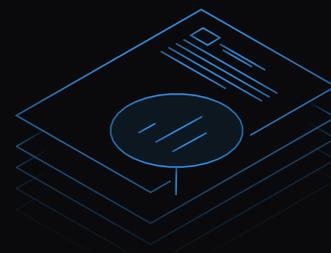# Innovation in Investment Banking Through AutoML

Tommy Tan was embarrassed.

A veteran of over 30 years in investment banking across Asia, Tommy had spent his career valuing companies and using those valuations to make investment decisions. But the industry and his peers were still using what he considered outdated technology and methodologies.

"I've always been embarrassed at the things that we do as professional investment bankers in valuing assets. We deploy what I consider to be 19th century technology and it's still the Wall Street standard."

Tommy had had enough. As CEO of TC Capital, a leading Pan-Asian boutique investment firm specializing in M&A and negotiated capital investments, Tommy and his team wanted to build their own valuation methodology, one that utilized cutting edge technology and took advantage of the amount of data available to bankers today. But to bridge the gap to this new methodology, Tommy needed to lean on automated machine learning.

More specifically, he needed automated machine learning and enterprise AI from DataRobot.

TC CAPITAL

"I find DataRobot to be a great tool for accelerating the application of data science, and we should think about harnessing data science to improve our work. That leaves the organization to focus your resources on where you add value."

— **Tommy Tan**
TC Capital CEO

Why Traditional Methods Aren't Good Enough

Traditionally, investment bankers in Wall Street and all over the world value firms through three standard methodologies:

- Comparing past mergers and acquisitions

- Looking at stock market valuations of similar companies

- Discounted cash flow (DCF) models - bankers estimate the present value of a company by projecting the stream of cash flows that a company being bought or sold can generate, and then discounting its total cash flow

Traditional Methods of Evaluation

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Looking at stock market
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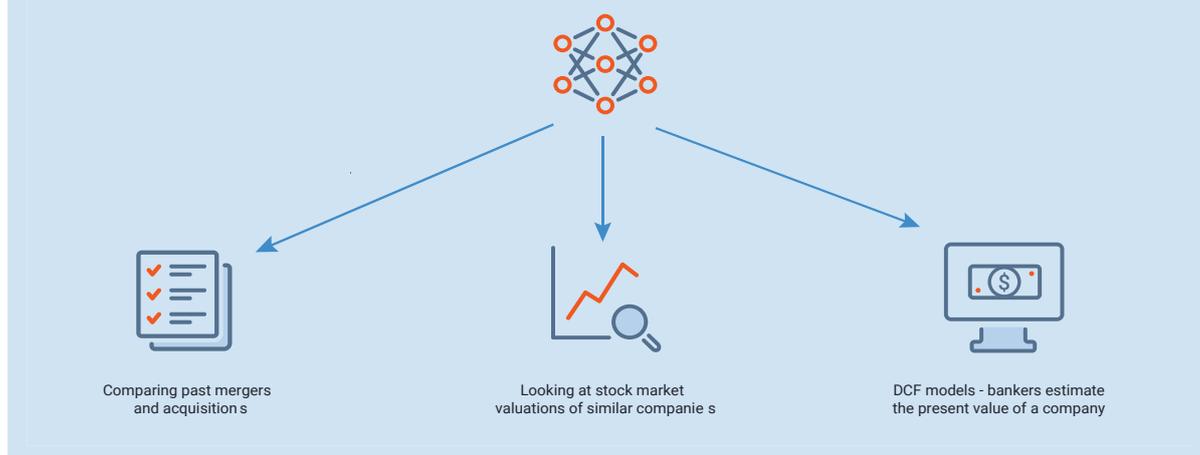
All these valuation techniques were not only manually intensive (and thus carried a high risk of human error), but they could also lead to valuations that were highly subjective. Qualitative considerations or standard metrics like price-to-earnings-ratios (PE) - which refer to the attractiveness of a company's stock price compared to its current earnings - can be unreliable because even comparable companies could have vastly different ratios, making single valuations using these features even more subjective. As Tommy bluntly puts it, "Anyone trying to run a regression on PE ratio will find really garbage results."

The DataRobot Difference with Automation

Tommy and his team had access to a treasure trove of data, and with these data points built a trading comparable table that includes information from 43,000 companies, with 560 variables on each individual company. That robust dataset - made up of a proprietary mix of financial, macro, industry, and web-sourced data - took TC capital nine months to assemble. But, as Tommy describes, they needed help from cutting-edge technology to make sense of it.

"It is humanly impossible to perceive patterns in this table, but that is what autoML is designed to do – analyze this data to find patterns that explain the different valuations of companies. DataRobot took care of not only autoML but also normalizing the data and all the tedious housekeeping and sanity checks. I trust DataRobot."

Within six months of implementing DataRobot, Tommy was able to use the automated machine learning and enterprise AI platform to automatically process this rich and robust large dataset and generated dozens of high quality, reliable models that provided highly accurate valuations. Before using the model to make investment decisions as part of TC Capital's valuation committee, that trust is crucial, to be able to rely on the model to be accurate in it`s predictive power.

"With over 560 features, the data was rich enough for the machine learning to detect valuation patterns that are not possible with the traditional small table methods," said Tommy. "We backtested the approach on historical data from the past 20 years and found the valuations to be highly accurate."

DataRobot

In backtesting, Tommy and his team measured the DataRobot model to see if trading strategies using those valuations made money - and they did, beating the market by nearly 3x. Tan could not believe what he was seeing from the model. The predictions from DataRobot were so consistent and accurate that Tommy soon relied on those valuations when voting on the valuation committee.

What's Next for Data Science at TC Capital

The data science work alone that DataRobot was able to automate for TC Capital would have probably cost the company $10 million and three years to do without DataRobot's help, estimates Tommy. DataRobot models now had a place at the investment table for TC Capital's investment bankers…but Tommy wasn't satisfied, believing that they could achieve even more with data science and automation.

Believing that autoML can be applied on a larger scale to help C-suite executives value public and private companies, TC Capital is launching an app, CeeSuite, doing exactly that. Leveraging a variety of sources including machine learning and data science (DataRobot models, crowd-sourced intelligence, and the knowledge of human experts, Tommy wants to put this app in the hands of executives and, in his words, "deliver something to executives to make them smarter than their advisors." The app is scheduled to be publicly available in Q1, 2020.

app screenshot

"We now have a truly modern approach to valuation which is objective, accurate, and immune to subjective choice by people preparing tables."

— Tommy Tan

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