TECHNISCHE UNIVERSITÄT DRESDEN

Faculty of Business and Economics
Chair of Economics, esp. Economic Policy and Economic Research

Topics in Economic Policy

The New Age of AI – Assessing the Impact of ChatGPT on Labor Market Outcomes

Winter semester 2023/24

Outline

Since its inception, ChatGPT has been making headlines almost daily, achieving milestones from passing legal bar exams to outperforming medical professionals in diagnostic tasks. While the economics of labor markets is a well-trodden field, the advent of large language models like ChatGPT appears to be a game-changer, necessitating a reevaluation of established theories and predictions.

Inspired a similar format by Scott Cunningham, this reading seminar aims to acquaint master's students with the latest developments in the economics literature on automation, with a particular focus on the labor market implications of large language models. We structure the seminar into three sections. This first section serves as a refresher on what economists have discerned about the impact of automation technologies, such as industrial robots and computers, on various types of labor tasks. It lays the groundwork for understanding the broader economic implications of technological advancements.

The second section delves into scholarly predictions about the influence of artificial intelligence on labor markets prior to the emergence of large language models like the one used by ChatGPT. It offers a critical examination of these forecasts, setting the stage for a nuanced understanding of how LLMs like ChatGPT fit into or disrupt these narratives.

The third section is the core of the seminar, presenting the most recent research on the labor market impacts of ChatGPT. It explores a range of outcomes, from shifts in job types and skill requirements to changes in income inequality and the future of work.

By the end of this seminar, students should be well versed in the evolving landscape of labor economics in the age of AI and large language models.

Schedule

Introductory session: 10 October 2023, 1.00 p.m. – 2.00 p.m., Room SCH B 37.

Seminar presentations: 12 & 19 January 2024, 9.30 a.m. – 3.00 p.m. Room SCH B 37.

Instructors

Prof. Dr. Alexander Kemnitz, office hours: Tuesday, 4.40 - 6.10 p.m., SCH C 265, e-mail: alexander.kemnitz@tu-dresden.de

Dimitria Freitas, MA, office hours: by appointment, SCH C 261, e-mail: dimitria.freitas@tu-dresden.de

Modules

MA-WW-VWL-2704a, D-WW-WIWI-2704a: Topics in Economic Policy

MA-IB-GPOE-WP-IW-01: Economic Policy and Globalization

Requirements

Basic knowledge of microeconomics and macroeconomics. Basic knowledge of statistics and empirical methods is also beneficial.

Application

As a first step, we will talk about the organization of the seminar and about the topics in the introductory session. Please familiarize yourself with the papers beforehand. You can choose your topic of interest and register for it in OPAL (first-come-first-serve). **All participants must register for the seminar in HISQIS by 01 November.**

Exam

Seminar paper (weight: 2/3)

The seminar paper has to provide an informative summary and a critical review of the seminal article. This means:

- The **main task of the seminar paper** is to detail the methods and the results of the seminal article.
- In addition, you should discuss the paper critically and – more importantly - place it into the context of the literature closely related in terms of methods and the specific topic.
- You may also describe how your article fits into the general context of the seminar. However, we expect to develop this in detail in the discussions of the presentations.

The seminar paper should not exceed 20 pages in 12pt font and 1.5-line spacing (15 pages only for module MA-IB-WP-GPOE-IW).

Please submit your seminar paper **by 05 January 2024** as a **hardcopy to the Chair's secretary** (Heike Becker, SCH C 264, office hours: 08.00 a.m. – 11.30 a.m.) and **upload it as a PDF in OPAL**.

Presentation and Discussion (weight: 1/3):

The presentation should provide a summary of the seminar paper. It should not exceed 20 minutes (excluding questions), followed by a discussion of about 25 minutes. All participants need to contribute constructively to the discussion of each presentation. Please submit your presentation by **08 January 2024 by uploading it in OPAL.** We will bring all presentations on a USB stick for the presentation day. You must not use another version other than the one you submitted by the deadline above.

The language of both examinations is English.

Topics

Section I – Revisiting the Economics of Automation

1. The Polarization of the Labor Market in Developed Countries

Autor, D.H., Dorn, D., 2013. The Growth of Low-Skill Service Jobs and the Polarization of the US Labor Market. American Economic Review 103, 1553–1597. https://doi.org/10.1257/aer.103.5.1553

2. The Polarization of the Labor Market in Developing Countries

Maloney, W.F., Molina, C., 2016. Are Automation and Trade Polarizing Developing Country Labor Markets, Too? https://doi.org/10.1596/1813-9450-7922

3. The Effect of the Computer Revolution

Frey, C.B., Osborne, M.A., 2017. The future of employment: How susceptible are jobs to computerization? Technological Forecasting and Social Change 114, 254–280. https://doi.org/10.1016/j.techfore.2016.08.019

4. The Displacement of Manufacturing Jobs

Acemoglu, D., Restrepo, P., 2019. Automation and New Tasks: How Technology Displaces and Reinstates Labor. Journal of Economic Perspectives 33, 3–30. https://doi.org/10.1257/jep.33.2.3

5. The Effect on Income Inequality

Acemoglu, D., Restrepo, P., 2022. Tasks, Automation, and the Rise in U.S. Wage Inequality. Econometrica 90, 1973–2016. https://doi.org/10.3982/ECTA19815

Section II – Pre-LLM Predictions on AI and Labor Markets

6. Predictions for Labor Market Dynamics

Lane, M. and A. Saint-Martin (2021), "The impact of Artificial Intelligence on the labor market: What do we know so far?", OECD Social, Employment and Migration Working Papers, No. 256, OECD Publishing, Paris, https://doi.org/10.1787/7c895724-en.

7. Predictions on the Effect on High-Skill Tasks

Webb, M., 2019. The Impact of Artificial Intelligence on the Labor Market. https://doi.org/10.2139/ssrn.3482150

Section III – The ChatGPT Paradigm—New Insights on Labor Market Outcomes

8. **The Magnitude of the Impact**

Eloundou, T., Manning, S., Mishkin, P., Rock, D., 2023. GPTs are GPTs: An Early Look at the Labor Market Impact Potential of Large Language Models. OpenAI White Paper. https://doi.org/10.48550/arXiv.2303.10130

9. **The Impact on Different Skill Levels**

Felten, E., Raj, M., Seamans, R., 2021. Occupational, industry, and geographic exposure to artificial intelligence: A novel dataset and its potential uses. Strategic Management Journal 42, 2195–2217. https://doi.org/10.1002/smj.3286

10. **The Gendered Impact of AI**

Chavda, J., 2023. Which US Workers Are More Exposed to AI on Their Jobs? Pew Research Center's Social & Demographic Trends Project. URL https://www.pewresearch.org/social-trends/2023/07/26/which-u-s-workers-are-more-exposed-to-ai-on-their-jobs/).

11. **The Impact on Inequality**

Agrawal, A., Gans, J.S., Goldfarb, A., 2023. Do we want less automation? Science 381, 155–158. https://doi.org/10.1126/science.adh9429

12. **The Impact on Productivity – The Case of Programmers**

Peng, S., Kalliamvakou, E., Cihon, P., Demirer, M., 2023. The Impact of AI on Developer Productivity: Evidence from GitHub Copilot. https://doi.org/10.48550/arXiv.2302.06590

13. **The Impact on Productivity – The Case of Consultants**

Dell'Acqua, F., McFowland, E., Mollick, E.R., Lifshitz-Assaf, H., Kellogg, K., Rajendran, S., Krayer, L., Candelon, F., Lakhani, K.R., 2023. Navigating the Jagged Technological Frontier: Field Experimental Evidence of the Effects of AI on Knowledge Worker Productivity and Quality. https://doi.org/10.2139/ssrn.4573321

14. **The Impact of the Productivity-Experience Gradient**

Brynjolfsson, E., Li, D., Raymond, L.R., 2023. Generative AI at Work. NBER Working Paper Series. https://doi.org/10.3386/w31161

15. **The Impact of the Productivity by Skill-Level**

Noy, S., Zhang, W., 2023. Experimental evidence on the productivity effects of generative artificial intelligence. Science 381, 187–192. https://doi.org/10.1126/science.adh2586