How Scary is Automation Risk? Evidence from a Large Survey Experiment

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Motivation

- Historically, digital technologies have substituted low-skilled and routine workers while complementing high-skilled and non-routine cognitive workers (Katz & Murphy, 1992; Autor et al., 2003)
- Recent advances in AI affect high-skill non-routine tasks, putting new types of jobs at risk of automation (e.g., Eloundou et al., 2023; Felten et al., 2023; Hui et al., 2023)
- Workers can respond to labor demand shifts by
  - retraining & upskilling (Di Giacomo & Lerch, 2023; Golin & Rauh, 2022; Hess et al., 2023; Lergetporer et al., 2023)
  - adjusting their occupational choice (Goller et al., 2023)

→ What is the willingness to pay of individuals to reduce their exposure to automation risk?

Summary

Research Question: What is the willingness to pay (WTP) of individuals to reduce their exposure to automation risk?

Empirical Strategy & Data: Discrete-choice experiment as part of a large-scale survey among 5,952 Swiss residents between 25 and 60

Findings:

- On average, individuals are willing to accept a 19% lower annual gross wage to work in a job with a 10 ppt. lower automation risk
- WTP varies with respondent age, gender, education, nationality, and risk-aversion

Conclusions: Job automation is considered a substantial threat, and people are willing to give up a lot to work in a more secure job

Discrete Choice Experiment

Survey respondents

1. are asked to imagine they had a 40-year-old child
2. are presented with a choice set of two *career paths*
   $\rightarrow$ Career paths vary in 4 *attributes*: highest education, hierarchical position, annual gross wage, and job automation risk
3. need to choose the preferred career path for their child

Discrete Choice Experiment

Example choice set:

Imagine you had a 40-year-old daughter today.
Which of the two career paths would you prefer for her, career path A or career path B?

	Career path A	**Career path B**
Highest educational attainment	University of applied sciences degree	Apprenticeship certificate
Hierarchical position	Low (without management position)	Low (without management position)
Annual gross wage (CHF)	100,000	130,000
Job automation risk	30%	45%

Attributes & Levels

Discrete Choice Experiment

Survey respondents

1. are asked to imagine they had a 40-year-old child
2. are presented two *career paths*
   $\rightarrow$ Career paths vary in 4 *attributes*: highest education, hierarchical position, wage, and job automation risk
3. need to choose the preferred career path for their child

Every respondent completes 7 varying choice sets

Applying a mixed logit model, respondent choices are used to approximate their preferences for career path attributes

Results

Mixed logit estimates and willingness to pay for career path attributes

	Coefficients	WTP
Automation Risk (10 ppt.)	-0.790***	-15305.5***
	(0.0247)	(371.7)
University Degree	-0.570***	-11035.6***
	(0.0424)	(917.7)
UAS Degree	-0.0375	-726.3
	(0.0328)	(642.9)
Top Management Position	0.0664**	1286.4**
	(0.0257)	(490.1)
Annual Gross Wage (10,000 CHF)	0.839***	
	(0.0272)	
N	83,328	83,328

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Heterogeneities Interactions

Results

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Individual determinants of WTP for a *lower* automation risk

	Full Sample
Male	-686.4*
	(333.7)
Age: 35 - 49	717.8
	(427.7)
Age: 50+	2102.0***
	(482.1)
Below Secondary Degree	2367.7**
	(814.0)
Secondary Degree	1953.6***
	(353.3)
Swiss Citizen	1244.4**
	(384.3)
Parent	-433.6
	(358.1)
Trait: Risk-seeking	-989.5**
	(339.6)
Constant	15943.8***
	(527.1)
N	5948

Conclusions

- Job loss due to automation technology is considered a substantial threat
  - $\rightarrow$ Typically implies diminished opportunities to secure similar positions
- Possible manifestations of individuals' identified WTP:
  - Switching to more secure occupations with lower pay
  - Investing time and money to train for a more secure occupation
  - Saving more to allow for early retirement, thus reducing the risk of future job automation
  - Preferences for policies and regulations to protect against job automation, even if economically disadvantageous

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Thank you!

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Literature

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DCE: Attribute-level universe

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	Attribute	**Levels**
$wage_a$	Annual gross wage (CHF)	75'000, 100'000, 115'000, 130'000
edu_a	Highest educational attainment	- University degree; - university of applied sciences degree; - apprenticeship certificate
pos_a	Hierarchical position	- Low (without management position); - high (top management)
$arisk_a$	Job automation risk	30%, 45%, 60%
-	Job satisfaction	Satisfied
-	Weekly working time	42 hours

Results: WTP for lower automation risk with interactions

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	(1)	(2)
Automation Risk (10 ppt.)	15305.5***	13879.6***
	(371.7)	(659.5)
Automation Risk × University Degree		2439.8***
		(550.5)
Automation Risk × UAS Degree		71.91
		(467.1)
Automation Risk × Top Management Position		776.9*
		(302.6)
N	83,328	83,328

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$