

Citizens and Grand Challenges

Research Consortium Event

Date & Time: March 28, 2024

Venue: Hotel President Seoul



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SESSION 1-1

**A comparative study of public opinion on
societal challenges in advanced economies
An early view**

Zhen Jie Im

A comparative study of public opinion on societal challenges in advanced economies

An early view

Zhen Jie Im — zi.egb@cbs.dk

Citizens and Grand Challenges: Research Consortium Event
Seoul

28 March 2024

Overview

1. Team
2. Motivation
3. Study design
4. Early findings
5. Recap

Team

Institutions	Members
Copenhagen Business School	Manuele CITI
	Caroline DE LA PORTE
	Zhen Jie IM
	Mads Dagnis JENSEN
	Janine LESCHKE
	Carolin SCHÜTZE (now at University of Malmö)
Korea Institute for Health and Social Affairs	Young-Kyu SHIN
Politecnico di Torino	Stefano SACCHI
Roskilde University	Anders EJRNÆS
University of Sussex	Wil HUNT
	Jacqueline O'REILLY
	Rachel VERDIN
	Partners
University College Dublin	Dorota SZELEWA
University of Delaware	Jin Yao KWAN
University of Helsinki	Minna VAN GERVEN
University of Oslo	Haldor BYRKJEFLØT

Motivation (1)

- Advanced democracies are confronted by (intensification of) numerous challenges:
- Population ageing during fiscal austerity
- Automation
- Globalisation
- Digitalisation
- Climate change (Green Transition)
- War

Motivation (2)

- Public opinion matters because it may influence (to vary extent) decisionmakers' actions and choices. (e.g. Abou-Chadi et al. 2020; Manza and Brooks 2006)
- Rich public opinion research on individual challenges. (e.g. E.g. Im 2024; McDonnell et al. 2022; Sacchi et al. 2020; Steiner et al. 2024)
- However, few explore the (some of) the challenges together. One reason is data constraints.

Motivation (3)

- Challenges may overlap leading to policy trade-offs (e.g. Zeitlin et al. 2019).
- In this way, an integrated understanding of how the public perceives these challenges is needed.
- E.g. Salience, hierarchy, policy demands, policy trade-offs.
- What does the public worry about, what do they want, and what are they willing to trade off?

Data (1)

- Brought together a consortium that designed and fielded our own survey to gather opinions on -
- Automation, digitalisation, climate change, war, population ageing in the context of fiscal austerity, diversity at the workplace, trust in public authorities
- Financed by and collaboration of between 5 institutions -
- Copenhagen Business School, Korea Institute for Health and Social Affairs, Politecnico di Torino, Roskilde University, University of Sussex

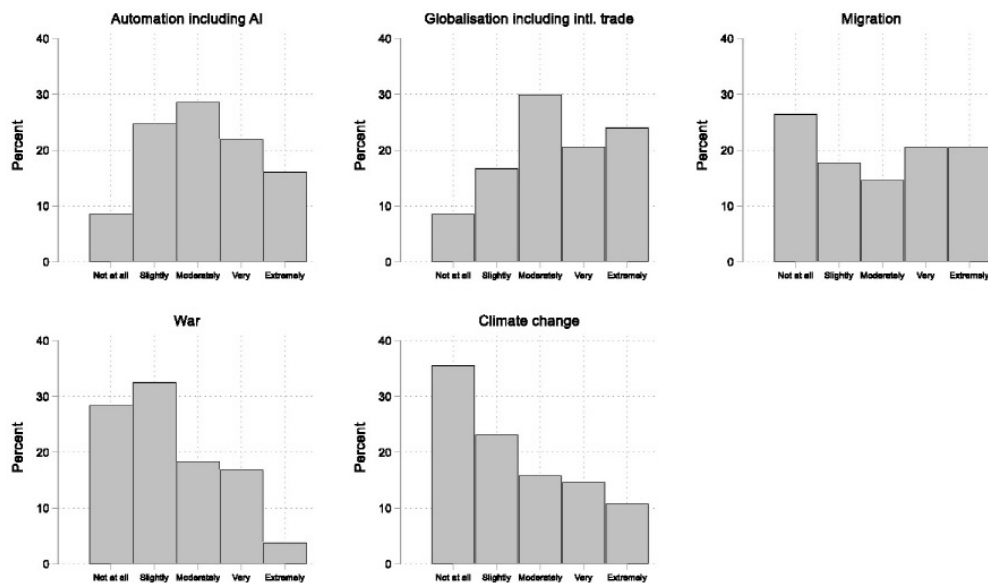
Data (2)

- 22,000 respondents using quota sampling in 10 countries –Denmark, Finland, Germany, Italy, Norway, Poland, South Korea, Sweden United Kingdom, United States
- LOI – circa 20 minutes (25 minutes in Korea)
- 41 main questions
- Fielded by YouGov
- Pilot (28 Feb 2024 to 7 March 2024) – DK, IT, UK
- Main (Expected Mid-April onwards)
- Data for main expected to be made publicly available at a later stage

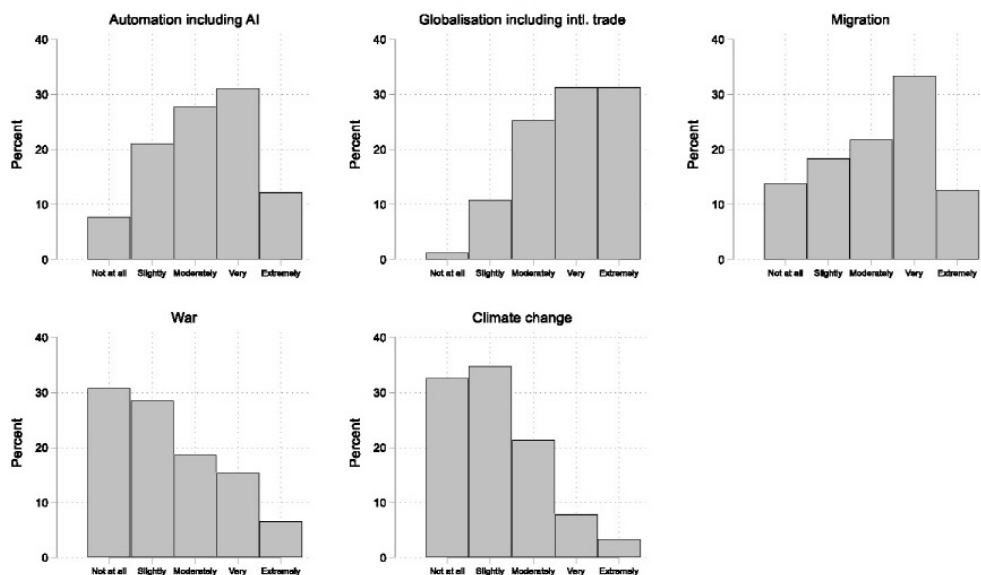
Early results (1)

- How concerned is the public about various social challenges?
- Question - "How worried are you about each of the following?"
- Automation, including artificial intelligence (e.g. ChatGPT)
- Globalisation, including international trade
- Migration
- War
- Climate Change

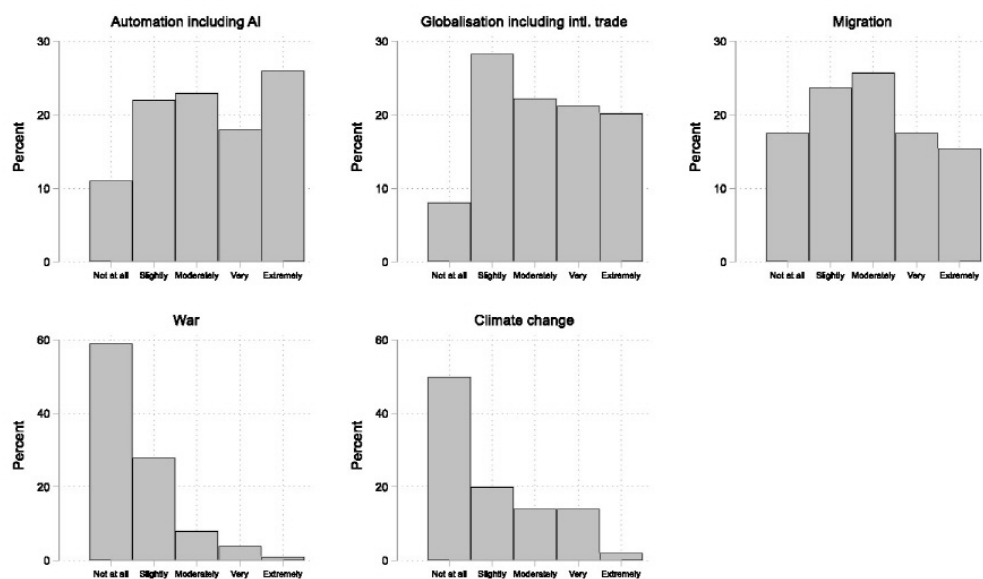
United Kingdom



Denmark



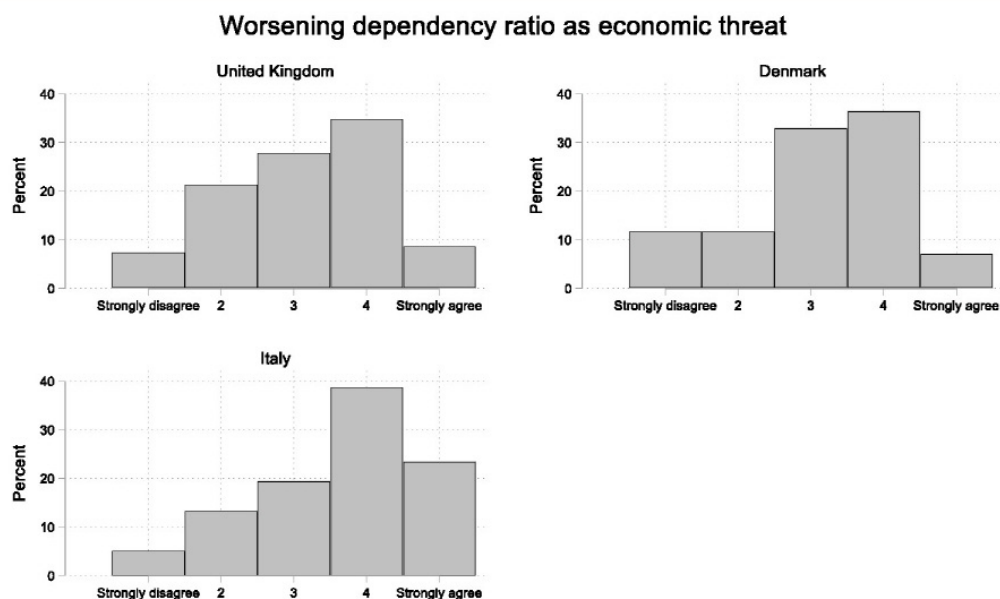
Italy



Early results (2)

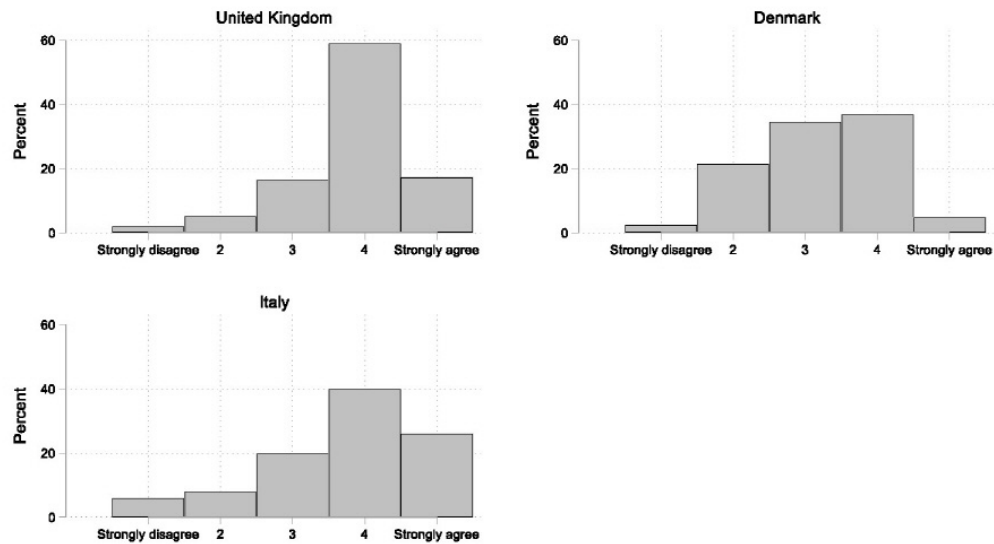
- Is a worsening dependency ratio an economic problem, and what to do about it?
- Question - "Please indicate the degree to which you agree or disagree with the following statement:"
- The increasing number of elderly people relative to the working age population poses a threat to COUNTRY ADJECTIVE economy
- Everyone in COUNTRY should be allowed to choose early retirement from work, even if it implies a decrease in their standard of living at the time of retirement
- Increasing the retirement age of workers results in fewer job opportunities for younger workers

Worsening dependency ratio an economic threat?



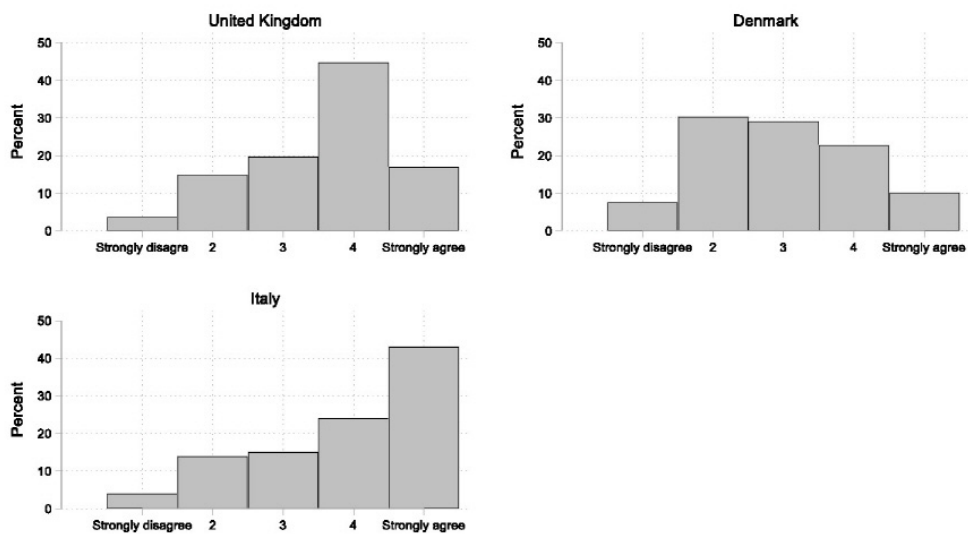
Early retirement even if decline in SOL during retirement?

Early retirement even if decline in SOL during retirement



Increase retirement age even if less job opp. for young workers?

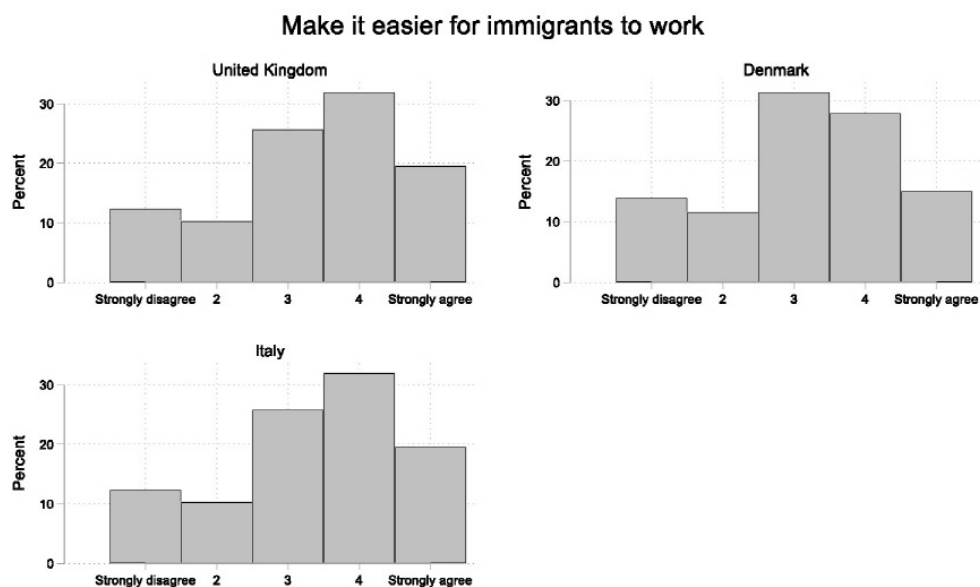
Increase retirement age even if less job opportunity for young workers



Early results (3)

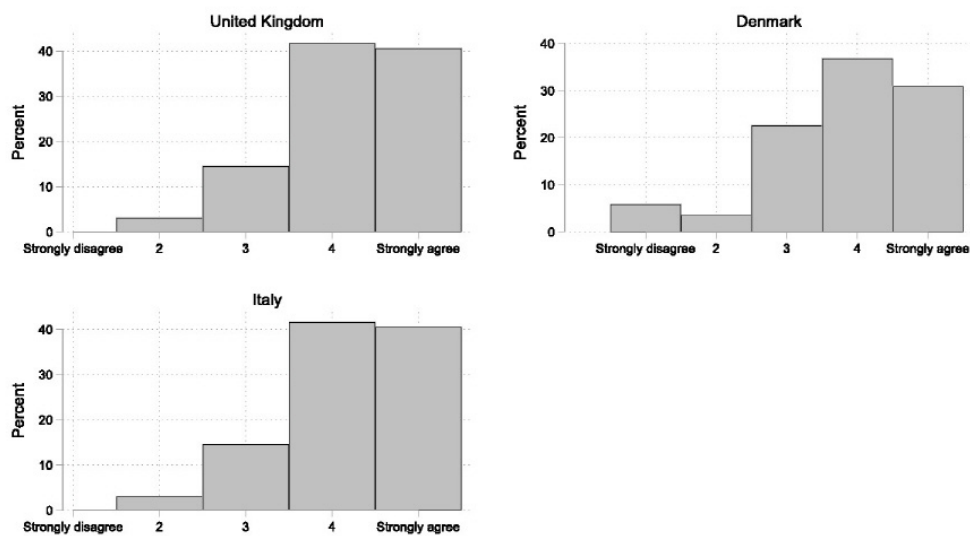
- How to reduce the dependency ratio?
- Question - "In COUNTRY people are living longer, while fewer children are being born. To tackle this issue, several actions could be taken by decision-makers. Please indicate the degree to which you agree or disagree with the following actions:"
- Make it easier for immigrants to work in COUNTRY
- Ensure free access to high quality public childcare services
- Provide cash benefits to families who have more than 1 child

Make it easier for immigrants for work?



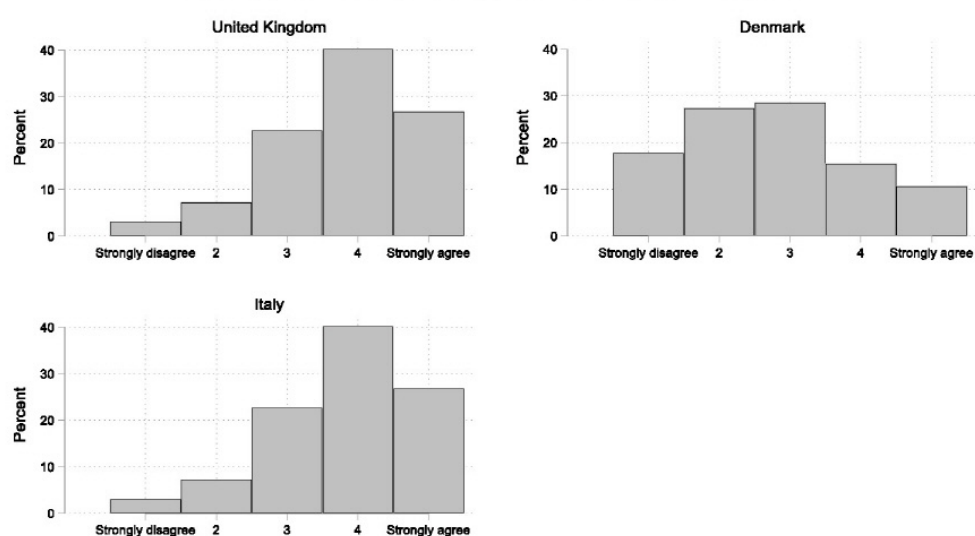
Ensure free access to high quality public childcare services?

Ensure free access to high quality public childcare services



Provide cash benefits to families with > 1 child?

Provide cash benefits to families with > 1 child

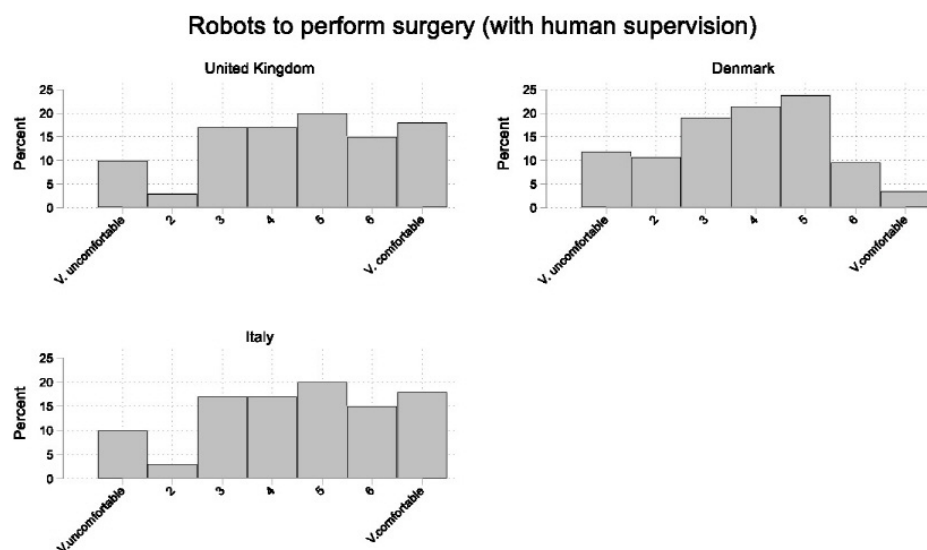


Early results (4)

- Medical care and old age - solutions for skilled labour shortage dying population ageing
- Question - "How comfortable/uncomfortable do you feel about the following uses of technology?"
- Robots to perform surgery (with human supervision)
- AI to diagnose diseases (with human supervision)
- AI-enabled robots for companionship in old age.

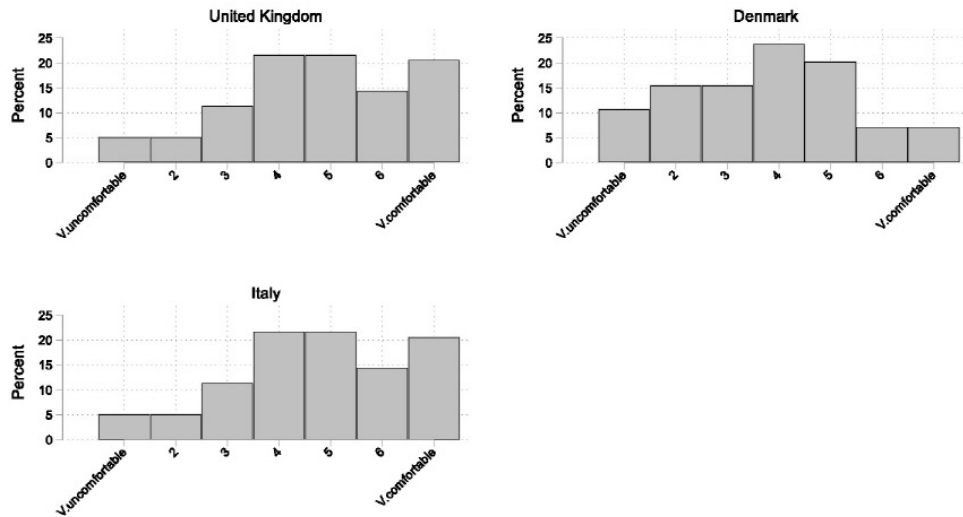
14/17

Robots to perform surgery (with human supervision)?



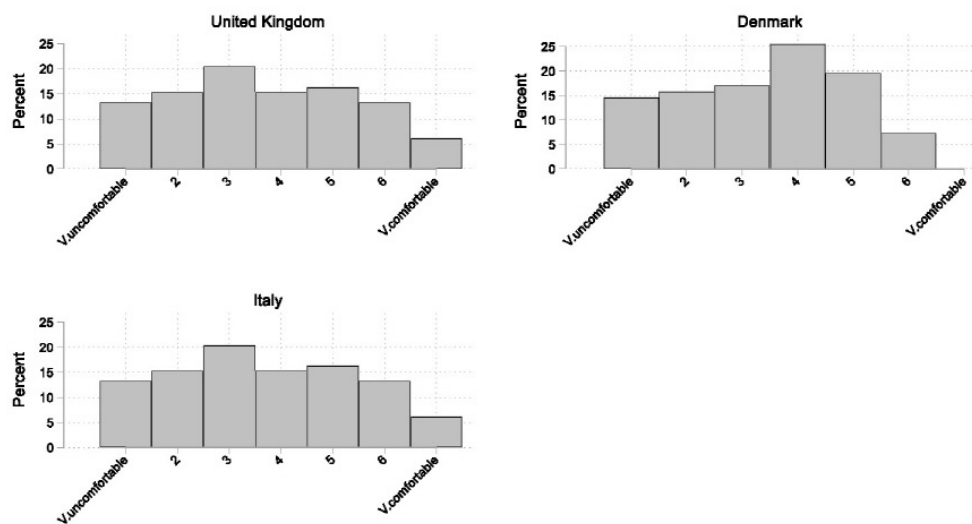
AI to diagnose diseases (with human supervision)?

AI to diagnose diseases (with human supervision)



AI-enabled robots for old age companionship?

AI-enabled robots for companionship in old age



Key preliminary findings

- In order of concern: Globalisation, Automation (AI), Migration -> Climate Change, War
- Dependency ratio - agreement that it is an economic threat. Weak, albeit with intra and inter country variation, on support for early retirement and extended working lives even with trade-offs.
- Free public childcare services - > immigration -> cash benefit for parents. Variation across policy types and across countries. Note especially Danish difference.
- AI for medical and old age care. Substantial variation across countries with Denmark as an outlier

In sum

- Variation in public opinion on worry about different challenges.
- Some solutions more supported than other. Public shows appetite to absorb some trade-offs
- But variation across countries – which type of institutional differences matter. The relevance of CPE approach?

The End.

Thank you

SESSION 1-2

Pilot study results on the green transition

Manuele Citi

PILOT STUDY RESULTS ON THE GREEN TRANSITION

Manuele Citi

Associate Professor,
Department of Management, Society and Communication



FINANCIAL TIMES



Climate change

The world is warming faster than scientists expected

FT, 25 Mrch 2024

But are citizens worried climate change?

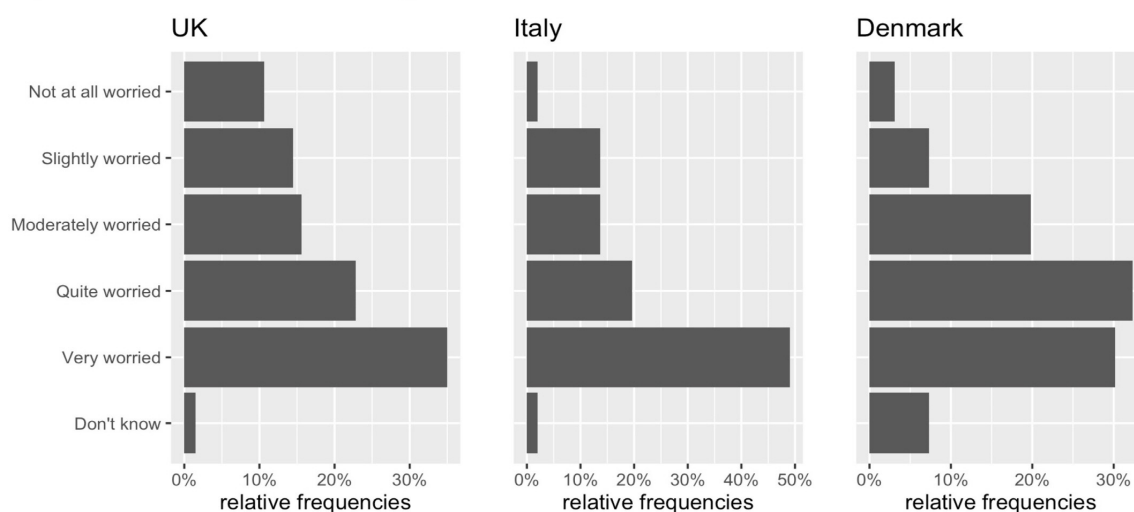
- We asked whether respondents were worried about climate change (q12_5)
- We asked whether respondents were afraid that
 1. Policies to cut carbon emissions will lead to some people making greater sacrifices than others (q39_1)
 2. Policies to cut carbon emissions will put their own job at risk (q39_2)
 3. Policies to cut carbon emissions will make their job less valued by society (q39_3)
 4. Policies to cut carbon emissions lead to job losses, older workers (55 years old or older) should bear these job losses more than younger workers



3

Do respondents worry about climate change? (Q12_5)

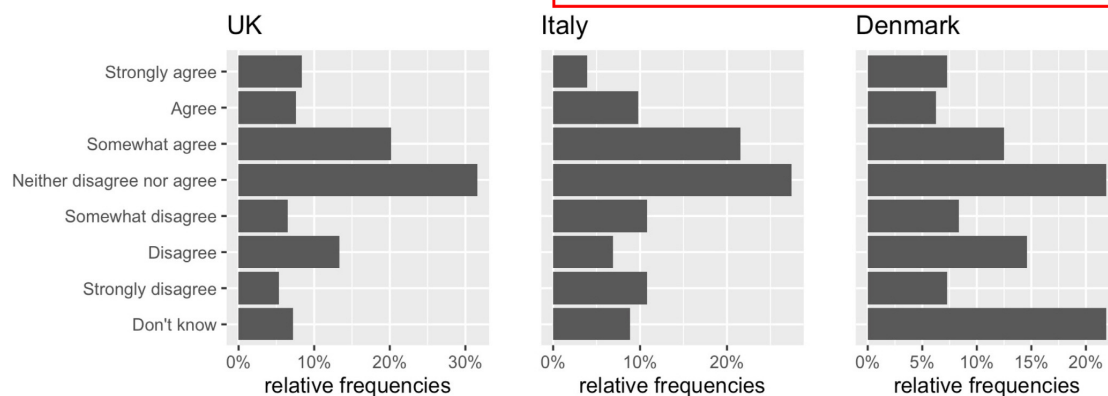
Are you worried about climate change?



4

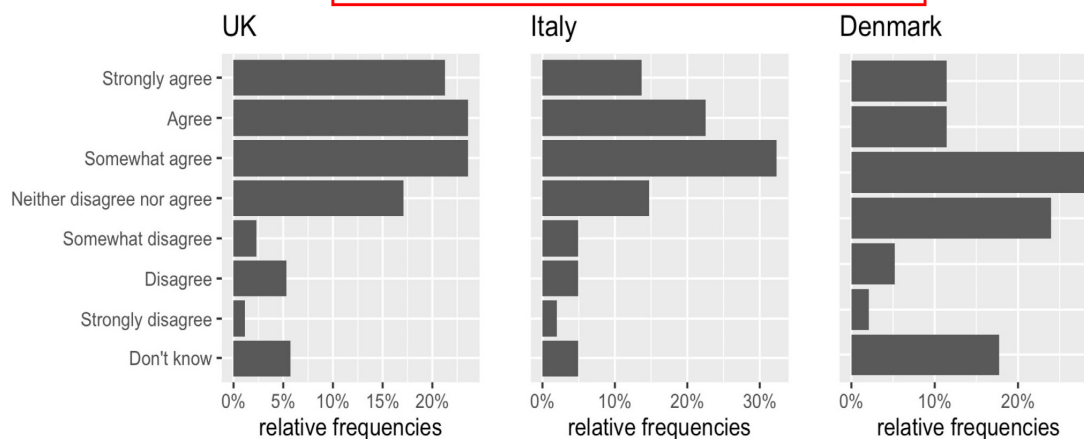
Climate adaptation: distributive dimension (Q39_1)

Are you afraid that policies to cut CO2 will lead to some people making greater sacrifices than others



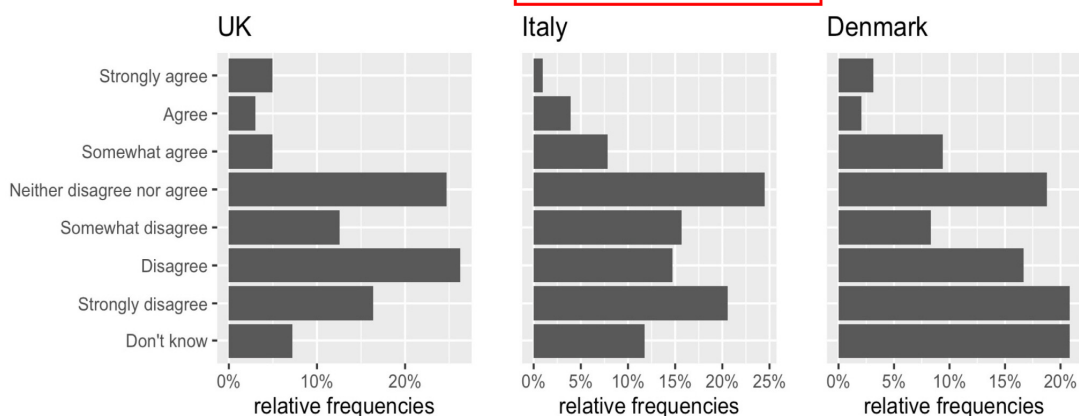
Climate adaptation: democratic dimension (Q39_2)

I am afraid that people like me will have no say in policies to cut carbon emissions



Climate adaptation: employment dimension (Q39_3)

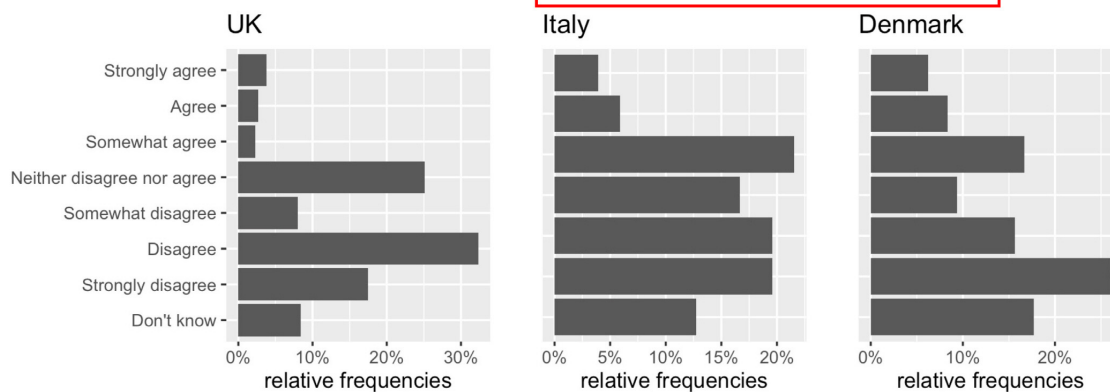
I am afraid that policies to cut carbon emissions will put my own job at risk



7

Climate adaptation: status anxiety (Q39_4)

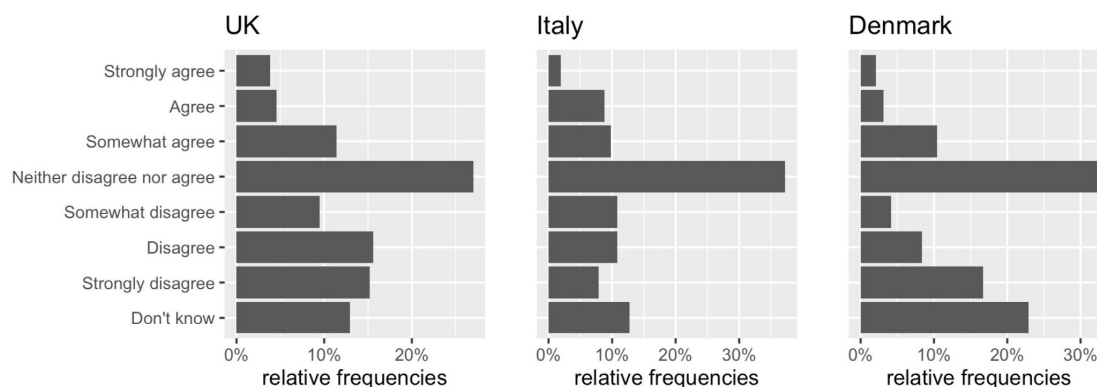
I am afraid that policies to cut carbon emissions will make my job less valued by society



8

Climate adaptation: intergenerational climate justice (Q39_5)

If cutting CO2 lead to job losses, older workers should bear these job losses more than younger work



9

The experimental segment

- Three experiments
 1. **Conjoint experiment** on labour market policies for climate adaptation (3 dimensions for the policies focused on fair pay, fair commuting distance and respect for professional competences)
 2. **Randomized control trial 1** on individual attitudes towards trans-national climate justice
 3. **Randomized control trial 1** on individual attitudes towards inter-generational climate justice



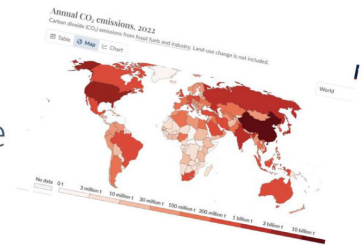
Experiment 1: Trans-national climate justice

Paying for the costs climate change? Individual attitudes towards trans-national climate justice

Contributors: [Manuele Citi](#), [Zhen Jie Im](#)

Date created: 2024-03-24 02:45 AM | Last Updated: 2024-03-24 02:46 AM

Category:  Project



- The issue of trans-national climate justice revolves around the notion of responsibility for climate change, and equitable ways to share the costs of climate adaptation across countries.
- In this experiment, we study how people respond to information on their country's level of per capita emissions when compared to the global level of per capita emission. In particular, we study how this information treatment affects their willingness to sacrifice a part of their yearly consumption to achieve climate sustainability



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Experiment 1: Hypotheses

H1: Respondents who are shown that their country's level of per capita emissions is higher than the world average will show a higher propensity to curb their level of consumption, compared to the respondents who are not shown this information.

H2: Respondents who are shown that their country's level of per capita emissions is lower than the world average will show a lower propensity to curb their level of consumption, compared to the respondents who are not shown this information.

H3: Respondents who are shown that their country's level of per capita emissions is higher than the world average, and has been constantly increasing in the past 20 years, will show a higher propensity to curb their level of consumption.



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RCT 2: Inter-generational climate justice

Big Dilemmas, Little Time: Individual Attitudes Towards Inter-Generational Climate Justice

Contributors: [Manuele Citi](#), [Zhen Jie Im](#)

Date created: 2024-03-20 07:40 PM | Last Updated: 2024-03-20 07:43 PM

Category:  Project



- Anthropogenic climate change represents a significant intergenerational sustainability dilemma, where the pattern of individual consumption may (in aggregate) impact the well-being and sustainability of future generations.
- The aim of this study is to examine individuals' willingness to sacrifice a portion of their present consumption in order to ensure sustainable climate conditions for future generations.
- We study how their attitude towards their own consumption changes when they are treated with an information treatment that focuses on an inter-generational climate justice (representatives of the younger generations protesting for sustainable climate conditions)



13

Experiment 2: Hypotheses

H1: Respondents that are made aware of the intergenerational climate dilemma (consequences for the future generations of the current patterns of consumption), will show a higher propensity to curb their current levels of consumption.

H2: The variable 'age' interacts positively with treatment, increasing the treatment's effect on the dependent variable (willingness to curb consumption).

H3: the variable 'income' interacts negatively with the treatment, decreasing the treatment's effect on the dependent variable (willingness to curb consumption).

H3: the variable 'concern for climate change' interacts positively with the experimental treatment, increasing its effect on the dependent variable (willingness to curb consumption).



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Thank you!



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SESSION 2-1

Digital revolution and welfare state reforms

Young Jun Choi

Digital revolution and welfare state reforms

Young Jun Choi

Professor, Department of Public Policy and Management
Institute for Welfare State Research, Yonsei University

Context: Evolution of social risks

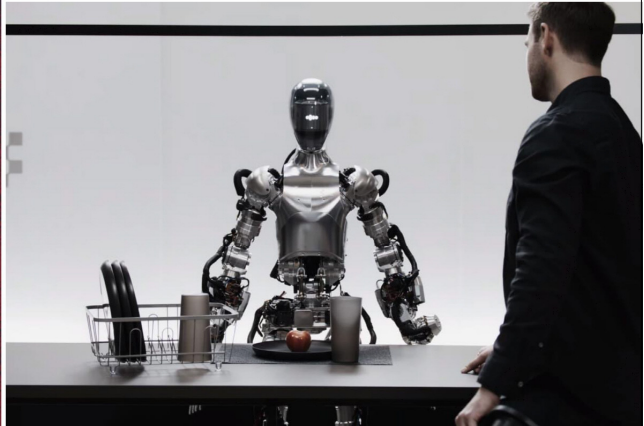
- Traditional and old social risks under the industrialization
 - Income and health (particularly of male-breadwinners)
 - Institutionalisation of the WS
- New social risks under the deindustrialisation and globalization
 - Care and Skills
 - Recalibration of the WS
- Now COVID social risks under the pandemic, digitalisation, and climate change (Choi et al., 2022)
 - Uncertainty and loneliness (Hertz, 2020)
 - Transformation of the WS?
- **DIGITAL REVOLUTION (DR) and the welfare state**
 - **DR on the WS and WS on the DR**

2

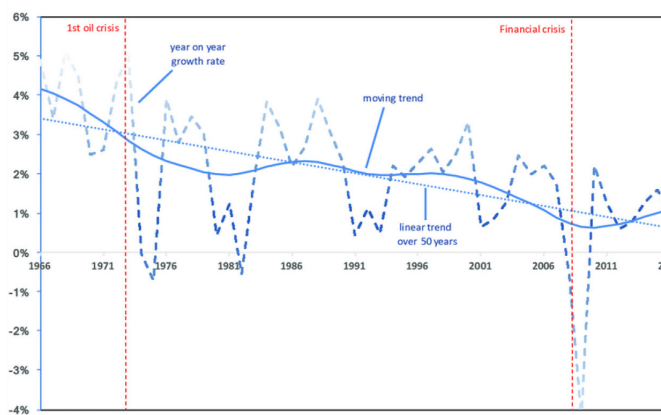


The New York Times

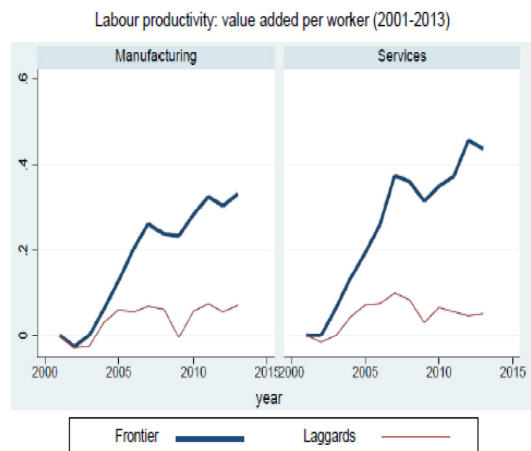
DR:
Fast and faster!
But, we do not know much
about the DR and the WS



DR: positive or negative on growth?



Jackson, T 2018: The Post-Growth Challenge: Secular Stagnation, Inequality and the Limits to Growth. CUSP Working Paper No 12. Guildford: University of Surrey.



Andrews, Criscuolo and Gal(2016:8, 12-14)

4



Key issues of DR and the Welfare State

- 1) Impacts on jobs: end of 'employment' as we know it?
- 2) Impacts on the administration of the welfare state: Digital Welfare State
- 3) Role of the welfare state for the inclusive and sustainable DR

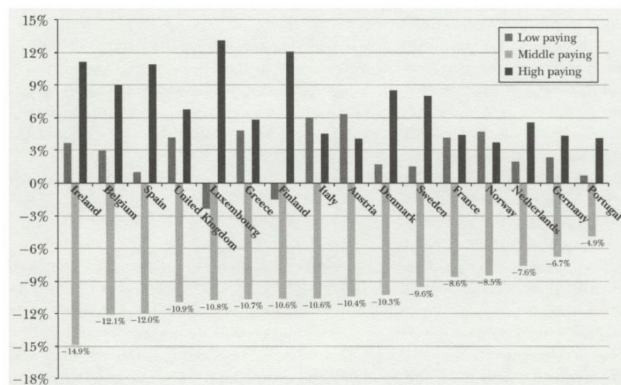
DR on jobs

- Skill-biased or routine-biased technological changes
 - Skilled or unskilled?
 - Routine or creative?
- Replacing jobs or tasks?
 - Highest employment rate ever or increasing instability?
 - Workers to independent workers?
- Regulation/power-biased technological changes
 - Those who are organised (influential) or not
 - Slowing the DR down?: Impact on economic growth?

<https://americansforprosperity.org/who-are-independent-contractors-pro-act/>



Change in Occupational Employment Shares in Low, Middle, and High-Wage Occupations in 16 EU Countries, 1993–2010



Source: Goos, Manning, and Salomons (2014, table 2).

Notes: High-paying occupations are corporate managers; physical, mathematical, and engineering professionals; life science and health professionals; other professionals; managers of small enterprises; physical, mathematical, and engineering associate professionals; other associate professionals; life science and health associate professionals. Middle-paying occupations are stationary plant and related operators; metal, machinery, and related trade work; drivers and mobile plant operators; office clerks; precision, handicraft, craft printing, and related trade workers; extraction and building trades workers; customer service clerks; machine operators and assemblers; and other craft and related trade workers. Low-paying occupations are laborers in mining, construction, manufacturing, and transport; personal and protective service workers; models, salespersons, and demonstrators; and sales and service elementary occupations.

출처: David H. Autor, 2015, Why Are There Still So Many Jobs? The History and Future of Workplace, The Journal of Economic Perspectives, Vol. 29, No. 3.

1 in 4 companies have already replaced workers with ChatGPT

Updated: February 27, 2023

<https://www.ft.com/content/b2928076-5c52-43e9-8872-08fda2aa2fcf>

Home > Resources > 1 in 4 companies have already replaced workers with ChatGPT

With the emergence of ChatGPT in November 2022, the question of how AI may affect jobs is top of mind for many. The publicly accessible AI chatbot has many capabilities, including the ability to answer questions, create content, write code, and more.

In February, ResumeBuilder.com surveyed 1,000 U.S. business leaders to see how many companies currently use or plan to use ChatGPT.

Key findings:

- 49% of companies currently use ChatGPT, 30% plan to
- 48% of companies using ChatGPT say it's replaced workers
- 25% companies using ChatGPT have already saved \$75k+
- 93% of current users say they plan to expand their use of ChatGPT
- 90% of business leaders say ChatGPT experience is a beneficial skill for job seekers

On this Page

Half of companies are using ChatGPT

1 in 2 companies have replaced workers with ChatGPT since November

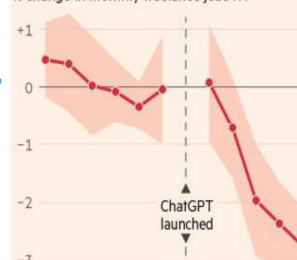
9 in 10 business leaders say it's beneficial for job applicants to have ChatGPT experience

<https://www.resumebuilder.com/1-in-4-companies-have-already-replaced-workers-with-chatgpt/>

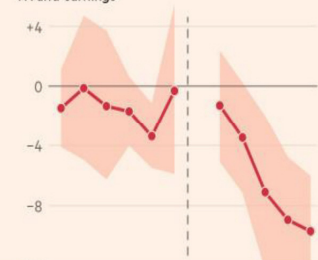
Generative AI is already taking white-collar jobs and wages in the online freelancing world

Change in employment and earnings from writing and editing jobs on an online freelancing platform after the launch of ChatGPT

% change in monthly freelance jobs ...



...and earnings



Digitalisation for what?

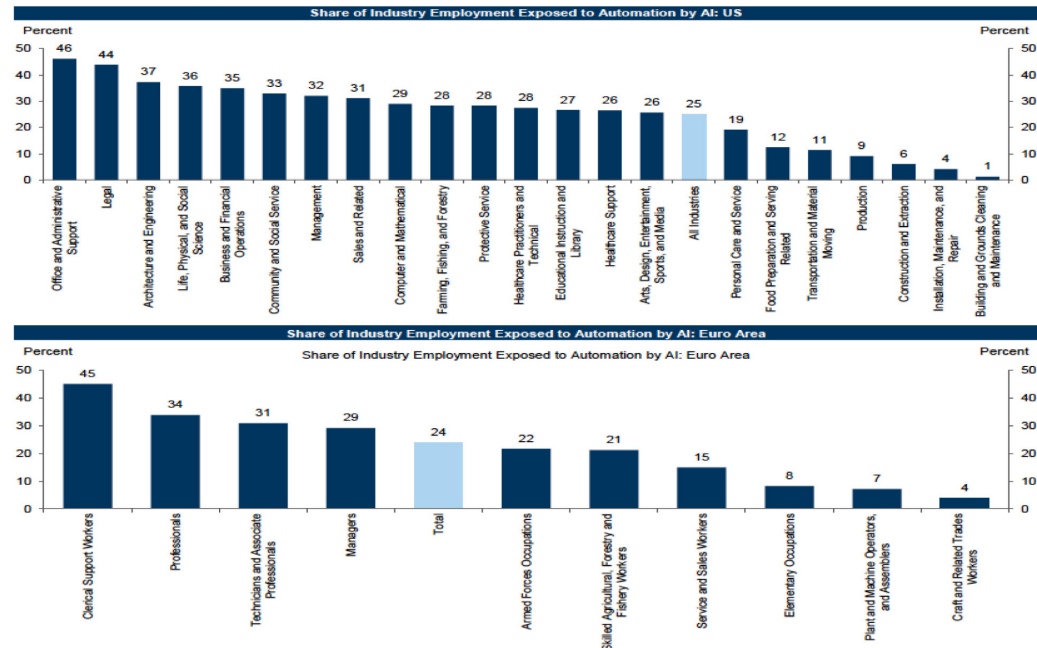
- Using data on occupational tasks in both the US and Europe, we find that roughly **two-thirds of current jobs are exposed to some degree of AI automation**, and that generative **AI could substitute up to one-fourth of current work**. Extrapolating our estimates globally suggests that **generative AI could expose the equivalent of 300mn full-time jobs to automation**.

Hatzius et al. 2023, The Potentially Large Effects of Artificial Intelligence on Economic Growth. Economic Research. Goldman Sachs. 2023/3/26

Moravec's paradox?

But, when AI meets affordable AB?

Exhibit 5: One-Fourth of Current Work Tasks Could Be Automated by AI in the US and Europe



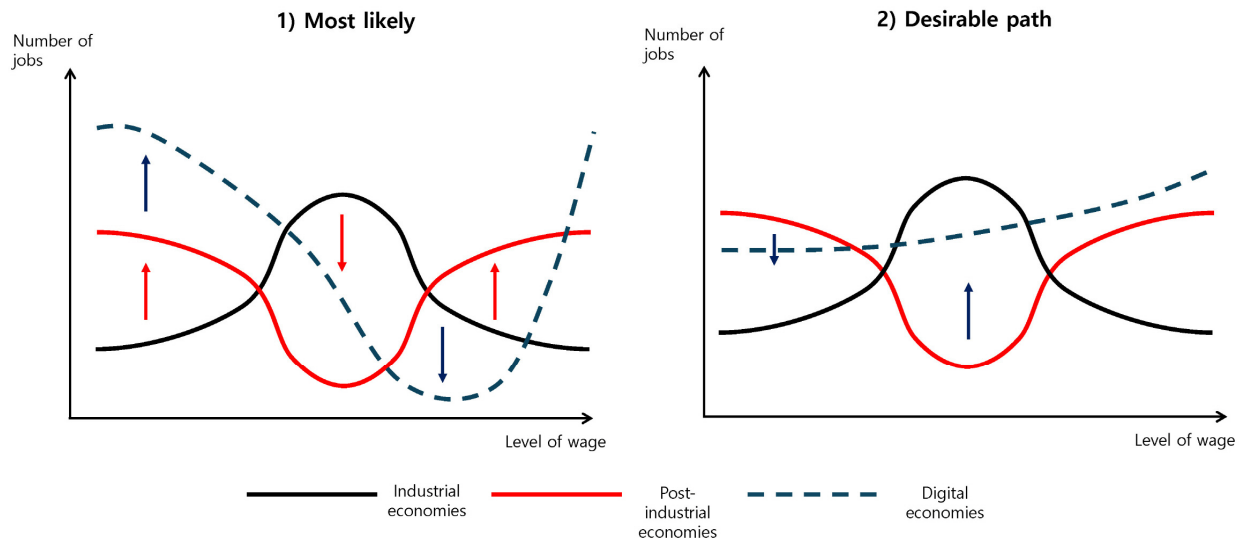
Source: Goldman Sachs Global Investment Research



The man and the dog (2016)

- "The factory of the future will have only two employees: a man and a dog. The man will be there to feed the dog. The dog will be there to keep the man from touching the equipment." - Warren Bennis."

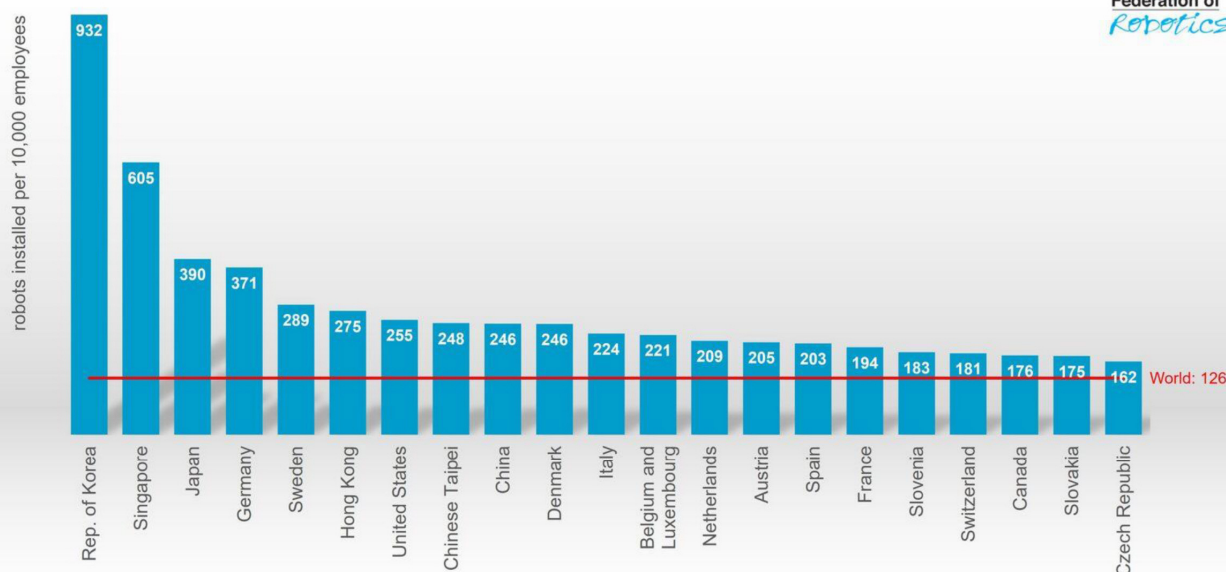
Significant reduction of middle-class jobs in the transition to post-industrial economies and likely to be continued in the era of the digital revolution: More low-paying (not traditional workers) than high-paying jobs



Automation on employment and working hours in the Korean manufacturing sector

- **Research question:** “How does automation impact employment and working hours across different subgroups in South Korea?”
 - Effects of automation on the number of total workers, regular/irregular workers and dispatched workers within the manufacturing sector
- **Data & Methodology**
 - Data: Korean Workplace Panel Survey (2015-2019, wave 6-8), Biannual survey conducted by the Korea Labour Institute, Unbalanced Panel (N=1,161)
 - Panel Regression Analysis , Fixed effect model /Random effect model
- Lee, S. and Choi, Y. (2024) Effects of automation on employment and working hours in the Korean manufacturing sector. *Social Security Research*, 42(1): 31-73.

Robot density in the manufacturing industry 2020



Source: World Robotics 2021

Estimation results

Table : Effects of automation on employment(Large enterprises: employees>=300)

Number of workers (log)		Total workers	Regular workers	Irregular workers	Dispatched workers
Automation	Slightly low	0.028 (0.102)	0.235 (0.158)	-0.394 (0.570)	1.379** (0.634)
	Moderate	-0.049 (0.094)	0.197 (0.158)	-1.258** (0.590)	1.220* (0.660)
	Slightly high	0.005 (0.095)	0.196 (0.164)	-0.625 (0.569)	0.629 (0.653)
	High	-0.104 (0.094)	-0.026 (0.160)	-1.051* (0.604)	1.693** (0.668)
Control variables		0	0	0	0
Observation		422	325	159	162
Hausman test (FE vs RE)		FE	FE	RE	RE
R-squared		0.242	0.415	0.317	0.417

Notes: ***, **, * refers to significance at 1%, 5%, 10% level respectively. Standard errors are reported in parentheses. Base categories: very low level of automation(0-20%), control variables are included but to reported to save space. The level of automation: Very low(0-20%), Slightly low(20-40%), Moderate(40-60%), Slightly high(60-80%), High(80-100%).

Estimation results

Table : Effects of automation on employment(Small and medium-sized enterprises : employees<300)

Number of workers (log)		Total workers	Regular workers	Irregular workers	Dispatched workers
Automation	Slightly low	0.041 (0.046)	0.036 (0.053)	1.953** (0.692)	1.334* (0.698)
	Moderate	-0.006 (0.047)	0.086 (0.057)	2.516*** (0.686)	1.041 (0.684)
	Slightly high	0.044 (0.048)	0.127** (0.057)	3.336*** (0.791)	0.850 (0.742)
	High	-0.021 (0.051)	0.005 (0.067)	2.397*** (0.664)	0.065 (0.763)
Control variables		0	0	0	0
Observation		739	605	135	184
Hausman test (FE vs RE)		FE	FE	FE	FE
R-squared		0.094	0.444	0.938	0.500

Notes: ***, **, * refers to significance at 1%, 5%, 10% level respectively. Standard errors are reported in parentheses. Base categories: very low level of automation(0-20%), control variables are included but to reported to save space. The level of automation: Very low(0-20%), Slightly low(20-40%), Moderate(40-60%), Slightly high(60-80%), High(80-100%).

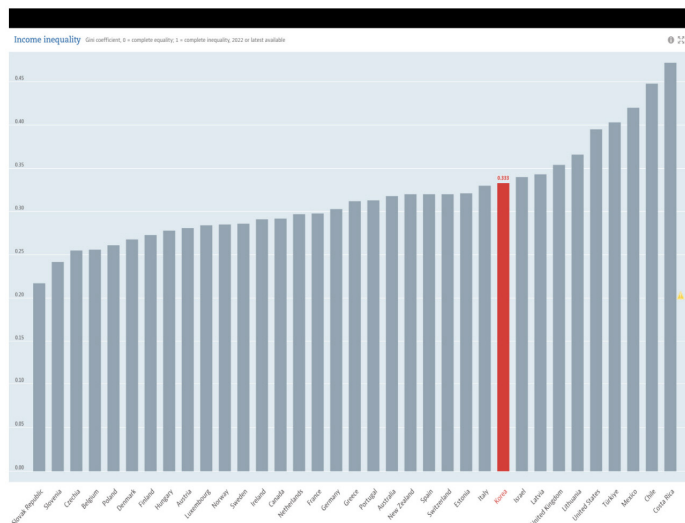
Estimation results

Table : Effects of automation on working hours

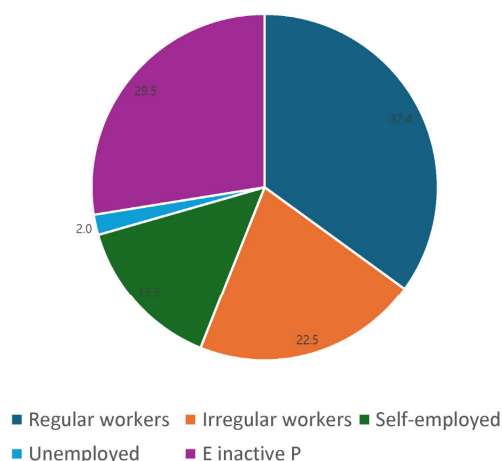
Hours worked per week		Total workers	Office workers	Production workers
Automation	Slightly low	1.542 (1.431)	2.559* (1.436)	6.483** (2.813)
	Moderate	1.963 (1.525)	3.148** (1.534)	9.479*** (3.154)
	Slightly high	0.749 (1.522)	0.387 (1.539)	10.710*** (2.766)
	High	-0.221 (1.692)	-0.883 (1.738)	2.929 (3.450)
Control variables		0	0	0
Observation		901	799	403
Hausman test (FE vs RE)		FE	FE	FE
R-squared		0.144	0.159	0.373

Notes: ***, **, * refers to significance at 1%, 5%, 10% level respectively. Standard errors are reported in parentheses. Base categories: very low level of automation(0-20%), control variables are included but to reported to save space. The level of automation: Very low(0-20%), Slightly low(20-40%), Moderate(40-60%), Slightly high(60-80%), High(80-100%).

Korean labour market: Divided and polarized (platform workers, around 3% of total WF in 2022 (MofEL))



% of Working Age Population (15-65) in 2022



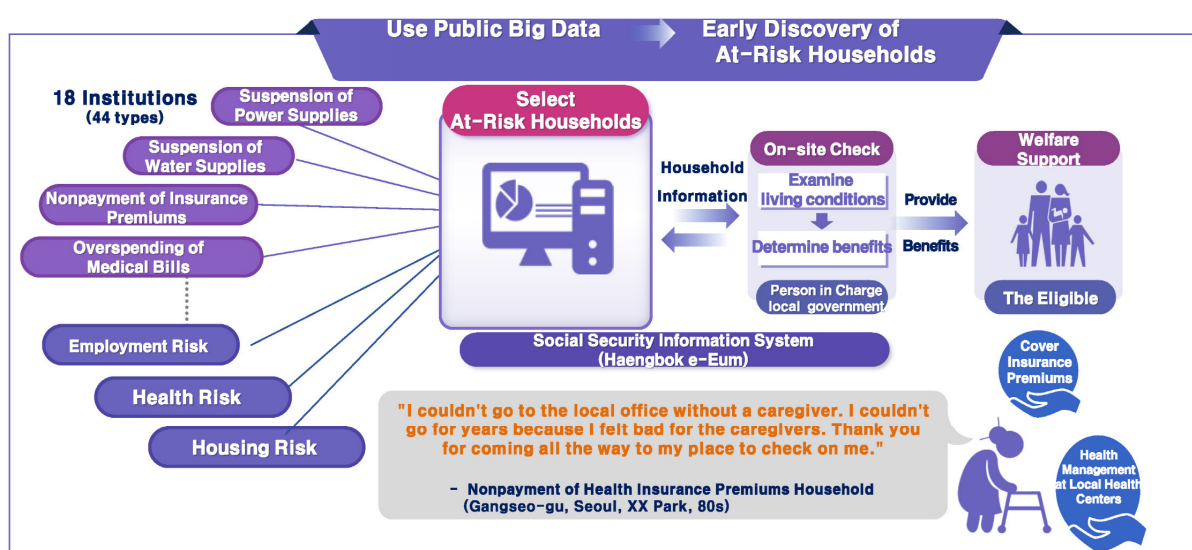
Social security in question

- Highest old-age poverty rate in OECD (Public pensions?)
- Lowest fertility rate in OECD (Leave policies in Employment Insurance?)
- Low coverage of social insurance for irregular employees and even lower for the self-employed, compared to regular/permanent workers
- High inequality and P90/P10 ratio
- Low net replacement rate of public pensions (36%, OECD-61.4% in 2022) and unemployment (36%, OECD-54% 12 month/single person in 2023), high out-of-pocket health expenditure (37%, OECD-20% in 2015)

Therefore.... more targeted and residual

- **Social security information system (Haengbok-E-eum)**
- support various social benefit programs for low-income and disadvantaged people, including public assistance and various social services
- KRW 35 trillion of welfare payments to eligible people (as of 2020) through the advanced screening system using ninety-one types of data, including income, assets and personal information collected, retained, processed and shared by twenty-six different agencies
- More and more small-sized & targeted welfare programmes (near to 140,000 programmes in central and local governments)

Social security information system (Haengbok-E-eum)



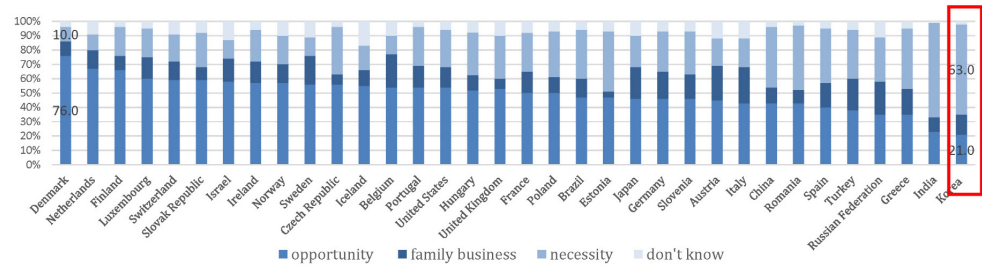
source : ssis.or.kr (Choi, 2023)

Digital welfare or digitalisation of the welfare state

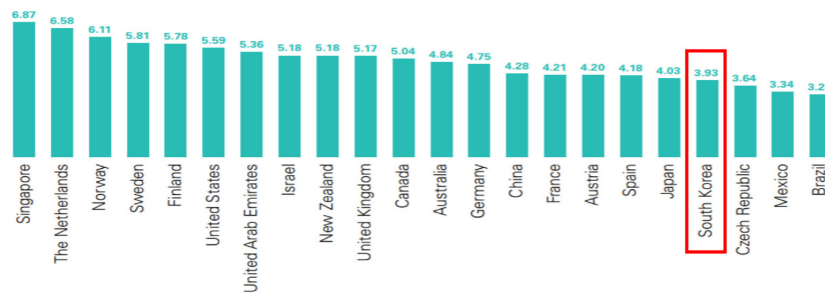
- Growing confidence on targeting of public benefits (McCully 2020)
 - *These technologies, many of which are powered by machine learning and automated decision-making systems, turn the needs of the most vulnerable in our society into numbers and variables.*
 - *Data collection in the welfare context often reinforces the marginality of those accessing public benefits by targeting them for extra scrutiny and suspicion*
- Withdrawal from the universalism and social rights (Alston, 2020; Iversen and Rhem, 2022)
 - *More and better information favoring risk differentiation and segmentation, and democratic politics historically driving risk pooling and integration*
 - Cases of Robodebt in Australia and SyRI in Netherlands

Increasing insecurity and the residual welfare state on the DR

Reasons for starting a business
(Opportunity, Family business, necessity)



➤ **Consumer Acceptance of Self-driving Vehicles**



Does income and employment security affect people's attitude towards innovation? (Ryu and Choi, 2020)

- Examining how individual instability and job characteristics affect the perception of the digital revolution
- Analysis of the survey data on 774 Koreans aged 19 to 69 in 2018

		My life will get better				Negative impact on my employment			
		Model 1		Model 2		Model 3		Model 4	
		Coef.	Std.Err	Coef.	Std.Err	Coef.	Std.Err	Coef.	Std.Err
Insecurity	Job insecurity	-0.261** *	0.770			0.243***	1.275		
	Income insecurity			-0.325***	0.722			0.108	1.114
	Employability	0.361***	1.4345	0.366***	1.441	-0.249***	0.780	-0.244***	0.783
My job is	Skilled	0.357***	1.4296	0.377***	1.458	-0.297***	0.743	-0.328***	0.720
	Not routine	0.031	1.0310	0.029	1.029	0.009	1.009	0.012	1.012
I am	Creative	0.374***	1.4536	0.357***	1.429	-0.003	0.997	0.019	1.019
	Influential	0.176***	1.1920	0.174***	1.190	-0.009	0.991	-0.008	0.992
Tech use	Difficult	-0.280**	1.3236	-0.289**	1.336	0.658***	1.931	0.656***	1.927
	Adaptive	0.313**	1.3671	0.297**	1.345	0.132	1.141	0.124	1.132

Inclusive and sustainable society in the DR

- Further problems in the era of the DR
 - Particularly social isolation and loneliness in Korea
 - Digital divide ...
 - Fewer children but more competition (higher shadow education spending per household)
- Why better and comprehensive social protection and social investment?
 - Empowerment and security in the digital world
 - Uncertainty makes us unhappy whereas stability foster happiness, creativity, adaptability, and risk-taking behaviours
 - Questions on existing social security and digital-driven social security development

SESSION 2-2

Don't touch the Welfare State?
Globalization, automation and public support
for welfare state interventions

Stefano Sacchi

Don't touch the Welfare State? Globalization, automation and public support for welfare state interventions.

++++Very early draft – do not circulate without authors' consent +++++

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Abstract

In front of major global changes of historical reach, such as the rise of robotics and automation and the global interconnection of the economy, demand for social protection is poised to change. While many have explored how structural shifts in labour markets affect preferences for social protection, only a limited number of studies employ experimental methods to determine how exactly different forms of social protection interplay in front such shifts, and how citizens and voters trade-off different features of social protection. We contribute to a growing literature exploring and comparing automation and globalization deploying a novel survey experiment in the United States, Japan, the United Kingdom, and five European Union countries. By means of a conjoint experiment we compare alternative policy packages which vary in terms of generosity, level of governance, different kinds of income maintenance together with or instead of different types of more activating education, and with or without extra protectionist interventions. We control for alternative sources of labour market shocks by presenting the experiment under different introductory scenarios,, one presenting a shock originating from automation of production processes, and one originating from an increase in international trade. Our results indicate that a solid cross-national consensus exists on dealing with secular labour market shifts through assistance programmes that only marginally change from existing ones, preferring support to unemployed to all other forms of social protection (including universal basic income), favouring a balanced distribution of resources between protection and expenditure to enhance human capital, paid by progressive taxation rather than any other form of financing(including debt financing). In contrast to our expectations, we do not find that respondents significantly differentiate between sources of risk, holding stable preferences between different sources of shock and individual degrees of risk exposure. All in all, our results indicate that the social contract characterizing western democracies since the 1990s still holds and is met with strong levels of support even in front of novel labour market challenges.

Keywords: Globalization, technological change, conjoint experiment, social policy, public opinion, public preferences, activation, compensation

1. Introduction

The world economy is changing. While some economists have argued that we are facing a “secular stagnation” in economic growth (Summers, 2013; Gordon, 2015) and have therefore called for more forceful public action to boost the long-term prospects of the global economy, important labour market shifts are taking place. Since the late 1980s, the global restructuring of supply chains and relocation of labour has taken place; and since the early 2010s, technological change, which according to some was stagnating, compressing productivity growth (Gordon, 2015) has picked up pace again. In front of these changes, demands for adapting the welfare state in western countries have flourished on all sides of the political spectrum. On the left, a strong cross-national coalition has emerged to demand more generous, universalistic welfare states rolling back some of the changes introduced since the 2000s. These proposals have been increasingly focusing on the introduction of unconditional, universal basic income (UBI) backed by monetary financing of public debt (Van Parijs & Vanderborght, 2017). On the right side of the political spectrum, instead, some have called for reducing spending focused on assistance programme to invest, instead, in education programmes (Ferrera & Hemerijck, 2003; Pierson, 1994) focused on Sciences, Technology, Economics and Medicine (STEM) as well as supporting western companies struggling to deal with global competition or slow in adopting technology, by reducing taxation and supporting hiring and investment (Rathgeb 2021). This ‘new’ politics of the welfare states is, in fact, not that new. Abundant research has studied the effects of long-term, structural shifts in the structure of modern economies on social preferences. However, most research has, to our knowledge, treated these preferences in isolation from each other, and –critically–our knowledge of the impact that the source and the intensity of these shocks have on the structure of social policy preferences is limited. Even though many possibilities for policy responses to these structural changes are frequently debated, these vary across many dimensions, including how redistributive responses can be, whether they target pure compensation or aim at adaptation by means of training, upskilling and education, and who has to pay for such schemes. The trade-offs between these policy dimensions are studied in a handful of relatively recent contributions (Häusermann & Kriesi, 2015), but rarely put in context of major socioeconomic changes of secular reach.

Against this background, we field an original twin-linked survey experiment answering four questions: (i) Do citizens support or oppose new welfare programmes tailored to structural labour market shifts such as globalization and automation? (ii) Which policy characteristics are the most important for citizens, on average and across countries? (iii). How do citizens see the typical welfare programme proposals coming from the neoliberal right, the far-left, and the centre-left? And finally, (iv) does exposure to different types of labour market shifts affect welfare preferences in a meaningful way?

We contribute to a growing literature deploying a pre-registered¹, original survey experiment on a highly representative sample of 2500 respondents in the United States, Japan, the United Kingdom, Italy, Sweden, Poland, Germany and the Netherlands. By means of a conjoint experiment we compare alternative policy packages which vary in terms of generosity, level of governance, different kinds of income maintenance together with or instead of different types of more activating education, and with or without extra protectionist interventions.

All in all, our results robustly show that respondents across many different countries generally support the creation of complementary welfare instruments to reinforce social security nets in front of structural labour market shifts such as globalization and technological change. Furthermore, we demonstrate that a consensus exists across countries regarding the preferred type of welfare to address these challenges. This is found in a limited and marginal evolution of classical welfare systems, augmented to make space for lifelong learning and on-the-job vocational training opportunities. Conversely, both the left-leaning, pure assistance model, and the right-leaning, productivity-oriented model are generally rejected across countries, albeit to varying degree (the latter commanding generally more support than the former, which is strongly rejected in all surveyed countries).

Finally, our results show that objective or subjective exposure to labour market pressures, be them globalization or automation, significantly affects the overall degree of support for these complementary welfare packages, but does not significantly affect the type of welfare preferred by individuals. Simply put, respondents seek forms of support or protection they are familiar with, when relatively more exposed to labour market shocks, but they do not alter their substantive preferences when exposed to these shocks. Hence, and in contrast to our expectations, we do not find that respondents significantly differentiate between sources of risk, holding stable preferences between different sources of shock. All in all, our results indicate that the social contract characterizing western democracies since the 1990s still holds and it is met with strong levels of support even in front of novel labour market challenges, such as globalization and automation, and requires, at least from a public support perspective, marginal and evolutionary adaptation, rather than radical rethinking.

2. Labour market changes and preferences for social policy variations

2.1. Public opinion and labour market transformation

For decades, the impact of globalization on labour markets has been widely discussed in political economy research of public opinion and policymaking, whilst the implications of technological change for labour markets and the welfare state have only more recently gained substantial scholarly attention. Among sources

¹ An anonymized version of the pre-registration has been provided to the editors of the journal and it is available upon request. A web link to the pre-registration will replace this footnote once the article is accepted for publication.

of structural labour market change, globalization and, more generally, labour market status have been more widely explored than other sources, like automation. Aldrich et al. (1999), Rueda (2005; 2006) and Burgoon and Dekker (2010) have explored the relationship between labour market vulnerability and public preferences; more recently, Walter and Maduz, (2009), Busemeyer and Garritzmann (2019); Emmenegger, (2009), Burgoon and Dekker (2010), and Vlandas, 2020 have looked at the impact of globalization-induced labour market vulnerability on policy preferences. A core finding that emerges from this literature, in line with the so-called compensation thesis of globalization (Cameron 1978; Katzenstein 1985), is that higher globalization pressures are systematically related to increased demands for social compensation or protection (Walter 2010, 2017) as well as public investments in human capital (Busemeyer and Garritzmann 2019). Others have focused instead the effect of globalization on voting behaviour and party preferences (e.g. Autor et al. (2016, 2020); Marx, (2013); Dancygier and Walter (2015); Negri (2019); Häusermann et al., (2020) and Marx and Picot (2020)). In the specific European context, De Vries and Hoffmann (2016) show that attitudes towards globalization are in fact an important determinant of voting for nationalist and right-wing populist forces (Colantone and Stanig 2019; Barone and Kreuter 2021; Caselli et al. 2020; Nicoli et al. 2023).

Compared to the study of globalization effects, the consequences of rapid technological change for the welfare state in general as well as related patterns of public opinion and policy preferences remain relatively understudied (Busemeyer 2022).

Technological change, in particular in the domain of Artificial Intelligence (AI), is likely to significantly transform labour markets – and thereby public demands on the welfare state – in the coming years (Autor 2023). Although technological change has traditionally been treated as a threat to low-skill jobs in manufacturing and services (e.g. Goldin and Sokolo 1982; Acemoglu 1998), recent advances in machine learning, AI, advanced software development, but also advanced forms of automation, have made technological change a threat to higher-level jobs by enabling the automation of more complex tasks. For instance, self-driving cranes can now stack containers at ports, and voice recognition and translation algorithms have enabled precise, real-time translations from any human-spoken language. The advancing automation of traditionally human-performed tasks has important implications for employment and wages, as it contributes to an increasing wage and wealth gap (e.g. Moll *et al.* 2021), job displacement (e.g. Acemoglu and Restrepo 2020) and job polarization (e.g. Goos and Manning 2007). Furthermore, projections about the likely future impact of technological change, also varying between modest (Arntz *et al.* 2016) and more alarmist (Frey and Osborne 2017) projections, fundamentally agree that technological change will massively change and transform labour markets in the coming years (Autor *et al.* 2020, Autor 2023).

Complementing research that studies the socio-economic implications of globalization or technological change, a growing research looks at political implications of such change. In a pioneering study, Thewissen and Rueda (2019) found a positive association between individual-level automation risk and support for redistribution. Other studies have found no association between automation risk and support for a universal basic income (Dermont and Weisstanner 2020). Findings are mixed regarding the link between tech-related

risks and support for active labour market and social investment policies (Sacchi et al., 2020; Busemeyer and Sahm 2022; Guarascio and Sacchi, 2021; Im 2021). However, a quite coherent finding that emerges from a range of studies using different data sources (Busemeyer/Sahm 2022; Busemeyer/Tober 2022; Busemeyer et al. 2022; Kurer/Häusermann 2022) is that individuals exposed to automation and digitalization threats (or perceiving themselves to be exposed) are more likely to demand social compensation policies from the welfare state rather than supporting social investment-type policies, even though the later would be more beneficial in the long term as a policy response to digitalization. Similar to the literature on globalization, recent papers have also started to probe the association between technological change and support for right-wing populism (Anelli et al. 2019; Frey et al. 2018; Im et al. 2019; Kurer/Palier 2019).

In sum, while generally the literature indicates that exposure to risks seems to be associated with policy preferences, the literature has not yet explored the relative importance of different sources of risk. While there is a wealth of studies on the impact of globalization on preferences and political behaviour as well as an emerging parallel literature on the implications of technological change, there are almost no studies which compare the relative impact of these two major changes on attitudes toward social policy. To our knowledge, the only three studies doing so are by Di Tella and Rodrik (2020), by Gallego and colleagues (2021), and by Nicoli, Sacchi and colleagues (2023). In a survey experiment among 5,685 US-American respondents (recruited via Amazon's Mturk), Di Tella and Rodrik (2020) find that, while people are more likely to demand protectionist measures (e.g. policies blocking or dampening source of disruption) in the face of job loss due to technological replacement, they are significantly more likely to demand such protectionist measures in the face of job loss due to offshoring. Similarly, in their survey experiments among 3,100 Spanish citizens, Gallego and colleagues (2021) find that respondents significantly favour protectionist measures when workers' jobs are threatened through offshoring, but not when jobs are threatened by automation. However, Gallego and colleagues (2021) also find no differences in support for redistribution to workers losing their jobs due to offshoring or technological replacement. Nicoli et al. (2023) use a semi-experimental setup, looking at how concerns over technological change and globalization affect preferences for EU-level social policy protection in 13 EU countries, finding that concerns over automation or globalization lead to somewhat different policy preferences. Yet, their experiment is not tailored to policies explicitly designed to counter the negative effects of either labour market disruption, there is no experimental control over the nature of the disruption, and no objective assessment of exposure to either disruption. Taken together, there is therefore no clear picture emerging on the relative importance of globalization- vs. technology-related risks shaping individual-level preferences, neither on the question of whether these two different sources of labour market risk are associated with different policy demands.

3. Design of Linked Conjoint Survey Experiments

Which welfare state programmes are preferred across countries in an era marked by long-term, deep changes in the structure of the global economy and the western labour markets? To answer this question, we field two parallel survey experiments modelling a large number of stylized welfare programmes to deal with such shocks. These vary across seven dimensions representing specific policy features. The selection of these policy features is driven by the need of finding a balance between theoretically-relevant instruments, the need of remaining as close as possible to the reality of the policy debate, and the need for remaining as simple and clear as possible to ensure respondents understand well the issues at stake. In our experiment we include features selected to represent the cornerstones of the debate on social policy, while ensuring their relevance to test fundamental aspects of human behaviour: the first dimension pertains the size of the new welfare expenditure to deal with the problem, the second pertains its financing, the third refers to the allocation of the money between education and social protection, the fourth captures the types of training schemes offered, the fifth models the type of income-support measures offered, the sixth models the level of governance of the entire programme, and the seventh operationalizes the presence or absence of additional regulatory features. A total of nearly 3100 *alternative* welfare programmes is tested through the experiment, each *very marginally* different from the previous one.

Furthermore, given the discussion in section 2, we want to make sure that we control for alternative sources of labour market risk when assessing preferences for welfare state reforms. Hence, each of the two experimental sets is introduced by a nearly identical frame clearly positioning the policy package in the context of countering the negative effects of either globalization or automation. The order through which individuals respond to the globalization or automation block is randomized. These introductions are presented in figure A1 in the appendix (the text in italic indicates components that vary between frames).

After each frame, respondents are confronted with three successive pairs of randomly selected policy packages (from a total of 3,072 possible combinations). Table 1 below provides a summary of the exact wording of all policy features. The wording of the dimensions is also nearly identical between experiments, with minor linguistic differences relating to the words and concepts of “globalization” or “automation”, when relevant.²

Size of the programme. The first dimension concerns the economic size of each proposed programme. Theoretically, this aspect is linked with attitudes towards generosity of the welfare state. The latter has

² Presenting respondents with two highly parallel conjoint experiments on responses to technological or globalization risks, respectively, might obviously introduce question-order effects – including “halo effects” where respondents may consciously or subconsciously think about whichever battery of questions comes second in a way that is coloured by the answers given to the first battery (Zaller 1990). Several features of our survey instrument, however, should limit such biasing effects. First and most importantly, the conjoint character of the survey includes looking at randomized combinations of policy features that makes it harder for a respondent to pin-point (or confess) which aspect of a policy might be driving his or her preference – and less likely also to let that carry-over to the next conjoint. Second, as already mentioned, the randomization should at least avoid question-order biasing in a particular direction of how thinking about one issue area shapes thinking about another. Third, the two distinct texts invite distinct evaluation, an invitation made explicit in the text introducing the second shown conjoint experiment, where we explicitly ask respondents to respond independently from their responses in the previous experiment (“Regardless of the opinion you expressed on the previous questions about [automation / globalization], ...”).

proven to be very resilient, prompting self-reinforcing feedback among the public opinion (Pierson 2006), which enables the survival of generous protection programs (Brooks & Manza, 2007)

To model this dimension, we derive the possible options for the hypothetical programme by emulating current trends in welfare spending in western countries. The smaller size programme would have a size of 0.35% of each country's GDP, or approximately half of what advanced economies now spend on unemployment, while the larger-sized programme would amount to 0.7% of each country's GDP, approximately the same as what advanced economies now spend on unemployment. Our expectation, here, largely builds on previous experimental results: *we expect individuals to prefer, on average, larger size programmes* (Hypothesis 1) (Vandenbroucke et al. 2018; Burgoon et al. 2022). By the same logic, in line with much recent literature on exposure to shocks and preferences for welfare state, those individuals who are particularly affected by either shock should be substantively more in favour of larger programmes than those who are not, since they would obviously stand to benefit more from the programme. We therefore raise a follow-up hypothesis, expecting that *individuals who perceive themselves to be at higher risk should be even more supportive of a larger programme than individuals who are or perceived themselves as less exposed* (Hypothesis 1b).

Financing. The second dimension focuses on how each programme would be financed. While of course a very large number of alternative financing schemes exist, we model four ideal-typical alternatives of how such welfare scheme would be provided with. Once again, these options are selected to reflect both the political and policy debate, and to test theoretical priors. First-off, programmes can be financed by decreasing spending in other areas, leading to zero increase in public expenditure. Second and third, programmes can be financed by generally increasing taxes, regardless of income; or by increasing taxes, but for the rich only. And finally, programmes can be financed by increasing public debt, to be repaid in the future. From a theoretical perspective, this dimension captures fundamental attitudes towards the distribution of responsibility for the welfare state, a central element of the economic left/right cleavage in politics. From a policy perspective, the dimension captures a wide range of alternatives which are actually discussed and present different redistributive implications. Based on the insights from literature on fiscal trade-offs (Bremer & Bürgisser 2022; Busemeyer & Garritzmann 2017), it is possible to come up with a ranking of the relative popularity of these different options. Since 'the rich' are typically perceived as being in the minority and also not particular deserving of compassion from 'regular' citizens, *we expect that proposals to tax the rich in order to finance the hypothetical program should receive the highest degree of support, whereas a proposal to increase taxes for all or to increase levels of public debt should receive the least support* (Hypothesis 2).

Allocation. The third dimension concerns the distribution of each programme's spending on income support and education support. To represent the policy debate, we include three alternative allocations of resources (50%/50% split between the two, an 80%/20% split in favour of income support, or an 80%/20% split in favour of education support). From a theoretical standpoint, this dimension should capture a fundamental tension between instruments of compensation, such as income support, and social investment policies, such education (Hausermann and Kriesi 2015, Ferrera & Hemerijck, 2003). The policy details of each are

embedded in dimensions four and five, while dimension three is only concerned with the relative importance of these two approaches to social policy. *On average, we expect individuals to prefer a balanced distribution of resources, favouring a 50%-50% split over tail options (hypothesis 3).* In this case, individual risk exposure is likely to matter: risk-exposed individuals are more likely to demand social compensatory measures rather than social investment. Hence, *individual risk exposure should be associated with greater support for measures in the domain of income rather than education support (Hypothesis 3b).*

Types of Education Support. The fourth dimension models the type of education support provided by the programme. To reflect the policy debate, we model this dimension so to present trade-offs between more general types of education support, on the one hand, and more specific ones on the other. In particular, we model trade-offs to represent the policy debate over the types of education expenditure that is more conducive to productivity enhancing. Many have suggested that STEM education is the best way to achieve labour productivity as well as income growth (Griliches 1992, Jones 1995, Carnevale et al. 2012M Colin & Palier 2015; McAfee& Brynjolfsson 2016). Deming and Noray (2018) show that technological change itself drives a growing STEM deficit, suggesting that widening STEM education ensures initial labour market competitiveness for recipients. However, Deming and Noray (2018) also concede that STEM education becomes obsolete fast, as technological change requires ever new skills; they find that “*STEM majors have flatter age-earnings profiles than college graduates who major in other subjects (..).*” (Deming and Noray, 2018: 36). In other words, they suggest that *STEM skills, not workers*, are in short supply, suggesting that both more generalistic, creative education, as well as lifelong learning, could help moderating the negative impact of technological-change induced STEM skill obsolescence. We model this rich debate by providing four alternative stylized ways to invest in education. First, money earmarked for education can be invested in supporting general higher education (regardless of the field of study). Second, it can be invested in STEM higher education only. Third, it can be invested in vocational training within companies themselves; and finally, it can be invested in supporting other types of lifelong learning education, outside the workplace. In general, we expect that the direction of the policy and political debate, which prioritizes investment on STEM, to have a bearing on the average preferences of public opinion. Hence, we expect that, on average, *citizens are more supportive of policy responses that would prioritize STEM investment over other types of education expenditure (Hypothesis 4)*, opting for a more specific, rather than a more universalistic, type of support programme. Furthermore, those individuals who are the most exposed to technological change probably stand to profit the most from robust support for re-skilling. We therefore raise a follow-up hypothesis, expecting that *individuals who are most exposed to technological change are more supportive of STEM investment, both than individuals who are not exposed to technological change, and individuals who are exposed to globalization (hypothesis 4b).*

Types of income support. The fifth dimension models different forms of income support. Once again, these are chosen so to reflect the main alternatives debated in the public sphere regarding how public money should be spent in face of labour market shifts.

In this dimension, we model four alternatives. The first represents an additional regular payment to those workers who lose their jobs to automation or globalization. In other words, it represents a form of extended unemployment benefit, very much in the tradition of already existing programmes. The second option models, instead, a universal basic income (UBI) scheme, providing for regular payment to all citizens. UBI schemes have been very much the focus of the debate over reforming the welfare state in recent years, with pilot attempts introduced in Finland and Austria. Support for UBI is strong in the left-leaning constituency of the US Democratic party, and initial advocacy was carried out by the Five Stars Movement in Italy during the 2018 electoral campaign (eventually resulting in a watered-down, conditional forms of poverty support labelled ‘citizenship income’). UBIs have also been widely studied in scientific literature (see among many others Hoynes and Rothstein 2018 for a review). We formulate this option as “income support to all citizens, through regular payments”. The third option covers the idea that the state should be the ultimate provider of jobs when the market fail to reduce unemployment. Payments through ‘jobs of public utility’ is often proposed as a response to the critique that UBI schemes would provide the wrong incentive to people, deterring them from finding jobs; in this version of the plan, the State would always provide a basic job to those in need, intervening in the labour market to reduce unemployment directly. Finally, the fourth option provides for subsidies to firms struggling to keeping up with competition induced by globalization, or unable to keep pace in technological change; by subsidising firms, proponents hope that these would keep employment even when they would otherwise struggle to retain workers.

All in all, we expect that paying out subsidies to firms should be least supported as respondents have no guarantee that these payments do not go directly to workers being affected. Even though, by the same logic, support via payments to all citizens should be the most supported on average since it benefits most of the people, it is reasonable to expect that many would doubt the political feasibility of such scheme. We therefore expect that respondents would prefer forms of support that concentrate the resources on those in need; in particular, we expect that *support for workers losing their jobs* will be the type of income supplement that meets higher levels of support (*hypothesis 5*).

Level of Governance. The sixth dimension concerns the programmes level of governance. Both globalization and technological change are global processes. It is therefore plausible that any action to counter their possible negative effects takes place in a coordinated way between groups of countries, or even globally. Or it is possible that some regions within countries decide to act on their own, without having to wait for others to take a decision. To represent this plurality of options, the experiment distinguishes between governance at the local, the national, the supra-national or the global level, embedding in a very simplified way the key elements of the so-called “second cleavage of politics” over the role played by non-national political organizations. Yet, in line with previous experiments (e.g. Vandenbroucke et al., 2018) it is plausible that citizens still view the nation-state as the prime *locus* for social protection, embedding community-wide networks of solidarity. In other words, it is likely that citizens across the 8 surveyed countries continue to consider social protection as one of the primary functions of their states. Accordingly, *we expect that citizens, overall, are likely to prefer national-level programmes over all other levels of governance (hypothesis 6)*, even though

important constituencies within each country might support supra- or sub- national programmes, or might differentiate their preferences depending on the shock they are exposed to.

Table 1: Overview of the dimensions (respondents see all the questions, and, depending on package, alternative answers)

Dimension 1: Size	
How large is the programme?	- 0.35% GDP (about half of what advanced economies spend on unemployment) - 0.7% GDP (about the same as what advanced economies spend on unemployment)
Dimension 2: Taxation	
What is the programme's impact on the taxes paid in your country?	- No change: the program is funded by cutting expenditures in other areas - By increasing taxes for everyone - By increasing taxes, but only for the rich - By increasing government debt, to be paid by future generations
Dimension 3: Distribution between income and education support	
How much does the initiative's spending focus on education support as opposed to income support?	- 20% on income support, 80% on educational support - 50% on income support, 50% on educational support - 80% on income support, 20% on educational support
Dimension 4: Type of education support	
What kind of educational support is provided?	- Support to higher education - Support to higher education, but only for science and technology fields - Support to vocational training and education within companies - Support to "lifelong learning" programmes, such as adult education
Dimension 5: Type of income support	
What kind of income support is provided?	- Support for workers losing their jobs to [automation / globalization], through regular payments - Support for all citizens, through regular payments - Support for firms to keep them in the market, through subsidizing payments - Support for the unemployed, through public-funded extra jobs
Dimension 6: Governance	
At what level of governance is the programme to be established?	- At [nuts1/nuts2/other sub-national] level - At national level - At [supra-national – regional organization] level - At global level
Dimension 7: Additional regulatory measures	
Are there extra measures to limit extensive [automation / globalization]?	- No extra limit - for the globalization conjoint: Yes, tariffs/duties entailing a 5% tax on sales of companies engaged in extensive multinational operations (trade, foreign investment, etc.) - for the automation conjoint: Yes, a 5% tax on sales of companies engaged in extensive automation activities

Additional regulatory measures. Finally, any such support package may be accompanied (or not) by broader regulatory efforts to prevent the problem from worsening further. The literature shows some support, especially among the most vulnerable workers, for policies aimed at slowing down the pace of technological

change and international trade (Mayda and Rodrik 2005, Gallego et al 2021). For instance, rules could be put in place to limit the number of robots, raise duties on products without sufficient domestic content, and so on. Determining expectations in this context is controversial. On the one hand, respondents may suspect that any extra cost companies will face might trickle-down to the consumers. Hence, rational choice would suggest opposition to the measures. On the other hand, the goal of the measure is to induce change in behaviour of companies, and we expect respondents to favour such rationale rather than reason in narrow self-interested terms.

To model this debate, the last dimension addresses whether additional measures should be taken to limit extensive automation or globalization or not. From a policy perspective, a very broad range of alternative regulatory options are available to policymakers, and represent the full range of alternatives is beyond the reach of this experiment. Yet, from an economic standpoint, any of such measures would eventually raise costs for those entities engaged in automation or outsourcing, costs which in turn might be passed over to consumers through higher prices. To make sense of such rich debate without confounding the respondents, our conjoint experiments provide a willingly reductive simplification of the regulatory debate, whereby there are either no additional measures, or measures which would result in effects equivalent to a 5% tax on sales for companies engaged in extensive automation or globalization respectively. We expect, on average, that citizens will be in favour of additional taxation on companies engaged in delocalization or automation (*hypothesis 7*), not least as mean to finance the programme itself, even though some might be concerned that the costs will be passed over to consumer.

After studying each pair of policy packages, the respondents are asked to answer the following three questions: (1) *Which one of the following two options do you prefer?* (answer categories: Option 1; Option 2); (2) *How much are you in favour or against Option 1?* (answer on a 5-point Likert scale ranging from “strongly against” to “strongly in favour”); (3) *How much are you in favour or against Option 2?* (answer on a 5-point Likert scale ranging from “strongly against” to “strongly in favour”).

4. Fielding of the survey experiment

Our research design relies on a particular type of survey experiment: a conjoint experiment. In conjoint experiments, participants rate a set of alternating *packages*, in our case *policy packages* (i.e., combinations of various policies), each varying in a set of *attributes* or, in our case, *policy features*, throughout seven *policy dimensions*. This method has several advantages over simple survey questions or more commonly used framing or vignette experiments on policy support (Hainmueller *et al.* 2014, 3). First and foremost, conjoint experiments allow robust determination of the causal effect of multiple treatments in a single study. In our case, we are able to assess both the distinct effect of each policy feature on support for the policy, as well as the effects of feature combinations across dimensions. Ultimately, this enables us to determine which

policy package finds the highest support among the respondents. Second, conjoint experiments enable assessing the relative explanatory power of the dimension, as it assesses the effect of multiple treatment components on a single outcome variable. Therefore, we are able to determine which policy dimensions are the most influential in determining public support. Third, by asking respondents to make choices based on multiple pieces of information, conjoint experiments assess preferences by resembling decision-making scenarios relevant to actual programmatic or legislative policymaking, in contrast to single-item preference evaluations. Lastly, conjoint experiments limit validity problems associated with social desirability in survey research, where the choice-set being evaluated can have various plausible justifications for each choice or evaluation that do not directly or obviously reveal preference.

The survey was fielded by IPSOS in eight industrialized democracies: Germany (DE), Italy (IT), the Netherlands (NL), Japan (JP), Poland (PL), Sweden (SE), the United Kingdom (UK) and the United States of America (USA). We selected these countries to ensure variation in (1) welfare state models and industrial structure, (2) economic performance in the past 10 years and (3) geographical location. Appendix X1 provides a summary of these criteria.

The sampling design used involved non-probabilistic quota sampling (Cochran 1953; 1977; Sudman 1976). A total of 20,000 respondents and 2500 respondents per country were reached via a representative web panel, fielded in September-October 2020. In order to test the validity of the survey instruments, a pilot survey has been carried out in July 2020 on a sample of 420 individuals: the results did not lead to substantial changes of the survey design.

The survey was administered through IPSOS' online platform and respondents were able to take the survey in their own language. The language variations of the survey were reviewed by native social scientists to ensure adequate translation properties and quality. Although IPSOS panels are already quite representative of the country populations, we further strengthen the representativeness by setting hard and soft quotas³. Hard quotas were set to the sample's distribution regarding *gender* (male, female), *age class* (15-29 years old, 30-49 years old, 50+ years old), *level of education* (3 categories based on the ISCED-11 classification⁴) *regional distribution* (a mix of NUTS 1 and NUTS 2) and *employment status* (employed, not employed). Soft quotas were set to Occupation (ISCO 1-digit classification, 10 categories) and economic activity (ISIC classification⁵).

5. Results

To answer our research questions, we proceed as follows. We first provide a descriptive snapshot of results, to assess overall levels of support. Second, we discuss the effect of policy dimensions on preferences, in the aggregate and by country. Third, we test how selected policy packages approximating 'classical' types of

³ In the sampling design adopted, the hard quotas define the structure of the target population. In contrast, the soft quotas used during the data collection monitoring phase inform the respondents' selection but do not constrain sample definition.

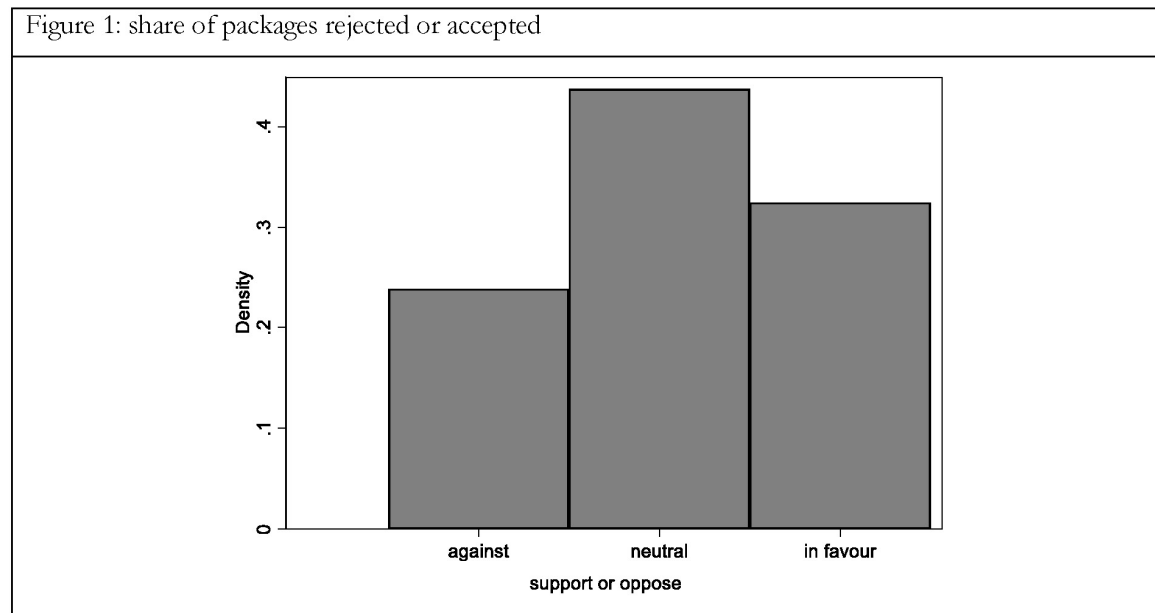
⁴ Less than primary, primary and lower secondary education (ISCED levels 0-2); Upper secondary and post-secondary non-tertiary education (ISCED levels 3 and 4); Tertiary education (ISCED levels 5-8).

⁵ Agriculture (A); Manufacturing (C); Construction (F); Mining and quarrying, Electricity, gas and water supply (B, D, E); Market Services (G, H, I, J, K, L, M, N); Non-market services (O, P, Q, R, S, T, U); Not elsewhere classified (X).

welfare regimes feature in the public opinion, both in general and across countries. And finally, we assess whether the level of exposure to structural labour market shifts affects preferences in general.

5.1. Descriptive results: do people support or oppose welfare programmes tailored to novel labour market shocks?

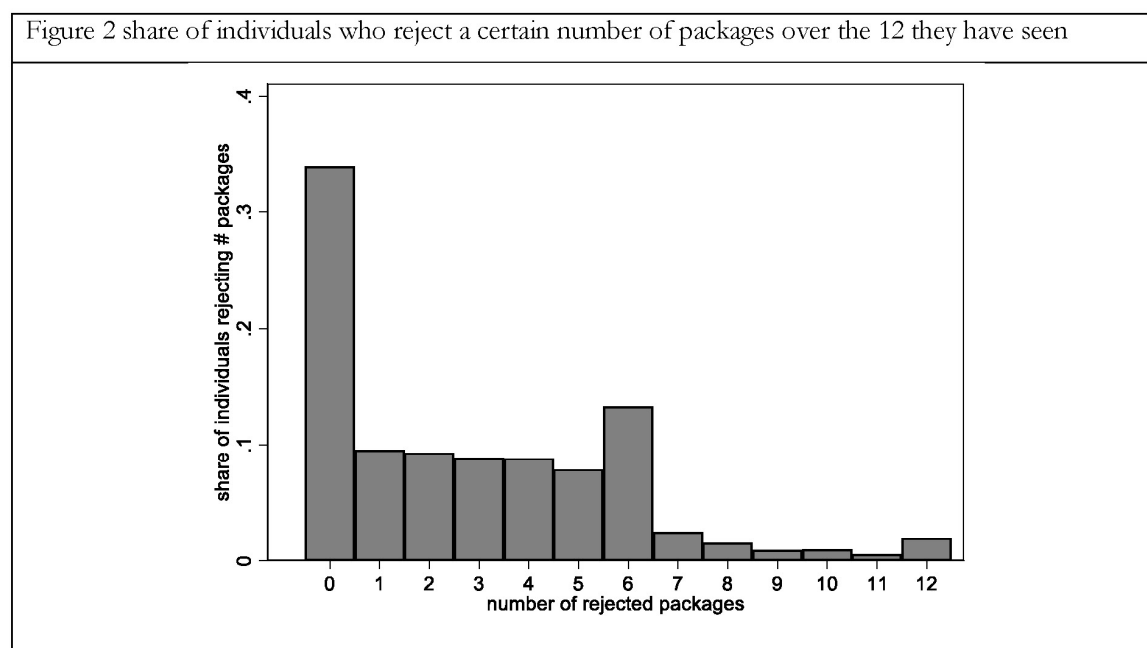
Do citizens support or oppose new welfare programmes tailored to structural labour market shifts such as globalization and automation? A look at the descriptive evidence provides us with information about the general level of support for policy interventions aimed at softening the distributional consequences of globalization and technological change. Figure 1 shows that, overall, are on average, and regardless of the policy content, relatively more in favour than against the introduction of new welfare programmes.. Slightly less than half of packages' ratings, indeed, fall in the middle of the scale (neutral judgment)⁶. Nonetheless, the supportive judgments greatly overcome the negative ones (respectively about 30% and 20% of the remaining ratings).



Of course, what matters is not only how many packages are supported or rejected in general, but how these patterns of support or rejection play out across respondents, who saw, overall ,12 alternative welfare packages across the two experiments. To this end, figure 2 shows that the great majority of individuals is not fundamentally opposed to such plans. The figure displays the share of individuals who reject a certain number of packages, out of the 12 possible rejections. In line with previous studies (see Burgoon et al. 2022; or Nicoli et al 2023) we consider that fundamental opposition implies rejecting all but 3 or 4 packages.

⁶ See Figures A3a-b for more detailed evidence.

All in all, fundamental opposition is less than 10%: eventually, the great majority of respondents has faced several combinations they are sufficiently happy with not to oppose them.



5.2. Main results: what policy characteristics are the most important for respondents?

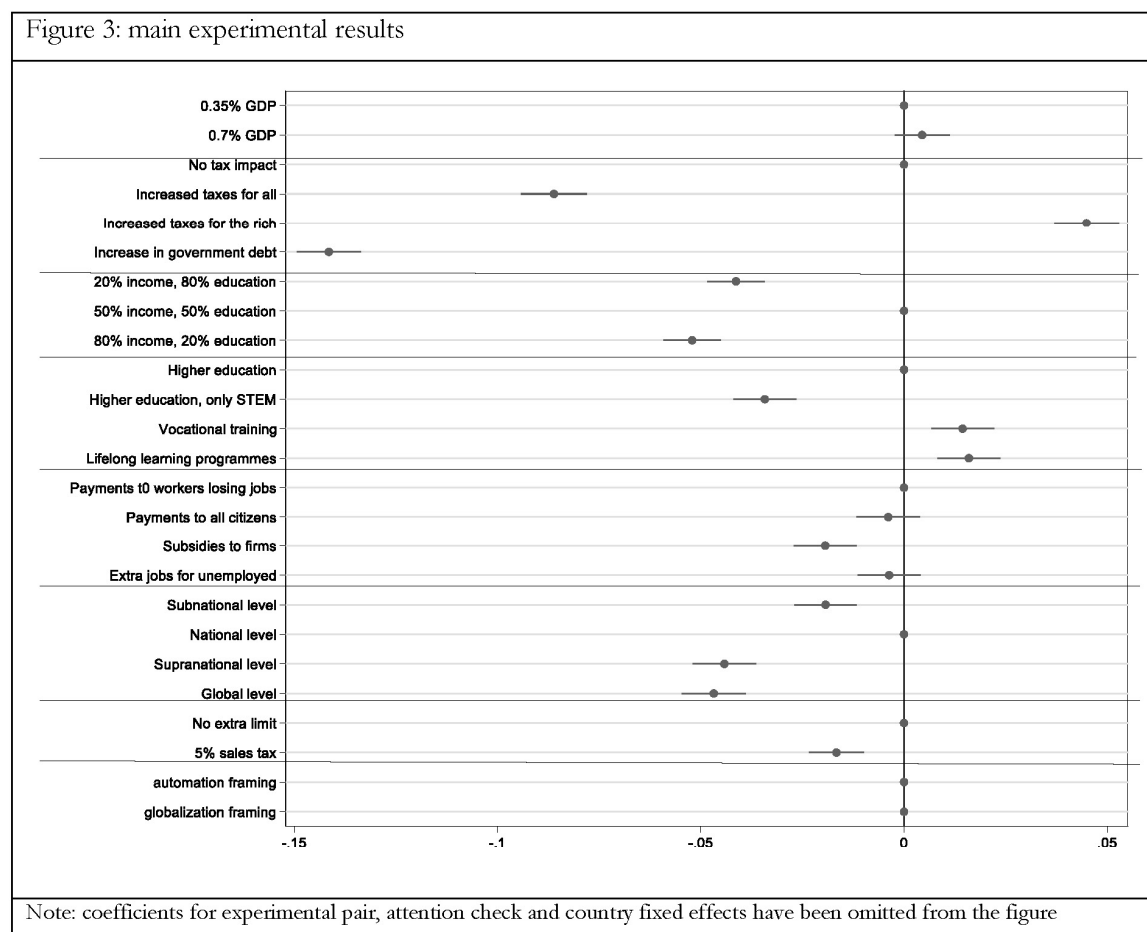
We now move to discussing the main findings of the experiment, testing which characteristics of welfare programmes do respondents prefer. Which policy characteristics are the most important for citizens, on average and across countries? Given that the experiment is fully randomized on a population-representative sample, we can for now abstract from demographic characteristics of respondents and focus on the purely exogenous, experimental characteristics of the policy, for which we can determine causality.

To do so, we conduct OLS estimates employing the *package choice* variable (indicating whether a package is chosen or not in a pair) as a dependent variable, and the policy dimensions associated with each chosen or rejected package as treatments. We also control for the nature of the shock, for respondents attention, for the sequence of the experiments, and for countries fixed effects. These results are shown in figure 3 (which omits controls), which allow us to test hypotheses 1-7.

Firstly, we look at public preferences vis à vis programme size. In line with much of the existing observational and experimental evidence we had expected that people would have preferred larger programmes. However, against our pre-registered expectations, our data clearly reject H1. Simply put, the size of the policy package (in terms of %GDP) does not significantly affect individuals' average preferences. in section 5.4 we will explore H1b to see whether the same holds for those individuals who are more exposed to labour market shifts, since individuals who are very exposed to either shock might prefer larger payouts.

Moving forward,, the type of taxation used to finance the policy turns out to be the most salient dimension. In line with H2, we observe a significant and positive effect of progressive taxation on policy support, whereas repurposing from other programmes without tax increases (the baseline) is strongly favoured over both new flat tax increases and increases in government debt to be repaid in the future.

Next, we explore how respondents seek to divide the resources provided in the programme between education and income support. In line with H3, a balanced distribution of resources between education and income support is found to be the preferred option.



We can now move into the policy details. Concerning the specific type of educational interventions supported, we had expected that individuals would, on average, prefer to focus resources in those fields that are often described as essential for labour market competitiveness, like STEM education (H4). Our findings strongly reject this expectation. Individuals seem to prefer vocational training and lifelong learning programmes over general higher education, particularly disliking STEM-oriented schemes. A possible conjecture explaining this pattern could be self-interest: since the great majority of our respondents is adults past formal higher education, they them personally stand to gain no benefit from concentrating resources on STEM higher education. On the other hand, both vocational training and lifelong learning opportunities would allocate some support to themselves as well. We do not have, however, additional information to

validate such self-interest oriented explanation, which remains, at this stage, a conjecture attempting to explain a finding we considered, at first, surprising. In section . in section 5.4 we will further explore these data to see whether the same holds for those individuals who are more exposed to labour market shifts hold substantially different preferences in this regard.

The next dimension focuses on the type of income support. Here, our expectation (H5) was that on average, individuals would continue to prefer forms of income support they are familiar with, like unemployment benefits. Results only marginally align with our expectations. While Respondents clearly reject handouts to firms and somewhat dislike both universal basic income and public jobs, the negative coefficients for these two latter policy variations are insignificantly different from the most preferred option, classical unemployment benefits. Since these are average effects across the entire population, these results suggest that important constituencies with somewhat neutral or favourable views of these specific policy options exist, albeit not majoritarian in the population at large.

Sixth, we move to assess the governance level at which such welfare programmes should be constructed, testing H6. In line with previous evidence and with our pre-registered expectations, we find that on average respondents strongly favour for the national governance. Again, important constituencies within the population might, in line with past experiments, support more sub-national or supra-national welfare packages, but on average a consensus remains for programmes organized at national level.

Finally, we assess whether respondents support additional measures targeted to those firms which extensively engage in automation or globalization activities. Against our expectation, individuals surprisingly reject the introduction of protectionist measures to slow down the pace of globalization and technological change among those firms, leading to a rejection of H7.

All in all, our results suggest that stability is a paramount concern for respondents, which fundamentally seem to be desiring more of the same when it comes to social protection. Individuals do not appear to be willing to significantly alter the arrangement of modern welfare states. These results show a strong preference for nation-based interventions, financed through traditional progressive taxation, evenly distributed between education and social protection. The former should mainly provide specific skills through vocational training, accompanying the citizens through their entire life course. Lastly, income protection should be mainly assured through classical compensatory measures, without any protectionist complementary intervention.

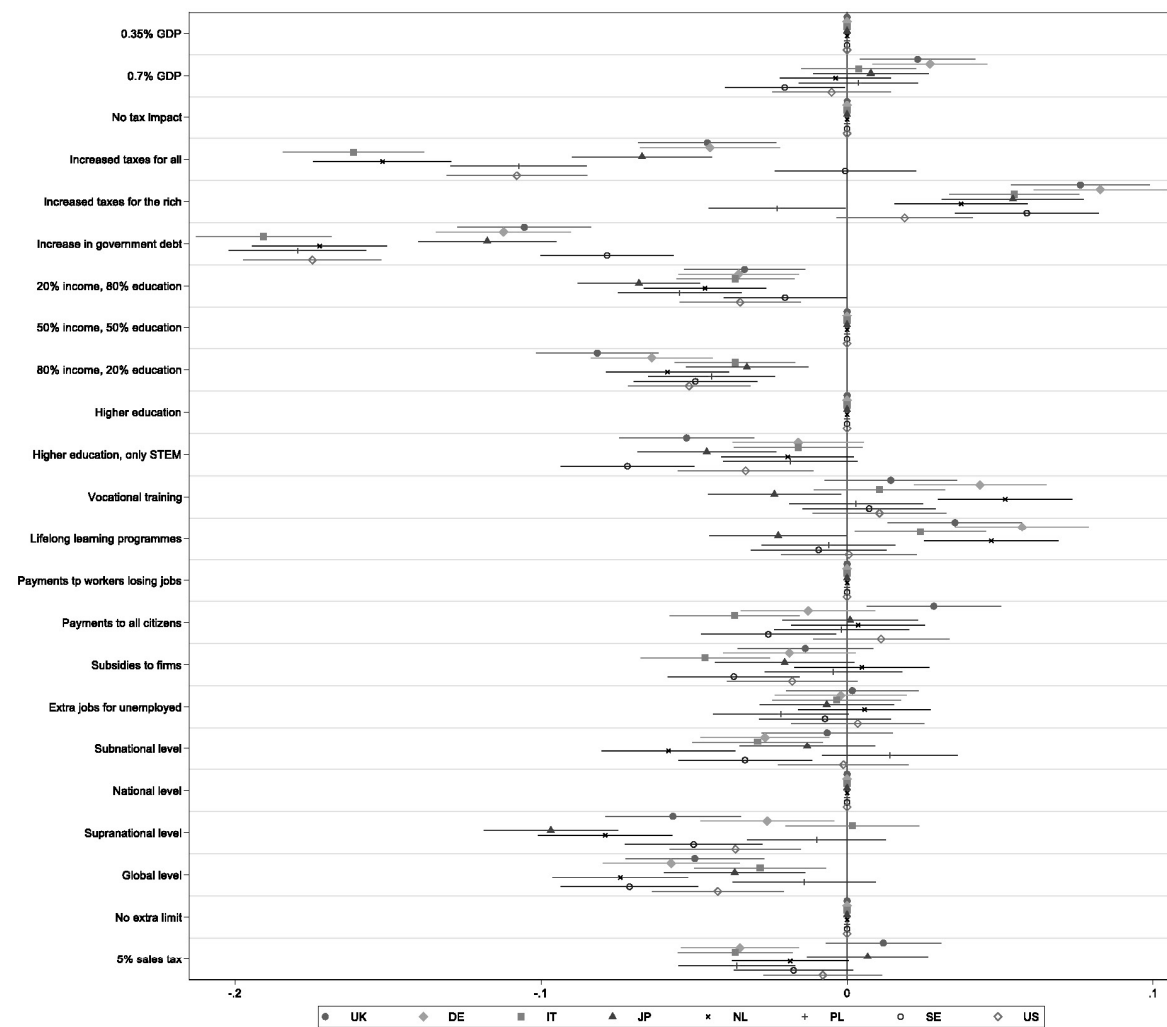
We further explore whether this pattern of support holds across all surveyed countries by running the experimental model separately for each of the eight countries (figure 4)⁷. The country samples are comparable with one another not just because all received the same conjoint experiments (in the respective native language of the sample country), but also because in all countries we surveyed 2,500 respondents to be similarly representative for regional distribution, age, income, education and broad categories of profession. This bird-eye overview shows that a limited number of significant differences exist between

⁷ See Appendix 3 for country-specific results of the two conjoints (globalization- and automation-related texts).

some of the countries studied. For instance, while Sweden and the USA oppose the more generous version of the programme, Germany and the UK tend to favour it. Sweden is also the only country to have a favourable view of flat taxation increases, while Italy is the country that dislikes it the most. Poland is the only country whose population does not significantly prefer progressive taxation over other financing options, with most countries differing only in degree of support for progressive taxation. Finally, while all polities express net distaste for accumulation of public debt, Sweden appears to be the least outspoken opponent of that type of financing.

All countries prefer a balanced distribution of spending between income support and education support, albeit opinions tend to be slightly less clustered when income support is prioritized, with significant differences between UK and Sweden, the least supportive of traditional protection, and Japan at the opposite end. When it comes to the specific type of education support, UK, Sweden, and Japan strongly reject STEM education, while the other polities show a milder distaste. Opinions are relatively polarized when it comes to lifelong programmes and vocational training instead, with especially Japanese, having a less positive/more-negative view of these schemes, while other countries, especially Germany and the Netherlands, supporting these programmes more than simple higher education investment.

Figure 4: main results, by country



With regard to income support, with respect to the baseline option of better unemployment benefits, the UK publics (and to some extent the US) prefer forms of basic income for all citizens, while all other country populations tend to dislike the idea (particularly Italy and Sweden); all countries's publics tend to reject the idea of subsidies to firms, interventions aimed to directly create extra public jobs.

With regard to governance, Poland has a preference for local governance above all other arrangements. Japan rejects continental coordination (in their case, at the ASEAN level) the most, while Italy and Poland are virtually indifferent between national or EU-level governance. Finally, the UK and Japan also slightly favour stronger penalties in the form of tax increases for companies engaged in globalization and automation activities, while Germany and Italy are the most opposed to extra taxation towards corporations. Overall, the main results do not appear to be shattered when focusing on each country separately, with few exceptions. Poland's rejection of progressive taxation, the opposition of Japanese respondents to vocational and lifelong learning, and the protectionist stances of the UK and Japan are the only results strongly conflicting with the aggregate findings.

5.3. Which cohesive model do people prefer for future welfare programmes? Post-Keynesian, social-democratic and neoliberal welfare proposals compared.

In the previous section, we analysed the effect played by specific policy dimensions independently from each other. However, some policy combinations are more interesting than others, because actual policy proposals contain a number of elements bound together. How do citizens see the typical welfare programme proposals coming from the neoliberal right, the far-left, and the centre-left? To answer this question, we proceed with testing public support, on average and within countries, for three alternative policy packages which approximate the policy offer of different political forces.

The Postkeynesian package. First, we bound together those dimensions which best correspond to the socioeconomic rationale underpinning the welfare programme of the left-leaning “modern monetary theory” (MMT) proponents, which some refer to as ‘post-Keynesian’ economic theory. The logic of post-Keynesian economics includes large programmes of public expenditure, financed through public debt emissions backed by a country's central bank, aimed at lifting all citizens' living standards, in the conviction that long-term economic prosperity is anchored in consumption growth, which in turn would be ensured by public debt backed by central bank intervention. Indeed, the cost-less nature of public indebtedness backed by central bank, and universal payments to citizens regardless of their needs profile, are the two central tenets of the post-Keynesian economic programme. In the context of our experiment, this package would therefore include large-size programmes (d1), financed through public debt (d2), primarily oriented to income support (d3), focusing on generalist education (d4) but especially Universal Basic Income (d5), administered at national level (d6) with additional actions undertaken against those companies engaging in extensive delocalization or automation (d7).

The Neoliberal package. At the opposite side of the political supply spectrum, we can find the neoliberal proposal for a lean, productivity-oriented welfare state. The economic logic of the neoliberal offer follows the idea that long-term welfare is only sustainable insofar it does not represent a weight on economic growth. For this to happen, welfare arrangements must be limited, conditional, and oriented towards productivity increases. The neoliberal welfare proposal is approximated in our experiments by packages which are smaller in size (d1), neutral on budget (d2), oriented towards education investment (d3), focused on STEM education (d4), with support for companies that invest (d5), administered at national level (d6), without additional actions against companies engaged in delocalization or automation (d7).

The social-democratic package. In-between these two options, we model a traditional social-democratic welfare offer, which would be very much in line with the type of welfare programmes individuals are already familiar with. The core tenets of this type of welfare proposal is the focus on redistribution from wealthy people to those actually in need, such as unemployed, and by generous public services such as public higher education. We model this classical welfare offer by bundling together packages which are larger in size (d1), financed through progressive taxation (d2) balanced between education and income expenses (d3), focused on financing all higher education (d4), and on supporting unemployed people (d5), governed at national level (d6) with additional action taken against companies engaged in extensive delocalization or automation (d7). Equipped with these ideal-typical packages approximating alternative political supply, we can conduct marginal analysis of interaction models to determine the level of support in the public opinion for these consistent packages. The predictive margins shown in Figure 5 report such estimates, displaying the level of support for these alternative models. We estimate these models excluding those packages which are valued as ‘neutral’, so to obtain a clearer picture of patterns of support or opposition. Results in figure 5 suggest that the population of the 8 countries surveyed is, on average, very much behind an extension of the existing welfare model, and is not convinced about fundamental deviations from the current compromise in either direction, although it might be open towards marginal adaptation, especially in the way resources are used in supporting education.

All in all, the level of support for the social-democratic alternative reaches 70%, while about 45% support the postkeynesian, MMT-inspired policy offer, and about 58% for the neoliberal proposal. While countries differences do exist (see figure 6), these do not fundamentally alter the described pattern. In all countries except Poland and Japan, the social democratic proposal is preferred to the neoliberal proposal which in turn is preferred to the post-Keynesian proposal. Only in Poland respondents prefer the neoliberal proposal over the social-democratic one, while Japanese respondents would rather support the post-Keynesian assistance-oriented programme than the neoliberal productivity-oriented programme. Importantly, the average support for the Neoliberal paradigm is significantly above 50% only in Poland and the US, and it is about 50% in Italy and the Netherlands. Conversely, the Neoliberal proposal gathers the least consensus in Sweden, which is somewhat expected given the robust social-democratic traditions of the Scandinavian country, and, more surprisingly so, in the United Kingdom, which has been long seen as the champion of neoliberal political economy in the European continent.

Figure 5: support or oppose, selected packages (neutrals excluded)

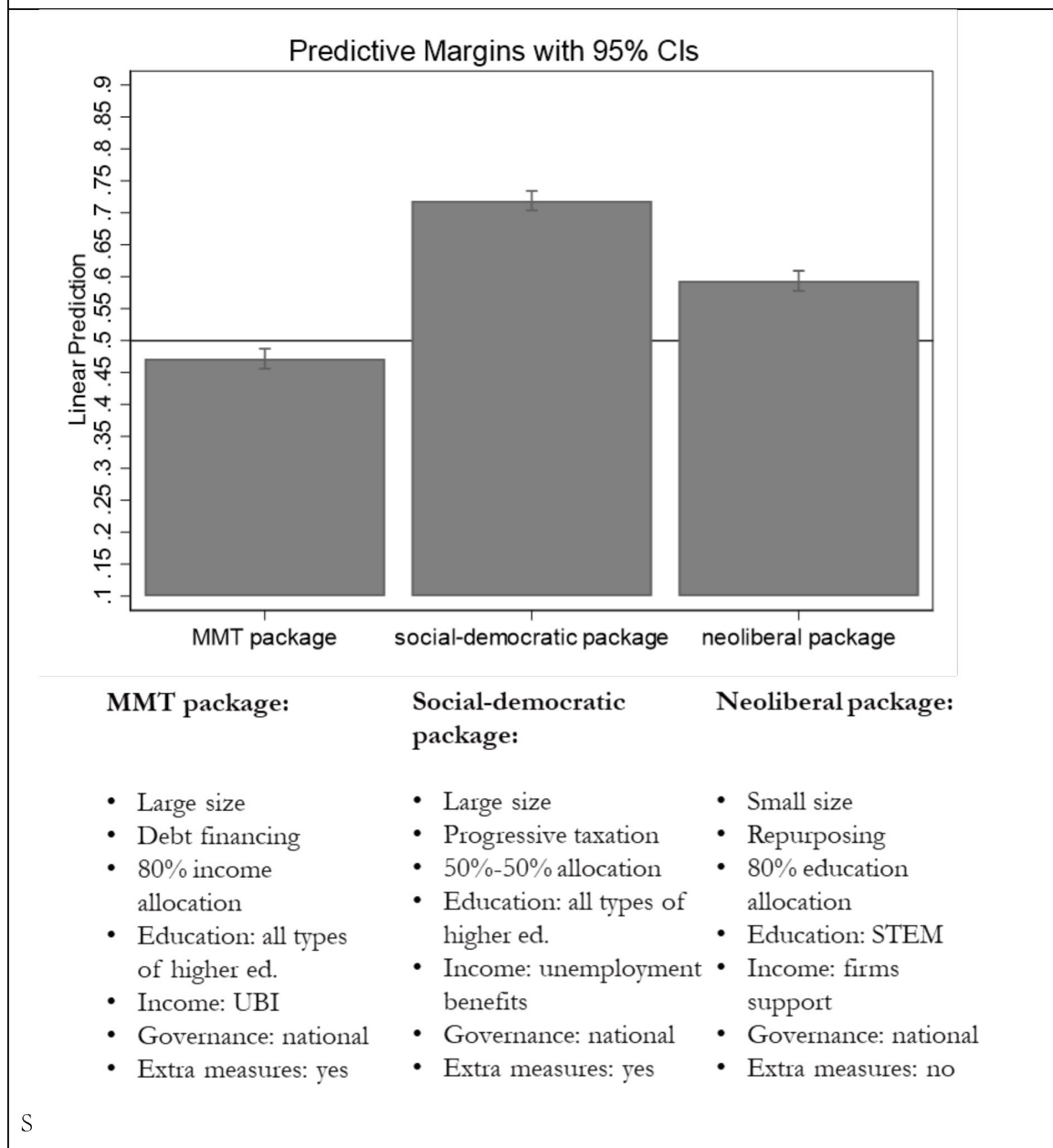
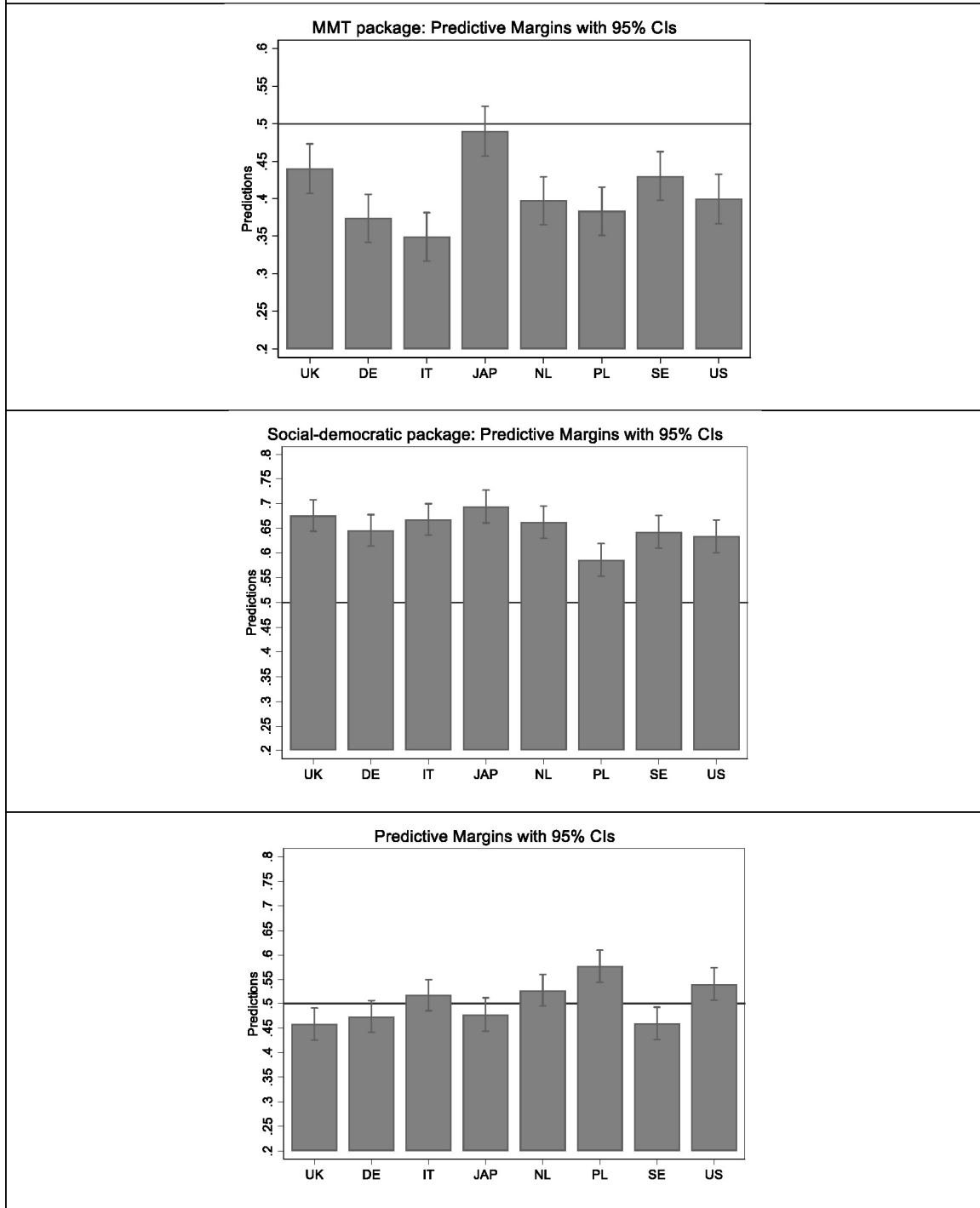


Figure 6: selected packages, by country



5.4. Do people differentiate policy preferences depending on their risk? Comparing globalization and automation exposure.

Finally, the last step of our empirical investigation concerns the analysis of the impact of different structural labour market risks on individual policy preferences. Do individuals exposed to different types of labour market risks meaningfully differ in their preferences?

To explore this conclusive research question, we make use of three different experimental and semi-experimental ways the respondents in the survey are confronted with different shocks. First-off, we exploit the fact that the order of the two experiments is randomized, with approximately half of the sample receiving each experiment first. By looking only at this first experiment, we can avoid halo effects and therefore compare the two frames. Second, we look at the ‘objective’ level of exposure to technological change and globalization of our respondents. We do so by matching our respondents with two widely-used, although highly imperfect, measurements of occupation risk exposure: the Routine Task Index (RTI) and the offshorability index. The former estimates the technological replaceability of occupations, assigning a growing score to occupations composed by routine tasks.⁸ We present this variable as ‘objective’ exposure to shocks. Finally, we make use of a battery of questions in our survey which captures a respondent’s concern with the economic effects of automation or globalization, on a scale from 0 to 10. We treat this information as ‘subjective’ concern with shocks. We proceed in the analysis by first looking at the effect that different types of exposure have on general patterns of support or opposition (i.e., regardless of the specific dimensions of a policy) and then we focus on how these different exposures impact specific policy preferences.

The general effect on support. Figure 7(a-c) reports the general levels of support, omitting the specific policy dimensions, by exposure to different introductory framings (7a), by high/low exposure to RTI or Offshorability (7b) and by high/low individual concern with automation or globalization (7c). The latter two allow us not only to determine whether one type of shock induces more or less demand for protection than the other, but also whether the intensity of the exposure matters. Figure 7a clearly shows that first exposure to the automation frame induces a statistically significantly higher level of support than first exposure to the globalization frame, regardless of the specific policy dimensions respondents are confronted with. Surprisingly, however, we see that objective exposure, measured through the (often contested) RTI index, signals that those individuals whose RTI is low are more supportive than those whose RTI is high, while the opposite is true for Offshorability. For individuals objectively exposed to globalization, support for welfare packages increases as exposure increases, while the opposite is true for automation. Notably, this distinction disappears when we look at how *worried* people are about automation and globalization: subjective worries clearly increase support for protection, under both scenarios. We attribute this effect to a temporal mismatch. By definition, concerns are forward-looking, while RTI is largely dependent on past

⁸RTI is calculated on the American O*Net database, using the formula of Acemoglu and Autor (2011). The offshorability index assigns higher scores to professions that do not require in-person contact, that can be easily delocalized (Blinder 2009). To build this index, we rely on the country-year-specific dataset by Mahutga et al. (2018) averaging the score by occupation across all European countries included with the ISCO-08 code. Both indexes are operationalized at the 3-digit of ISCO08 classification. Higher scores for both indexes entail a higher risk of job loss, which supposedly increases risk perception, and, in turn, triggers higher support for generous compensatory policies. The O*Net database is available at <https://matthewcm.ucr.edu/data.html>.

trends and experiences. Simply put, our interpretation is that those individuals who are seriously worried about automation are not yet affected by it to the extent that it would already appear in RTI: in other words, individual concern ‘overshoots’ the RTI.⁹

Exposure and specific policy characteristics. Finally, we move to compare how the support for different policy characteristics is affected by exposure. To do so, we conduct a series of subgroup analyses, presented in figure 8a-8e. The figure respectively displays the differentiated effects for first exposure to either globalization or automation framing (panel a), low and high offshorability index (panel b), low and high RTI index (panel c), low and high concern with automation (panel d) and low and high concern with globalization (panel e).

Generally, speaking, our expectation was that individuals would be differentiating their policy preferences depending on the type of shock and on the intensity of their exposure to it. More in detail, we had raised H1b, expecting that workers more exposed to globalization and automation would have preferred larger programmes, and H3b, expecting that more exposed individuals would be more in favour of assistance programmes focused on income, than non-exposed individuals. Finally, we had expected that individuals who are exposed to automation would be more likely to support STEM educational support, than individuals who are either not exposed, or exposed to globalization (H4b).

On the grounds of the models underpinning Figure 8, we can however safely reject these hypotheses. Regardless of whether individuals are objectively exposed to a labour market risk or subjectively concerned with it, there are no statistically significant differences on preferences for programme size (rejecting H1b). respondents who are highly concerned with globalization or automation are slightly less likely to reject programmes focused on supporting income rather than education, although this effect is highly significant only for globalization (marginally so for automation) and non-significant for objective exposures, leading to supporting H3b only in the case of subjective perceptions. Finally, The pattern expected for STEM investment is the opposite of what we expected: we had expected individuals who are more exposed to, or concerned with, technological change to favour the allocation of resources to STEM education, but these respondents are instead even less favourable of this option than their non-exposed or non-concerned peers. One possibility is that these respondents do not see themselves as potential receivers of STEM investment, but fear that STEM investment received by others (possibly, younger students) would only result in accrued competition for them and accelerating technological change, as suggested by Deming and Nooray (2018). Either way, our results lead to a robust rejection of H4b.

⁹ This interpretation is further supported by the very low correlation between RTI and the concern question, which is below 0.05, and by the negative correlation between RTI and a more specific question asking respondents to indicate, on a scale of 1 to 5, to what extent they agree or disagree with the statement ‘automation is affecting my sector of employment’.

Figure 7a-7c: absolute levels of support, by framing, objective & subjective exposure

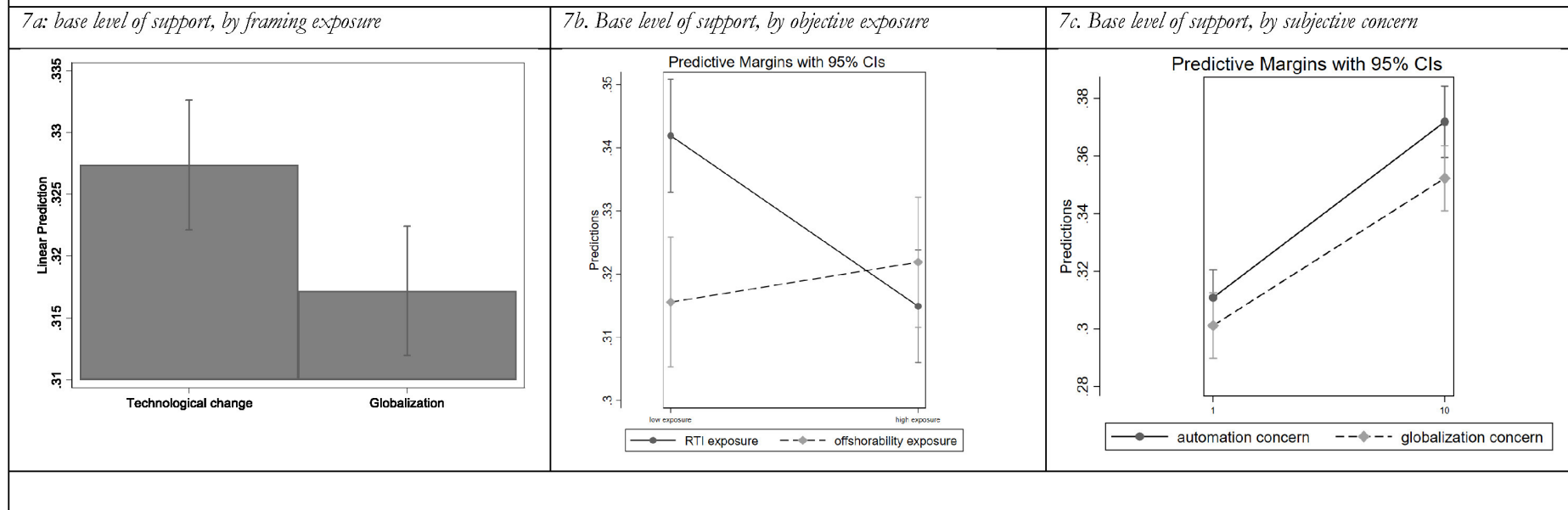
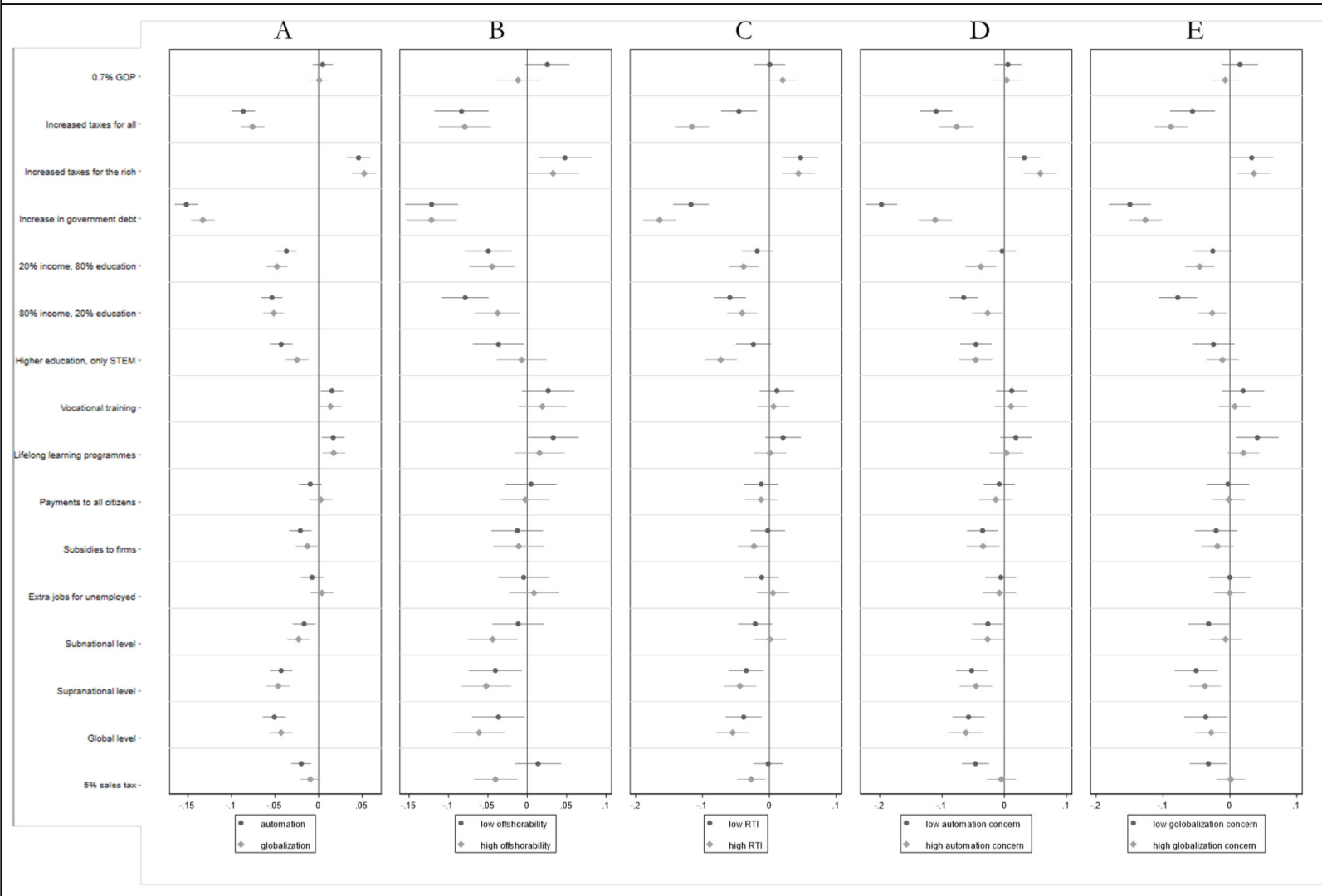


Figure 8a-8e: dimension effects by different types of exposure



Some additional significant effects are also present. For instance, individuals who have a low exposure to RTI are marginally less negative vis à vis flat taxation increases; while individuals who are much worried about automation are also significantly less negative regarding public debt, and more favourable towards additional measures against companies, than their non-concerned peers. Conversely, workers active in sectors characterized by high offshorability are significantly against additional actions towards companies engaged in globalization. Our interpretation is that these workers—who have not lost their jobs yet—could be afraid they might, if their companies lose more competitiveness and need to make up for lost sales by further delocalizing.

All in all, even though some interesting effects are present, the magnitude of the preferences shifts attributable to differences in the origin or intensity of shocks is very limited. Often, these are not enough to shift a preference from one policy option to another, but lead to stronger or weaker support for certain options. All in all, our analysis shows that The source and intensity of labour market risk significantly affect the overall level of support for social protection, but do not otherwise meaningfully alter the content of policy preferences over welfare state arrangements.

5. Conclusions

In an era characterized by fast yet structural changes to the global political economy, fundamentally altering the socioeconomic foundations of modern western society, it is paramount to determine how structural labour market shifts affect public demands for social protection. To address this key problem, we fielded an original twin-linked survey experiment, asking several research questions. In particular, we designed the experiment to understand to what extent do support or oppose new welfare programmes tailored to structural labour market shifts such as globalization and automation, which policy characteristics are the most important for citizens, on average and across countries, how citizens react to the typical welfare programme proposals coming from the neoliberal right, the far-left, and the centre-left, And finally, whether exposure to different types of labour market shifts affect welfare preferences in a meaningful way.

We fielded a large experimental survey fielded in 8 countries, including 5 EU countries, the UK, Japan and the US. By means of a two-layered conjoint experiment, we determine the effect of a large number of specific policy options to determine causal patterns of public support, under the two scenarios of rising globalization and technological change. We exploit our flexible design investigate the preferences for three ideal typical policy offers from social and political forces—a post-keynensian welfare programme a neoliberal welfare programme, and a social democratic one. Finally, by linking respondents' answers with individual-level exposure to globalization and automation risks, we were able to gauge how personal exposure to individual risks affects patterns of preference.

All in all, our results show that while public support for programmes balancing the negative effects of automation and globalization is relatively high, individuals do not fundamentally differ in their preferences depending on the origin of the shock. Their preferences are largely consistent and favour a redistributive,

moderately ambitious programme, enshrined in national governance systems, which evenly distributed the available resources between training and income-support schemes. Progressive taxation is the preferred mean to provide the resources needed to finance the intervention. Vocational and lifelong learning programmes are preferred over general higher education, while respondents do not show distinguishable preferences concerning the income-support measures, although they see the expansion of existing unemployment benefits as a stable and convincing option.

These patterns do not significantly vary across the countries considered, with minor exceptions. The rejection of radical political changes in the welfare states under the pressure of mounting economic modernization is confirmed by the preference for a “social democratic package”, which preserves an even distribution of resources between universal training and compensatory measures for the unemployed. Finally, individual risk exposure, typically seen in the literature as a driver of public preferences, seem to play a minor role in determining the content of public preferences, although it certainly does affect the overall patterns of support and opposition.

Given the importance that different shocks have in the literature, our findings –contrary to our pre-registered expectations— reveal surprisingly little difference in the extent to which and how publics think about policy interventions to address globalization risks as opposed to technological change. This pattern holds not only for the pooled results of the eight country samples, but also for the individual country samples. This “non-effect” or lack of differences might well be artefacts of the subtleties of the survey instrument or a tendency to adjust the way one thinks about one kind of risk having already thought about another kind of risk. However, it might also reflect substantively meaningful similarities in the ways publics think about technological and globalization risks – given that both are often written about in similar terms in the press and in political debate. All in all , sociotropic elements – such as the country of origin— play a stronger role than individual exposure or type of shock.

These strong results notwithstanding, some limitations are in order. First, with the exception of individual-level risk exposure to offshorability and automation, we do not extensively explore individual-level characteristics. This is due to the fully experimental nature of our survey, which allows for meaningful causal inference to the extent the variables of interest are truly independent and randomly assigned. Yet, these average effects notwithstanding, public attitudes on assistance packages can be expected to differ significantly between more or less educated respondents; or respondents with lower or higher incomes; or for that matter across any range of demographic or socio-economic cleavages (e.g. gender, ethnicity, migration status, region of residence, occupation). Future work will explore these semi-experimental effects in full, discussing how experimental treatments might be modulated by the characteristics of the respondents.

Second, our study covers only simplified and in any event limited variation in the policy realms actually relevant to mitigating economic pain from globalization or technological change. There are many more fine-grained distinctions that might matter – for instance, within education activation, there are differences in training versus relocation and conditionality arrangements relevant to adjustment and each likely to elicit

distinct public attitudes. And at the same time there are more policy interventions that we ignore in the existing study – for instance, various kinds of technology policies (investment or education provisions for particular inventions and sectors) or anti-globalization interventions (Foreign Direct Investment or offshoring policies, trade regulations and linkage to standards, etc.).

Third, our study is by its very nature “pre-political,” taking place in a survey interaction that might be very different and not translate into a political setting in past or future political debates about assistance packages to address globalization and/or technological risks. This raises some important issues with respect to external validity, or the generalizability of our findings beyond our surveyed sample setting. This is a potential shortcoming, even while our experiment provides strong leverage for the internal validity of our claims about how our sample respondents value different aspects of policies to address technological and globalization risks. In fact, there is a quite generic trade off between internal validity and external validity with respect to most any experimental design. And our framing and wording of the experiments take some pains to reflect actual locution and bases of real political debate. But only further research, including observational studies of the kinds of dimensions and issues problematized in our experimental research design, will address whether the inferences we draw hold in actual political conflict and policy development. These limitations notwithstanding, this paper provides the first conjoint experiment comparing the risks derived by global economic transitions, and –for the first time – matching experimental results with individual risk exposure. These aggregate and pooled findings suggest that there is a cross-national, meaningful traction for new policy-political initiatives to redress technological and globalization risks on equal footing. These initiatives would encounter stronger public support if they focus on active workers rather than firms, on progressive-taxation financing rather than flat taxes or a running-up of debt, on national level safety nets more than regional or global governance forms, and on safety nets without extra taxes limiting the globalization or technological innovation itself.

References

- Abbott R. B., Bogenschneider B. (2018), Should Robots Pay Taxes? Tax Policy in the Age of Automation. *Harvard Law & Policy Review*, n.12, pp.145-175.
- Acemoglu D. (1998), Why Do New Technologies Complement Skills? Directed Technical Change and Wage Inequality, *The Quarterly Journal of Economics*, n.113(4), pp.1055–1089.
- Acemoglu D., Restrepo P. (2020), Robots and Jobs: Evidence from US Labor Markets, *Journal of Political Economy*, n.128(6), pp.2188-2244.
- Acemoglu, D., & Autor, D. (2011). *Skills, Tasks and Technologies: Implications for Employment and Earnings* (pp. 1043–1171).
- Amrtz M., Gregory T., Zierahn, U. (2016), The Risk of Automation for Jobs in OECD Countries: A Comparative Analysis, *OECD Social, Employment and Migration Working Papers*, OECD Publishing, Paris, n.189.
- Autor D., Mindell D., Reynolds E. (2020), The Work of the Future: Building Better Jobs in an Age of Intelligent Machines, *MIT Task Force on the Work of the Future*, Cambridge.
- Autor, D. H., Levy, F., & Murnane, R. J. (2003). The Skill Content of Recent Technological Change: An Empirical Exploration. *Quarterly Journal of Economics*, 118(4), 1279–1334.
- Bлиндер, A. S. (2009). How many U.S. jobs might be offshorable? *World Economics*, n.10(2), pp. 41–78.
- Bлиндер, A. S., Krueger, A. B. (2013). Alternative Measures of Offshorability: A Survey Approach. *Journal of Labor Economics*, 31(2), pp. 97–128.
- Mahutga, M. C. , Curran, M, Roberts, A. (2018). Job tasks and the comparative structure of income and employment: Routine task intensity and offshorability for the LIS*. *International Journal of Comparative Sociology*, 59(2), pp. 81-109.
- Weisstanner, D. (2021). Technological change and labour market policy preferences. In *Handbook of Labour Market Policy in Rich Democracies*, ed. D Clegg, N Durazzi. Cheltenham, UK: Edward Elgar. In press
- Boons F., Montalvo C., Quist J., Wagner M. (2013), Sustainable innovation, business models and economic performance: an overview. *Journal of Cleaner Production*, n.45, pp.1-8.
- Brooks, C., & Manza, J. (2007). *Why Welfare States Persist: Public Opinion and the Future of Social Provision*. University of Chicago Press.
- Busemeyer M. R., Garritzmann J. L. (2019), Compensation or Social Investment? Revisiting the Link between Globalisation and Popular Demand for the Welfare State, *Journal of Social Policy*, n.48(3), pp.427-448.

Bussemeyer M., Sahm A. (2021), Social Investment, Redistribution or Basic Income? Exploring the Association Between Automation Risk and Welfare State Attitudes in Europe. *Journal of Social Policy*, pp.1-20.

Cochran W.G. (1953), *Sampling Techniques*, New York: John Wiley & Sons, Inc.

Cochran W.G. (1977), *Sampling Techniques*, 3rd Edition, New York: John Wiley & Sons, Inc. Dermont C., Weisstanner D. (2020), Automation and the future of the welfare state: basic income as a response to technological change?, *Political Research Exchange*, n.2, pp.1-11.

Deming, D.J., & Noray, K.L. (2018). Stem Careers and Technological Change, *National Bureau of Economic Research*, Working Paper 25065.

European Commission (2018), *Artificial Intelligence for Europe. Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions*, COM/2018/237 final.

European Commission (2021), *Proposal for a regulation of the European Parliament and of the council laying down harmonised rules on artificial intelligence (artificial intelligence act) and amending certain union legislative acts*, COM/2021/206 final.

Ferrera, M., & Hemerijck, A. (2003). “Recalibrating Europe’s welfare regimes”. In J. Zeitlin & D. M. Trubek (A c. Di), *Governing Work and Welfare in the New Economy. European and American Experiments*. Oxford University Press.

Frey C. B., Osborne M. A. (2017), The future of employment: How susceptible Are jobs to computerisation?, *Technological Forecasting and Social Change*, n.114(1), pp. 254-280.

Gallego A., Kuo A., Manzano D., Fernández-Albertos J. (2021), Technological Risk and Policy Preferences. *Comparative Political Studies*.

Goldin C., Sokoloff K., (1982), Women, Children, and Industrialization in the Early Republic: Evidence from the Manufacturing Censuses. *The Journal of Economic History*, n.42(4), pp. 741-774.

Goos M., Manning A. (2007), Lousy and Lovely Jobs: The Rising Polarization of Work in Britain. *The Review of Economics and Statistics*, n.89(1), pp.118–133.

Griliches, Z. (1992). “Introduction to output measurement in the service sectors”, *Output measurement in the service sectors*, University of Chicago Press, pp. 1–22.

Guarascio D., Sacchi S. (2021), Technology, risk and social policy. An empirical investigation. *GLO Discussion Paper*, n.833, Global Labor Organization (GLO), Essen.

Hainmueller J., Hopkins D. J., Yamamoto T. (2014), Causal inference in conjoint analysis: Understanding multidimensional choices via stated preference experiments. *Political analysis*, n.22(1), pp.1-30.

Häusermann, S., & Kriesi, H. (2015). "What Do Voters Want? Dimensions and Configurations in Individual-Level Preferences and Party Choice". In *The Politics of Advanced Capitalism* (pagg. 202–230). Cambridge University Press. <https://doi.org/10.1017/CBO9781316163245.009>

Im Z. (2021), Automation risk and support for welfare policies: how does the threat of unemployment affect demanding active labour market policy support? *Journal of International and Comparative Social Policy*, n.37, pp.76-91.

Jones, C. I. (1995). R & D-based models of economic growth, *Journal of Political Economy*, 103(4), 759–784.

Kovacic M. (2018), The making of national robot history in Japan: monozukuri, enculturation and cultural lineage of robots. *Critical Asian Studies*, n.50(4), pp.572-590.

Mayda, A. M. and Rodrik, D. (2005) 'Why Are Some People (and Countries) More Protectionist than Others?', *European Economic Review*, 49, 1393–1430.

McAfee A., Brynjolfsson E. (2016), Human Work in the Robotic Future: Policy for the Age of Automation. *Foreign Affairs*, n.95(4), pp.139-50.

Moll B., Rachel L., Restrepo P. (2021), Uneven Growth: Automation's Impact on Income and Wealth Inequality. *NBER Working Paper*, n.28440.

Nicoli F., Sacchi S., Burgoon B and G. Buzzelli (2023) Globalisation and automation as sources of labour-market competition, and support for European Union unemployment insurance. *Bruegel Working Paper Series*, issue 13/2023

Pierson, P. (1994). *Dismantling the Welfare State?* Cambridge University Press.

Pierson, P. (1996). The New Politics of the Welfare State. *World Politics*, 48(2), 143–179. <http://www.jstor.org/stable/25053959>

Prettner K., Strulik H. (2020), Innovation, automation, and inequality: Policy challenges in the race against the machine. *Journal of Monetary Economics*, n.116, pp.249-265.

Rathgeb, P., (2021), Makers against takers: the socio-economic ideology and policy of the Austrian Freedom Party, *West European Politics*, 44:3, 635-660.

Robertson P. L. (2017), *Technological diffusion in local, regional, national and transnational settings*. In Handbook on Geographies of Technology. Cheltenham, UK: Edward Elgar Publishing.

Rodrik D., Di Tella R. (2020), Labour Market Shocks and the Demand for Trade Protection: Evidence from Online Surveys. *Economic Journal*, n.130, pp.1008-1030.

Sacchi S., Guarascio D., Vannutelli S. (2020), Risk of technological unemployment and support for redistributive policies. In: Careja R., Emmenegger P., Giger N. (eds) *The European Social Model under Pressure*. Springer VS, Wiesbaden. https://doi.org/10.1007/978-3-658-27043-8_16

Standing G. (2017), *Basic income: a guide for the open-minded*, Yale University Press.

Sudman S. (1976), *Applied Sampling*. New York: Academic Press.

Thewissen S., Rueda D. (2019), Automation and the Welfare State: Technological Change as a Determinant of Redistribution Preferences. *Comparative Political Studies*, n.52(2), pp.171–208.

Van Parijs, P., Vanderborght, Y. (2017), *Basic Income: A Radical Proposal for a Free Society and a Sane Economy*, Harvard University Press

Wagner A., William R. (2014), Spaces of the possible: universal Darwinism and the wall between technological and biological innovation. *Journal of Royal Society Interface*, n.11.

Wagner M. (2016), Managing disruptive innovation with technology acquisitions: the informing case of software-based high-technology industries. *Technology Analysis & Strategic Management*, n.28(8), pp.979-991.

Wagner M. (edited by) (2012), *Entrepreneurship, Innovation and Sustainability*. Routledge.

Walter S. (2010), Globalization and the Welfare State. Testing the Microfoundations of the Compensation Hypothesis. *International Studies Quarterly*, n.54(2), pp.403-26.

Walter S. (2017), Globalization and the Demand-Side of Politics. How globalization shapes labor-market risk perceptions and policy preferences. *Political Science Research and Methods*, n.5(1), pp. 55-80.

Zaller J. (1990), Political awareness, elite opinion leadership, and the mass survey response. *Social Cognition*, n.8(1), pp.125-153.

Web references

<https://trumpwhitehouse.archives.gov/articles/accelerating-americas-leadership-in-artificial-intelligence/>

Appendix 1: sample information and experimental details

1. Introductory frames.

Figure A1: introductory frames.

“We would like you to think about a new public initiative on work and <i>[automation / globalization]</i> to help citizens prepare for or deal with <i>[rapid technological change / the risks of economic globalization]</i>, including <i>the [automation of production processes, the rise of robotics, and artificial intelligence / trade, foreign investment and global production chains]</i>. The public initiative being discussed can combine different policy measures. Some measures provide direct income support to compensate workers who lose their jobs to <i>[automation / globalization]</i>. Other measures provide educational support to help citizens adjust to or prepare for new jobs and generally thrive in a more <i>[automated / globalized]</i> economy. Still other policy measures limit or slow <i>[automation / globalization]</i> itself to protect workers from employment risks. People disagree about which combination of such policy measures is best for the new public initiative. In addition, some people say that any such public initiative will be ineffective or too costly, or will delay job creation and harm those workers who lose their jobs to <i>[machines / global competition]</i>. We would like your opinion on such a possible “public initiative on work and <i>[automation / globalization]</i>”. On the following pages, you will be presented with two program options at a time which differ from one another on several policy measures that will be combined within the program. For each pair of options, you will be asked to tell us which of the two options you prefer or find least objectionable, and also how much you would support or oppose each option. This will be repeated three times.”
Note: text in italic indicates variations in wording between the two frames

2. Sample properties.

As expected, the youngest cohort is characterized by higher complexity in fulfilling the quotas across countries (except for Poland) and was compensated by the older cohorts. However, deviations between the theoretical sample and population structure are moderate: excluding Japan, where the variation is -14.7%, in the other countries they are below 10%. Concerning gender, the adherence between theoretical and obtained samples is almost perfect, with Japan and the Netherlands presenting the highest underrepresentation, respectively 4.0% (female) and 1.7% (male). In online surveys, educational level, and in particular, low educational level, constitutes the most challenging quota to respect. However, this issue has slightly influenced our samples. Excluding Japan, deviations between the theoretical sample and population structure are limited - below 13% - and no educational level quota is particularly underrepresented across countries. The very high overrepresentation of low-educated respondents of Japan can be considered "expected", given the minimal share of the population with low education reported by

the official statistics, according to which this quota for Japan had to be below 1%. Concerning the territorial distribution, the population structure satisfies the hard quotas with only two cells (Sweden: North Middle Sweden and Poland: Warsaw's capital city), characterized by a deviation close to 25%.

Table A1: Deviations between the theoretical sample and the actual sample: age (%)

Country	15-29	30-49	50+
Germany	96.6	101.2	101.2
Italy	86.6	103.4	105.1
Netherlands	98.9	100.4	100.4
Poland	103.8	97.5	100.4
Sweden	98.4	100.6	100.9
United Kingdom	90.1	102.6	106.3
USA	96.4	101.4	101.9
Japan	85.7	103.0	107.0

Table A2: Deviations between the theoretical sample and the actual sample: gender (%)

Country	Males	females
Germany	99.3	100.7
Italy	102.0	98.0
Netherlands	98.3	101.7
Poland	98.8	101.2
Sweden	100.2	99.7
United Kingdom	101.8	98.2
USA	99.4	100.6
Japan	103.9	96.0

Table A3: Deviations between the theoretical sample and the actual sample: age classes (%)

Country	Less than primary, primary, and lower secondary education (levels 0-2)	Upper secondary and post-secondary non-tertiary education (levels 3 and 4)	Tertiary education (levels 5-8)
Germany	102.2	98.2	102.2
Italy	94.4	102.9	106.0
Netherlands	101.8	97.3	101.9
Poland	98.7	98.1	104.9
Sweden	102.2	98.6	100.4

United Kingdom	105.4	92.4	105.2
USA	89.5	101.5	101.1
Japan	2950.0	87.2	103.3

Table A4: Deviations between the theoretical sample and the actual sample: employment status (%)

Country	employed	not employed
Germany	100.5	98.5
Italy	101.6	97.8
Netherlands	101.1	96.2
Poland	102.5	94.8
Sweden	99.8	100.8
United Kingdom	100.5	98.4
United States of America	99.7	100.8
Japan	103.6	88.2

Table A5: Deviations between the theoretical sample and the actual sample: regional distribution (%)

GERMANY	DELTA %
DE1: Baden-Württemberg	101.2
DE2: Bavaria	99.5
DE3: Berlin	100.0
DE4: Brandenburg+DED - Sachsen+DEE - Sachsen-Anhalt	98.7
DE5: Bremen+DE9 – Niedersachsen	99.8
DE6: Hamburg	97.6
DE7: Hessen+DEG – Thüringen	99.9
DE8: Mecklenburg-Vorpommern+DEF - Schleswig-Holstein	94.1
DEA: Nordrhein-Westfalen	101.7
DEB: Rheinland-Pfalz+DEC - Saarland	101.2
ITALY	DELTA %
ITC1: PIE+ITC2 VDA	100.8
ITC3: Liguria	108.9
ITC4: Lombardy	103.6
ITF1: ABR+ITF2 MOL	103.0
ITF3: Campania	85.6
ITF4: Apulia+ ITF5: Basilicata	103.3
ITF6: Calabria	100.5

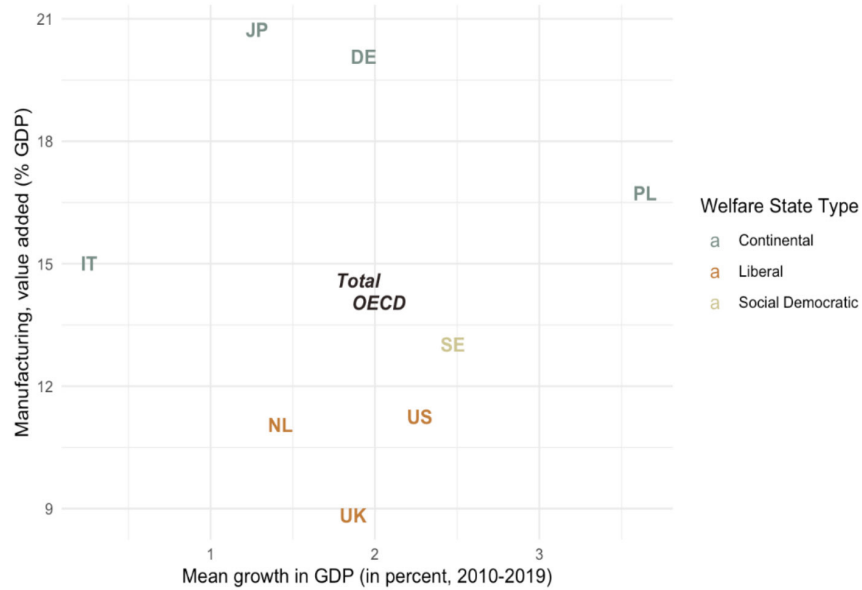
ITG1: Sicily	88.9
ITG2: Sardinia	109.3
ITH1: BZ+ITH2 TN+ ITH4 FRI	102.4
ITH3: Veneto	99.4
ITH5: Emilia-Romagna	102.9
ITI1: Tuscany	102.7
ITI2: UMB+ITI3 MAR	105.8
ITI4: Lazio	102.6
THE NETHERLANDS	DELTA %
NL11: Groningen	103.8
NL12: Friesland	103.2
NL13: Drenthe	101.2
NL21: Overijssel	102.4
NL22: Gelderland	95.0
NL23: Flevoland	101.3
NL31: Utrecht	103.1
NL32: North Holland	107.4
NL33: South Holland	93.2
NL34: Zeeland	100.6
NL41: North Brabant	98.4
NL42: Limburg	105.1
POLAND	DELTA %
PL21: Lesser Poland	102.4
PL22: Silesia	103.8
PL41: Greater Poland	103.2
PL42: West Pomerania	100.5
PL43: Lubusz	100.4
PL51: Lower Silesia	101.1
PL52: Opole region	100.1
PL61: Kuyavian-Pomerania	106.9
PL62: Warmian-Masuria	95.1
PL63: Pomerania	100.4
PL71: Lodzkie	101.8
PL72: Swietokrzyskie	101.2
PL81: Lublin Province	101.0
PL82: Podkarpacia	102.7
PL84: Podlaskie	104.4
PL91: Warsaw's capital city	74.1

PL92: Mazowiecki region	103.6
SWEDEN	DELTA %
SE11: Stockholm	114.8
SE12: East Middle Sweden	94.2
SE21: Småland with Islands	97.2
SE22: South Sweden	106.4
SE23: West Sweden	102.3
SE31: North Middle Sweden	74.4
SE32: Central Norrland	111.5
SE33: Upper Norrland	58.4
UNITED KINGDOM	DELTA %
UKC: North East England	104.5
UKD: North West England	101.9
UKE: Yorkshire and The Humber	101.0
UKF: East Midlands	104.6
UKG: West Midlands	98.8
UKH: East of England	93.9
UKI: Greater London	101.6
UKJ: South East England	101.8
UKK: South West England	107.6
UKL: Wales	84.3
UKM: Scotland	101.1
UKN: Northern Ireland	79.0
UNITED STATES OF AMERICA	DELTA %
USAA: North East	101.1
USAB: South	97.1
USAC: Midwest	100.3
USAD: West	103.5
JAPAN	DELTA %
JPA: Hokkaido	101.8
JPB: Tohoku	91.5
JPC: Northern-Kanto, Koshin	108.9
JPD: Southern-Kanto	100.2
JPE: Hokuriku	65.0
JPF: Toukai	104.3
JPG: Kansai region	108.5
JPH: Chugoku	104.1
JPI: Shikoku	97.2

Country selection

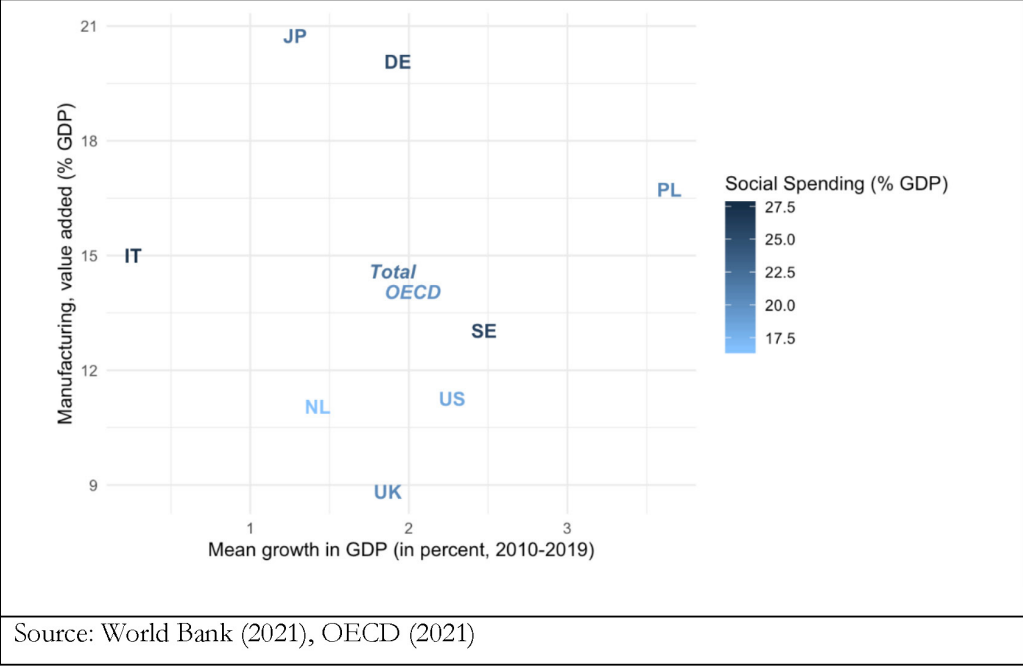
Figure 1 demonstrates how the selected countries vary with regards to their past economic performance, industrial structure, and geographical location. Our sample's mean growth in GDP from 2010 to 2019 ranges from 0.26% in Italy to 3.64% in Poland. Furthermore, the sample's highest share in manufacturing (Japan, 20.75% of GDP) is more than twice the share size of the lowest manufacturing share (UK, 8.84% of GDP).

Figure A2a: Overview of the countries surveyed



Source: World Bank (2021)

Figure A2b: Overview of the countries surveyed



Appendix 2: Additional results

Figure A3a: distribution of support, by conjoint

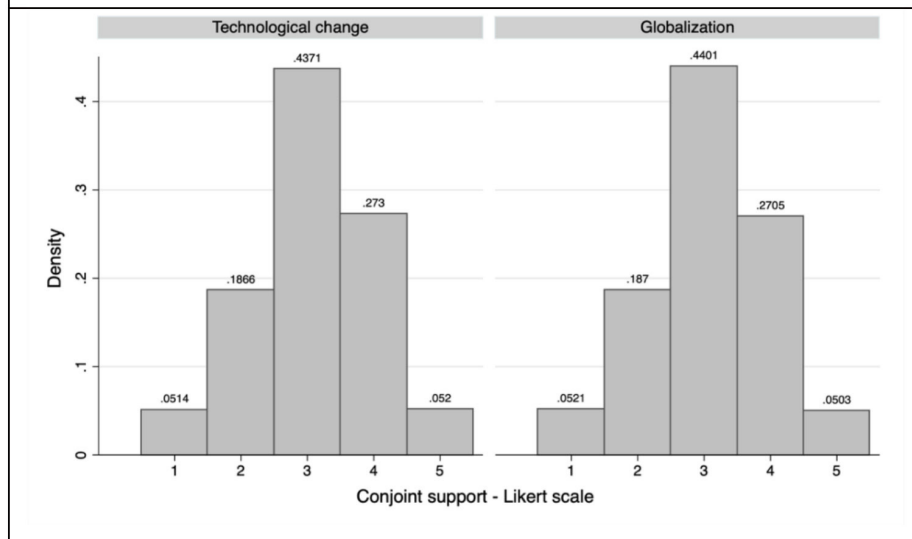


Figure A3b: distribution of support, by country & conjoint

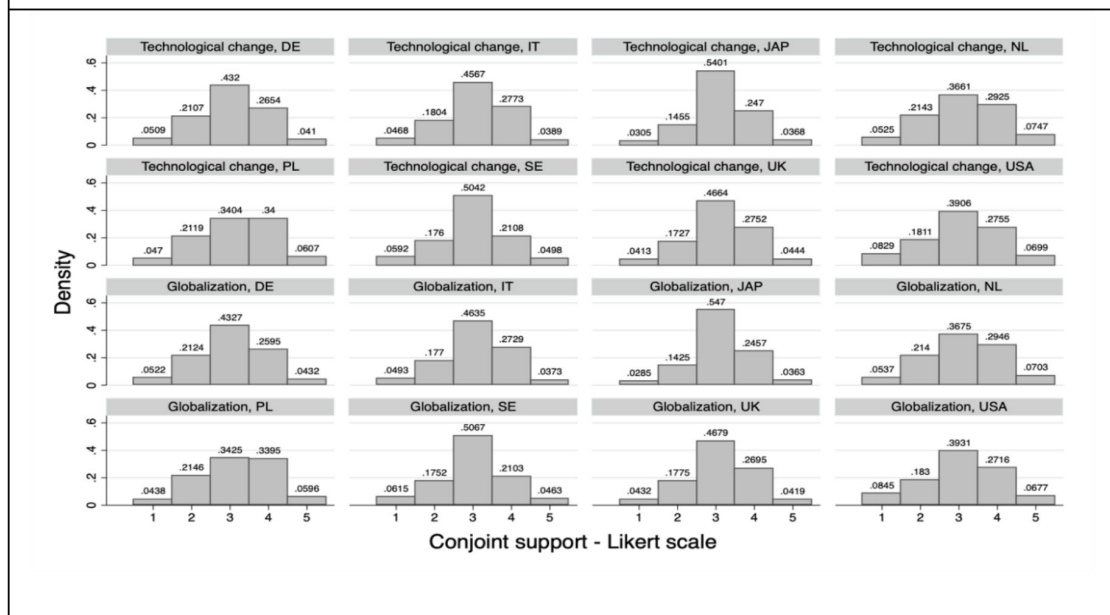


Figure A4: baseline specification, by types of dependent variable, attention fails excluded

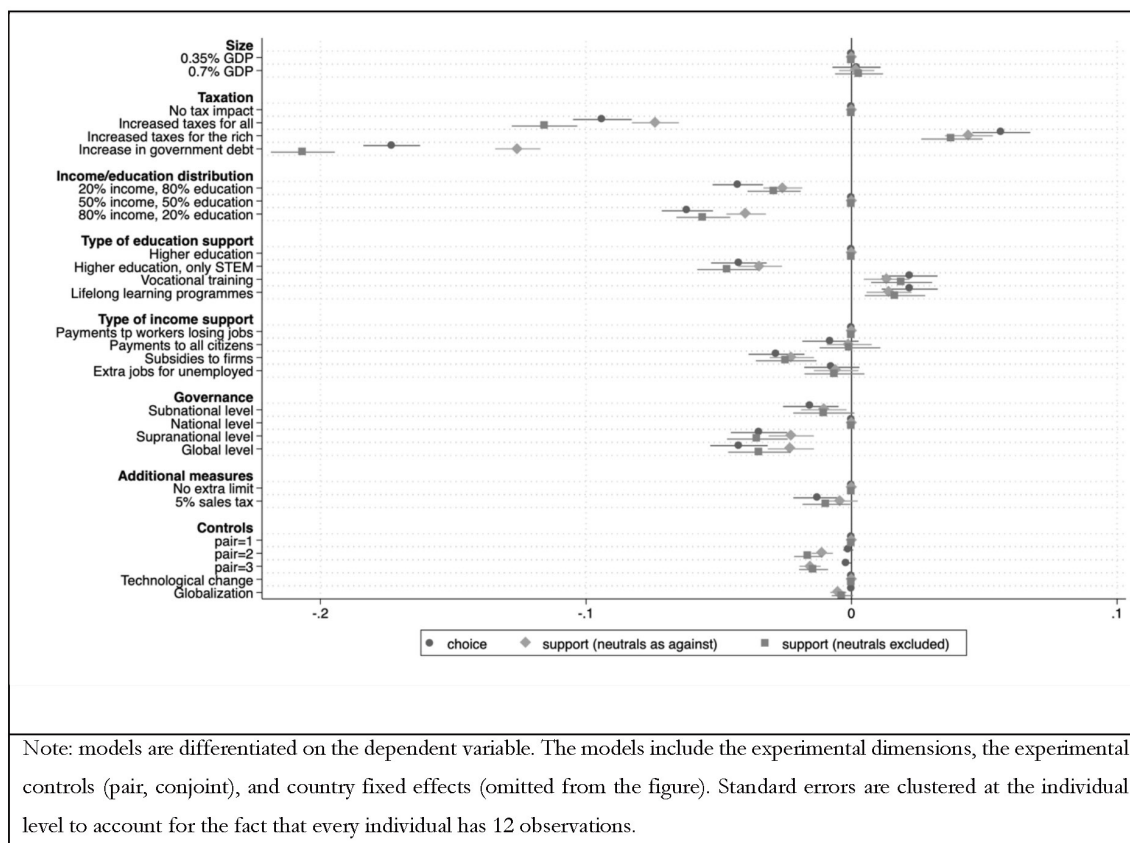


Figure A5: baseline specification, by types of shock, , full sample

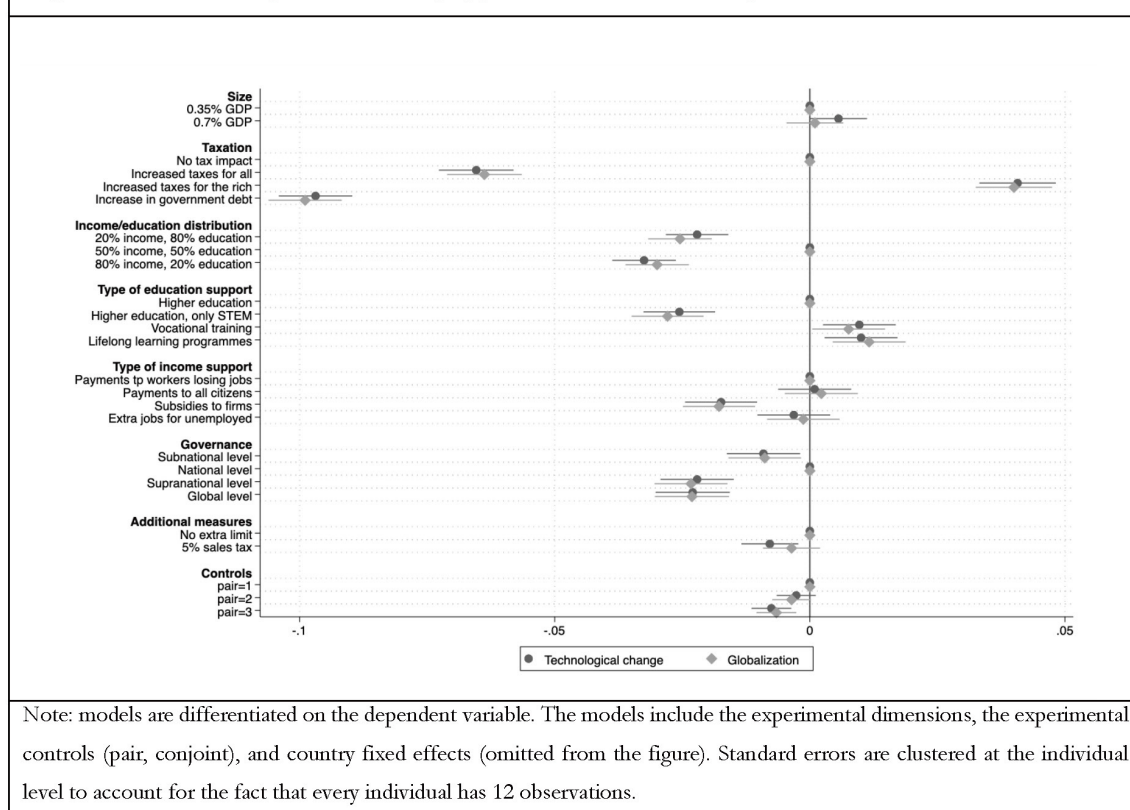
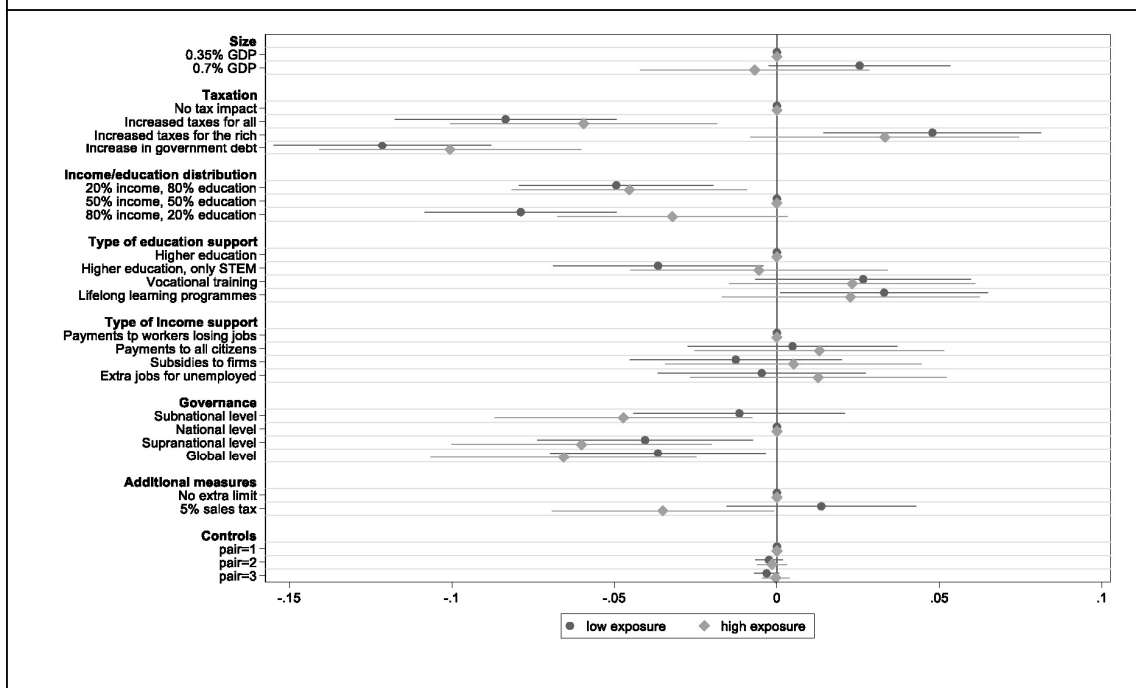
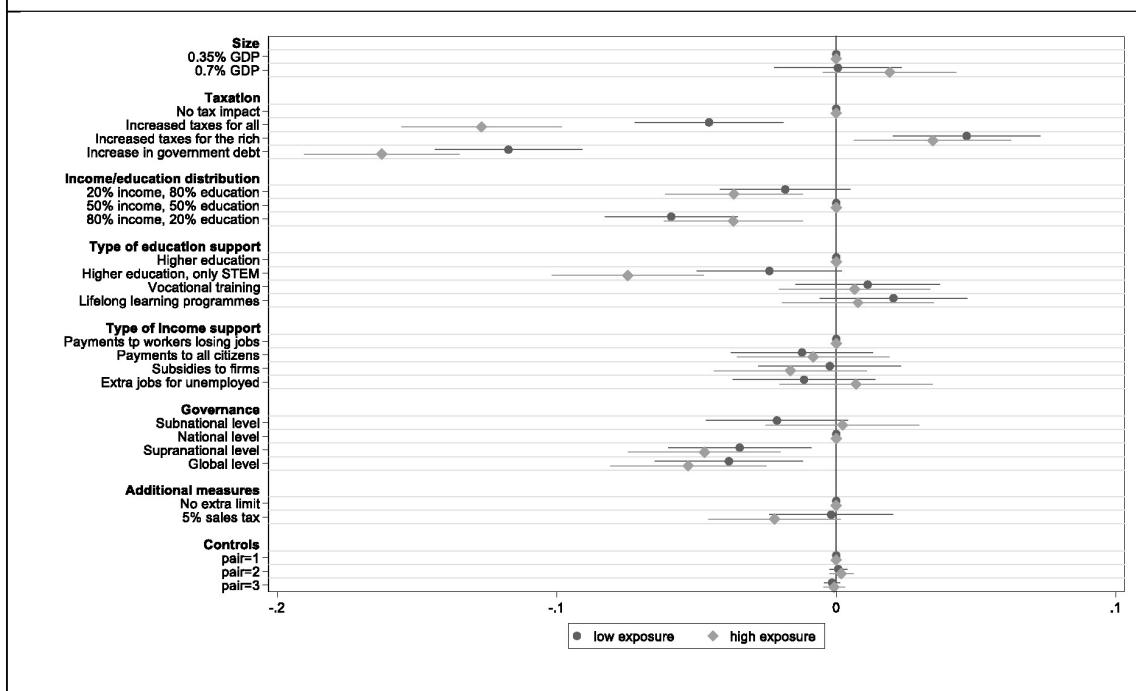


Figure A6: baseline specification, by individual exposure to Offshorability Index only



Note: The dependent variable is package choice. The models include the experimental dimensions, the experimental controls (pair), and country fixed effects (omitted from the figure). Standard errors are clustered at the individual level to account for the fact that every individual has 6 observations. Note also that we restricted the analysis only to the first 3 pairs of packages seen by each individual, since about half was confronted with the automation conjoint first, and the other half with the globalization conjoint first

Figure A7: baseline specification, by individual exposure to RTI only

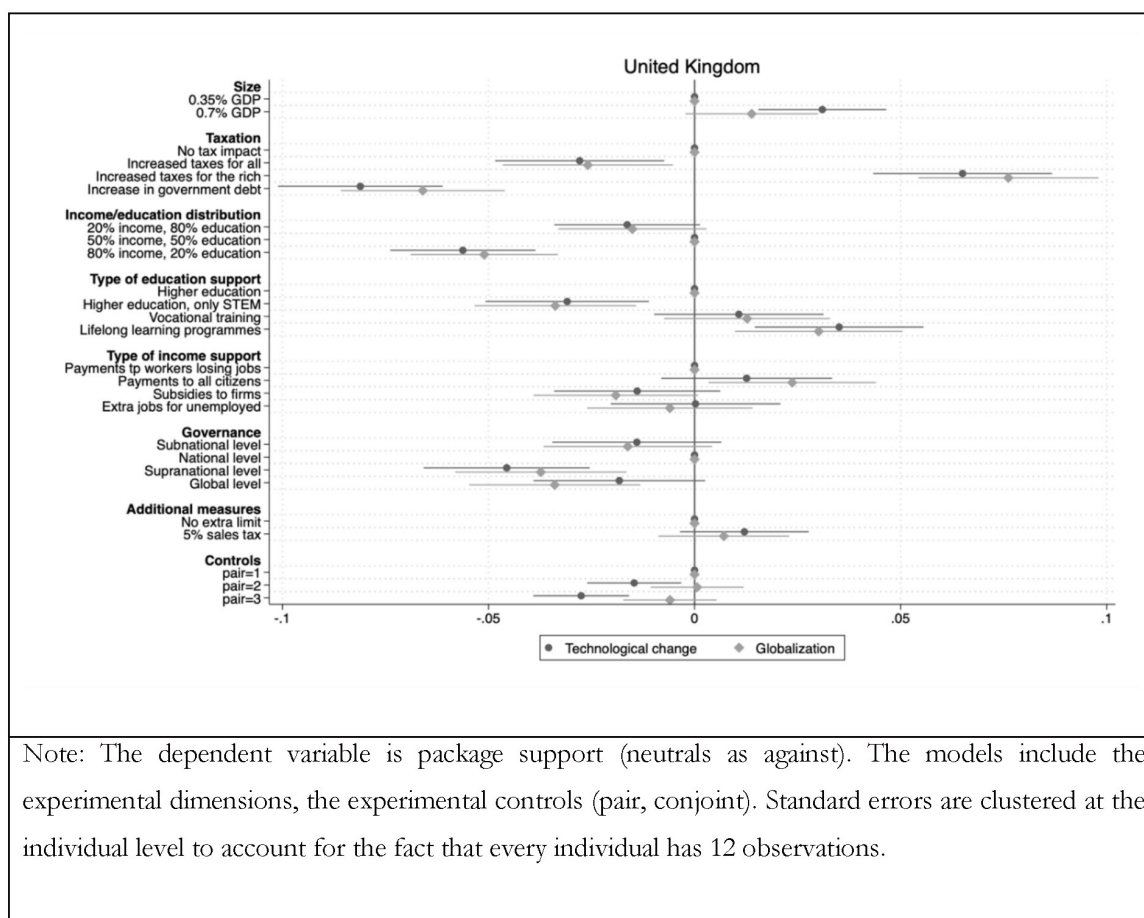


Note: The dependent variable is package choice . The models include the experimental dimensions, the experimental controls (pair), and country fixed effects (omitted from the figure). Standard errors are clustered at the individual level to account for the fact that every individual has 6 observations. Note also that we restricted the analysis only to the first 3 pairs of packages seen by each individual, since about half was confronted with the automation conjoint first, and the other half with the globalization conjoint first.

Appendix 3: Country by country analysis

Figures A8-A14 clarifies the respective portraits per-country story, allowing us to highlight country-whole differences and judge whether there are differences between frames focusing on globalization and technological change. With respect to the latter, in most countries respondents think about the two sources of economic disruption very similarly, without much differentiation in the way they affect their patterns of response. Even when differences exist, these are seldom statistically significant. In the UK, for instance, respondents seem rather less favourable to generous programmes targeting globalization rather than automation, but the differences are statistically non-significant.

Figure A8: UK only: baseline specification, by conjoint type



German respondents seem not to differentiate in any meaningful way between the two sources of potential disruption: they tend to provide very consistent answers on the nature of the support policy at stake regardless of the source of risk. Along with the Italian respondents, they tend to have a less negative view of supranational governance as compared to other countries, but again without fundamentally differentiating between sources of risk; compared with Italians, they also tend to have a more negative view of global governance arrangements, which are clearly opposed by the respondents in then German sample. In the Italian case, interesting differences (which remain, however, statistically non-significant at the 5% threshold) pertain the distribution of monetary benefits between education and income, the type of income support, and the governance of the programme. Income support is less objected upon when it targets globalization. When income support is provided, however, Italians have a slightly favourable view of creating public jobs to counter technological change, but not to counter globalization. Regarding governance, Italians tend to support EU-level governance of technological change, but not when it comes to globalization.

Figure A9: DE only: baseline specification, by conjoint type

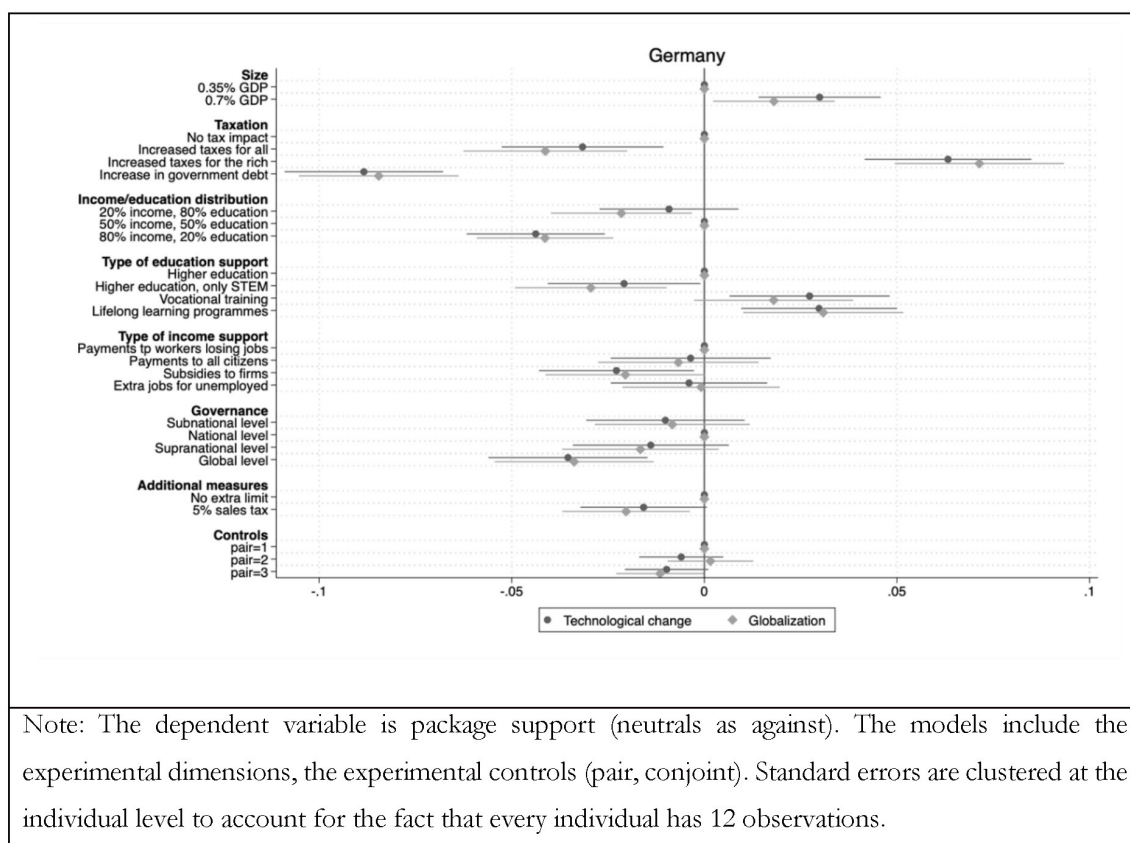
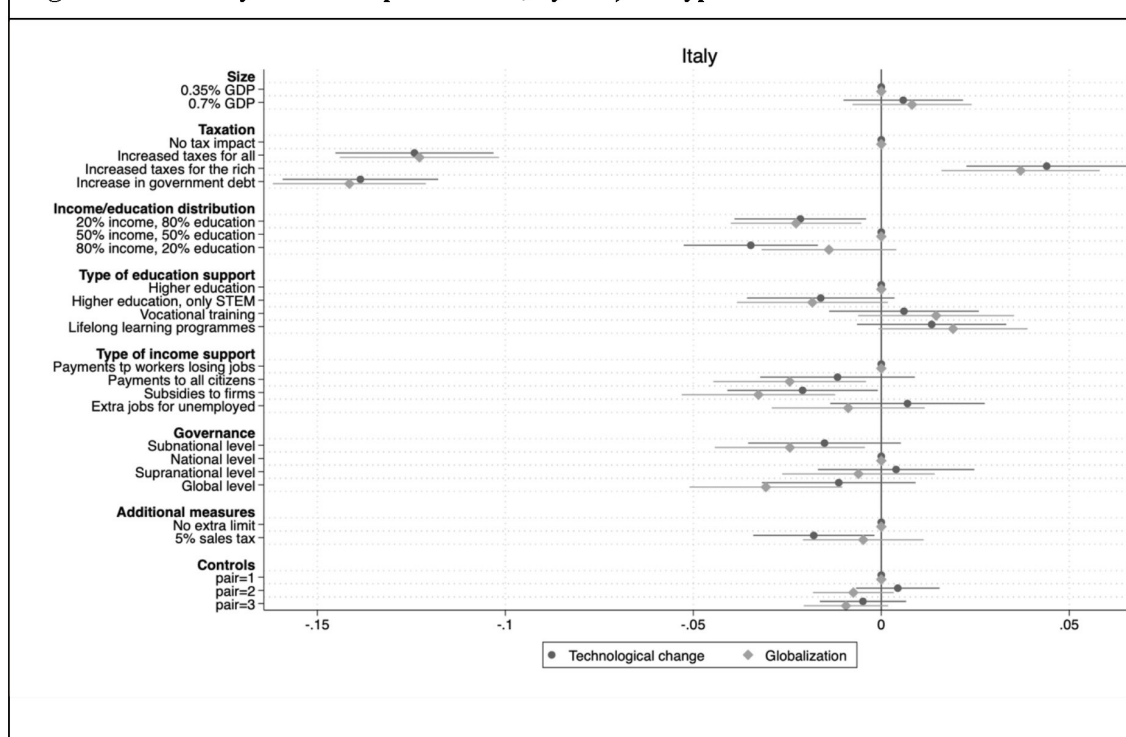


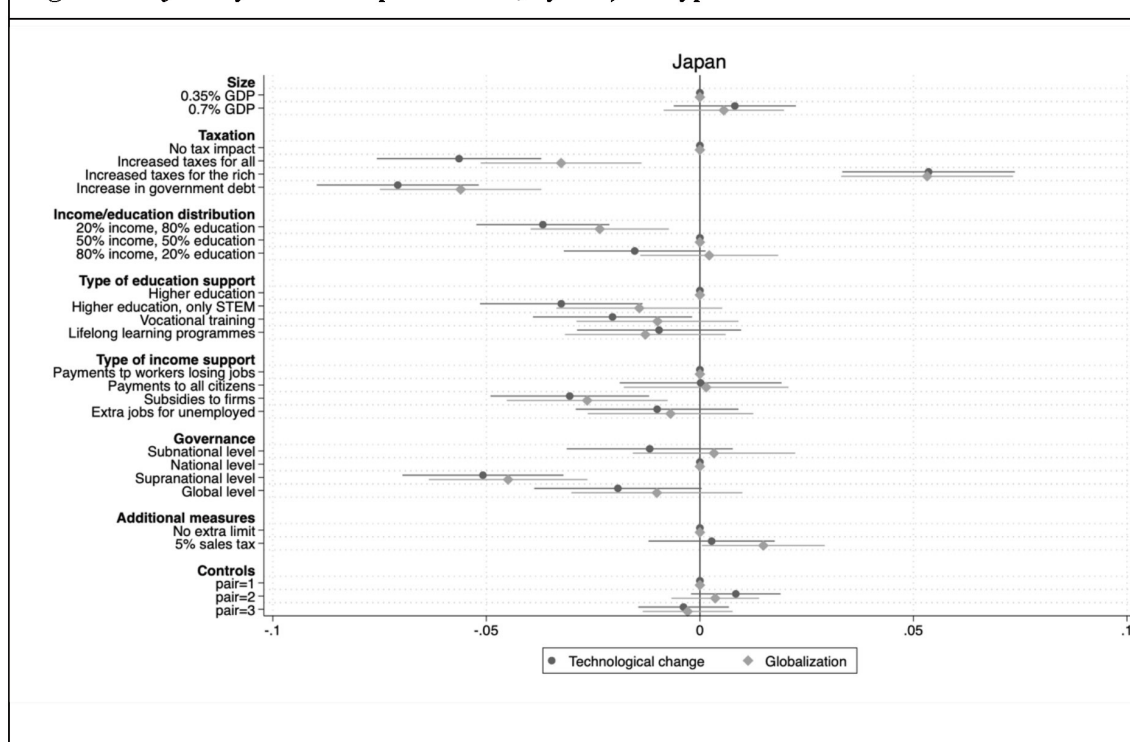
Figure A10: IT only: baseline specification, by conjoint type



Note: The dependent variable is package support (neutrals as against). The models include the experimental dimensions, the experimental controls (pair, conjoint). Standard errors are clustered at the individual level to account for the fact that every individual has 12 observations.

Japanese respondents, in general, tend to have more supportive views of policies targeting globalization than policies targeting automation. This emerges across various specifications: respondents are less willing to suffer linear tax increases or extra debt to face disruptions induced by technological change, they are less interested in local governance forms, and are relatively less in favour of additional taxes on companies when it comes to automation as compared to globalization. More importantly, they hold rather negative view of income support to counter the negative effects of automation, while they hold an indifferent or even positive view of income support to counter the negative effects of globalization.

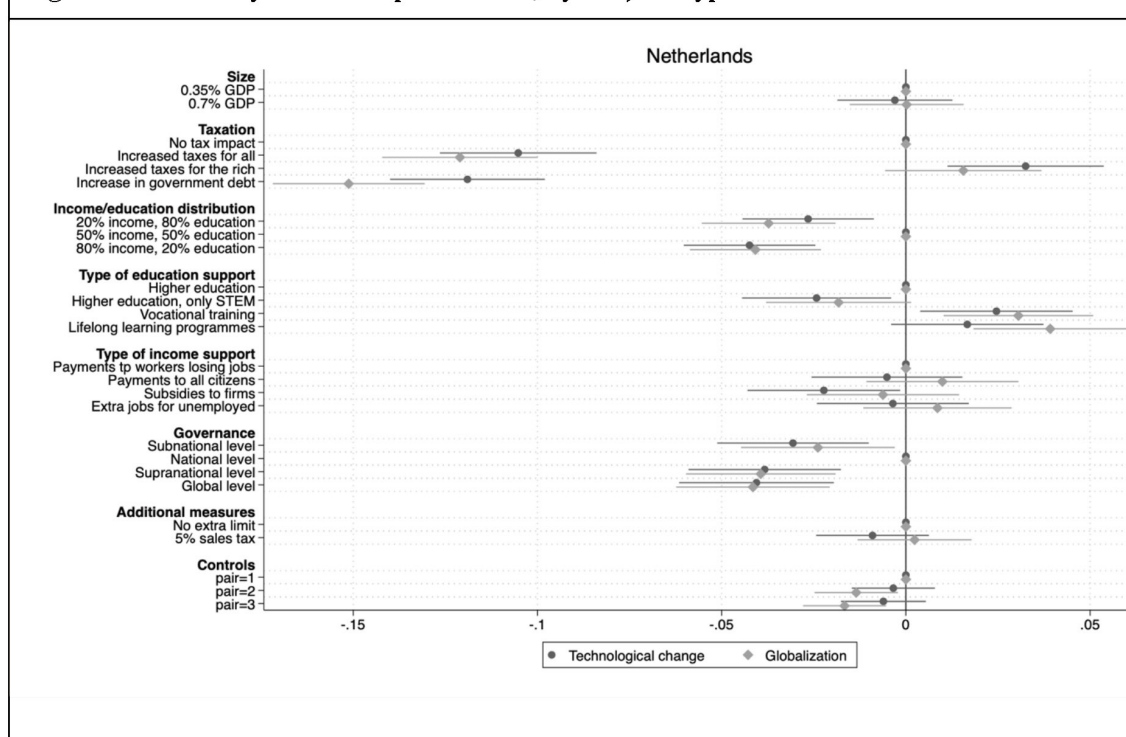
Figure A11: JP only: baseline specification, by conjoint type



Note: The dependent variable is package support (neutrals as against). The models include the experimental dimensions, the experimental controls (pair, conjoint). Standard errors are clustered at the individual level to account for the fact that every individual has 12 observations.

Conversely, Dutch respondents tend to have different priorities when compared with Japanese respondents. Dutch respondents are in general more wary of technological change than they are of globalization, and this is reflected to some extent in the marginally more favourable views they hold regarding policies addressing automation as compared to globalization. While they generally dislike public debt, for example, they tend to be much more negative to extra public debt undertaken to counter globalization than to counter automation. However, when it comes to the types of income support characterising the potential policies, Dutch respondents have a more positive view of direct transfers to all citizens in the case of globalization-induced shocks, which suggests that they perceive globalization as a broader and more general source of potential issues. Notably, the Dutch respondents have a strong preference for national governance, which they prefer over all other types of coordination.

Figure A12: NL only: baseline specification, by conjoint type

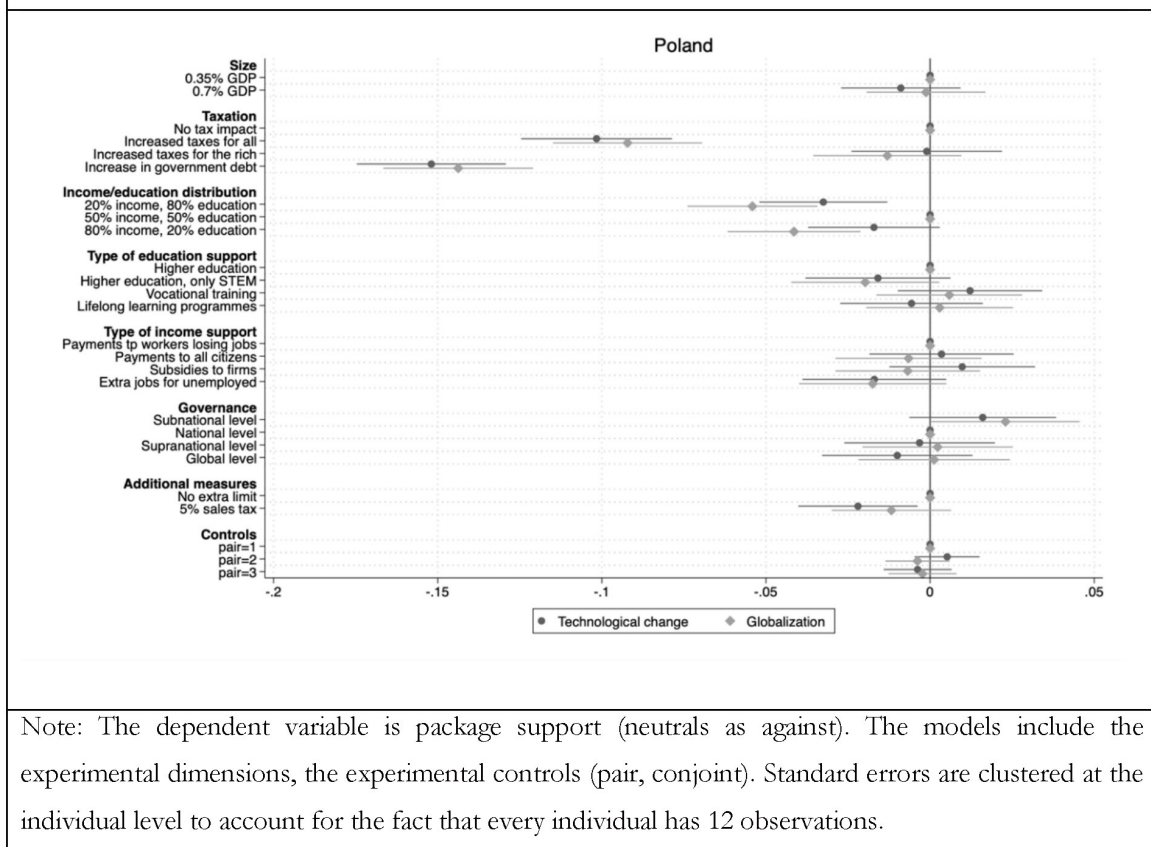


Note: The dependent variable is package support (neutrals as against). The models include the experimental dimensions, the experimental controls (pair, conjoint). Standard errors are clustered at the individual level to account for the fact that every individual has 12 observations.

Respondents from Poland, not differently from German respondents, tend not to differentiate much between the two sources of potential disruption. However, they seem generally slightly more concerned with automation, and they tend to be less negative with regard to income transfers in the case of disruptions induced by technological change as opposed to disruptions induced by globalization; they also tend to be more supportive of firms in the case of automation, supporting subsidies and opposing extra sale taxes. Interestingly, when compared with respondents from other countries, Polish respondents tend to have very favourable views of subnational governance, indicating a quasi-unique mistrust in national institutions which does not emerge in any other country-specific sample.

Respondents from Sweden tend not to differentiate between sources of risk. Notably, they display a very strong support for forms of progressive taxation, even when compared with other countries, and tend to have a less negative attitude towards public debt.

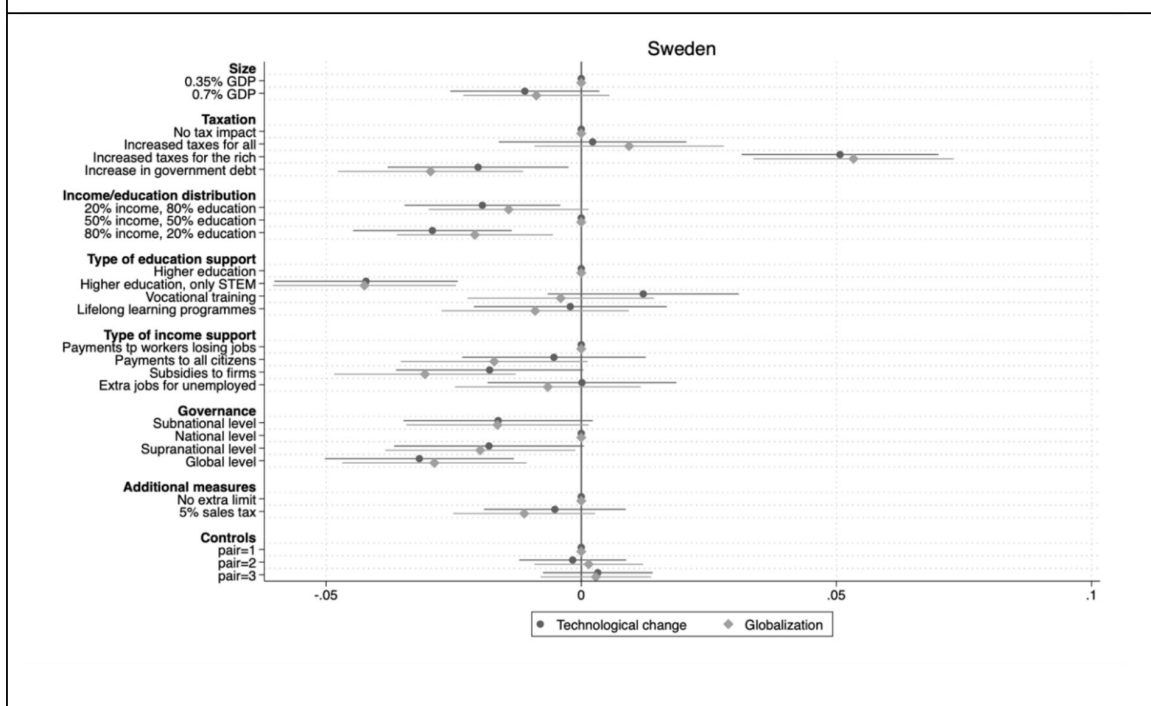
Figure A13: PL only: baseline specification, by conjoint type



However, these attitudes follow very similar paths both with regard to policies addressing globalization, and to policies addressing automation. The only policy dimension where Swedish respondents display a somewhat differentiated attitude pertains investment in vocational training, which tends to be slightly preferred over broad higher education investment (the baseline level) in case of policies addressing automation, whereby the same policy appears to be slightly disliked when the focus of the programme is on globalization.

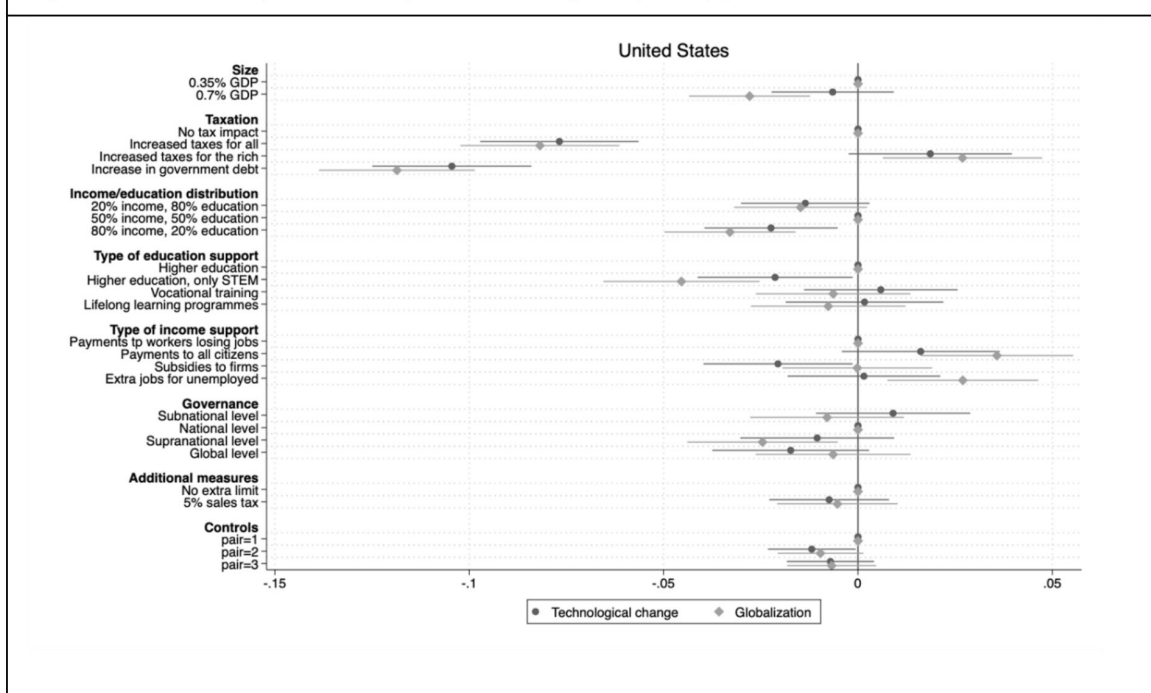
Finally, the last country in our sample is the USA. The American patterns of preferences do not dramatically differ from European ones. However, in line with patterns of opinion and policy, the USA respondents tend to prefer a less generous variant of government-provided assistance provisions than do their European counterparts. And Americans tend to be less supportive than their European counterparts of packages inclusive of progressive taxation. Less intuitively, USA publics' preferences are relatively differentiated when it comes to income support alternatives to counter globalization or automation. In particular, USA respondents are quite supportive—in the case of policies addressed to globalization—of income support directed to all citizens and to the provision of public jobs, and tend to be less sceptical than other countries when it comes to subsidizing firms.

Figure 1A4: SE only: baseline specification, by conjoint type



Note: The dependent variable is package support (neutrals as against). The models include the experimental dimensions, the experimental controls (pair, conjoint). Standard errors are clustered at the individual level to account for the fact that every individual has 12 observations.

Figure A15: USA only: baseline specification, by conjoint type



Note: The dependent variable is package support (neutrals as against). The models include the experimental dimensions, the experimental controls (pair, conjoint). Standard errors are clustered at the individual level to account for the fact that every individual has 12 observations.

SESSION 2-3

Varieties of digitalization: work and welfare ecosystems

Rachel Verdin | Jacqueline O'Reilly

Varieties of digitalization: work and welfare ecosystems

Rachel Verdin & Jacqueline O'Reilly
University of Sussex, Digit Centre



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Overview

- The concept: Digital welfare ecosystems
- The evidence: Varieties of Digitalisation
- Comparative benchmarks and evaluation

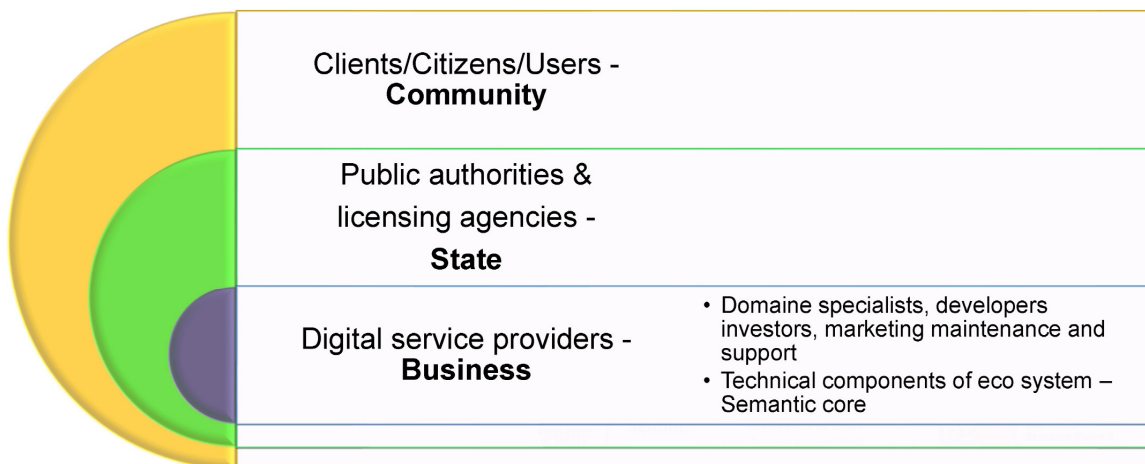


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Conceptual architecture of digital welfare ecosystem



New dynamics of connections

The State: Digitalised systems dependent infrastructure of connectivity to deliver services.

Businesses provide the technological infrastructure.

Community: Third sector organisations knowledge about connecting with target groups.

Previous business/NGO connections: outsourcing service delivery eg: ALPM or health

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Digital Welfare EcoSystems & Social Citizenship

State:

EU; National; regional and local

Business:

MNCs,
National & local
telecom providers
& developers

Community:

NGOs, civil society
organisations
& trade unions



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The roll-out of digitalised welfare services depends on **processes inside and outside government.**

Interdependencies and actors' responses can generate more or less open tensions.

Different relations and divisions of responsibilities between public authorities, the market, and organized civil society.

Great complexity of issues and institutional patterns means that **decision-making becomes dispersed.**

How do stakeholder influence digital welfare provisions?

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Evidence: Varieties of Digital Welfare EcoSystems

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Varieties of digital welfare ecosystems

Synergised:

collaborative synergies between core actors
(Norway and Estonia)

Fragmented:

stratified (Spain), fragmented (UK) or federalised (Germany) systems; **uneven development** and poorly coordinated (Italy and Hungary).

These differences have implications for:

27 Mar exercising social citizenship and addressing digital divisions

Comparative benchmarks



- **European focus:** State of the Digital Decade (previously DESI); E-government benchmark; I-DESI
- **Global focus:** UN E-government Development Index; Digital Intelligence Index, and OECD Digital Government Survey

Why are they important?

"Now more than ever, understanding the digital ecosystem has become an urgent and policy relevant exercise."

Nils Bernhardt

Deputy Director General, Digital
Transformation, European
Commission

- Proxy measurement
- Policy lever
- Consciousness raising

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What do they measure?

- Range of indicators with broad focus on topics such as infrastructure, public services, skills and leadership
- Indexes subject to ongoing change

"E-government has expanded and evolved from siloed approaches in a handful of high-income countries to whole-of-government and whole-of-society approaches in virtually all countries around the globe" (UN 2022)

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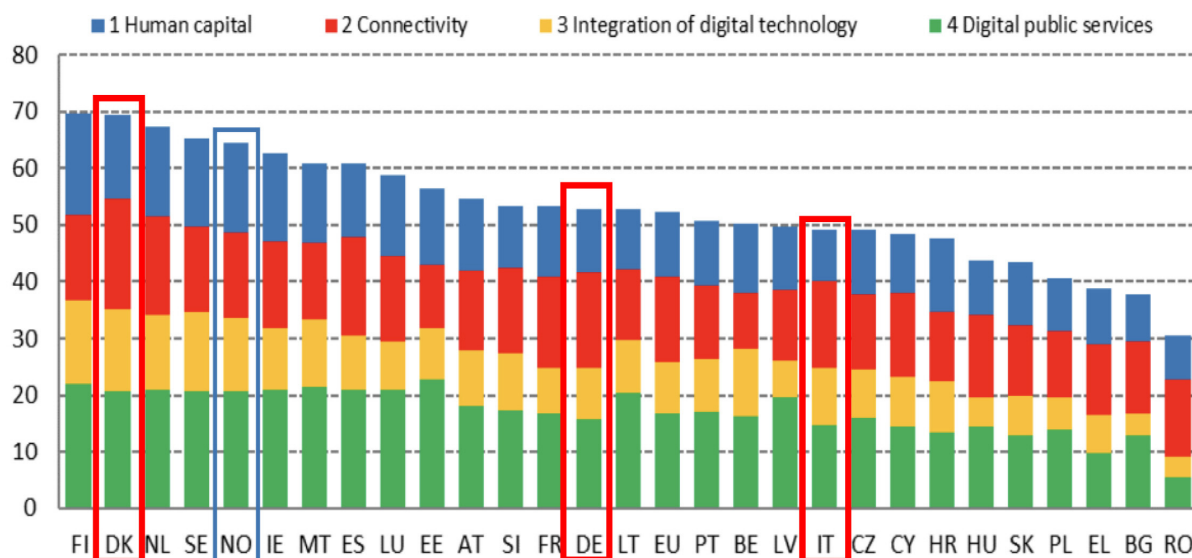


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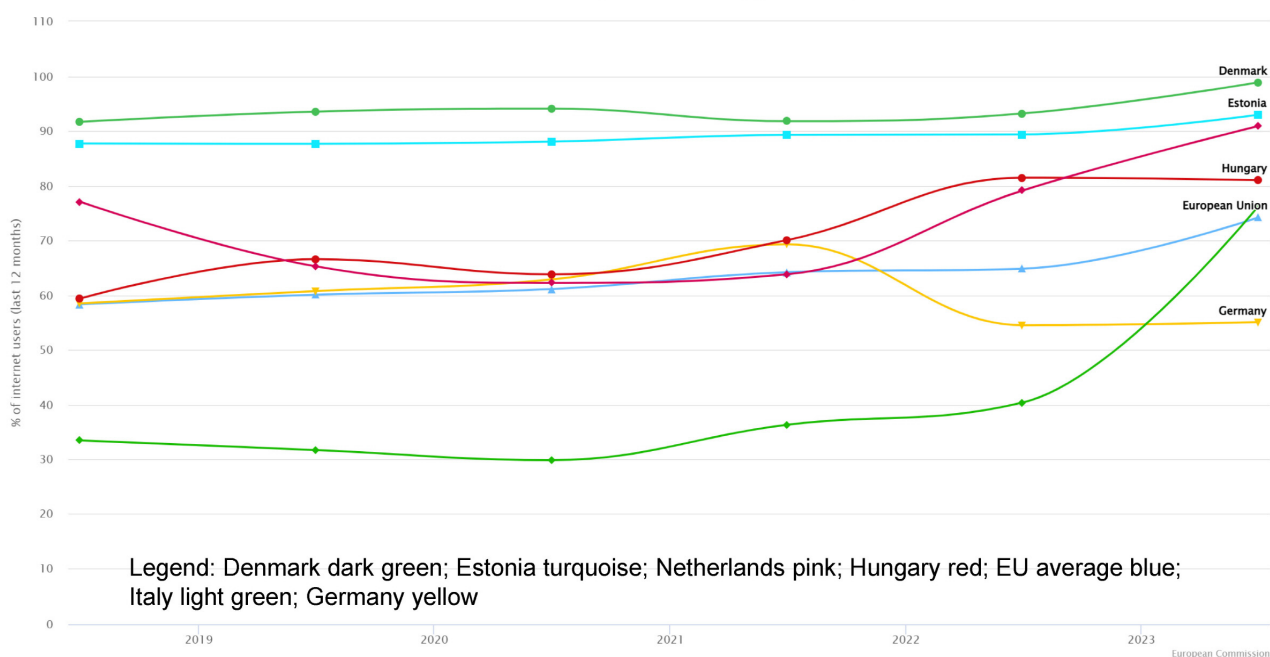


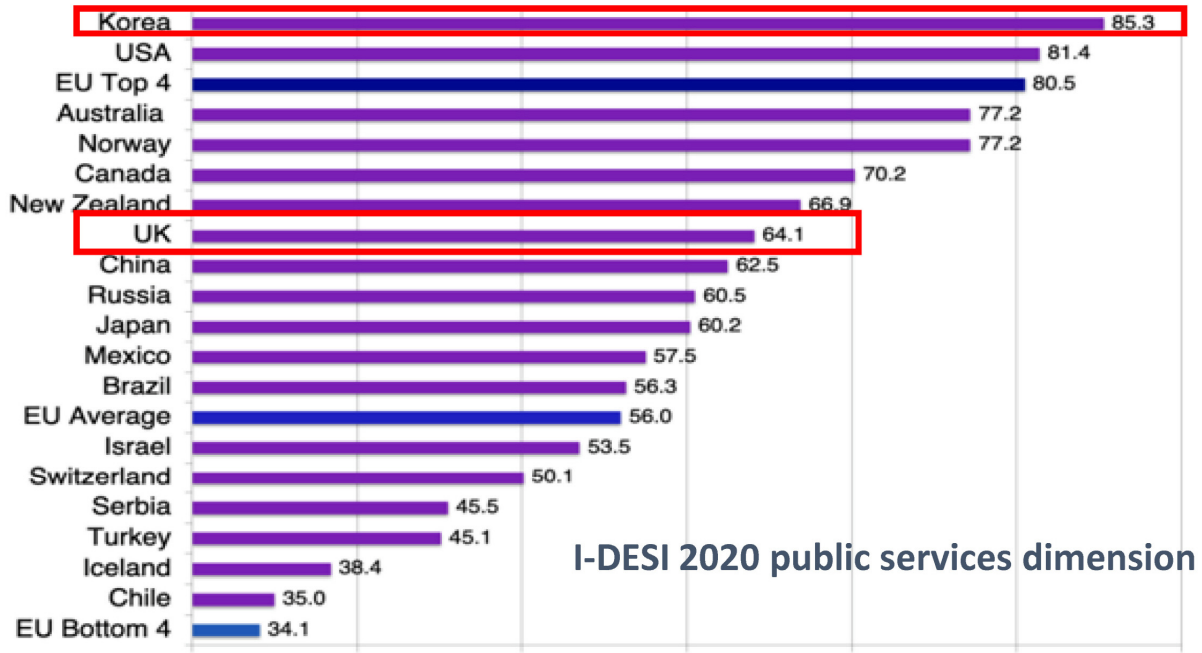
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Digital Economy and Society Index (DESI) 2022 ranking



e-Government users, All Individuals (aged 16–74)

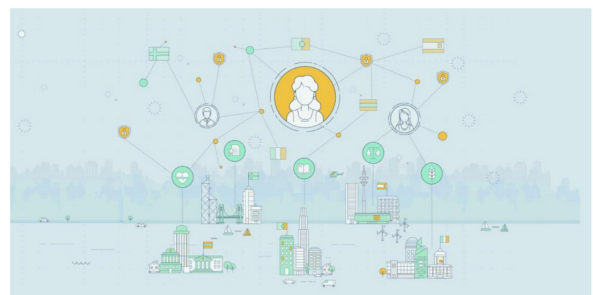




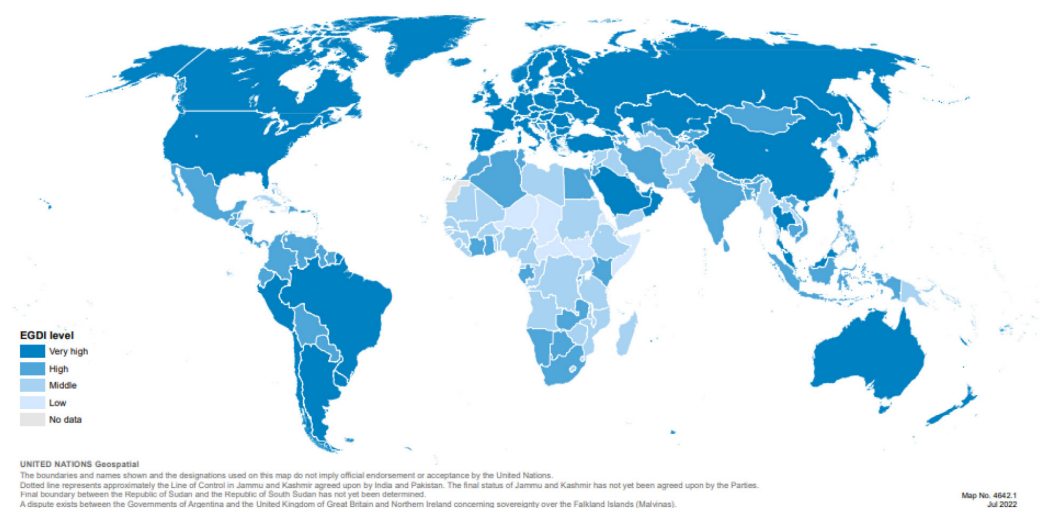
DESI and associated benchmarks

Trends and pace of development:

- Comparatively flat trajectory for digital skills
- EU 27 comparatively strongest in connectivity and digital skills / weakest in use of the internet and digital public services
- The largest EU economies are not the frontrunners



UN e-government development index 2022



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UN E-Government Development Index 2022

- **Leaders:** Denmark, Finland, South Korea, New Zealand, Sweden, Iceland, Australia, Estonia, Netherlands, US, UK, Singapore, UAE, Japan & Malta.
- **Priorities:** Digital by default approaches have been prioritised for social protection, health and education services (17% increase 2020-22)
- **Emerging policy areas:** AI, how to align digital transformation with the green transition and digital inclusion

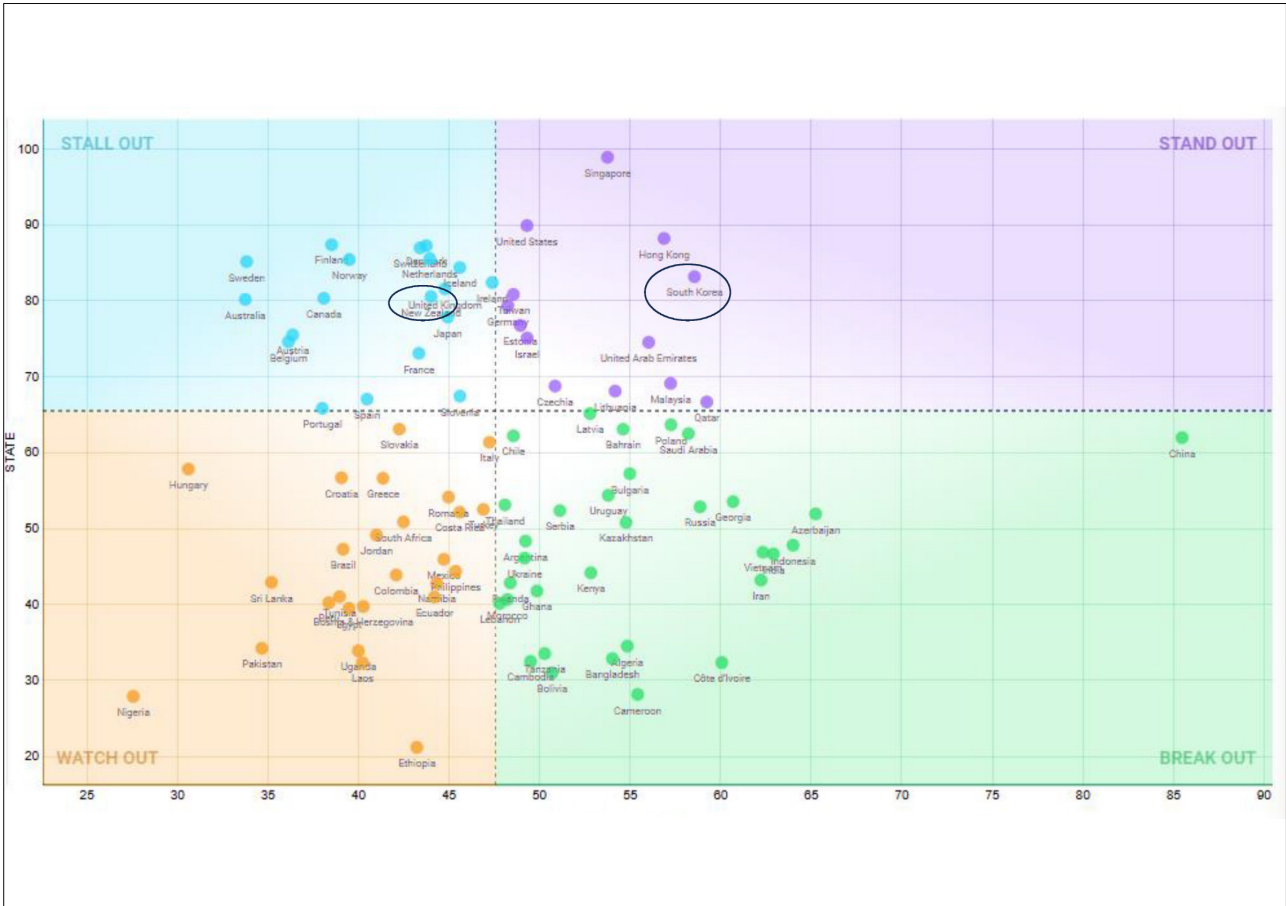
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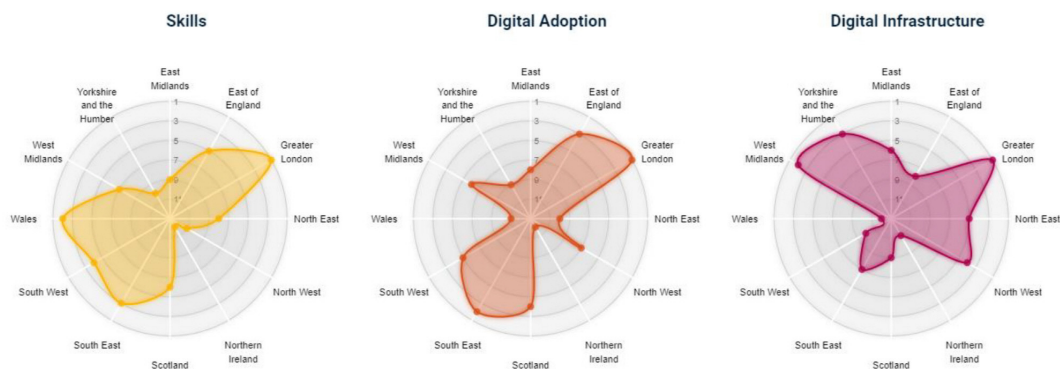


Digital Intelligence Index

		South Korea	UK	Denmark	Italy
Digital Trust	Attitudes	25/42	26/42	06/42	12/42
Digital Trust	Behaviour	11/42	14/42	26/42	31/42
Digital Evolution	Supply	05/90 ↘	17/90 ↘	02/90 ↑	36/90 ↘
Digital Evolution	Demand	01/90 ↑	09/90 ↗	03/90 ↗	33/90 ↘

↘ Slowly receding ↗ Slowly advancing ↓ Rapidly receding ↑ Rapidly advancing

Within country comparisons: the UK



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So what?



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Performance monitor

- Broad overall upward convergence
- Pace of progress is varied (stalled v rapid)
- Different metrics but similar findings
- Phases of development (i.e. national users, business services, basic then key enablers)



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Policy lever

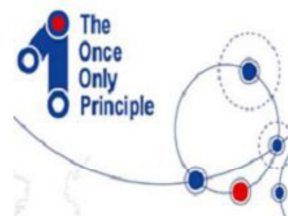
Top performing countries:

- Targeted strategy
- Ongoing monitoring and accountability
- Test, develop and adapt



Similar policy approaches include:

- Open interoperable data
- Digital identity systems
- Streamlined services



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Consciousness raise



Characteristics of top performers:

- coordination
- trust
- historical juncture
- political will
- country income level /investment
- skills

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Varieties of Digitalisation: Fragmented

The UK

Government Digital Service introduced in 2011

UK progress faltering according to iDESI, UN and OECD indexes

- Technical Debt - National Police Database and Pension Services Computer system
- Poor usability and quality of data, Digital ID
- Siloed approach and lack of technical skill – 4% public servants digital professionals
- Centralised approach but poor coordination and lack of strategic oversight



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Varieties of Digitalisation: Synergised

Korea

Early adoption

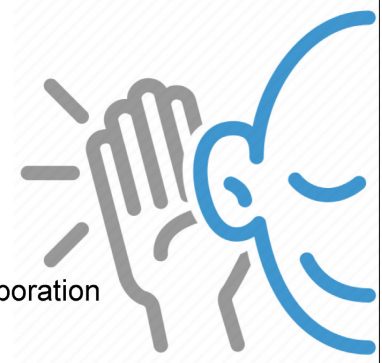
- 1987 → National key databases computerized
- 2001 → Integrated e-government
- 2014 → Smart government
- 2023 → Digital Platform Government

Public-private, inter-ministerial and central-local government collaboration

Ongoing innovation

Trust?

Digital Inclusion?



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Conclusion

More organic and dynamic analysis of institution building

Digital ecosystems require

a different form of coordination from traditional organizations and markets.

*Ecosystems = The **coordination processes** of digital actors involved in the process.*

*A digital ecosystem **interacts with the non-digital world***

***And** different societal institutions increasingly need to interact with digital ecosystems.*

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How do evolving digital welfare ecosystems sit with existing societal institutions and inequalities?

interaction between digital ecosystem and '*non-digital world*' and the way '*institutions interact with digital ecosystems*' is an important perspective well illustrated by the impact and effect of lockdowns imposed during the covid pandemic

Lockdowns accelerated this digital transformation of welfare services & public going online (OECD 2022).

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SESSION 2-4

Robotization and In-work poverty

Young-Kyu Shin | Zhen Jie Im

Robotization and In-work poverty

Dr. Young-Kyu Shin (KIHASA) & Dr. Zhen Im (CBS)



CONTENTS

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KOREA INSTITUTE FOR
HEALTH AND SOCIAL AFFAIRS

1. Background & research questions
2. The impacts of technological change on the labor market
3. How robotization would affect in-work poverty
4. Workers' bargaining power and IWP risks by robotization
5. Methods
6. Findings
7. Conclusions



1. BACKGROUND & RESEARCH QUESTIONS

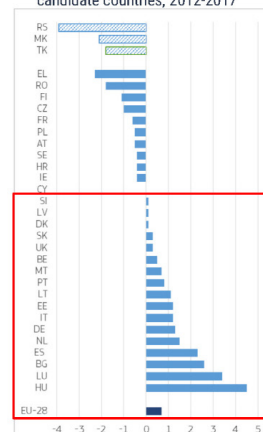
- Increased emphasis on **activation policies**
- Labor market dualization** in the post-industrial society
- Growing concern that **robotization** may further increase unemployment in the future

Growth in the number of people **working but poor**



There is little knowledge of the **association between the rise of robotization and the incidence of in-work poverty (IWP).**

Change in the IWP rates in EU member states and candidate countries, 2012-2017



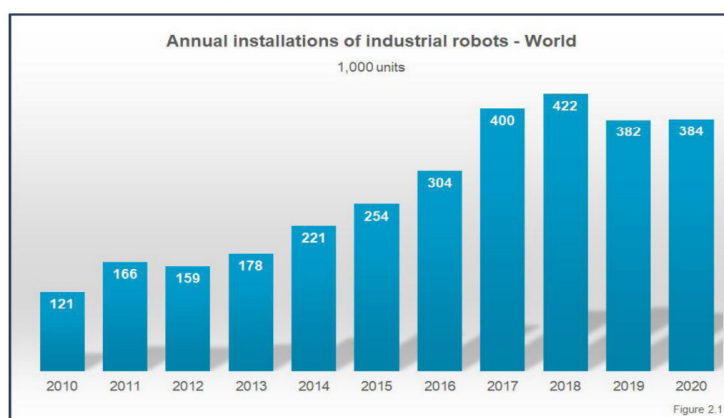
Source: Peña-Casas et al. (2019)

3



1. BACKGROUND & RESEARCH QUESTIONS

- The rapid growth of industrial robots



Source: World Robotics 2021 - Industrial Robots

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1. BACKGROUND & RESEARCH QUESTIONS

RQ1. What is the association between the rise of robotization and the incidence of IWP?

RQ2. If robotization and IWP are associated, does workers' bargaining power moderate the relationship?

5



2. THE IMPACTS OF TECHNOLOGICAL CHANGE ON THE LABOUR MARKET

■ The **Routine-Biased Technical Change (RBTC)** hypotheis (Autor et al., 2003)

- Technological developments have made **redundant many routine workers** by taking over codifiable and repetitive tasks.
- This causes **job polarisation**: a decline in employment in medium-wage routine jobs, accompanied by the growth of high-paying (cognitive non-routine) jobs and low-paying (manual non-routine) service occupations.

■ Empirical evidence on **the impact of technological change on the labour market**

- In terms of RBTC, **employment in medium-wage routine jobs has declined, while low-wage employment in services has grown** (Autor et al., 2006; Goos & Manning, 2007; Goos et al., 2014; Naticchioni et al., 2014; Michaels et al., 2014).
- Regarding **whether technological change causes a decrease in wages**, studies show **mixed findings** (see Autor & Dorn, 2013; Mishel et al., 2013; Naticchioni et al., 2014).

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3. HOW ROBOTIZATION WOULD AFFECT IWP

Robotization and jobs in services

- According to the RBTC literature, the rise of robotization is likely to generate **more manual non-routine jobs in the service sector**.

The features of such jobs

- Short job tenure
- The prevalence of part-time employment
- A high proportion of vulnerable solo self-employment
- Disadvantages in being protected by unemployment benefits
- Less opportunity of job training

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3. HOW ROBOTIZATION WOULD AFFECT IWP

IWP in the post-industrial labour market

- IWP is **a matter of unemployment** rather than low wage levels (Halleröd et al., 2015; Hick and Lanau, 2018).
- **Workers who have trouble in getting a job are likely to become self-employed**, who often experience a higher IWP risk due to unstable income (Jansen, 2019; Halleröd et al., 2015).

The rise of
robotization

The growth of
employment in
manual non-routine
jobs in services

The spread of
income insecurity by
frequent moving
between jobs and
unemployment

The increase in the
probability of **IWP**

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4. WORKERS' BARGAINING POWER AND IWP RISKS BY ROBOTIZATION

Worker organisations mainly focusing on insiders

- Generally, trade unions tend to be more active in advocating labor market insiders.
- Despite their high IWP risks, outsiders are often excluded from trade unions' protection, particularly in dualized labor markets.

Strongly against salary cut, but defenseless against declines in employment

- Parolin (2021) demonstrates that organized labor can be effective in preventing from wage cuts even in occupations at higher risk of automation but tend to accept declines in employment.

Thus, it is hard to expect that workers' bargaining power would moderate IWP risks caused by robotization considering they are likely to increase due to frequent moving in and out of jobs.

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5. METHODS

Cases

- 18 OECD member states from 2010 to 2018

Data

- Microdata: Luxembourg Income Study waves 5 (2000) to 11 (2019)
- Robotics data: Installations and Operational Stock for Industrial Robots data by the International Federation of Robotics
- Economic and institutional data: OECD database

Datasets for analysis by country

Country	Year	Country	Year	Country	Year
Austria	2000, 04, 07, 10, 13, 16, 19	France	2013, 16, 18	Italy	2000, 04, 08, 10, 14, 16
Belgium	2000, 04, 07, 09, 13, 16	Germany	2000, 04, 07, 09, 13, 16, 18	Netherlands	2004, 07, 10, 13, 16, 18
Canada	2013, 16	Greece	2000, 04, 07, 10, 13, 16	Slovakia	2004, 07, 10, 13, 16, 18
Czech Rep	2002, 04, 07, 10, 13, 16	Hungary	2009, 12, 15	Spain	2000, 04, 07, 10, 13, 16
Estonia	2007, 10, 13, 16	Iceland	2004, 07, 10	Switzerland	2007, 10, 13, 16, 18
Finland	2000, 04, 07, 10, 13, 16	Ireland	2004, 07, 09, 13, 16, 18	United States	2000, 04, 07, 09, 13, 16, 18

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5. METHODS

Statistical models

- Two-level modeling: individual and country-year levels
- Random intercept logistic models
- Population and design weights applied

Variables

- Dependent variable: whether a respondent is working and in a poor household.
 - Working: being in employment for more than 26 weeks in the income reference year
 - Poverty line: 60% of the median of equivalized household disposable income
- Explanatory variable: Robot density
 - Robot density: the number of operational industrial robots relative to the number of employees
- Control variables
 - Individual-level: age, gender, cohabitation, education level, and the number of children at home
 - Country-year level: union density, collective bargaining coverage, centralization of wage bargaining, NRR of unemployment benefits, EPL for regular worker dismissal, EPL for temporary employment use, and social expenditure on family, and GDP growth rate

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6. FINDINGS – Robotization and IWP

IWP	Model 1		Model 2		Model 3		Model 4	
County-year level								
Robot density	0.078 *	(0.036)	0.111 **	(0.043)	0.116 ***	(0.030)	0.120 ***	(0.031)
GDP growth rate			0.022	(0.017)	0.024	(0.014)	0.022	(0.014)
Social expenditure on family			-0.077	(0.072)	-0.023	(0.060)	-0.003	(0.064)
NRR of unemployment benefits			-0.007	(0.007)	0.004	(0.007)	-0.001	(0.008)
EPL for regular contracts					-0.173 ***	(0.040)	-0.133 *	(0.058)
EPL for temporary contracts					-0.140 **	(0.051)	-0.129	(0.075)
Collective bargaining coverage							-0.002	(0.003)
Union density							-0.007	(0.006)
Centralization of wage bargaining							0.075	(0.069)
No. of groups	95		90		87		80	
No. of Samples	1,386,225		1,351,993		1,262,253		1,208,333	

Ref. = reference category; coefficients and robust standard errors (in parentheses).

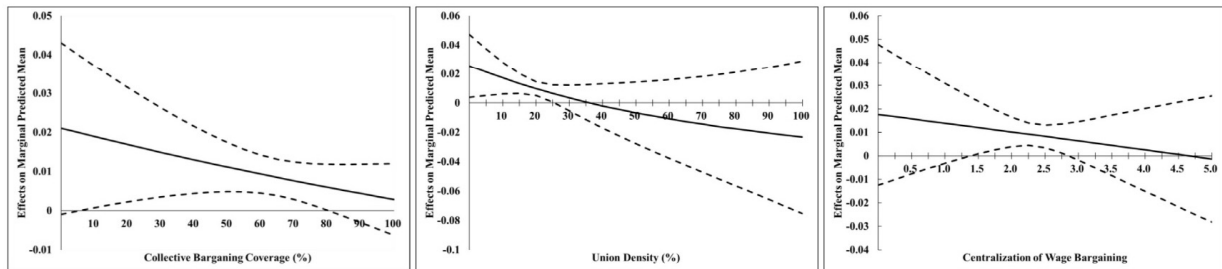
* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

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6. FINDINGS – Marginal effects of robot density

Average marginal effects of robot density on in-work poverty over collective bargaining coverage, union density, and the centralization of wage bargaining



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7. CONCLUSIONS

Summary

- The rise of robotization is **positively associated** with the incidence of IWP.
- Increasing workers' bargaining power is not enough to **ameliorate** the impact of robotization on IWP.

In the age of robotics, to prevent IWP...

- not only increasing the wages of lowest-paying jobs, but also **improving employment security of vulnerable workers** are required.
- social policies and labor market institutions need to be **restructured and redesigned** considering that **robotization is a new external shock** to the welfare state.

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**Thank you for
your attention!**



MEMO >

Lined area for writing the memo.

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