COMMENTARY

Generative AI Will Reshape the Workforce. These Companies Are Most Exposed.

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May 17, 2023, 3:00 am EDT

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The release of generative artificial intelligence has implications for firms' labor inputs and market valuations. Anecdotal evidence is already adding up. IBM's CEO Arvind Krishna told Bloomberg News this month that of the company's 26,000 non-customer-facing roles, "I could easily see 30% of that getting replaced by AI and automation over a five-year period." Microsoft's CEO Satya Nadella says the company needs to invest in a "major platform shift in this new era of AI," according to a memo published last week by Business Insider. Microsoft is not providing raises to its full-time staff this year, the memo said.

This news comes as little surprise to us. Both companies are on our short list of the major U.S. firms most exposed to ChatGPT, the chatbot AI released by the research laboratory OpenAI in November. We created the list as part of a new study that constructs and

analyzes firm-level workforce exposures to generative AI. Our premise is that tasks performed by the labor forces of more exposed firms can more easily be performed by generative AI applications relative to the tasks executed by the workforces of less exposed firms (and industries).

Top 10 Large U.S Companies with Highest Exposure to ChatGPT

Company	Market Capitalization (billions)	Sector
IBM	110	Information
Intuit	119	Information
Qualcomm	116	Manufacturing
Fiserv	74	Information
NVIDIA	706	Manufacturing
S&P Global	116	Administration and Support Services
Broadcom	262	Manufacturing
Verizon	158	Information
Microsoft	2,310	Information
3M	56	Manufacturing

Barron's asked the companies on this list for comment. S&P said its acquisition of the company Kensho in 2018 would allow it to provide "an integrated generative AI offering to our customers." Verizon did not respond. The others declined to comment.

Source: Calculations by Andrea L. Eisfeldt, Gregor Schubert, and Miao Ben Zhang

Our study builds on the idea that generative AI and related large language models will increase firm-level free cash flows through a labor effect working through two potential channels. First, firms whose labor force can be substituted for with cheaper generative AI-based capital will experience higher free cash flows by lowering input costs. Second, firms whose labor inputs are more complementary to generative AI will experience higher cash flows due to the technological improvement in an input that is complementary to their workforce. While we do not take a stand on whether generative AI is a substitute for, or complementary to, labor with higher exposures, our work shows that firms that have a higher share of occupations

exposed to generative AI experience gains in value across a wide array of industries.

We constructed a quantitative estimate of the impact of the technology on firms' values based on a new firm-level measure of exposure to productivity improvements from using Generative AI. We measured the impact of the release of ChatGPT on equity returns at the firm level. Firms whose labor forces were more exposed to Generative AI outperformed firms with lower exposures.

We found that the impact of the release of ChatGPT on firm values varies widely across industries, as well as within industries across firms. While there was a significantly positive impact on firms with more exposure to generative AI, such as in publishing and some financial industries, there was a significantly negative impact in other industries, such as real estate. Value losses for incumbents are consistent with the idea that for some industries, Generative AI will lead to new entrants and displacement of existing firms.

To assess the impact of ChatGPT on different firms, we measured firm-level exposure to generative AI in two steps. First, we used ChatGPT to assess whether each of the 19,265 tasks currently performed by various occupations can be done more productively by using the current ChatGPT or after investment in adapting its capabilities for business use cases. Second, we mapped occupations to publicly traded firms using a dataset about firms' occupational employment. This dataset is constructed from millions of public employee profiles such as those on LinkedIn. This firm-level exposure measure thus captures the ability of the tasks currently performed by labor at those firms to be performed (or made more efficient) by generative AI. Our measure is the first of its kind to measure the exposure to generative AI at the *firm* level.

We used 2022-2023 earnings call transcripts to validate our labor-based measure of firms' exposure to generative AI. The transcripts paint a similar picture. We found a strong relationship between our measure and firms' mentions of Generative AI during earnings calls. We also found that Twitter mentions and earnings call mentions of generative AI increased substantially following the release of ChatGPT.

What happens to the valuation of more exposed companies? We created a model portfolio, "Artificial Minus Human," that goes long higher and short lower generative AI exposure stocks. It saw 0.4 percentage-point higher daily excess returns in two weeks after ChatGPT's release, and 9% cumulative over four months.

Of course, evaluating how large language models will impact firms is a moving target: every week brings news of further advances in what these models can do or of startups and established companies adapting their capabilities for particular use cases. As a result, to the degree that these new capabilities were not yet priced in, we are likely to see further fluctuations in stock prices, as new companies become likely to deploy these technologies. However, one thing is certain: given the scale and speed of the technological advances we have seen in large language models, investors need to think creatively about how the economy might be reshaped—and perhaps learn how to use generative AI to their own advantage in their own work in the process.

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