort involved to get the basics so investors can spend their time determining what it all means and taking action.

After all, much as it is with listening to music, so it is with investing. That is, the basic tenets of investing have not changed. Investors have their views that affect how they go about reaching their goals; how they pursue greater alpha or work to manage risk. They take positions and make decisions about: where to invest, such as the emerging markets or developed markets; which sectors to focus on, such as information technology or consumer discretionary; which factors to tilt toward or away from, such as momentum or quality; employing sustainable investing practices, such as choosing to integrate environmental, social and governance (ESG) considerations into a portfolio or excluding certain companies because of ESG concerns; and, one of the oldest questions, value or growth.

Again, these types of views continue to form the basis for investigation, analysis and building and maintain portfolios. The difference is that, just as with music and many other areas of our non-professional lives, technology has evolved. As a result, views can be incorporated faster and more efficiently.

Digital immigrants vs. Digital natives

The level at which an investment professional embraces, uses and pushes forward with technology seems to be inversely correlated with their age. While nearly everyone walks around with a powerful computer in their pocket these days, for those of us who have been in the game longer, it's a learned behavior. Younger new hires for the MSCI Research and Product Development team, for example, come to the workforce having never known life or work any other way. The comfort level of these "digital natives," therefore, tends to be much higher. Regardless of any individual's fluency, however, this technology isn't going anywhere, and us veterans need to catch up.

So far
so faster

As it turns out, preparing to catch up may mean getting ready to run, and fast. The pace of technological change has tended to increase. Take the example of processing speeds. As I mentioned earlier, it's vital that investors have tools to help make sense of the plethora of data that exists, and we do. Consider the time it would take in 1959, when Harry Markowitz sought to measure the co-variance of 2,000 securities versus in 1993, when I was a Ph.D. graduate student. And today, you could accomplish the same tech driven calculations instantly.

At this rate, it's no exaggeration to say we live in a world with seemingly limitless possibilities. With the acceleration of data collection, and machines' ability to process it, investors could conceivably go from making decisions based on a specific number of inputs, to an ever-growing number. Even the algorithms used, which have been around for decades and seemingly wouldn't change, may evolve as well, powered by the rapid accelerations in technology enabled by the proliferation of data.

Is the term "big data" big enough?

There is more data from more sources than ever before. This includes more-ready access to traditional sources of data, as well as what is known as alternative data. Here, we briefly discuss three methods, including searching for key words in corporate findings, using online mentions to assess consumer sentiment and drawing insights from stock transactions by company insiders.

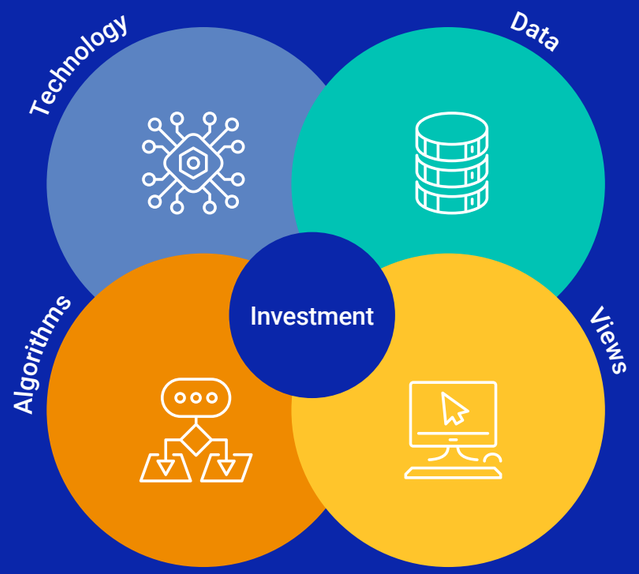
Thanks to natural language processing and machine learning, it's possible to gain valuable information from machine reading of a company's 10-k filings or transcripts of an earnings call. Depending on an investor's views or thesis, it's possible to scan for key words, such as sustainability or diversity. The technique can also be used to develop a sense of how the company defines itself through frequency of words used and patterns noted in these texts. Such a strategy may be helpful for constructing peer groups to guide stock selection, weightings and measuring relative performance.

Another means of data collection allows us to acquire consumer-sentiment metrics based on changes in the number of citations a company receives on its products and brands in reviews, social media and other web content, and its relationship with that company's fundamentals and stock performance.

Our final example looks to the company insider transactions dataset, including filtering for transactions done by key company executives, those related to employee compensation. We found that this data stood out with unique characteristics when compared to traditional risk model style factors.

While investors are flooded with these alternative datasets, not all have shown value. When the Research team at MSCI analyzed the three methods above, however, we found they stood out as having explanatory power beyond traditional factors.

Indeed, on their own, the value and potential of technology, algorithms and data is notable, but limited. The true power comes from the intersection of these three along with investors' views.



Reshaping financial services

The power of these forces has been felt in financial services firms as much as in any other sector. Asset managers, even fundamentals-driven investors, have begun to incorporate technology into their process. Supplementing the human analyst with the advancements in technology, algorithms and data means more time and more added value by making use of the analysis and insights to build and maintain portfolios. Such data science techniques – the intersection of technology, algorithms and data – are not only more cost efficient, but are more time efficient, allowing for better focus and more time to be thoughtful rather than executional.

At MSCI, we've seen how this intersection has affected our day-to-day operations. In 2019, we introduced the Data Science Platform (DSP) to our Research teams.

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Bringing it **all together**

Let's take a look at an example to show how this acceleration comes together to provide investors the opportunity for greater transparency, insight and control – and how it makes it much easier to access and put technology to use as investors formulate, investigate and implement their views.

For starters, our hypothetical institutional investor develops an investment thesis that starts with key issues or identifying long-term trends that can affect stock performance. In our example, the investor's thesis is that companies representing sustainable innovation will outperform their peers over time. They look at how key issues align within the environmental, social and governance pillars, using the MSCI ESG Ratings model.

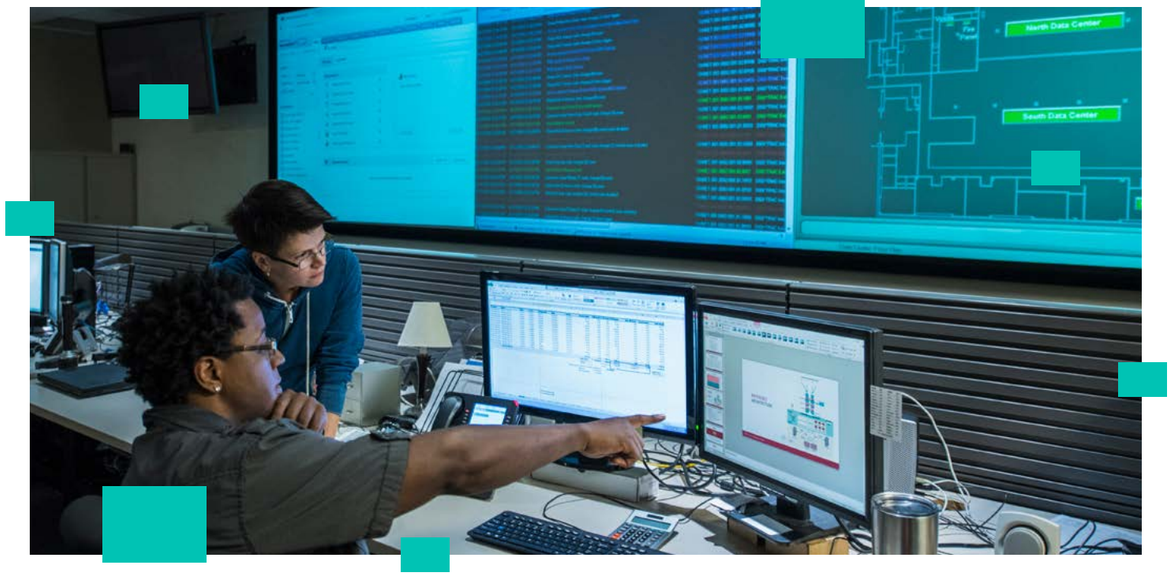
Key issues as defined by the MSCI ESG ratings model

E		S		G	
Environmental		**Social**		**Governance**	
Climate change	• Carbon emissions • Product carbon footprint • Financing environmental impact • Climate change vulnerability	**Human capital**	• Labor management • Human capital development • Health & safety • Supply chain labor standards	**Corporate governance**	• Board • Pay • Ownership • Accounting
Natural resources	• Water stress • Biodiversity & land use • Raw material sourcing	**Product liability**	• Product safety & quality • Chemical safety • Financial product safety • Privacy & data security • Responsible investment • Ins. Health & demographic risk		
Pollution & waste	• Toxic emissions & waste • Packaging material & waste • Electronic waste	**Stakeholder opposition**	• Controversial sourcing	**Corporate behavior**	• Business ethics • Anti-corruption practices • Corruption & instability • Financial system instability • Tax transparency
Environmental opportunities	• Clean tech • Green building • Renewable energy	**Social opportunities**	• Access to communications • Access to finance • Access to healthcare • Oppty. In nutrition & health		

In our investor's path toward seeking long-term investment opportunities, they ask themselves: How could a company achieve long-term growth? The thesis may be that the answer is innovation, and that consistent innovation comes from effective human capital management. Innovation, however, does not get reported on a balance sheet. Instead, it progressively manifests itself over time.

Human capital management can be measured by assessing a company based on a fixed set of HR practices, including public metrics such as turnover or employment-related lawsuits.

These concepts have always been possible to measure, but it's been difficult. Due to the technological advancements we've been discussing, it's become easier to do. Using a machine learning algorithm allows for a rapid "read" of company filings for relevant wordlists or phraseology related to innovation and human capital management. Perhaps more importantly, they're able to then calculate the keyword frequency and generate what we could call an innovation score. This, in turn, allows the investor to create a peer group/opportunity set of companies with high exposure to the innovation theme. From there, they can construct a portfolio and rebalance annually based on repeating the process with the company's public filings information. A sample of what the full process might look like is shown on the following page.



From index objective to keyword dictionary

MSCI Research refines the index objective

1 Initiate	2 Components	3 Parse top internet search results	4 Word selection	5 Comprehensive keyword list
"Companies that potentially stand to benefit from increased adoption and utilization of **robotics** and **artificial intelligence (AI)**, including those involved with industrial **robotics and automation**, non-industrial robots, and **autonomous vehicles**."	1. Robotics 2. Artificial intelligence 3. Autonomous vehicles	1. Blogs on relevant topics 2. News articles and other public resources	After sorting for relevance and frequency, natural language processing tools rapidly produce a list of key words for quality review	1. Robotics - robots, bot, android. actuator 2. AI - AI, artificial intelligence, intelligence 3. Autonomous vehicles - sensors, pneumatic, drone, motion control

The only constant **is change**

While the pace of change may have quickened, the story of human beings is a story of constant change and technological advancement. This is just as true in the world of investment.

Given the interest in gaining exposure to volatility in today's market, let's take the low volatility, or minimum volatility (min. vol.) factor, as an example. The technology that allowed us to identify and pinpoint the low volatility factor dates back to the 1970s. Some of the research behind it dates back even further. Continued advances allowed investors to adopt the idea into strategies. Then, companies like MSCI created indexes around min. vol. and asset managers introduced Min Vol ETFs and made them available to institutional investors. And today, investors can receive real-time alerts on market moves and related events and, if it makes sense, move money in or out of that ETF without missing a beat.

Everything we take for granted today was once revolutionary. Looking further ahead, it seems entirely possible that one day – and it may be soon – investors across the spectrum will be able to ask a question aloud, such as, "What's my largest area of risk in emerging markets?" and get an answer back in seconds spoken in plain English.

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