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RESEARCH BRIEFS · AUG 10, 2023

ChatGPT and Corporate Policies

Investment scores generated by ChatGPT using conference call transcripts are strongly predictive of companies' future capital expenditures for up to nine quarters, controlling for other predictors. The scores also predict intangible investment, R&D, and total investment, and are negatively correlated with future stock returns.

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Understanding corporate investment policies is key to predicting corporate growth as well as forecasting GDP, with aggregate investment representing the most volatile component of national output. While measures such as cash flows or Tobin's q (an indicator of investment opportunities of firms, calculated as the ratio of a company's market value to its replacement cost) are commonly used to predict firms' investments, private information, such as the expectations of managers, contains predictive power as well. This paper aims to use ChatGPT to harvest such information systematically from companies' quarterly earnings calls and test whether it provides new clues about companies' future investments.

ChatGPT Investment Score vs. Realized Investment
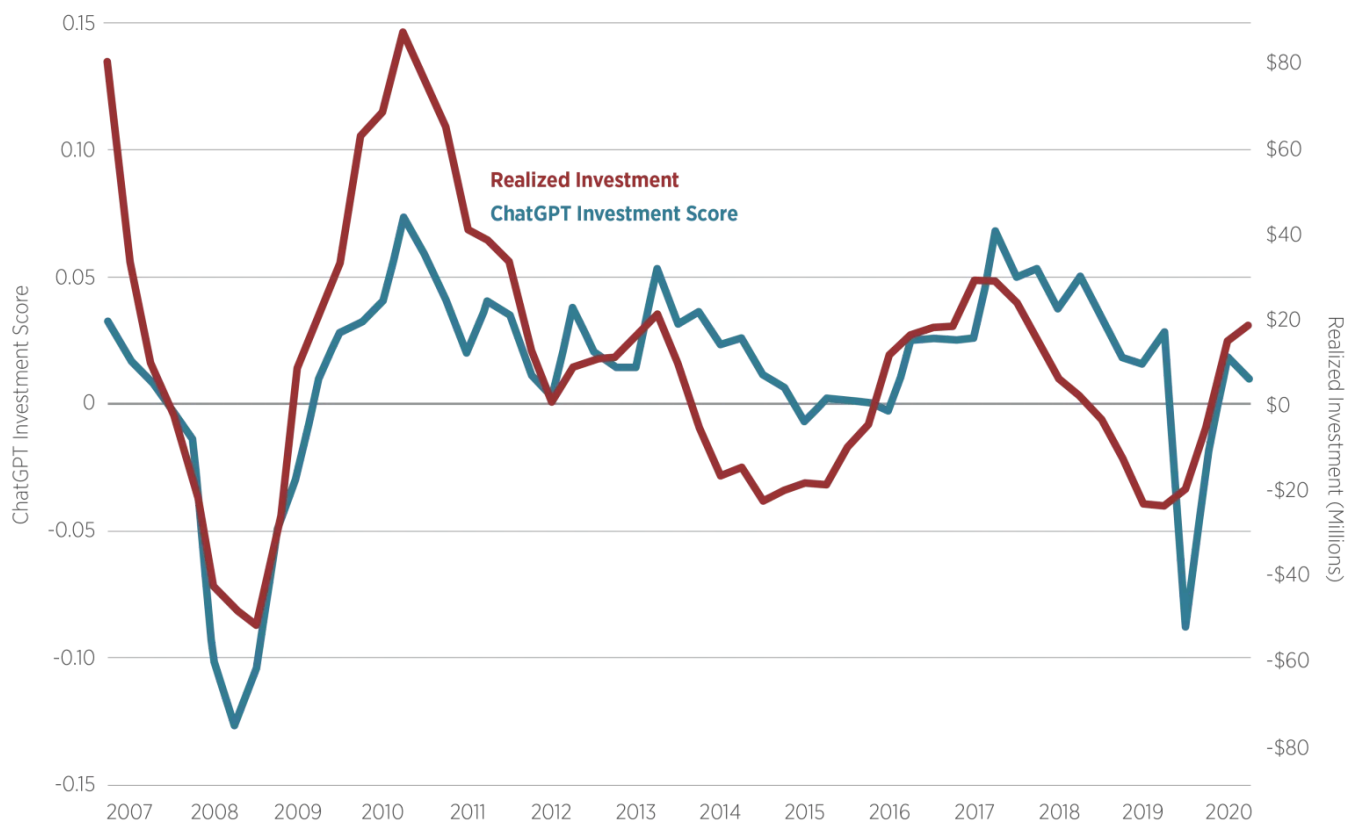
Note: This figure shows ChatGPT Investment Scores compared to actual changes in capital expenditure (Realized Investment) over time. For each quarter, investment is calculated as the change in capital expenditure between the preceding year and the following year.

The authors use 74,586 conference call transcripts from 3,878 unique companies recorded between 2006 to 2020 to construct the ChatGPT Investment Score. They split each transcript into chunks, which they input to ChatGPT along with a prompt asking the program to use the text to predict the firm's capital spending over the next year. ChatGPT replies with one of five responses —increase substantially, increase, no change, decrease, and decrease substantially—which the authors assign a score of -1, -0.5, 0, 0.5, or 1, representing a company's ChatGPT Investment Score.

Before proceeding with their main analysis, the authors first confirm that the ChatGPT Investment Scores reflect accurate information about companies' investment plans. To do so, they compare the scores to results from the Duke CFO survey, which asks managers directly about their investment plans, as well as to historical data on capital expenditures. They also show that the ChatGPT Investment Scores tend to capture industry-wide trends in investment, such as the increased investment in software and biotech that occurred during the COVID-19 pandemic.

Finally, the authors link their ChatGPT Investment Scores to data from the quarterly Duke CFO survey, Compustat, and the Center for Research in Security Prices to obtain additional information about each company, such as their actual investments, their intangible and physical capital, as well as measures of Tobin's q. They document the following concerning the ChatGPT Investment Score:

- ChatGPT Investment Scores bear a significant positive relationship with future investment, keeping constant other determinants of investment. A one-standard-deviation increase in the ChatGPT Investment Score is associated with a 0.034 standard-deviation increase in capital expenditures in the quarter after the conference call. This relationship is not subsumed by other determinants of investment, such as Tobin's q, total cash flows, lagged capital expenditure, or other observable firm characteristics, suggesting that ChatGPT Investment Scores provide substantial new information about firms' growth opportunities.

- A company's ChatGPT Investment Score continues to accurately predict its future investment for nine quarters following the observed conference call. A one-standard-deviation increase in the ChatGPT Investment Score is associated with a total increase in future investments over nine quarters that is equal to 1.17% of book assets, or 34% of a standard deviation of quarterly capital expenditures. This suggests the long-term nature of managers' expectations as expressed on conference calls.

- ChatGPT Investment Scores are helpful for predicting other forms of investment as well, including intangible investments like R&D and total investments in both the short and the long term.

- Consistent with the tendency for high-investment stocks to generate lower returns, ChatGPT Investment Scores are negatively correlated with future stock returns. Firms with highest ChatGPT Investment Scores tend to experience significantly negative future returns, further aligning with theories about investment-based asset pricing.

- ChatGPT can also obtain managerial expectations about changes in dividend payments and employment policies accurately from earnings calls excerpts, suggesting that the approach developed here has the potential to be applicable to a wide range of corporate policies.

This paper is the first to use ChatGPT to extract managerial expectations of corporate policies from corporate earnings calls and validate them empirically. The

authors' new AI-based investment measure, the ChatGPT Investment Score, contains substantial new information about firms' growth opportunities over the short and medium term, suggesting that ChatGPT can be used to improve the predictions about future investments and returns. More broadly, this research and related research demonstrate the potential for ChatGPT to collect useful data from text-based sources that were formerly challenging to analyze.

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