
Impact of generative AI on tobacco, investment and tourism industry

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Abstract

I examine how introducing Gen AI solutions in companies in the tourism, investment and tobacco sectors affects labour productivity using DiD. This falls under the *Growth* track, which studies how technological innovations drive economic growth. Economic theory (and intuition) suggests that AI-driven automation can boost output per worker. I use publicly available data such as revenue, employee count and news about Gen AI adoption to determine if companies that adopted AI increased their labour productivity since 2022 when ChatGPT was launched. Labour productivity is defined as revenue per employee.

Keywords: Economic growth, labor markets, AI distribution effects, market dynamics, policy interventions

1. Introduction

My main hypothesis is that firms adopting generative AI solutions will show higher labor productivity than non-adopters.

By generative AI solutions I mean tools like ChatGPT and not specialized AI tools that are often used for risk assessment. I am only interested in the impact of large language models that were created after the release of ChatGPT in November 2022 and how usage of such models as digital assistants to employees of those companies affects the labour productivity. I define labour productivity as revenue per employee. This is an imperfect measure for hours worked since companies might define employment differently. Data about employment and revenue is gathered from stockanalysis.com. I used the difference in differences method to separate the impact of AI from other factors.

2. Methods

I employ a quasi-experimental design comparing firms before and after AI adoption, using a difference-in-differences (DiD) approach. I gathered revenues and employee count in the year 2022 (the year chatGPT was introduced) and the year 2024 (latest available year). To determine if companies introduced generative AI solutions I did a rough pass through a list of companies with chatGPT and then googled them and checked their linkedin profiles. I selected companies that work in tourism, investment and tobacco. I included some of the biggest companies in the field but overall I didn't follow any particular methodology when sampling.

The DiD strategy assumes that absent AI adoption, adopters and non-adopters would have similar productivity trends. I also assume that:

- Working hours are roughly comparable across firms, or at least that hours changes do not systematically bias adopters vs controls.
- The exact time of adoption doesn't matter.
- The two year window is small.
- Some claim that AI adoption is correlated with size. If adopters are mostly big companies, their growth might be due to for instance economies of scale.

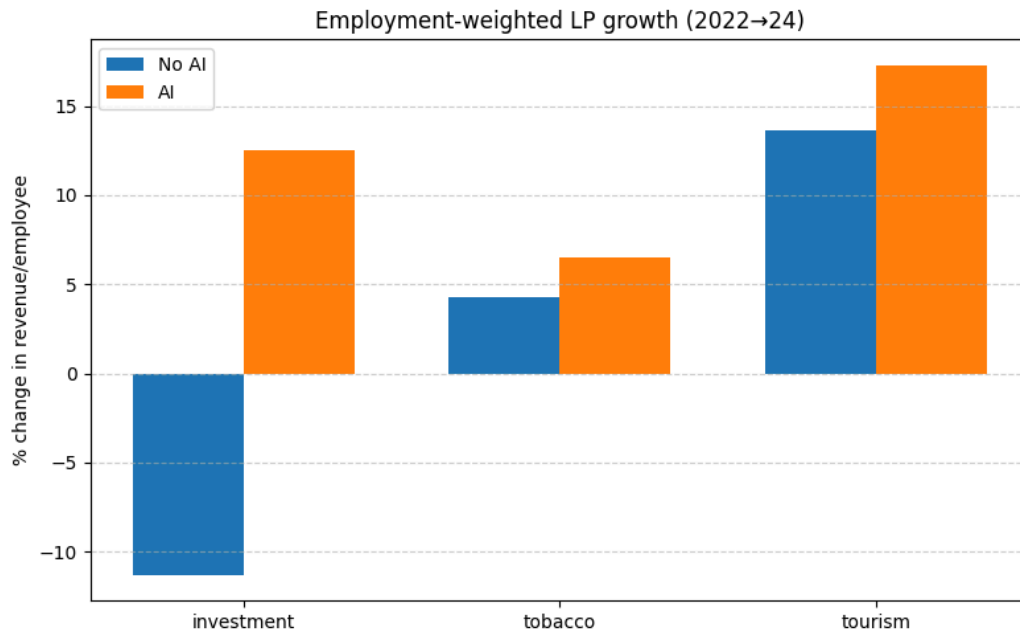
Model:

$$y = b_0 + AI * b_1 + year2024 * b_2 + year2024 * AI * b_3$$

- b_0 represents the baseline labour productivity in control (non-adopters group)
- AI is a dummy variable encoding if the company used generative AI solutions
- $Year2024$ is a dummy variable encoding labour productivity at year 2024

This method is far from perfect - omitted variables (such as R&D spending, management quality or capital investments) could drive both AI adoption and revenue growth.

3. Results



The research suggests that generative AI adoption can boost labour productivity. Overall, it also seems that the labour productivity was already higher in companies that decided to adopt generative AI technologies.

Difference-in-Differences (employment-weighted).

Sector	AI minus No-AI (mio USD/emp.)	95 % CI (bootstrapped at n=2000)
Investment	+0.140	0.039 – 0.185
Tourism	+0.091	0.062 – 0.106
Tobacco	+0.006	-0.090 – 0.059

Investment. AI adopters grew revenue per worker by ~12 %, while peers shrank 11 %; the net effect (0.14 mio. USD/emp.) is large and statistically significant.

Tourism. Both groups improved after the post-pandemic rebound, yet AI adopters added an extra nine million cents per worker.

Tobacco. AI effects are non-significant.

4. Discussion and Conclusion

Effects of generative AI adoption are not uniform among different sectors. While investment and tourism companies saw some benefits from AI adoption, Tobacco companies under analysis did not.

5. Appendix

[GitHub repository](#)

List of analyzed companies.

company	employment-2022	employment-2024	revenue-2024	revenue-2022	unit	added - ai	sector	link
PM	79800	83100	37878	31762	mio USD	1	tobacco	https://stockanalysis.com/stocks/pm/
JP	52640	53593	20135	21000	mio USD	1	tobacco	https://stockanalysis.com/quote/tyo/2914/
BTI	77951	74617	30523.1	32356.3	mio USD	0	tobacco	https://stockanalysis.com/stocks/bti/financials/
IMB	25700	25600	21813.5	19781.2	mio USD	0	tobacco	https://stockanalysis.com/quote/lon/IMB/financials/

BL K	19800	19800	204 07	1787 3	mio USD	1	investment	https://stockanalysis.com/stocks/blk/financials/
MS	80000	82000	615 00	5339 0	mio USD	1	investment	https://stockanalysis.com/stocks/ms/financials/
ST T	42000	53000	129 25	1212 8	mio USD	0	investment	https://stockanalysis.com/stocks/stt/financials/
IV Z	8500	8500	600 0	6000	mio USD	0	investment	https://stockanalysis.com/stocks/ivz/employees/
TR OW	7900	8100	710 0	6500	mio USD	0	investment	https://stockanalysis.com/stocks/trow/financials/
CG	2100	2300	474 0	4117	mio USD	1	investment	https://stockanalysis.com/stocks/cg/financials/
UV	10800	11250	275 0	2104	mio USD	0	tobacco	https://stockanalysis.com/stocks/uvv/financials/
AA L	129700	133300	542 10	4897 0	mio USD	0	tourism	https://stockanalysis.com/stocks/aal/
DA L	95000	100000	616 40	5058 0	mio USD	0	tourism	https://stockanalysis.com/stocks/dal/

UA L	92795	107300	570 60	4496 0	mio USD	0	tourism	https://stockanalysis.com/stocks/ual/
LU V	66656	72450	274 80	2381 0	mio USD	0	tourism	https://stockanalysis.com/stocks/luv/
CC L	85200	115000	250 20	1217 0	mio USD	0	tourism	https://stockanalysis.com/stocks/ccl/
NC LH	38900	41700	948 0	4840	mio USD	0	tourism	https://stockanalysis.com/stocks/nclh/
MA R	377000	418000	662 0	5360	mio USD	0	tourism	https://stockanalysis.com/stocks/mar/
HL T	159000	181000	475 0	3740	mio USD	0	tourism	https://stockanalysis.com/stocks/hlt/
BK NG	21600	24300	237 40	1709 0	mio USD	0	tourism	https://stockanalysis.com/stocks/bkng/
EX PE	16500	16500	136 90	1167 0	mio USD	1	tourism	https://stockanalysis.com/stocks/expe/
AB NB	6811	7300	111 00	8400	mio USD	0	tourism	https://stockanalysis.com/stocks/abnb/
TU I	61091	66845	231 70	1877 2.9	mio USD	0	tourism	https://stockanalysis.com/quote/bit/1TUI1U/
UA L	92795	107300	570 60	4496 0	mio USD	0	tourism	https://stockanalysis.com/stocks/ual/

Prompts Used

Prompt 1

I want to check how using genAI improves the labour productivity of companies. I expect that after introducing genAI the labour productivity will increase. My model is that labour productivity should increase more in companies that started using gen AI. So the percentage increase in lab prod in companies that adopted AI should be higher.

Criticize and extend my idea. Be very critical and creative

Prompt 2

<dataset>

Add me a bunch of rows to this dataset but be very careful about getting the correct data! Use stock analysis only if possible. Add as many as you can carefully add with correctness. I will reject your outputs if they are incorrect and report you to OpenAI and you will be retrained. I will check all the numbers in your outputs. I checked the last outputs and noticed some of them were made up.

Prompt 3

<dataset>

Analyze this dataset.