



Can Executives' Speech Patterns Provide a Good Investment Guide?

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Wouldn't it be great to know the level of truth in, say, Federal Reserve chairman Ben Bernanke's words when he speaks about the outlook for the U.S. economy? And what about the CEO of a public company, or a hedge fund manager or a highly persuasive entrepreneur you've just invested in?

Two peer-reviewed and updated reports will appear in the *Journal of Accounting Research* this spring which hone in on the public statements of CEOs and CFOs during earnings conferences calls with analysts, with the goal of finding complementary and superior tools for predicting a company's health.

Working from the huge volume of text and audio recordings of executives that has stacked up since Regulation Fair Disclosure in 2000, experts in computer science, accounting and an area of study known as 'emotional speech' are increasingly combining computer power with the latest research in behavioral science to analyze CEO and CFO linguistic tendencies and vocal patterns. The research analyzes various aspects of an individual's word selection or voice elements to identify 'emotional states' such as levels of stress, excitement and deception.

The first report focuses solely on the words an executive uses and is entitled *Detecting Deceptive Discussions in Conference Calls*, co-written by David Larcker, a professor of accounting at Stanford's Graduate School of Business, and Anastasia A. Zakolyukina, a PhD candidate in accounting at Stanford. Early results appear promising, according to Larcker. He says "our (speech analysis) models do better than straight accounting models," in predicting serious financial problems or the possibility of financial restatements by a material amount. To be more precise, Larcker says his automated model is 4 percent to 6 percent better than a random guess about a company's health. And he says that it is 3 percent better than a traditional accounting assessment, which can be manipulated to some degree.

Larcker says that his early findings indicate that an investor can make money shorting the companies where there is a high probability of deceit. The investor would need to focus their analysis on the linguistic tendencies of the CFO on a conference call rather than the CEO, however, because "the CFO is more intimately involved in the preparation of the financial statements."

Larcker's research involved the development of an algorithm to analyze the text (not the audio portion) of approximately 16,000 U.S. quarterly earnings conference calls between 2003 and 2007,

honing in on the more spontaneous and sometimes far more revelatory question-and-answer portion of the calls. They then compared their linguistic analysis with instances of financial restatements to identify any correlation between a CEO's choice of words during earnings calls and the company's later corporate performance.

[Using prior emotional speech and linguistic research that identifies words and word clusters that have shown to be indicative of deception, Larcker and Zakolyukina's review of conference call texts showed that executives who are less-than truthful tend to use collective words such as 'we,' 'us' and 'you' when talking about the company, and tend to avoid 'I.' Other red flags indicative of a less-than truthful CEO are repeated references to general knowledge and the use of phrases such as 'you know,' 'investors well know' and 'others know well.'

Larcker adds that deceptive CEOs are less likely to use phrases such as 'shareholder value,' 'value creation' and 'value improvement' and have a tendency to use what he calls extreme positive emotion words such as 'great,' 'definitely' and 'phenomenal' in a repetitive manner.]

While the findings have their limitations — for example, CEOs often prepare and rehearse their earnings call comments, while some individuals do have unique word-pattern choices that may be indicative of deception but may not be apparent to an algorithm — Larcker says the initial results are promising enough for further research, something he is continuing to do with a focus on CFO speech.

In the second study, William Mayew, a professor in accounting at Duke University's Fuqua School of Business, took a slightly different tack. He employed a study of 'emotional speech,' making use of audio recordings of the first five minutes of the Q&A session with the CEO on 1,572 corporate earnings calls.

Mayew assessed this information using commercially available, vocal emotion analysis software and by identifying one particular vocal marker for close analysis — the cognitive dissonance in a CEO's voice that indicates uneasiness, particularly the emotional reaction when what you say and what you feel are at odds. This vocal marker can be measured via software, says Mayew, and allowed him to more closely analyze a CEO's 'emotional speech,' looking for high levels of cognitive dissonance — an indicator of possible deceit.

As Mayew explains it, his early research is trying to determine what attributes in voice are the most relevant when assessing CEO vocal tendencies and truth in corporate reporting.

As with Professor Larcker, Mayew's paper — Analyzing Speech to Detect Financial Misreporting, co-written with Professors Jessen Hobson and Mohan Venkatachalam — is currently available on the website for the Journal of Accounting Research.

His findings: The cognitive dissonance metric can predict the financial restatement of a company's earnings 11 percent better than chance. While he views that number as low, he says "that is about what you find in the use of other financial markers and is relative to what we look for in accounting results." He emphasizes, however, that one could never use such findings in a court of law, at least for now. "But for sorting of stocks, being able to predict a bad news event at 11 percent over chance is

something that institutional investors and others will be interested in.”

The research was inspired, Mayew says, by the fact that instances of fraud by wealth managers such as Bernie Madoff and companies such as Enron have shown that sophisticated market participants, including institutional investors, can be ‘remarkably unsuccessful’ at detecting financial fraud.

Mayew tempers his enthusiasm for his findings by saying he views it as “a complementary measure to analyzing a company’s health that do not make accounting numbers irrelevant,” but adds that he and his colleagues are continuing on with their research, working on the creation of an optimization model that can predict corporate restatements, based on a combination of spoken word, textual and accounting number indicators.

At least one investor, hedge fund manager Bill Burnham of Inductive Capital, is somewhat skeptical of the new findings. “As with most statistical analyses ... there’s often a big gap between an academically interesting finding and a financially viable trading strategy,” Burnham said, pointing out that “this kind of statistical analysis is more likely to be useful to either a high-volume quantitative firm or fundamental firm that is looking for additional screening variable to help it filter down a potential universe of stocks.”

Burnham also noted that as CEOs and CFOs become aware of this new approach to company assessment, they may notably alter their speech patterns and emotions in an effort to throw the dogs off the scent. “It’s not hard to imagine IR firms coaching CEOs and CFOs to avoid certain tones, cadences and inflections,” he said.

Professor Julia Hirschberg, a professor of computer science at Columbia University, who studies emotional speech and speaker states to create software to spot deception in voice and word choice, emphasizes that it is important to remember that different people lie differently, with some raising their voice pitch while lying and others lowering it, and so on. Therefore, the key to identifying deception by algorithm or machine is to develop methods of classifying people using some independent measure.

“We are trying to find ways of classifying people into deceptive behavior categories such as ‘openness to experience’ versus ‘neuroticism’ using simple personality tests, which we administer to subjects before observing them in normal versus deceptive conditions,” she said. “Our current system can distinguish deceptive from non-deceptive speech with 70 percent accuracy — better than human performance of 58 percent on the same data, though her work is not specific to the financial industry.

Professor Mayew acknowledges that some CEO will likely try to mask their voice markers on conference calls but insists that it’s very hard to hide one’s emotional markers over time. For now, he views his efforts to parse CEO speech for signs of deception as “the very tip of the iceberg in terms of understanding the role of voice and emotion markers in capital markets.”

“We are simply trying to uncover the most important aspects of accounting numbers, text and voice that matter in understanding company health — what analysts do in real life — and then find a way to automate the process.”

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