USING DATA SCIENCE TO NAVIGATE A VIRAL CRISIS

EXECUTIVE SUMMARY

The world is more awash in news and data than ever before. The arrival of the coronavirus has only added to the noise and turbulence. How can investors wade through all of that to filter out the critical elements and navigate the uncertainty created by the coronavirus?

It's not easy, but can be done by harnessing information from a variety of unique data sources and actively integrating that along with industry expertise. Some of these data points, like coronavirus case figures and consumer transaction data, allow us to broadly assess positioning across the market and across sectors. Other pieces of information, like employee work-from-home reviews and our conversations with corporate management, help us assess potential leaders and laggards in an industry. Together, these data points allow us to pivot into areas where we see emerging tailwinds and away from those facing prolonged headwinds.

## EXTRACTING INSIGHTS AND CONNECTING THE DOTS

Investors often think security analysis is about examining financial statements and grilling management teams. It is, but it's much more than that too, particularly at times of profound disruption like we're experiencing now due to the coronavirus. As the COVID-19 pandemic rattles global markets, our analysts and portfolio managers are tapping into the flexible data platform that AllianceBernstein has built over the years to track not just the headline statistics, but also the hidden insights under the surface that others may miss. The following lays out some of those unique insights.

CORONAVIRUS CASES ARE ONLY THE BEGINNING

By now, you've surely seen charts of coronavirus cases and deaths by country over time. But we believe that case and fatality data points, which everyone on Wall Street watches, only tell part of the story. Driven by epidemiology, our analysts have gone further by creating an estimate of the reproduction rate (R0), which captures the number of people each infected person passes the virus on to. When countries can reduce that number to less than 1 and keep it there, instead of growing exponentially, the virus decays exponentially. From our perspective, once that number falls below 1, daily life and economic activity can begin to normalize.

While rough, as the government-reported numbers are not perfect, this approach provides a unique view of the data. As you can see in *Display 1*, South Korea, Italy, and the US have finally pushed the virus down through that tipping point in recent weeks. Singapore had it under control but has had recent flare-ups requiring another lockdown. That shows that even once containment begins to work, we'll still likely have to manage flare-ups until a real solution is in place.

DISPLAY 1: IF COUNTRIES DROP THEIR REPRODUCTION RATE (R0) BELOW 1, THE VIRUS FADES AWAY
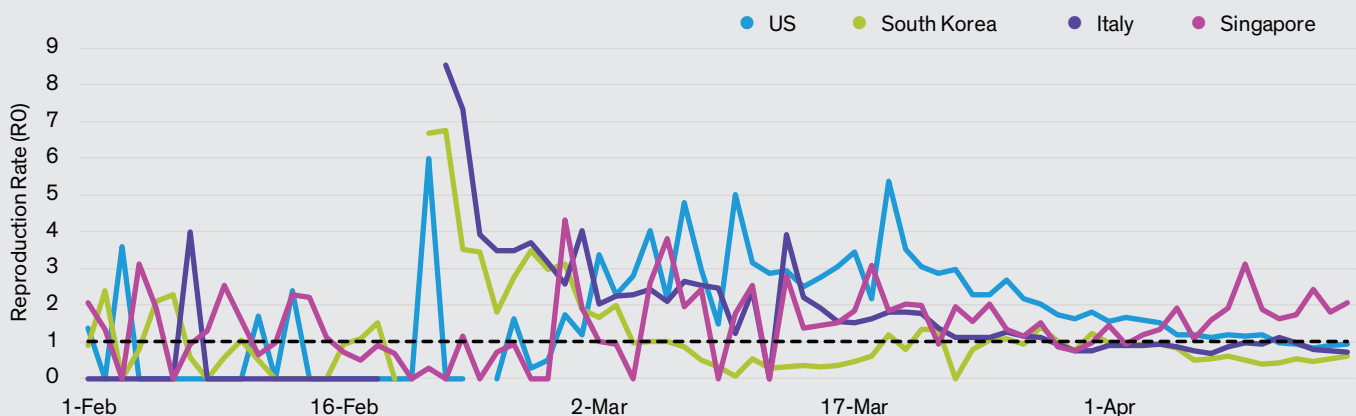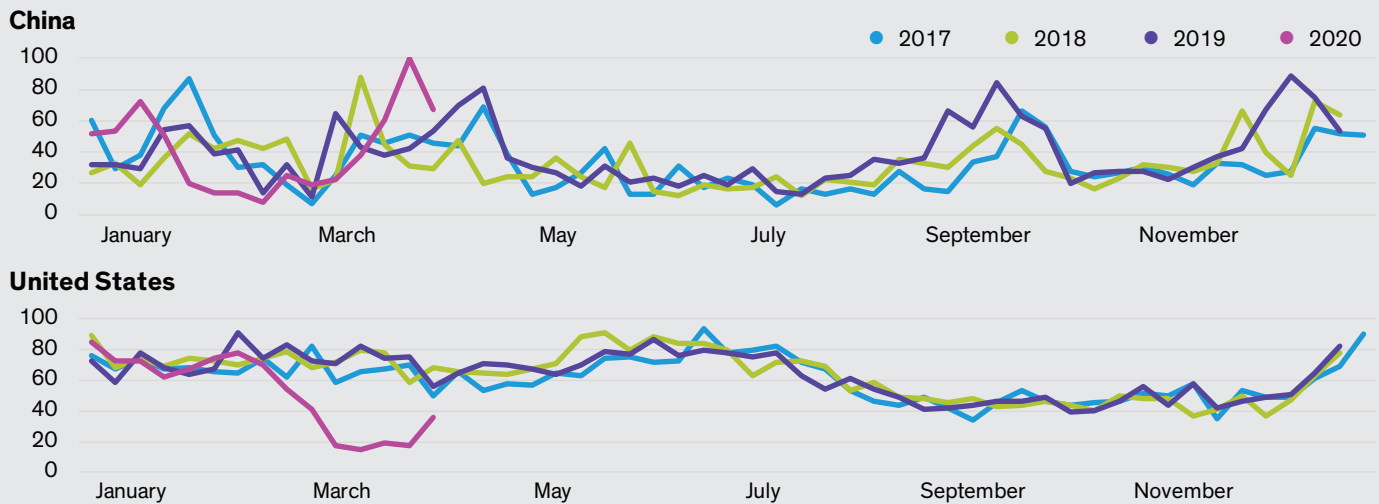

As of April 15, 2020.
Source: Johns Hopkins, AB

BEHAVIORAL DATA SHOWS KEY TRENDS AND INFLECTIONS

Using confirmed case data as well as other metrics that allow us to glimpse behavioral changes, our analysts believe they can identify inflection points in the fight against coronavirus… as well as reversals in the financial markets.

Academic research shows that the best decision-making comes from blending different skills and perspectives. In order to implement that in our research process, we mix the industry-specific knowledge of our fundamental analysts along with the capabilities of our data science team. Using our data platform, our analysts can capture elements of consumer behavior from various angles and combine those views to build a picture of how people and companies are responding to the pandemic.

For example, after troughing earlier this year, Chinese internet searches for "vacation" have started to rise again. This is paralleled by recent weeks' data showing the number of daily active users of Chinese travel booking websites has risen well above the levels seen a year ago. Meanwhile, in the US, searches for "vacation ideas" have fell off a cliff in March and may have bottomed in the past couple weeks (*Display 2*).

DISPLAY 2: GOOGLE SEARCHES FOR "VACATION" IN CHINA AND THE UNITED STATES (SEARCH POPULARITY)

As of April 12, 2020.
Source: Google Trends, AB

Another interesting source of data and insights is daily and weekly consumer transaction data, which allows us to see the economic impact of the virus weeks or months before it appears in company earnings and government economic data. By looking at spending across various industries, we can clearly see the pantry-stocking effect for grocers, the recent boon for video game companies, and the significant decline in revenues across the travel and hospitality industry (*Display 3*).

**DISPLAY 3: GROCERY AND VIDEO GAME SPENDING INCREASED WHILE DISCRETIONARY SPENDING COLLAPSED**
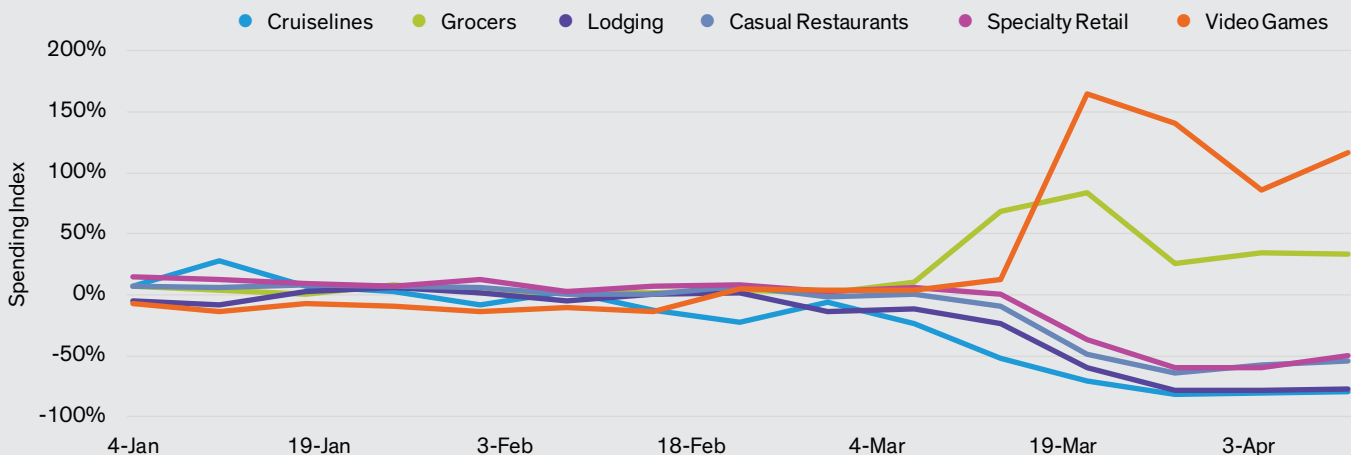
As of April 11, 2020.
Source: MScience, AB

ALTERNATIVE DATA SEPARATES THE WHEAT FROM THE CHAFF

While those data points help us view the broad macro and industry trends, which help with our market timing and sector allocations, we're also sifting through the data to distinguish how different companies are positioned to weather this storm and how well they're proving themselves through these challenging times. This enables us to differentiate them from their competitors and thus enhance our stock selection process.

For instance, suppose we want to see how exposed various US semiconductor companies' supply chains are to China. Looking at our data, we see that most of their suppliers are actually in the United States (*Display 4*). Looking at the semiconductor manufacturers' customers rather than their suppliers, we can see that most of these companies make semiconductors for Apple, so any negative impact on demand for iPhones, iPads, and MacBooks will hit them as well.

**DISPLAY 4: MOST SEMICONDUCTOR COMPANY SUPPLIERS ARE LOCATED IN THE US
(NUMBER OF SUPPLIERS LOCATED IN EACH COUNTRY)**

United States 99
Japan 27
Taiwan 22
South Korea 17
China 15
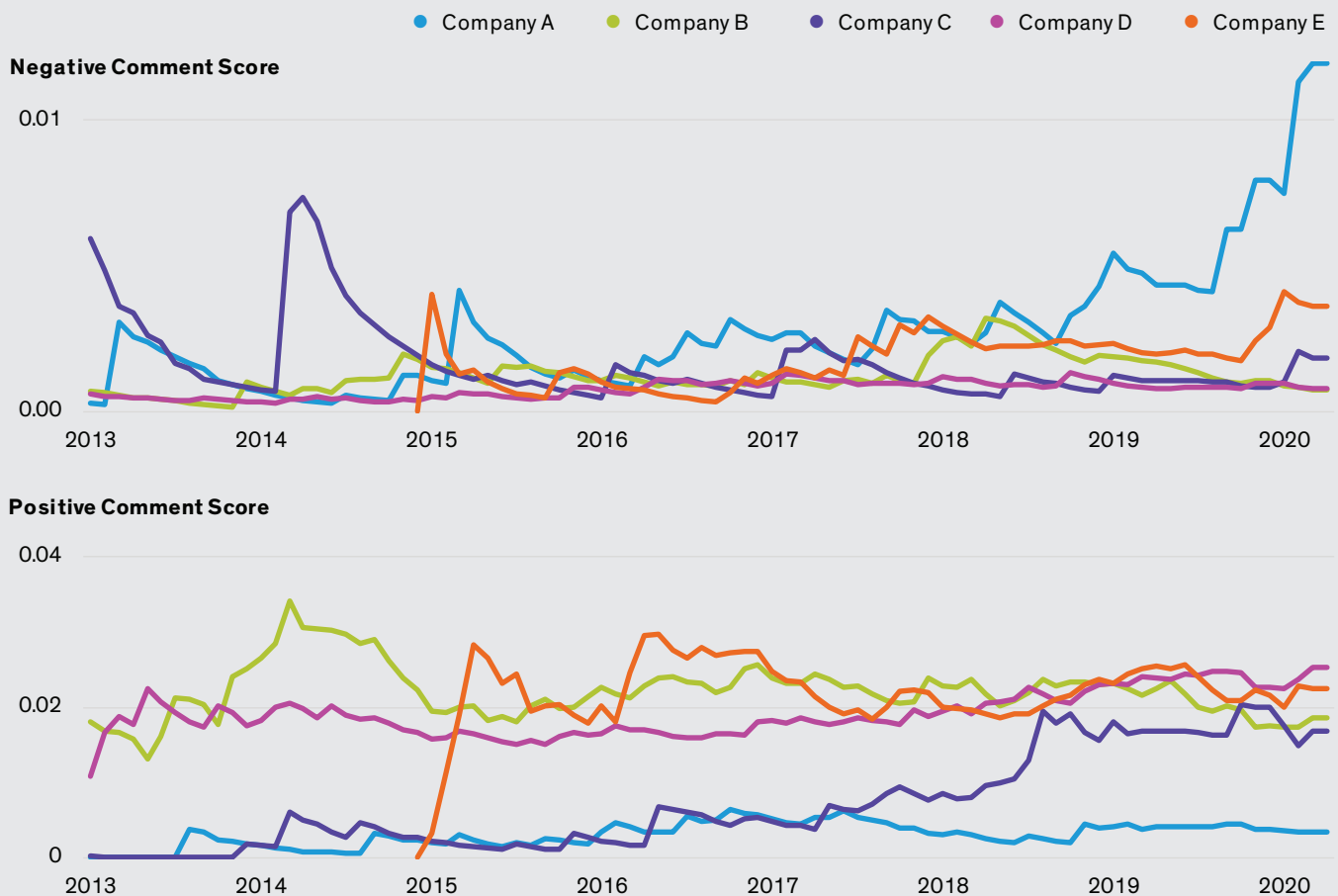Israel 10
UK 9
Germany 7
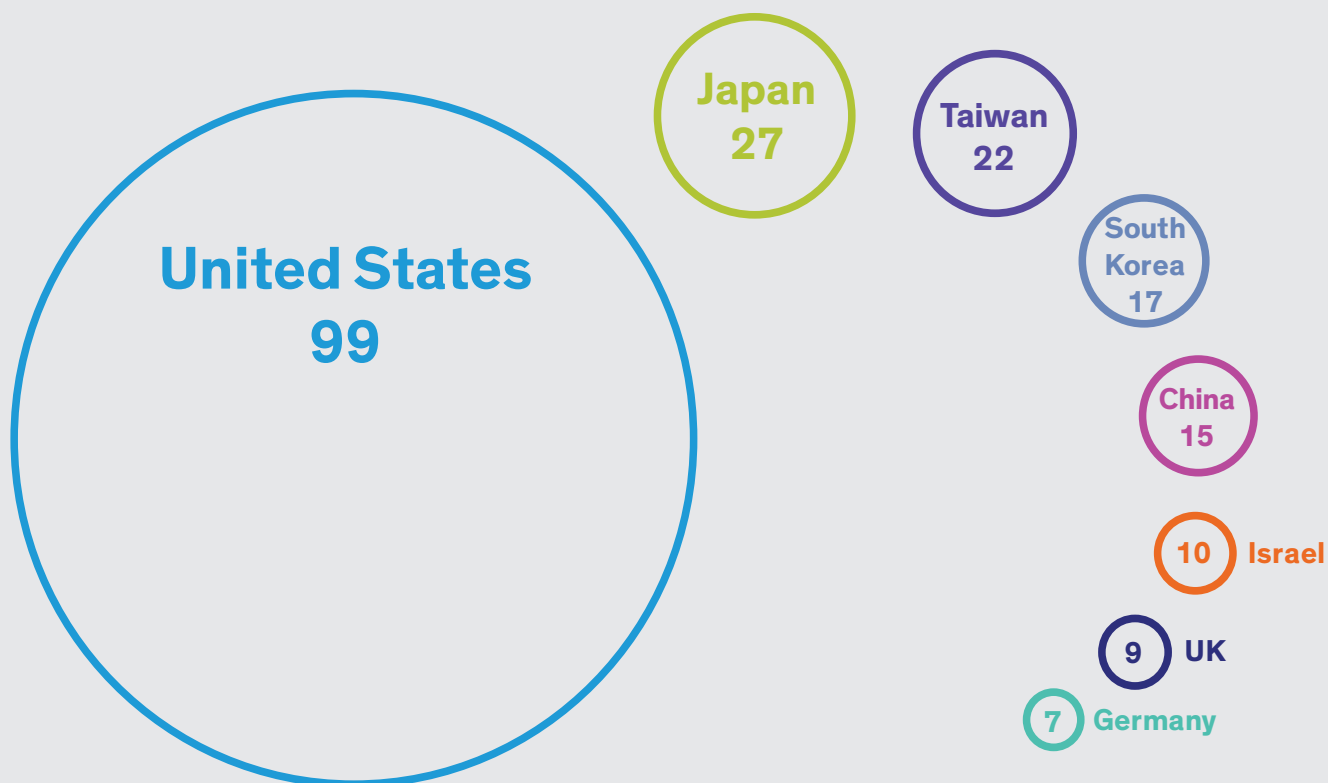
Source: FactSet, AB

In addition, we're able to utilize alternative data to monitor how companies in various industries are handling the switch to work-from-home arrangements. This can have both operational and reputational ramifications—if workers aren't equipped to effectively do their jobs at home, then corporate productivity will suffer. And if this is connected to other human resources issues, it could presage dissatisfied workers leaving once the economy normalizes, creating longer-term headwinds.

As an example, let's look at the US health insurance industry (*Display 5, next page*). Many of these companies seem to be doing a good job, with work-from-home complaints hovering at around a normal level. But starting last fall and continuing through the present, one company (which we've renamed Company A here) has had an increasing volume of work-from-home complaints. Looking at it the other way, from the perspective of positive work-from-home comments, we spot the same issue. Most companies have a normal level of positive comments on their work-from-home accommodations. But now Company A is well below the pack, with relatively few employees speaking positively about their work-from-home arrangements. That raises questions about what is otherwise a highly regarded company in the industry.

CORONAVIRUS IS A CORPORATE ENGAGEMENT ISSUE

Finally, we have not let our Environmental, Social, and Governance (ESG) analysis and corporate engagement dwindle due to this pandemic. Quite the contrary, we've actually incorporated companies' coronavirus responses directly into our ESG framework and our proprietary ESIGHT platform, which shares company-level ESG data and perspectives across our global research teams. This enables all our teams to access and add information about companies' evolving fundamentals and ESG practices and to directly share insights into their coronavirus responses.

DISPLAY 5: ONE HEALTH INSURANCE COMPANY STANDS OUT FOR POOR WORK-FROM-HOME CONDITIONS

● Company A ● Company B ● Company C ● Company D ● Company E

Negative Comment Score

Positive Comment Score

As of March 31, 2020.
Source: Glassdoor, AB

In addition to traditional engagement topics such as compensation and carbon emissions, we're now having coronavirus-focused ones as well. Recent engagements have ranged from several major consumer brands to one of the health care companies responding most directly to the pandemic. These engagements allow us to be sure these companies are being responsible corporate citizens as well as to better understand the opportunities and threats that the coronavirus poses for their businesses. And our platform allows us to share these important insights across all our investment teams.

THE SIGNAL AND THE NOISE

The coronavirus has created a cacophony of new data. By integrating it into our flexible platform where all our investment teams can utilize it to answer their key questions, we can filter through the noise and find the signal that will enable us to make better investment decisions on behalf of our clients. From both a quantitative and fundamental foundation, we construct and test our investment theses. Armed with that perspective and the conviction of that process, we believe that we will be able to take advantage of the market turbulence and deliver value for our clients.

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