

AI's economic impact may lie in codifying organizational knowledge

New metric gauges how AI expands knowledge that can be codified and spread across companies.



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How to measure the economic impact of artificial intelligence?

Most attempts by economists to answer that tough question have focused on quantifying

potential gains from production automation or growth driven by AI-enabled research and innovation.

But those metrics may only be part of the story, according to a [working paper](#) by IESE's [Eduard Talamàs](#) and Martin Beraja of UC Berkeley Haas. A more complete assessment includes how AI may expand the knowledge that can be codified and spread across companies, narrowing the knowledge gap between mature firms and new entrants.

Drawing on data from the U.S., this metric suggests AI could as much as double economic output over the long run, and generates a very different picture of which industries and sectors stand to gain most from AI adoption, and which are unlikely to reap large benefits.

The dynamics of codifying knowledge

Understanding the dynamic begins with the phenomenon, well-documented in economics, that mature companies are substantially more productive than average firms. That's because companies get better at what they do over time, learning how their operations run most efficiently, what their customers seek from them and what functions in their industry. Employees develop expertise, managers refine their practices and the organization accumulates a kind of institutional wisdom that makes it more productive.

Traditionally, companies have codified that institutional knowledge via manuals, training systems, consulting and franchising. But much crucial information has remained tacit, in the minds and practices of employees. AI has the potential to change that, detecting patterns directly from practice — such as experiments, evaluations and choices — and learning from data without the need to articulate knowledge first.

Turning tacit knowledge into codified knowledge allows it to be transferred from individuals to groups, organizations and beyond. This does not require companies to share proprietary information. Instead, new firms may benefit from the earlier codified knowledge through employee experience, education, manuals, courses, suppliers, consultants and other channels. This then puts new companies and mature firms on more equal footing in terms of organizational knowledge.

Measuring AI-enabled knowledge

To quantify the potential increase in economic output if firms could narrow the knowledge

gap, Beraja and Talamàs have created a metric, which uses readily available data on firm size and lifespan, that is the ratio of output with codifying technologies over output without the new technology.

Using 2023 U.S. Census data on business establishments, the authors calculate that the ratio for the U.S. economy is approximately 2, meaning that AI-driven knowledge codification has the potential to double aggregate economic output in the long run.

The timeframe for the doubling is uncertain, since it hinges on how fast companies adopt AI across industries.

A new map of AI-exposed industries

This approach redraws the map of which industries are most impacted by AI. Much has been written about which occupations are most susceptible to being replaced by AI. But those predictions have focused on the technical capacity of AI — if, say, it is readily able to do the work of a junior lawyer or replace programmers — rather than on the value generated.

Beraja and Talamàs find that many industries where LLMs appear easy to adopt yield relatively modest value gains, while many low-exposure industries may experience large gains from greater codified knowledge. It turns out that what is easiest to automate with AI is not necessarily what is most valuable, and vice versa.

Drawing on U.S. Census data on firm size and exit rates by age within 80 industries, the paper plots the value of codification against standard scores of industry exposure to LLMs. Four categories emerge:

- **High AI exposure and high value creation.** A small group of sectors scores high on both how easily AI can be adopted and how much value can be created thanks to greater codified knowledge. These sectors appear in many studies as ripe for AI adoption, and include education, professional services and wholesale intermediation. These are sectors that produce ample data from which AI can learn, potentially benefiting new entrants to the market.
- **High AI exposure but low value creation.** These are sectors in which AI can do much of what workers do, but where earlier learning won't necessarily translate into substantial value creation. They include sectors such as publishing and ambulatory healthcare. Many tasks are within reach of LLMs, but professional training, technical standards and experienced workers already transmit a substantial part of the

relevant knowledge across organizations.

- **Low AI exposure but high value creation.** These are sectors that are rarely identified in AI-exposed industry lists but that stand to experience some of the biggest potential gains from accelerated codified knowledge. They include truck transportation, food manufacturing and building construction, sectors that generate useful data but where many of the underlying activities remain physical and context dependent.
- **Low AI exposure and low value creation.** In some sectors, core tasks are largely physical and experienced tradespeople, mechanics and machinists can provide much of the requisite expertise. Companies in this category include specialty trades, repair services and metal manufacturing.

This is a radically different tool for measuring AI, but AI is a radically different technology. It complements other metrics, using data on the life cycle of firms that is already compiled in many countries and allowing economists to begin understanding the ways in which artificial intelligence will reshape the economy.

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