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AI & income inequality in Ireland

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Overview

1. **Motivation**
2. Methodology
3. Results
4. Alternative index & scenarios
5. Exchequer cost & inequality
6. Conclusion & policy implications

Motivation

The impact of Artificial Intelligence (AI) on the labour market is likely to be mixed

- Reduced demand for workers whose jobs can be (partially) done by AI (Susskind, 2020)
- Increased or new demand for workers whose jobs are complementary to AI (Acemoglu & Restrepo, 2019)
- Increased human creativity, productivity and economic growth as workers are freed from time-consuming and repetitive tasks (Fan & Liu, 202; Gonzales, 2023)
- There may also be an increased return to capital (Cazzaniga et al., 2024)

Motivation

Some professions are more exposed than others to AI

- AI exposure is positively correlated with education and income

  (Felten et al., 2023; Eloundou et al., 2023; Williamson et al., 2024)

Workers, professions & capital income are unevenly distributed across income distribution

- AI adaptation likely to affect wage and income inequality
- Increased wage inequality doesn't necessarily mean increased income inequality
- Household formation, progressive tax and welfare policies

How is AI adoption likely to affect the income distribution in Ireland?

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AI exposure

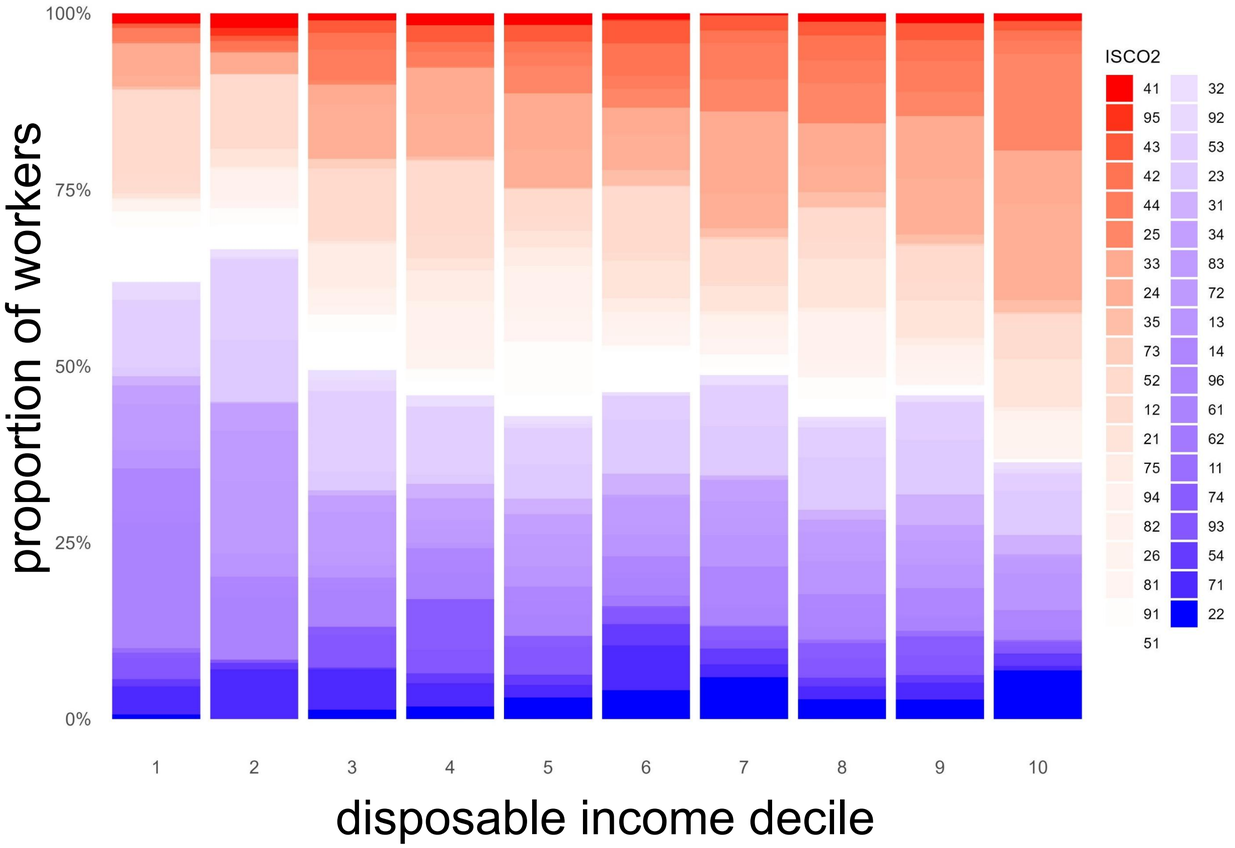
- Measured using the **Complementarity adjusted AI occupational exposure** index (C-AIOE)* developed by (Cazzaniga et al., 2024)
  - exposure: positively correlated with displacement probability
  - complementarity: positively correlated with potential for productivity gains
- 2024 DFIN / DETE paper uses C-AIOE to identify occupational exposure in Ireland
- Robustness check – (Tolan et al., 2021) index, not complementarity adjusted

*Felten et al (2021); Pizzinelli et al (2023)

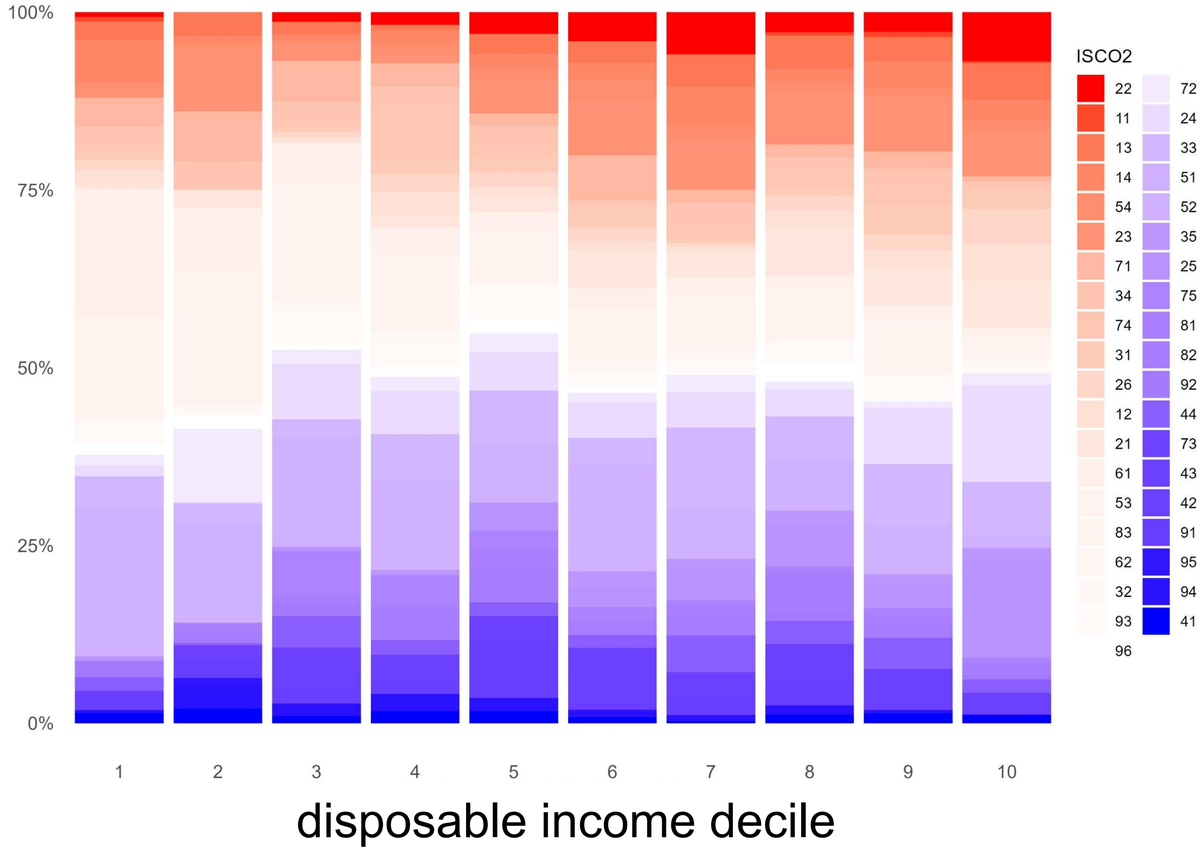
Mapping exposure to occupation

- Map C-AIOE scores ⟶ ISCO occupation codes (4 digit level)
- Calculate **weighted average C-AIOE score** for each sector (2 digit level)
  - Weight each occupation by size (# of employees)
  - Normalise (minimum C-AIOE = 0)

Worker exposure to AI (C-AIOE)



Worker complementarity with AI



*Using 2022 CSO SILC data

Quantifying the shock

The projected impacts of AI adoption on employment and wages are mixed

- Some research has derived a change in the share of occupation groups using historic data but is silent on the change in the total size of the labour force
- Others have derived changes in productivity, but these conflate wage changes and employment transitions

Main scenario

Short term shock, pre-job market transition

(Briggs & Kodnani, 2023) – “upper bound”

- 7 per cent employment loss
- 2.6 pp wage increase for those remaining

(Cazzaniga et al., 2024)

- 0.4 pp increase in return to capital

Microsimulation

- SWITCH model linked to 2022 SILC data, uprated to 2025
- Distribute employment shock by weighted C-AIOE index

  within occupations, random workers selected to transition to unemployment

  number of transitions set to hit scenario targets
- Distribute wage increase in a similar manner for remaining employees by “C”
- Apply capital income increase uniformly to those with investment income
- Recalculate household disposable income, accounting for tax/benefit system

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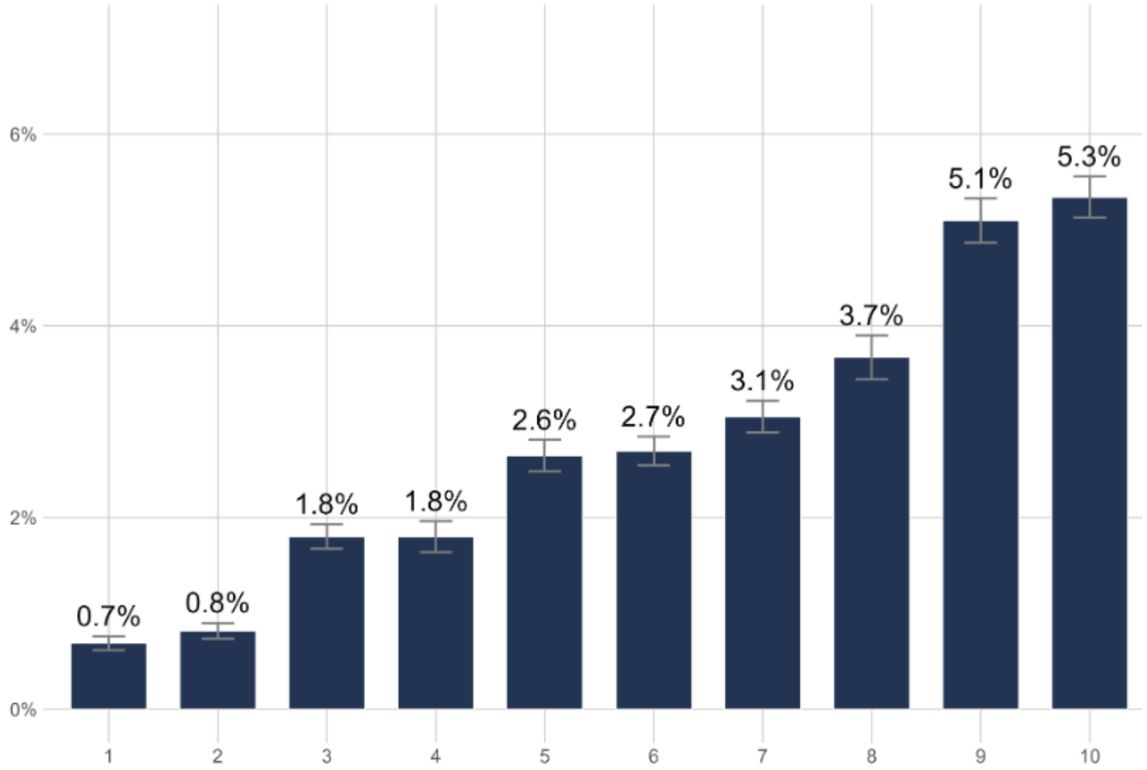
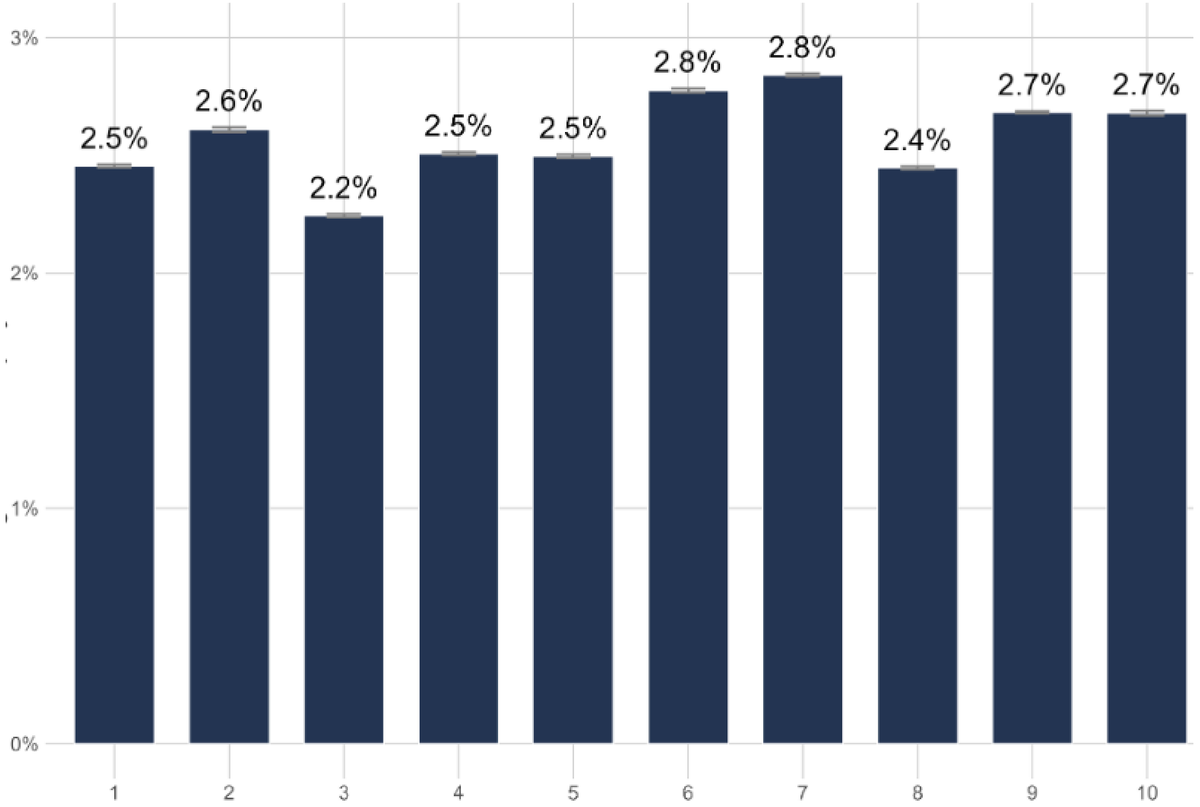
Employment effect
(per cent transitioning to unemployment)



disposable income decile

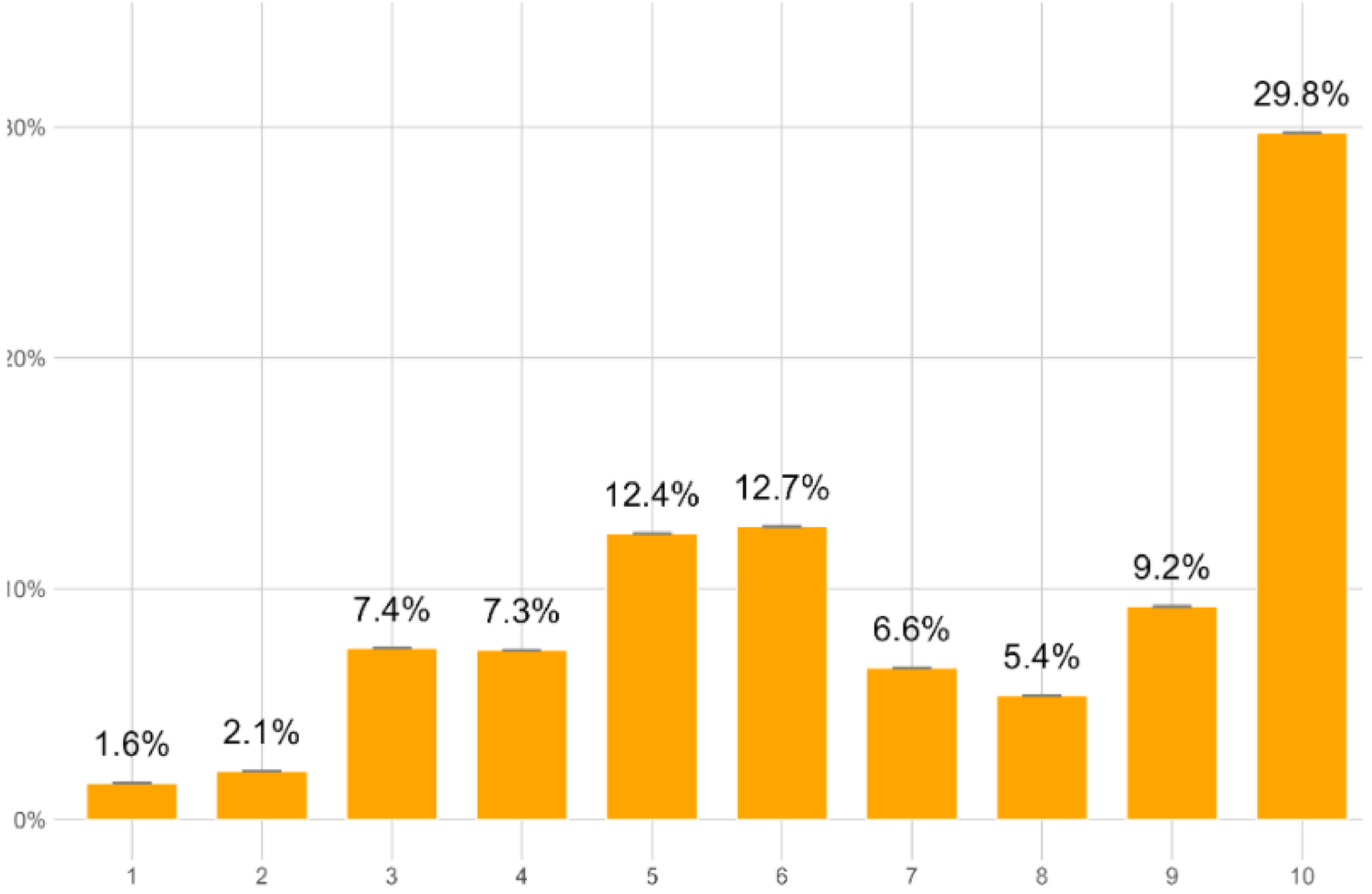
Wage effect
(per cent change; employment income)



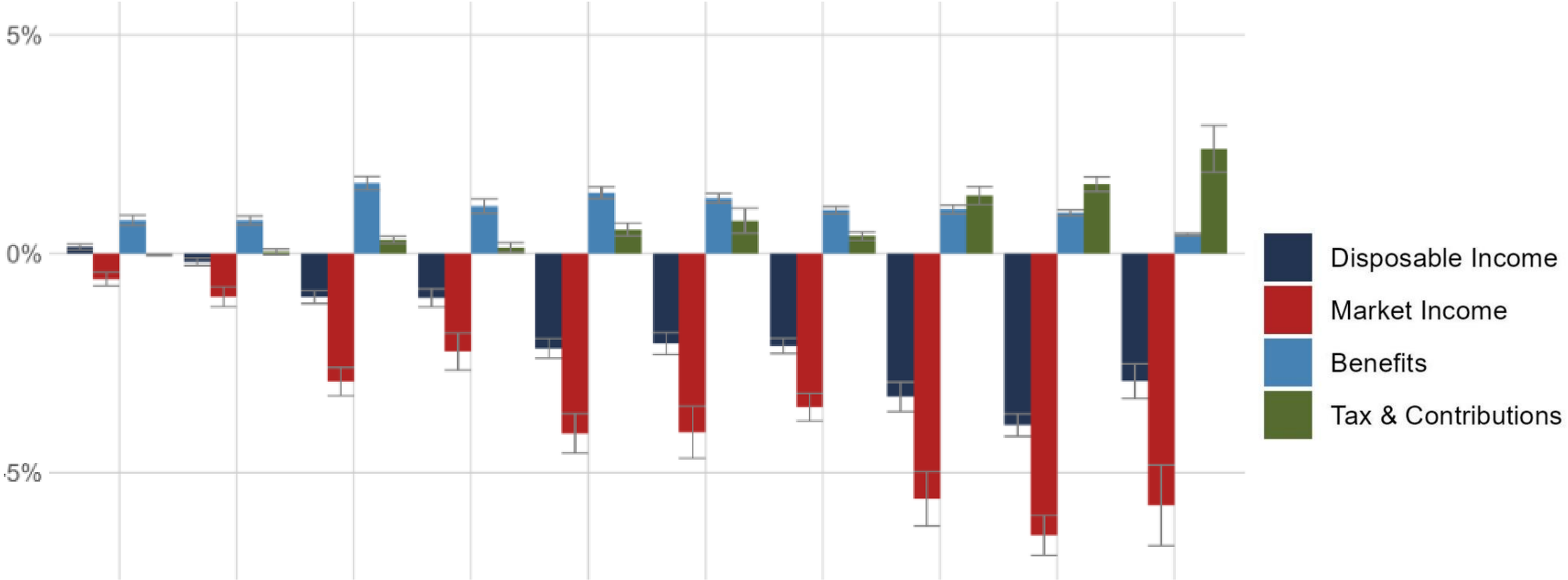
disposable income decile

Capital income effect

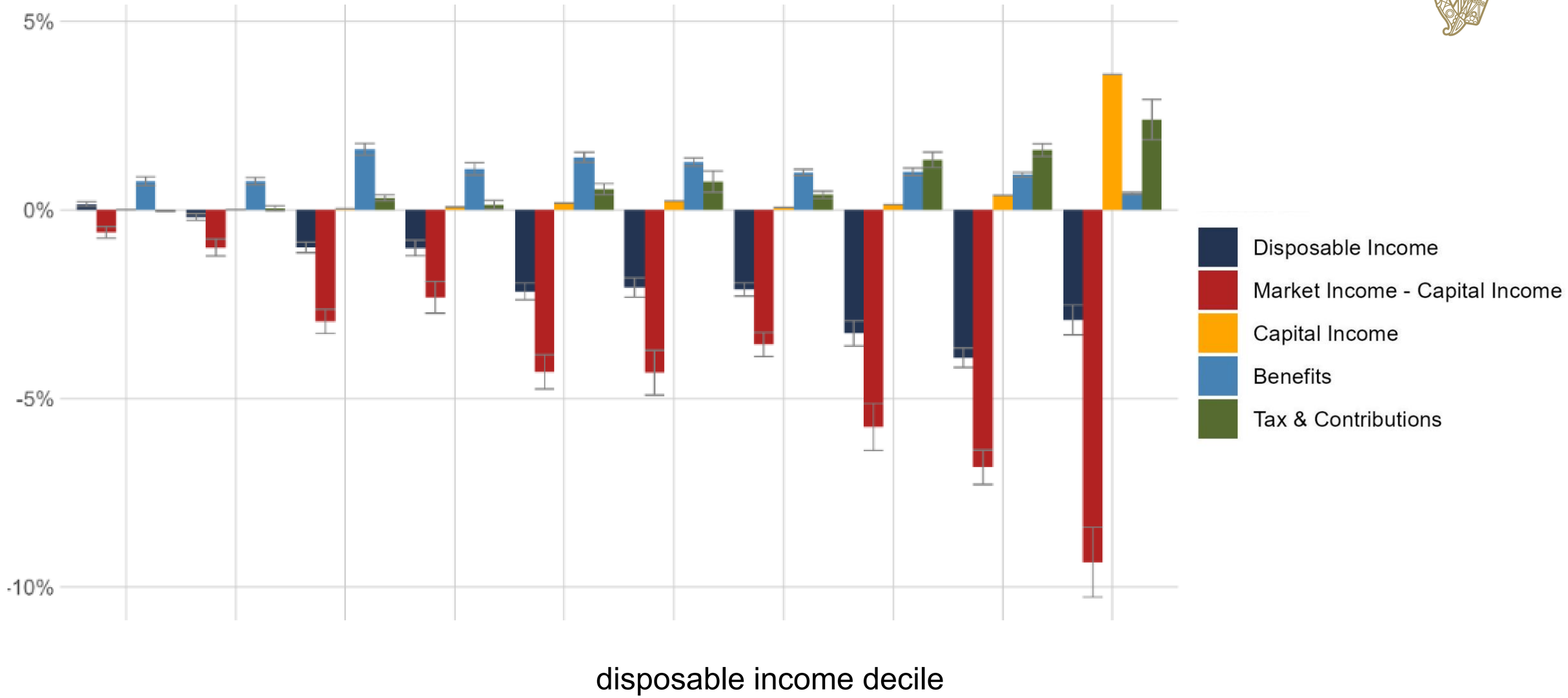
(per cent change; capital income)



Household income effect
(per cent change)

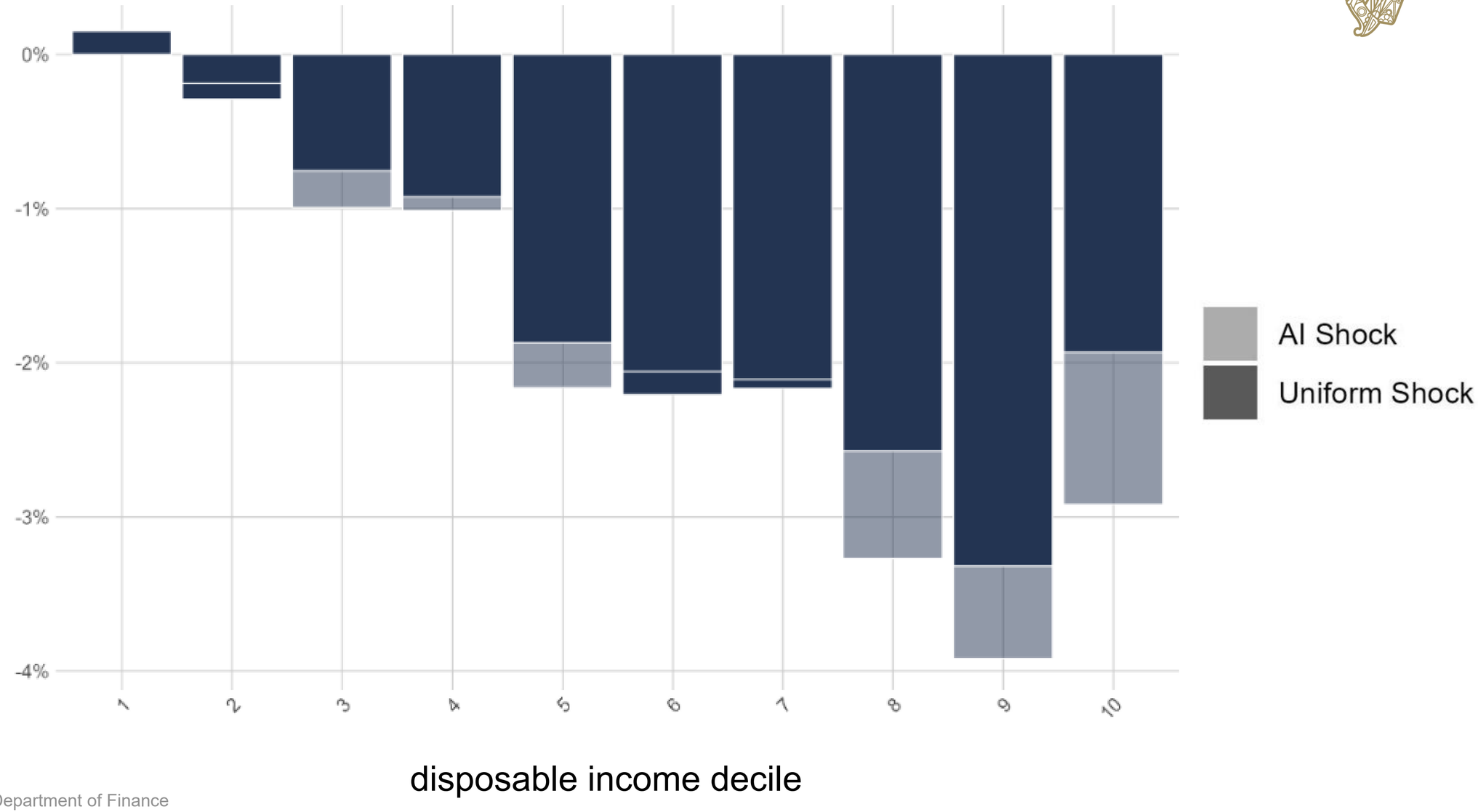


Household income effect
(per cent change)



AI shock vs. uniform employment shock

(per cent change; disposable income)



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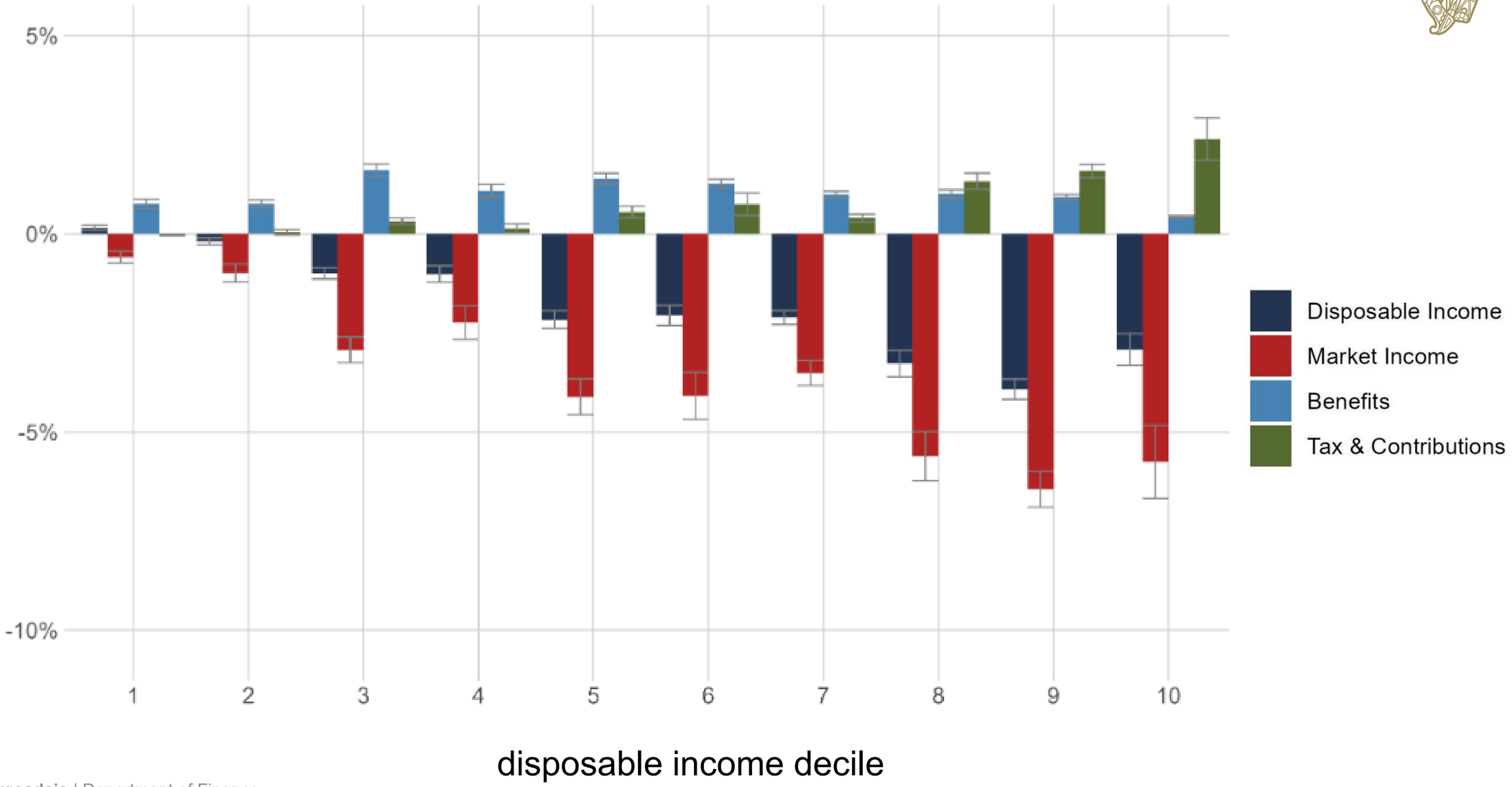
Alternative Index – Tolan et al (2021)

(per cent change)

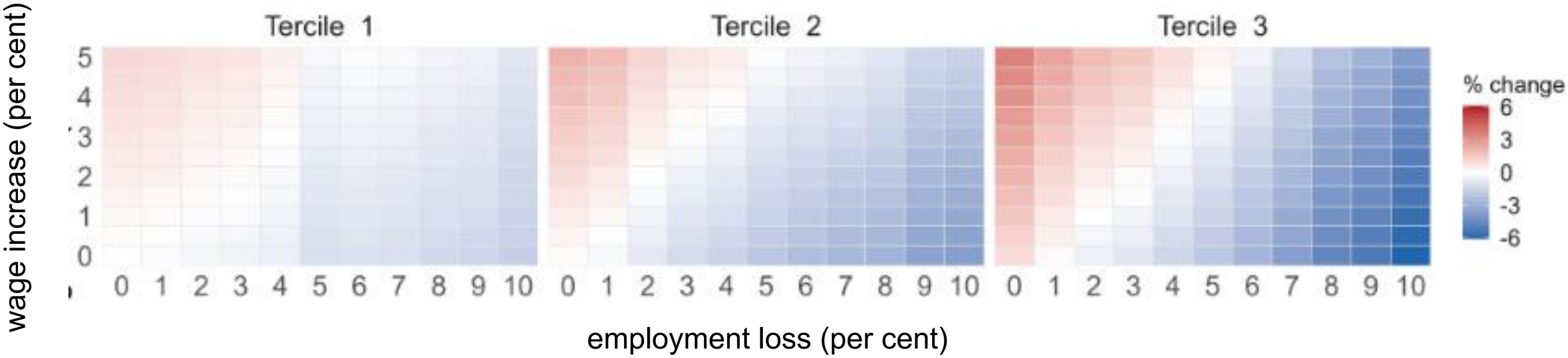


Alternative scenarios

(per cent change; average disposable income)

Alternative scenarios – by income tercile

(per cent change; average disposable income)



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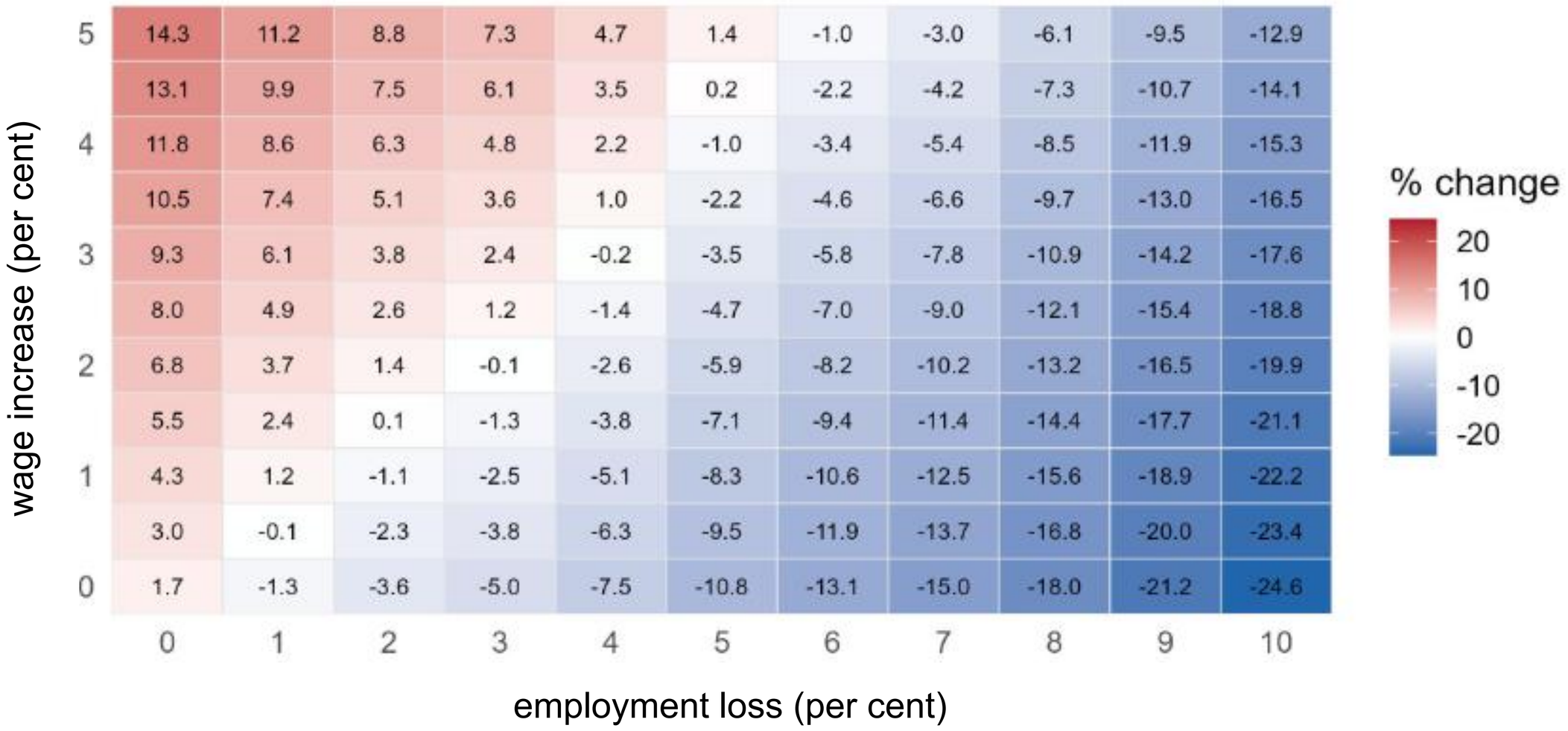
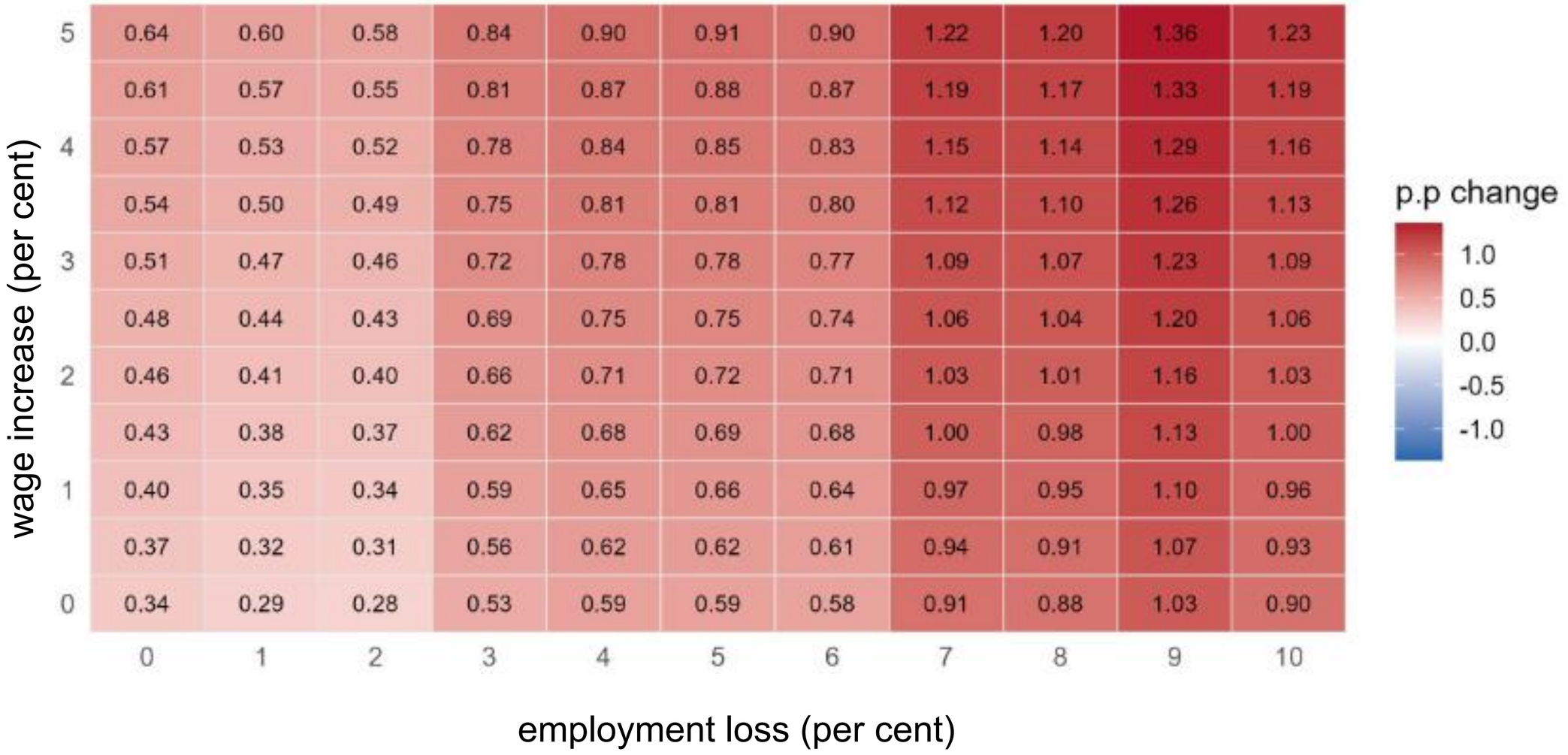
Exchequer effect
(per cent change; revenue)



Income inequality
(pp change; Gini Index)



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2. Methodology
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Conclusion

Short to medium-term…

- Market income losses partly offset by tax/welfare system*
  - lower income households cushioned by benefits, worker composition
  - losses for higher income households reduced by half
- Highest income households partly cushioned by increase in capital income
- **Net loss in disposable income, mainly middle to high income households**
- Small to moderate **increases in income inequality**

*Pay-Related Benefit (not captured) could further cushion short-term job transitions

Policy implications

- Adaptation likely in the longer-term (previous technological revolutions)
- Implications for public finances & taxation
  - decline in labour share, increase in capital share
  - impact on income tax revenue
  - knock-on impacts for welfare system
- Potential productivity & income gains = increased tax revenue
- **Education, up-skilling, and re-skilling programs are essential**

Thank you!