



“Intelligent Augmentation”: IA Instead of AI

Our New York Technology Development Center helps us make better decisions.

November 2019

KEY INSIGHTS

- Our New York Technology Development Center is designed to be a technology accelerator for our firm, as well as a partner for our investment division.
- Tools developed by the Center and our Equity Data Insights team in Baltimore have helped our analysts and portfolio managers deepen and extend their understanding of market dynamics and industry trends.
- Identifying hidden patterns in industry data through machine learning will provide important new tools for analysts in the coming years.

Here at T. Rowe Price, we believe that there are crucial factors in a business's success that can't be captured by numbers and spreadsheets. That's why our analysts and managers travel across the globe to meet with managements and get a ground-level view of a company's operations and customers. People, not computers and algorithms, are central to our investment process. This sets us apart from some on Wall Street, who are increasingly turning to computers to make investment decisions.

That said, we have been early and continuing believers in the power of technology to upend markets and industries—including our own. For many years, we have eagerly embraced the potential that technology offers to help us better serve clients and improve investment outcomes. We are especially interested in how our investment staff

can deploy technology to deepen and extend their understanding of market dynamics and industry trends.

Collaboration With Our Investment Division

It is in this spirit that we opened our New York Technology Development Center two years ago. The Center is designed to be a technology accelerator for our firm, with a focus on developing specialized capabilities in data science. We located the Center in New York partly because of the city's unique ecosystem of “fintech” firms, which offers both access to talent and closer proximity to our business partners.

The Center is far more than the fintech resource of T. Rowe Price, however. Our New York team members work closely with our investment division, seeking to harness the power of technology to aid in their research and decision-making



Robert Sharps
Group CIO

For many years, we have eagerly embraced the potential that technology offers to help us better serve clients and improve investment outcomes.



Cloud-based computing, falling memory prices, and other innovations have made gathering massive amounts of data cheap and easy.

process. The data scientists, application developers, and data engineers in our New York office collaborate to provide end-to-end solutions for our business.

Technologists and investment professionals have separate skillsets and sometimes seem to speak different languages. For that reason, we established a special Equity Data Insights (EDI) team with skills in both arenas. Situated in Baltimore in our investment division—as far as we are aware, a unique arrangement within our industry—the team helps analyze the unmet needs of our analysts and managers and translates them into actionable projects for our New York team.

The combined teams' goal is to help our investment analysts absorb more information and derive better insights into their industries. As the Center's leader, Jordan Vinarub, puts it, the goal is "intelligent augmentation" instead of artificial intelligence—"IA" instead of "AI." According to Jordan, his team "aims to apply automation and insight generation to help our business partners shift their mindshare to more valuable parts of the investment process."

IA in Action

Recent advancements in cloud computing, along with the availability of massive new datasets, have made it possible to apply machine learning to investing. Here are a few examples of how our investment division, the EDI team, and the Center have come together to put IA in action:

1 Clearly, how well a company is performing affects the value the market places on its stock, but the precise linkage is often unclear. The investment division wanted to gain deeper insight into how a company's various fundamentals—such as its earnings growth rate and profit margins—feed through into the stock's valuation multiples (such as its price-to-earnings ratio).

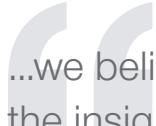
Using machine learning to analyze decades of performance information

and millions of data points, the EDI team and the Center developed a model that provides a theoretical valuation (TV) for every stock in the Russell 1000 Index. Analysts can use the tool to see how the TV might respond to a given change in fundamentals, such as an acceleration in the company's growth rate.

2 Cloud-based computing, falling memory prices, and other innovations have made gathering massive amounts of data cheap and easy. Government agencies, companies, and other institutions have put online valuable databases on consumer patterns and other information that can be mined for investment insights. The challenge is how to sort through these massive datasets—especially for analysts trained on Excel but unfamiliar with database software.

Vincent DeAugustino, one of our financial services analysts, knew there was valuable information buried in the millions of consumer complaints filed with the Consumer Financial Protection Bureau (CFPB). The EDI and Center teams helped provide Vincent and his colleagues with a CFPB "dashboard," which provides quick and easy information into how complaint volumes are changing over time. Vincent and his team can now quickly determine how well banks and other institutions are addressing problems.

3 Big data have also opened the possibility of analyzing consumer trends at the level of the individual purchaser. Using anonymized credit card data, the EDI team and the Center developed a pipeline for our retail analysts to gauge which brands in a given category do the best job at retaining customers. Our analysts can now see not only how likely consumers are to keep spending at a given retailer, but how much their spending is changing over time. This helps our analysts make more nuanced predictions about a company's revenue growth than by simply looking at trends in topline numbers.



...we believe that the insights of our investment professionals provide the only way to deliver index-beating returns.

What's Next?

Investment analysts pore through reams of data to track a company's "key performance indicators," or KPIs. Some KPIs apply broadly, such as revenue growth or net profit margin. Others are more tailored to a given industry, such as average daily users for a social media platform. The release of such information can have an immediate and large impact on a company's stock price.

For this reason, finding novel and obscure KPIs that provide insight into a company's performance might provide a considerable investment advantage. To search for them, the EDI team is cooperating with the Center in deploying machine learning, which uses algorithms and statistics to find patterns in data, rather than relying on explicit

instructions from a programmer. For this reason, machine learning has the potential to help our analysts find KPIs that we've never even considered.

Using Technology to Deepen Our Insights

According to *The Economist*, funds run by computers now account for 35% of the U.S. stock market and 60% of its trading activity.¹ That will never be our strategy, as we believe that the insights of our investment professionals provide the only way to deliver index-beating returns. I am excited to see technology extending and deepening our perspectives, however, and I look forward to seeing what new advantages we gain from the efforts of our EDI and New York teams in the coming years.

¹ "The Rise of the Financial Machines," October 3, 2019.



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