



## INSIGHT 17

# AI MAY HAVE MIXED AND UNEXPECTED IMPACTS ON PRODUCTIVITY

While AI holds strong productivity prospects, productivity gains might be tempered by uneven AI adoption, particularly in the trades and among SMEs, by unforeseen costs linked to early or premature AI adoption, and by concerns about working conditions putting brakes on AI adoption amid changing work conditions.

## TODAY

**The productivity benefits of AI are concentrated in white-collar professions.** Since AI tools excel at tasks such as writing and data retrieval, fields that involve significant cognitive work are most prone to see productivity gains.<sup>1</sup> These include white-collar professions such as customer service and software development.<sup>2 3 4</sup> Jobs requiring substantial physical labour, such as the trades have less AI uptake currently and are unlikely to see significant productivity gains from AI without further advances in robotics (see insight X on Robotics) – although AI is able help with tasks such as managing clients and preparing invoices.<sup>5</sup>





### Labour productivity

A measure of economic productivity, calculated by dividing gross domestic product (GDP) by the total number of hours worked.

**Businesses in Canada have been slow to adopt AI.** Only 6% of businesses reported using AI from 2023 to 2024.<sup>6</sup> Those who do not use AI said it was not relevant to their operations, too expensive, not mature enough, or raised concerns about privacy and security.<sup>7</sup> Larger firms are more likely to adopt AI, as such Canada's relatively slow adoption of AI may be linked to how SMEs dominate the economy – employing 64% of private sector workers, compared to just 46% in the U.S..<sup>8 9 10</sup> Canadian SMEs often struggle with access to capital and tend to be less productive and innovative compared to SMEs in other countries.<sup>11</sup> Additionally, as the Bank of Canada states, Canada has a productivity problem, with no productivity growth in recent years and the second-lowest **labour productivity** growth in the G7.<sup>12 13 14</sup>

**AI only enhances worker productivity where it is fit for purpose.** A global survey revealed that almost all C-suite executives expect AI to boost productivity, but half of workers say they do not know how to achieve the expected productivity gains, and two-fifths believe their company is asking too much.<sup>15</sup> This may reflect misunderstanding of AI's current capabilities: when workers are asked to use AI for tasks for which it is ill-equipped, productivity decreases by as much as 20%.<sup>16</sup> However, workers that have high AI literacy and feel like they have agency over the choice to use AI, are more likely to feel positively about AI in the workplace.<sup>17 18</sup>

**Workers are anxious about AI automation and unions are pushing back.** A survey of workers in 18 countries found that 41% expect AI to replace some or most of their job functions.<sup>19</sup> In the U.S., 65% of workers fear AI will replace their job and 72% fear it will negatively impact their pay.<sup>20</sup> Labour unions across the world are acting in response. For instance, the Writers Guild of America secured an agreement that its members would still receive full credit and compensation if generative AI is used.<sup>21</sup> Unions in Spain and Italy have forced food-delivery platforms to disclose information about how they are using AI in management.<sup>22</sup> The International Longshoremen's Association has won protections against employers implementing equipment that is "devoid of human interaction".<sup>23</sup>



# FUTURES

## **AI adoption might boost productivity and solve labour shortages but create new challenges for workers.**

Integrating AI into the workplace could increase productivity in sectors with shortages of skilled labour, such as healthcare, manufacturing, and logistics.<sup>24 25</sup> However, it could also increase pressure on workers to learn how to integrate AI and cope with its errors and limitations.<sup>26</sup> For some workers, AI may automate more basic and routine tasks, leaving them with more cognitively demanding and stimulating tasks. For others, AI may automate the cognitive work, leaving the worker with routine and oversight tasks. As AI handles more cognitive work, employees may lose the opportunity to practice skills such as critical thinking, potentially reducing the quality of human oversight.<sup>27</sup> Less intellectually stimulating work may also reduce job satisfaction.<sup>28</sup> Workers may also find they need to work longer hours to meet unrealistic employer expectations of output.<sup>29</sup>

## **Businesses that rush to adopt AI could face increased costs if systems do not work as advertised.**

The potential benefits of adopting AI could offer businesses a significant first-mover advantage. However, AI systems can look more impressive under ideal test conditions than in the real world, where the need for human oversight to identify biases and errors may reduce their efficiency.<sup>30</sup> Companies that adopt AI systems that are not yet fit for purpose may struggle with employee retention as they lead to low morale and high rates of burnout.<sup>31</sup> Mistakes caused by subpar AI systems expose companies to unexpected costs and lawsuits. Companies that are more careful and strategic in incorporating AI into their business may be better able to take advantage of productivity gains as the reliability and accuracy of AI systems improve (see insight x on AI reliability and transparency).

**AI rollout may be hampered by social backlash and liability concerns.** While AI can offer improvements to workflows for businesses and workers across many sectors, public- or customer-facing AI may be unpopular. For example, AI customer service agents may struggle to handle more complex problems and lack flexibility to bend the rules to build goodwill with a customer. Consumers could prefer to spend with businesses that do not use AI, whether due to a lack of trust in AI (see insight X on AI and trust), in solidarity with workers, or simply out of preference for dealing with a human.<sup>32</sup> As legal frameworks evolve, businesses may be hesitant to take on the liability risks if customer-facing AI systems behave in unexpected ways (see insight X on AI and harms).

**AI could reshape Canada's economy in ways that are hard to predict.** As SMEs struggle to access the capital and technical expertise to adopt AI, they could stagnate and be outcompeted by larger corporations. This may accelerate the concentration and consolidation of the Canadian economy. On the other hand, AI could remove costs and barriers, making it easier for entrepreneurs to start new businesses and take them to scale. In some cases, AI may enable business to scale their operations without necessarily growing their workforce. This could lead to jobless growth, where GDP increases despite fewer jobs.



# IMPLICATIONS

- Continued productivity declines could lead to **decreased tax revenues, stagnant wages, and poorer standards of living.**
- Workers may have to engage in **perpetual upskilling and learning** to keep up with **rapidly** evolving AI systems and innovations.
  - › New education markets in AI adoption and implementation may emerge.
  - › Up-to-date AI skills may be valuable in the labour market.
- **Critical thinking and analytical skills** may be even more highly desired by employers.
  - › These skills are important for effectively overseeing AI but may be harder to cultivate as AI takes over creative and higher-order thinking.
- AI adoption could limit **human-to-human interaction** and increase **social isolation in the workplace.**
- Effective AI adoption could **spur investment in productive capital** if it can create higher returns than non-productive asset classes, such as real estate.
- Canadian businesses may be **highly dependent on foreign companies** that provide AI tools and platforms that are central to their operations.
- Economies of scale in adopting AI could centralize power in a smaller number of dominant firms, **reducing the diversity of Canada's business landscape.**
- › Conversely, AI could drive a wave of entrepreneurialism and enable more self-employment.
- Fears around job security could drive unionisation and increase labour advocacy.
  - › Businesses unable to automate may be outcompeted by foreign or non-unionized competitors.
- A faster pace of work and other causes of AI-driven burnout in the workplace may make **traditional work structures unsustainable.**
  - › Firms that employ humans to do only menial oversight tasks may struggle more with burnout, employee turnover, and low engagement.
  - › Firms that can strike the balance between employee security and AI automation could be highly desirable employers.
- AI automation may have **uneven gender impacts**, depending on whether progress is quicker in automating technical fields that are dominated by men, or administrative fields dominated by women, such as human resources.
  - › Care work, which has traditionally been dominated by women, may be less prone to automation and could see an influx of men.

## Endnotes

- 1 Mehdi, Tahsin, and Marc Frenette. “Exposure to Artificial Intelligence in Canadian Jobs: Experimental Estimates.” Statistics Canada, September 25, 2024. <https://www150.statcan.gc.ca/n1/pub/36-28-0001/2024009/article/00004-eng.htm>.
- 2 Brynjolfsson, Erik, Danielle Li, and Lindsey Raymond. “Generative AI at Work.” Cambridge, MA: National Bureau of Economic Research, April 2023. <https://doi.org/10.3386/w31161>.
- 3 McKinsey. “Unleash Developer Productivity with Generative AI,” June 27, 2023. <https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/unleashing-developer-productivity-with-generative-ai>.
- 4 Noy, Shakked, and Whitney Zhang. “Experimental Evidence on the Productivity Effects of Generative Artificial Intelligence.” *Science* 381, no. 6654 (July 14, 2023): 187–92. <https://doi.org/10.1126/science.adh2586>.
- 5 Mehdi, Tahsin, and Marc Frenette. “Exposure to Artificial Intelligence in Canadian Jobs: Experimental Estimates.” Statistics Canada, September 25, 2024. <https://www150.statcan.gc.ca/n1/pub/36-28-0001/2024009/article/00004-eng.htm>.
- 6 “The Daily — Canadian Survey on Business Conditions, First Quarter 2023.” Statistics Canada, February 27, 2023. <https://www150.statcan.gc.ca/n1/daily-quotidien/230227/dq230227b-eng.htm>.
- 7 Statistics Canada. “Reasons Business or Organization Does Not Plan to Use Artificial Intelligence (AI) in Producing Goods or Delivering Services over the next 12 Months, Third Quarter of 2024.” Government of Canada, August 27, 2024. <https://doi.org/10.25318/3310087901-ENG>.
- 8 Melhorn, Stephanie Ferguson, Makinzi Hoover, and Isabella Lucy. “See the Data behind America’s Small Businesses.” U.S. Chamber of Commerce, May 20, 2024. <https://www.uschamber.com/small-business/small-business-data-center>.
- 9 “Key Small Business Statistics 2023.” Innovation, Science and Economic Development Canada, February 2, 2024. <https://ised-isde.canada.ca/site/sme-research-statistics/en/key-small-business-statistics/key-small-business-statistics-2023>.
- 10 Eastwood, Brian. “The Who, What, and Where of AI Adoption in America.” MIT Sloan, February 7, 2024. <https://mitsloan.mit.edu/ideas-made-to-matter/who-what-and-where-ai-adoption-america>.
- 11 Jean, Jimmy, Randall Bartlett, and Kari Norman. “Accelerating Small Business Success: Navigating the Canadian Innovation Landscape.” *Economic Studies*. Desjardins, October 16, 2023. <https://www.desjardins.com/en/savings-investment/economic-studies/canada-disruptive-innovation-sme-oct-16-2023.html>.
- 12 Rogers, Carolyn. “The Productivity Problem.” Bank of Canada, March 26, 2024. <https://www.bankofcanada.ca/2024/03/productivity-problem/>.
- 13 Gu, Wulong, and Michael Willox. “The Post-2001 Productivity Growth Divergence between Canada and the United States: The Role of the Information and Cultural Services Industry.” Statistics Canada, December 21, 2023. <https://www150.statcan.gc.ca/n1/pub/36-28-0001/2023012/article/00006-eng.htm>.
- 14 Williams, David. “Canada’s Productivity Performance over the Past 20 Years.” Business Council of British Columbia, May 24, 2022. <https://www.bcbc.com/insight/canadas-productivity-performance-over-the-past-20-years>.
- 15 Robinson, Bryan. “77% Of Employees Report AI Has Increased Workloads And Hampered Productivity, Study Finds.” *Forbes*. Accessed December 20, 2024. <https://www.forbes.com/sites/bryanrobinson/2024/07/23/employees-report-ai-increased-workload/>.
- 16 Somers, Meredith. “How Generative AI Can Boost Highly Skilled Workers’ Productivity | MIT Sloan.” MIT Sloan, December 20, 2024. <https://mitsloan.mit.edu/ideas-made-to-matter/how-generative-ai-can-boost-highly-skilled-workers-productivity>.
- 17 Bezrukova, Katerina, Terri L. Griffith, Chester Spell, Vincent Rice Jr., and Huiyu Evangeline Yang. “Artificial Intelligence and Groups: Effects of Attitudes and Discretion on Collaboration.” *Group & Organization Management* 48, no. 2 (April 1, 2023): 629–70. <https://doi.org/10.1177/10596011231160574>.

- 18 Krauss, Autumn. “New SAP Research Shows Mixed Attitudes Around AI at Work, Revealing Why AI Literacy Is Imperative.” SAP News Center, October 28, 2024. <https://news.sap.com/2024/10/research-shows-mixed-attitudes-ai-at-work/>.
- 19 Hanowell, Ben, and Ben Richardson. “Most Workers Think AI Will Affect Their Jobs. They Disagree on How.” ADP Research, June 10, 2024. <https://www.adpresearch.com/worker-sentiment-ai-impact/>.
- 20 Hemmerdinger, Jennifer. “New EY Research Reveals the Majority of US Employees Feel AI Anxiety amid Explosive Adoption.” EY, December 6, 2023. [https://www.ey.com/en\\_us/newsroom/2023/12/ey-research-shows-most-us-employees-feel-ai-anxiety](https://www.ey.com/en_us/newsroom/2023/12/ey-research-shows-most-us-employees-feel-ai-anxiety).
- 21 Kinder, Molly. “Hollywood Writers Went on Strike to Protect Their Livelihoods from Generative AI. Their Remarkable Victory Matters for All Workers.” Brookings, April 12, 2024. <https://www.brookings.edu/articles/hollywood-writers-went-on-strike-to-protect-their-livelihoods-from-generative-ai-their-remarkable-victory-matters-for-all-workers/>.
- 22 De Stefano, Valerio, and Simon Taes. “Algorithmic Management and Collective Bargaining.” *Transfer: European Review of Labour and Research* 29, no. 1 (February 2023): 21–36. <https://doi.org/10.1177/10242589221141055>, 28.
- 23 DeManuelle-Hall, Joe. “What the Longshore Union Deal Means for Workers.” *Jacobin*, January 11, 2025. <https://jacobin.com/2025/01/ila-longshore-strike-automation-trump>.
- 24 Nicholson, Peter. “Industrial Revolutionary.” *Public Policy Forum*, December 11, 2024. <https://ppforum.ca/publications/industrial-revolutionary-ai-productivity-prosperity/>.
- 25 Turner, Mark. “Automating The Mundane: How IT Solutions Can Rescue Staff From Needlessly Repetitive, Time-Intensive Tasks.” *Finance Monthly*, January 22, 2024. <https://www.finance-monthly.com/2021/11/automating-the-mundane-how-it-solutions-can-rescue-staff-from-needlessly-repetitive-time-intensive-tasks/>.
- 26 Gupta, Shalene. “AI Creates More Work and Longer Hours for Some Employees. Is the Productivity Boom over-Hyped?” *Fast Company*, July 23, 2024. <https://www.fastcompany.com/9115821/ai-productivity-overestimated-more-work-longer-hours-upwork-survey>.
- 27 Gerlich, Michael. “AI Tools in Society: Impacts on Cognitive Offloading and the Future of Critical Thinking.” *Societies* 15, no. 1 (January 3, 2025): 6. <https://doi.org/10.3390/soc15010006>.
- 28 Toner-Rodgers, Aidan. “Artificial Intelligence, Scientific Discovery, and Product Innovation.” *arXiv*, December 21, 2024. <https://doi.org/10.48550/arXiv.2412.17866>, 35.
- 29 Gupta, Shalene. “AI Creates More Work and Longer Hours for Some Employees. Is the Productivity Boom over-Hyped?” *Fast Company*, July 23, 2024. <https://www.fastcompany.com/9115821/ai-productivity-overestimated-more-work-longer-hours-upwork-survey>.
- 30 “The Strategic Necessity of Human Oversight in AI Systems.” *Lumenova AI*, September 17, 2024. <https://www.lumenova.ai/blog/strategic-necessity-human-oversight-ai-systems/>.
- 31 Robinson, Bryan. “77% Of Employees Report AI Has Increased Workloads And Hampered Productivity, Study Finds.” *Forbes*. Accessed December 20, 2024. <https://www.forbes.com/sites/bryanrobinson/2024/07/23/employees-report-ai-increased-workload/>.
- 32 Dijk-Hildebrand, Olwen van. “Human Support vs. AI Assistance: Which Do Consumers Truly Prefer?” *2Stallions (blog)*, June 15, 2024. <https://2stallions.com/blog/human-support-vs-ai-assistance-which-do-consumers-truly-prefer/>.

© His Majesty the King in Right of Canada, 2025

For information regarding reproduction rights: <https://horizons.gc.ca/en/contact-us/>

PDF: PH4-227/2025E-PDF

ISBN: 978-0-660-78228-7

Aussi disponible en français sous le titre : L'IA pourrait avoir des répercussions inattendues sur la productivité.

#### DISCLAIMER

Policy Horizons Canada (Policy Horizons) is the Government of Canada’s centre of excellence in foresight. Our mandate is to empower the Government of Canada with a future-oriented mindset and outlook to strengthen decision making. The content of this document does not necessarily represent the views of the Government of Canada, or participating departments and agencies.