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Quants find new ways to identify inventive companies
By Rob Mannix
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NEED TO KNOW
- o Simply counting the number of patents a company holds is of limited analytical use, due to some patents being much more valuable than others.
- o Some quant investors have built diagrams showing how often firms cite other firms 'research.
- o Quant IP's innovation score is used to avoid bad investments as well as finding good ones.
- o Insolvent payments processor Wire card held just one patent compared with rival PayPal's more than 500.
- o Several active managers in China have started collecting patent data; managers in the US and Europe can already buy datasets that claim to measure innovation within companies.

Wirecard's executives presented the German payments processor as a technological pioneer. Yet the since-disgraced company held just one patent when it filed for insolvency last June.

US rival PayPal, which operates in broadly the same space, has more than 500 patents, according to data from Quant IP, a firm that produces innovation scores for companies. Several Wirecard executives are now being investigated for fraud and stockholders have been wiped out.

The potential gains from identifying innovative companies and avoiding fraudulent, or merely slow-moving firms has prompted quant funds to use systematic strategies based on patent data.

Investors in aggregate tend to undervalue inventive companies because putting a price on smart ideas is difficult, quants have figured. Identifying and buying shares in the most innovative companies should therefore outperform the market over time. Technological dawdlers and the makers of inflated claims should fall behind their competitors. Shorting those stocks would make sense too.

Quants have mostly relied on raw counts of patent filings to make these strategies work. Progress has been stuttering at times. An ETF launched by Claymore Group, now part of Guggenheim Partners, to invest this way ceased trading in 2012 due to a lack of investor interest.

Counting patents as a proxy for innovation has an obvious drawback: some patents are much more valuable than others. Innovative companies may have only a handful of patent

registrations, but they could be disproportionately useful inventions. Some clever businesses hardly generate any patents. It's hard to see how Amazon would patent its cloud technology, one expert points out.

Quants are using new techniques to overcome the limitations of raw patent counts. They have begun fashioning more advanced signals from the patent data and are looking at alternative datasets, such as research and development and even visa applications, for clues as to how ingenious or not a company might be. Investors are trying to see the bigger picture, explains Chashaka Wimalaweera, an analyst at alternative data research firm Neudata. "They are trying to map the patent landscape."

Buy signals

Wolfe Research, which licenses quant models to investor clients, uses the number of times a patent is cited as one indicator of its value. The more useful a patent, the more likely another firm will cite the innovation in its own applications, says Yin Luo, Wolfe's head of quantitative research.

Wolfe's model also creates a diagram of patent cross references – a map of interconnectedness between firms. The closer a company sits to the center of the network – the more it is getting cited by other businesses that are also innovating – the stronger the signal to buy.

"It is a tangible way to quantify intangible assets," Luo says. For now, the model covers only public companies in the US. But Wolfe is collecting patent filings from patent offices in the European Union, Japan and China to replicate its model elsewhere.

Buy-siders hint at similar exercises. Vladimir Zolotov, director of global equity research at Acadian Asset Management, says the firm has used quant signals related to innovation in its investing for some time and is investigating new ones.

"Some fall under the rubric of intangibles, both direct and indirect," he says. Indirect intangibles refer to signals inferred from raw patent data. Experts elsewhere talk of tracking hot technologies in which filing activity is greatest, for example, and investing in those areas. "Other[signals] help unearth hidden connections between firms which may otherwise look unrelated,"Zdorovtsov says.

Quant IP looks at whether patents cite old or new innovations. Patents and citations in pioneering areas are scored as more valuable.

Alternative citations

A second way to sort genuine innovators from fakes is to combine patent data with additional information. Abraham Thomas, chief data officer at Quandl, a vendor, says the firm has added merger and acquisition data to patent data to help value portfolios of intellectual property (IP).

By looking at what companies have paid in acquisitions, Quandl can estimate the value of a target's patents. "One or two" hedge funds are doing this in-house, he says.

In cases where no valuation data exists, quants are able to sift filings using natural language processing to find similar patents for which a value is known, Thomas says.

A third possibility is to look at licensing data. In the US, public companies must disclose their licensing agreements. Alan Kwan, an assistant professor at the University of Hong Kong, has found that markets react slowly to licensing disclosures, implying that savvy investors can turn a profit simply from buying stocks after announcements. Stocks climb about 3% in the month after licensing deal is declared, Kwan's research revealed.

The delay in repricing stocks is explained by corporate secrecy on licensing agreements, he says. "Companies like to go into stealth mode before they make these announcements." It takes time for investors to work out what a company has done once the information is disclosed.

A fourth means of finding the most innovative firms ignores patents. Extract Alpha, a specialist in creating tradeable innovation signals for buy-siders, monitors applications for work visas. This approach identifies the companies that are aggressively hiring for technical roles such as data scientists.

The proof is in the performance

All of these approaches are only valid if they produce benchmark-beating returns. By that test,2020 has been an encouraging year. Wolfe's innovation-driven model trading long/short in stocks is up 4.1% year to date. A Quant IP mutual fund has beaten the MSCI World Index by 9%since January. ExtractAlpha's long-short factor is up 55% year to date, though that figure does not account for transaction costs.

"This year, and especially around March, a lot of the focus in the market has been on companies that are relying on technology or are more adapted to operating online," says Vinesh Jha, ExtractAlpha's founder. The most innovative stocks plunged with the market in late February and March, but their fall was smaller than the declines of duller stocks. "We've seen a trend of more innovative companies and industries outperforming roughly since 2013, with a huge acceleration this year." During the Covid turmoil in March, the strategy experienced "no discernible dip", Jha says.

A cynic might say 2020's rally in big tech stocks propelled the innovation-seeking strategies to success. Yet they also outperformed when the market reversed in November. Wolfe's strategy was down only 1.8% in the month that the first vaccines were revealed to be effective. The strategy had limited losses even though there was a 10-plus standard-deviation rotation in some equity factors that favored cheap old-economy stocks over more recent winners.

"The model has proved to be remarkably robust at market turning points," Wolfe's Luo says.

Likewise, Jha's innovation model hardly faltered at all in November. Innovative companies are present in most parts of the economy, he says. Businesses such as Regis Corporation – an operator of hair salons – and Children's Place – a clothing company – rallied 20% or so on November 9 when markets pivoted sharply. Both score in the 90s on ExtractAlpha's one-to-a-hundred measure of corporate innovation.

Even sceptics say the new ideas are worth exploring. Harin de Silva, who leads a quant investing team at Wells Fargo Asset Management, tried in the past to extract signals from numbers of patents filed, but found nothing to add to well-established factors in quant equity investing. Looking at how often companies cite the patents of other companies, though, is "very clever", he says.

At Wolfe, Luo says patent signals are one of the top three areas of interest from clients. In the US and Europe, datasets combining patent and acquisitions data sell for upwards of $100,000 for a year's access, says Quandl's Thomas. The idea is catching on in emerging markets, too. A couple of active managers in China have started collecting patent data there, Luo says.

There are, however, reasons not to get carried away. Innovation signals cross over with other factors. Jha says ExtractAlpha's model has a low correlation to value, a low correlation to dividend yield but a positive correlation with growth and leverage.

"It's clearly not uncorrelated to some other things, so we have to be careful about that," he says. But if you control for other factors, "you can show this type of factor is something additive".

Intuitively, that makes sense. "You're trying to capture something that's not in the conventional accounting metrics that other factors rely on," Luo says.

Innovation signals may be especially useful in industries such as IT and healthcare, which are gaining extra interest during the pandemic. IT and healthcare valuations often rely on rapid growth, which depends in turn on research and development. R&D, however, is costly and can make company look overpriced by conventional accounting metrics, leading value strategies in particular to go short on such stocks. It's a glitch that arguably has held back value investing strategies in recent years.

Adding signals based on innovation to value strategies could help. Innovation scores are "a way for investors to get a handle on the growing importance of IP in all industries," says Lucas von Reuss, Quant IP's co-founder. They also help picking winners and avoiding losers, he adds.

Von Reuss names Nikola Corporation as an example of a stock that investors would want to avoid. Nikola, a US company that builds electric trucks, holds 20 patents, according to Quant Itself are design patents bought from another company. The other eight seem not to add up toa coherent patent strategy, von Reuss says.

The Securities and Exchange Commission and the US Justice Department are investigating Nikola for fraud. A recent report from short-seller Hindenburg Research said an electric truck showcased in a marketing video was being rolled down a hill. Nikola confirmed in a statement that the truck did not drive under "its own propulsion".

Why innovative works

There are three reasons why stocks of innovative companies can be expected to beat the market.

Alan Kwan, an academic at the University of Hong Kong, thinks innovative companies get underpriced because stock analysts won't make bullish calls on companies that might amount to nothing.

Instead, they fixate on earnings. "The market cares about making sure it can predict company earnings because earnings are what the investor takes home," he says. "But these companies aren't earnings stories. They're long-term bets on a technology. The market is afraid of picking winners when the vast majority of innovative firms go bust."

Second, the companies themselves are trying to hide their successes. Studies have shown that innovative companies tend not to report research and development. This is known as the information paradox: a company that discloses information about a technological advance devalues its own work by revealing too much about its secrets.

Third, intangible capital expenditure shows up right away as a cost on the balance sheet, unlike capital expenditure on plants or machinery that can be spread over several years under accounting rules.

R&D expenditure can make it look like a company has started spending money "willy nilly", Kwan says. "Then the market gets disappointed."

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