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Labour Market Risks, Skill Transferability and Public Opinion on the Green Transition

Lars van Doorn, Olaf van Vliet

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LABOUR MARKET RISKS, SKILL TRANSFERABILITY AND PUBLIC OPINION ON THE GREEN TRANSITION[*]

Lars van Doorn[†]   Olaf van Vliet[‡]

Abstract

The transition towards a green economy has distributive consequences; existing carbon-intense jobs will disappear, whereas new jobs in green sectors will be created. Individuals with specific skills who risk losing their job due to these policies face unfavourable labour market prospects. This translates into a potentially long spell of unemployment or a substantial drop in income if they accept reemployment in jobs in which their skills are less relevant. In contrast, those individuals with transferable skills are more likely to reap the benefits of this transition. Hence, we argue that an individual's labour market risk is essential for understanding the roots of public opposition to climate policies. More specifically, the transferability of an individual's skill profile shapes preferences towards climate policies. To test our theory, we introduce a new measure that captures the transferability of skills by linking them to occupations. This measure appears to be related to measures of perceived occupational mobility and subjective labour market risk. Our cross-sectional and longitudinal models based on comparative survey data confirm the importance of skill transferability in the context of support for the green transition. This also provides valuable insights in understanding why it has been so difficult to introduce the climate policies underpinning this transition.

[†] Leiden University, Department of Economics (e-mail for correspondence: l.m.j.van.doorn@law.leidenuniv.nl)
[‡] Leiden University, Department of Economics, and Institute of Public Administration; Erasmus University Rotterdam, Erasmus School of Social and Behavioural Sciences

INTRODUCTION

Climate change is one of the most pressing challenges that humanity faces today, with the potential to cause severe economic, social, and environmental consequences in the coming years. As such, it has become an issue of great concern among policymakers, academics, and the public. Yet, whereas many governments have committed themselves to limiting the average temperature increase to less than 2 degrees Celsius above pre-industrial levels, introducing the policies to achieve this goal remains difficult. This difficulty stems partly from the public opposition to these policies (Schaffer et al., 2022). Understanding the roots of this opposition is fundamental for the introduction of future climate policies.

The policies underpinning the transition towards a green economy have distributive consequences; existing carbon-intense jobs will disappear, whereas new jobs in green sectors will arise. This will be associated with concerns regarding an individual's labour market prospects (Vona 2019; Weber 2020). Literature on earlier structural economic transformations such as globalisation and technological changes has demonstrated how labour market risks which go along with such transformations have shaped policy preferences (Pardos-Prado and Xena 2019; Scheve and Slaughter 2001; Walter 2017). However, most literature on the adoption of climate policies, so far, has largely ignored the important role of occupational mobility.

In this paper, we focus on an individual's economic risks and provide a novel explanation for understanding environmental support and attitudes towards climate polices. Whether individuals will be sheltered from the potential adverse employment effects of the green transition or be able to reap its benefits is largely dependent on their skill profile. Individuals with skills that are transferable to a broad group of occupations should feel relatively safe in the face of the green transition. In contrast, those individuals with specific skills endure unfavourable labour market prospects should they lose their job. Since their skills are only relevant for a small number of occupations, the event of job loss is likely to result in a long spell of unemployment or a substantial drop in income if they accept reemployment in jobs in which their skills are less relevant. This difference in risk exposure explains why we expect opposition amongst the latter group to climate policies, which have insecure, potentially adverse labour market effects.

We provide empirical evidence for the link between labour market risks and environmental support and corresponding climate policy preferences. In this regard, we rely on two waves of the International Social Survey Programme (ISSP) on the environment. To assess the importance of perceived labour market risks, we introduce a new measure of skill transferability in the comparative political economy literature. This measure is rooted in Lazaer's (2009) skill weight approach, and frequently used in the labour economics literature. To do so, we use detailed individual-level survey data from the OECD's Programme for International Assessment of Adult Competencies (PIAAC).

This dataset contains information on how individuals use their skills at work. As far as we know, we are the first to use this measure in relation to policy preferences.

In addition, we examine the mechanism through which the transferability of an individual's skills operates in shaping individuals' policy preferences. In the comparative political economy literature, it is often assumed that individuals are aware of how labour market shifts affect their jobs and increase the risk of becoming unemployed (Gallego and Kurer 2022; Rehm 2009; Thewissen and Rueda 2019; Walter 2010). In contrast, Ahrens (2024) recently contended that these assumptions might be too strong (Ahrens 2024). Our study contributes to this literature by actually testing these assumptions explicitly. The results show that skill transferability is positively related to the perceived relevance of skills and negatively related to subjective labour market risk.

Overall, we show that individuals with transferable skills have a lower probability to prioritise the economy over the environment. This finding is robust across sub-samples, to the inclusion of additional control variables, and to alternative model specifications. More generally, our findings show the relevance of labour market risks, measured with our refined concept of skill transferability, for understanding climate policies. Thereby, our results contribute to a growing literature on public support for climate policies (Beiser-McGrath and Busemeyer 2023; Gaikwad et al. 2022; Mildenberger and Tingley 2019; Umit and Schaffer 2020). In showing the importance of labour market prospects, we provide valuable insights in understanding why it has been so difficult to introduce climate policies.

THE ARGUMENT - CLIMATE POLICIES AND SKILL TRANSFERABILITY

Structural economic change and labour market risks

In explaining attitudes towards environmental policies, we build on the comparative political economy literature by focussing on people's expectations about the economic impact of these policies. Scholars have showed how worries regarding the anticipated effect on market income, either in the present or the future, of structural economic changes, like globalisation, and technological progress, shaped preferences (Gallego and Kurer 2022; Pardos-Prado and Xena 2019; Rehm 2009; Walter 2017). As a substantial part of market income depends on an individual's labour market status, labour market risks are at the heart of this body of literature. The causal mechanism in this regard is that workers perceive economic risks because their skills can only transfer part of their skills from one occupation to a new occupation, which typically translates in lower market income. Hence, risks that affect people's occupation - either because the occupation can easily be offshored or automated, or because of increased competition from immigrant workers - translate into higher demand for social protection (Thewissen and Rueda 2019; Walter 2010, 2017) or opposition towards related policies (Gallego et al. 2022; Scheve and Slaughter 2001; Wu 2022).

Remarkably, climate change and policies which are aimed at mitigating the effects of climate change have not been considered as major drivers of structural economic change in the comparative political economy literature yet. However, based on insights from the economic literature which indicate that the green transition will have substantial employment effects, it can be expected that labour market risks are a relevant factor in the politics of the green transition.

The Employment Effects of Climate Policies

Recent macro-economic studies predict that the overall employment effects of the green transition tend to be positive or neutral (Hafstead and Williams III 2018; Shapiro and Metcalf 2023). Using general-equilibrium models, they show that the job losses in affected sectors arising from the climate policies underpinning the green transition, such as carbon taxes or performance standards, will be offset by positive employment effects in the whole economy. While the validity of these models typically hinges on assumptions, like perfect labour mobility (Heutel and Zhang 2021), the evidence on the impact of existing carbon taxes confirms that there is no evidence that carbon taxes have affected overall employment in Europe (Martin et al. 2014; Metcalf and Stock 2023). At the same time, the predicted overall employment effect will be associated with a shift in the employment structure, requiring a substantial number of workers to reallocate to less carbon-intensive sectors.

Indeed, numerous studies which examined the employment effects of climate policies that have already been implemented echo the need for workers to reallocate (Becker and Henderson 2000; Curtis 2018; Curtis et al. 2024; Greenstone 2002; Kahn and Mansur 2013; Millimet and Roy 2016; Popp et al. 2024; but also see Berman and Bui 2001; Morgenstern et al. 2002). As climate policies have chipped away at employment in affected sectors, job prospects for workers employed in these sectors changed dramatically. For example, after the 1990 Clean Air Act Amendment was implemented, workers in regulated sectors experienced a substantial drop in income of 20 percent compared to their pre-regulatory earnings, stemming from unemployment and lower earnings in future employment (Walker 2013). Moreover, it took up to five years for incomes to recover. This adds to previous studies showing that the adverse effects of job losses are relatively persistent (Davis and Von Wachter 2011; Jacobson et al. 1993).

However, the short-term adverse employment effects might also spill-over into the broader economy. Analysing how regions that initially prospered during the coal boom in the 1970s experienced a dramatic drop in employment in the mining sector, Black et al. (2005) show that employment also contracted in other sectors. Furthermore, these effects tend to be relatively persistent as well (Autor et al. 2021). Thus, we can conclude that the literature shows that climate policies do not result in massive employment

losses. However, these policies have the potential to shift employment structures, which potentially increases economic concerns in the broader economy.

This picture also emerges in the literature analysing attitudes toward climate policies and environmental support. Various studies show that individuals worry that climate policies have adverse effects for the broader economy. In fact, when it comes to voting for climate policies many voters considered this as one of the most important determinants for their voting decision (Shwon et al. 2010). Concerns about the broader impact of climate policies also contributed to the rejection of carbon taxes in Switzerland in two separate occasions (Carattini et al. 2017; Thalmann 2004). These findings confirm that feelings of economic insecurity are not limited to those directly impacted by climate policies (Gaikwad et al. 2022). Instead, the worries regarding these policies are also shared amongst a broader public.

Skill Transferability

We argue that the employment concerns associated with the introduction of climate policies resonate with a broader public and that the degree to which individuals would be affected by job losses differs. Displaced workers typically lose productivity when they move to the next job because they can only transfer part of their skills. This, in turn, translates into lower earnings or unemployment spells. However, there are differences in the degree to which workers can transfer their skills across occupations. This implies that some workers will have higher levels of occupational mobility, and that the transition from one occupation into the next goes relatively smoothly. In contrast, exiting unemployment might be more challenging for other workers, as their skills have lost relevance.

This idea has also been put forward in the comparative political economy literature by Iversen and Soskice (2001) in the context of redistribution. They argued that workers with specific skills will demand higher levels of redistribution as job loss would result in potentially long unemployment spells or a substantial drop in earnings. The opposite is true for workers with transferable skills. Their skill profile allows them to move across occupations without losing much productivity. In a similar vein, Pardos-Prado and Xena (2019) show that the economic risks associated with specific skill profiles explain anti-immigrant attitudes. We build on these insights and argue that individuals with transferable skills face relatively lower economic risks in the event of job loss. Therefore, they are more likely to support policies that have uncertain economic impacts, in this case climate policies.

EMPIRICAL APPROACH AND DATA

Measuring Skill Transferability

In the above, we have emphasised the importance of people's occupational mobility on attitudes towards environmental policies. To capture the ease with which workers can move from one occupation to another, we take a skill-weight approach (Lazear 2009). Occupations bundle different combinations of skills, each skill with a different weight attached. These weights reflect the relevance of the skill. For instance, occupations that rely heavily on physical skills attach a higher weight to this type of skills. The transferability of a skill between two occupations is determined by the difference in the attached weights. If these weights are similar, workers can transfer this skill without losing productivity. This implies that workers can move relatively easy between occupations to which the same bundle of skills is relevant.

To ascertain skills' relevance within occupations, we rely on the PIAAC survey, which is conducted by the OECD, and which contains individual-level information on workers' skills-use. For each ISCO two-digit level occupation, we create skill weights using the frequency a skill is typically used. First, we recode all answers into a work-time scale. To create comparable individual-level weights, we use this scale and divide the time spend on each individual skill by the sum of time spend on all skills. Second, we take the average time spend on each skill by occupation and country. This leaves us with country-specific occupations skill weights, which relax the assumption that skill-use in occupations is identical is identical across countries.

Next, we need a measure that empirically captures the transferability of skills between occupations. Gathmann and Schönberg (2010) have used the angular distance to calculate the difference in skill-use between occupations.[4] They think of the bundle of skills of each occupation as a vector. Doing so, allows them to position occupations relative to another. Figure 1 illustrates the logic of this measure for a teaching professional and an assembler, which is visualised on the left-hand panel of the figure. For simplicity, we suppose that there are only two types of skills: communication skills, and physical skills. We use information from the PIAAC survey to position both occupations, following the above-described procedure. If we consider physical skills (shown on the y-axis), there is a sizeable difference between the two occupations. Not surprisingly, this type of skills is more relevant to assemblers. Turning to communication

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[4] The angular distance (sometimes referred to as the uncentered correlation) is calculated using the following formula:

$$AngDis = \frac{\Sigma_{j=1}^{J}\left(q_{jo} \times q_{jo'}\right)}{\left[\Sigma_{j=1}^{J}\left(q_{jo}^2\right) \times \Sigma_{k=1}^{J}\left(q_{jko'}^2\right)\right]^{\frac{1}{2}}}.$$

Here, o and o' denote two occupations, and q_{jo} is the weight of skill i in occupation o.

This measure has also been used for analysing the length of unemployment spells, differences in wages, and the likelihood of occupational switches (Baley et al. 2022; Eggenberger et al. 2018; Fedorets et al. 2019)

skills (shown on the x-axis), the difference is smaller. Whereas teaching professionals rely heavily on this type of skills, they are relevant to assemblers too.[5]
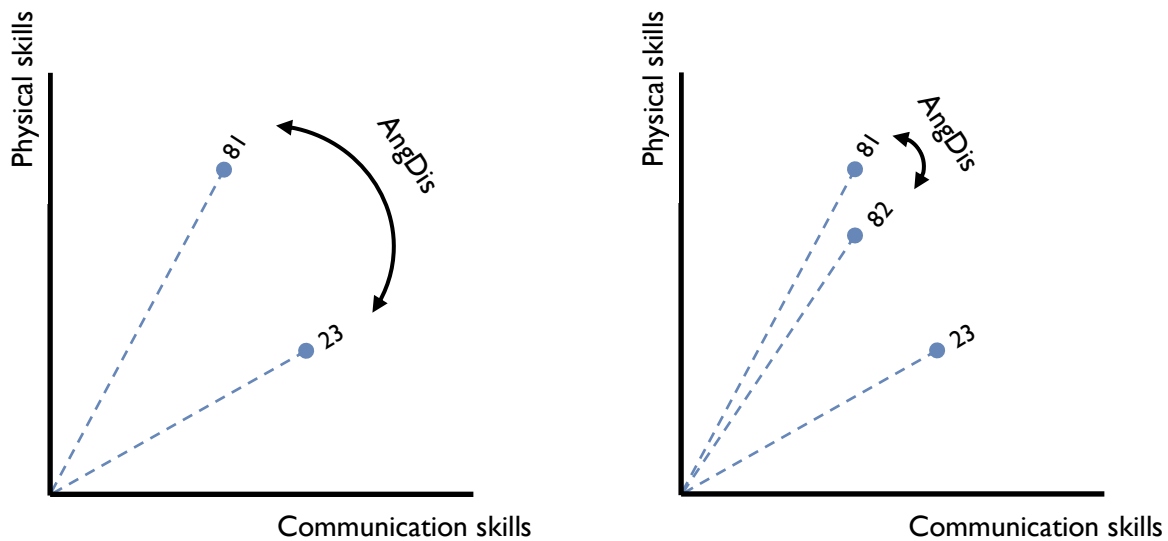

Figure 1. The angular distance based on only two skills (physical and communication skills) for three occupations; teaching professionals (23); assemblers (81); and stationary plant and machine operators (82). The numbers in the figure and the parentheses correspond to their ISCO08 two-digit code.

Based on the position of both occupations in the two-dimensional vector space, we can calculate their angular distance between the two positions.[6] Moreover, we can also compare the transferability of skills between occupations. The right-hand panel of Figure 1 shows that the angular distance is much smaller between assemblers to stationary plant and machine operators. A priori, we would indeed expect that the skill profiles of stationary plant and machine operators and assemblers are more alike than the profiles of teaching professionals and assemblers.[7]

We address two issues to ensure that our measure actually reflects the ease with which workers switch occupations. First, we take differences in educational requirements and income between occupations into account.[8] The ISCO occupation scheme distinguishes four different skill levels. These levels reflect the formal and informal education requirements. As skill weights do not reflect these requirements, it might be that skills are less transferable between occupations than our measure would suggest. Therefore, we weight the difference between each pair of occupations which entails a step up in skill requirements by the difference in ISCO skill levels. A similar argument holds for income:

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[5] Assemblers also need these skills to exchange information and communicate with their co-workers.
[6] Note that the angular distance is equal to the cosine angle between the position of both occupations.
[7] See table A3 for the five closest and most distant possible occupational moves.
[8] Note that our main results also hold without correcting for these differences.

whereas two occupations can be relatively similar regarding their skill bundle, their average wage might differ substantially. Occupational moves that entail a drop in wages are less attractive and limit workers mobility. Hence, we create four occupational income quartiles and weight the difference of each pair which entails a step down in income by the distance between the associated quartiles.

Second, we weight occupation moves by the relative size of the exit-occupation across countries and time. We use the share of the occupation in the labour force as weight. Doing so, ensures that we do not inflate our measure by including matches that are theoretically close, but are not realistic given the current labour market structure. For example, a move between two occupations should increase potential occupational mobility more if there is actually demand for the occupation, compared to a match in which this is not the case.

Finally, we take the weighted average angular distance between an occupation and all other occupations to define people's occupational mobility. This reflects how many skills of their current occupation workers can transfer to other occupations without losing productivity.[9] To ease interpretation, we normalise our measure to a 0-1 scale, in which higher values indicate that higher levels of skill transferability.

Brown Occupations

We argued that environmental policies bring about labour market risks for individuals in brown occupations. In identifying these jobs, we follow the work by Vona et al. (2018). First, they define sectors in the 95th percentile of polluting intensity for at least three pollutants as pollution-intensive.[10] Second, occupations that are overrepresented in pollution-intensive sectors are categorised as a brown job, which is the case if an occupation's relative share of employees is at least seven times larger than the share of employees for all occupations in pollution-intensive sectors. In other words, only those occupations whose probability is seven times higher than any other occupation to be apparent in a pollution-intensive sector are categorised as a brown. As occupations are coded at the six-digit SOC-2010, we use the U.S. Bureau of Labor Statistics crosswalk to four-digit ISCO-08 occupations. This procedure yields a list of 64 occupations which are categorised as a brown job.

Data and Method

We draw on public opinion data from the ISSP to measure attitudes towards climate policies. To capture people's appetite for these policies, we use the following statement: *"We worry too much about the environment and not enough about prices/jobs today."*

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[9] Table A4 reports the skill transferability for each occupation. Whereas agricultural, forestry, and fishery labourers have the lowest skill transferability, electrical and electronic trade workers rank highest.

[10] These are CO_2 and seven other pollutants (CO, VOC, NO_x, SO_2, PM_{10}, $PM_{2.5}$, and lead), which are all regulated by the United States' Environmental Protection Agency.

Respondents are asked to indicate whether they *Strongly disagree, Disagree, Neither agree or disagree, Agree,* and *Strongly agree* with this statement. To ease interpretation of our results, we construct this variable by recoding these answers into three categories: *(Strongly) disagree*, *Neither agree or disagree* and *(Strongly) agree.*[11] As this question reveals respondents feelings about the environment vis-à-vis the economy, we interpret our results as concerns about the economy as a consequence of protecting the environment, typically accomplished by policies that demand labour markets to adjust. Hence, respondents who prioritise the economy over the environment are assumed to oppose environmental policies.

The statement above is included in ISSP waves on the environment (2000 and 2010). Importantly, these waves also include information regarding a respondent's ISCO08 two-digit occupation. This enables us to link respondents to our measure of skill transferability.[12] As our measure of skill transferability is country-specific, our sample of countries is limited to those that are included in both the PIAAC survey and the ISSP. This leaves us with a sample of 11 advanced industrialised democracies.[13]

Because our dependent variable is a constructed ordered measure, we assess the proposed relationship between skill transferability and attitudes towards climate policies with ordered logistic regression models.[14] All our models include country and wave fixed effects, to control for unobserved heterogeneity between countries and common contemporary shocks affecting all countries and individuals respectively. Our models include a vector of individual-level control variables, including gender, age, age squared, living with child(ren), education, income in quintiles, and labour market status. Including these variables, we ensure that are results not are driven by confounding factors. Previous research has shown that higher levels of both education and income are associated with support for climate policies (Bechtel et al. 2019; Franzen and Meyer 2010; Hornsey et al. 2016, but also see Mildenberger and Leiserowitz 2017).[15] Similar results are found for female, student, and people with (young) children (Bush and Clayton 2023; Dechezlepretre et al. 2022). In contrast, opposition towards climate policies is found amongst older people and the unemployed (Hartmann and Preisendorfer 2023).

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[11] Also, we discard *Don't knows* and nonresponses in our analyses.

[12] We include all working-age individuals of working-age (25-65) in our sample. As the ISSP asked unemployed about their previous occupation, we are able to link unemployed respondents to our measure as well. Our results also hold if we use a sample of only prime-aged (25-55) individuals in the labour force.

[13] The countries included in our sample are Belgium, Denmark, France, Germany, Netherlands, New Zealand, Norway, Spain, Sweden, the United Kingdom, and the United States.

[14] We us robust standard errors and include weights supplied by the ISSP.

[15] In Table A5, we show the correlations between our measure of skill transferability and education and income.

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RESULTS

Prioritising the Economy over the Environment

Table 2 shows our results for the relationship between skill transferability and the probability that an individual prioritises the economy over the environment. The first model (M1) includes only our main variable of interest; the second model (M2) adds the induvial-level controls and the third model (M3) adds country and wave fixed-effects. Most importantly, the estimates for skill transferability are highly significant in both models. In line with our expectations, individuals with transferable skills have a lower probability to prioritise the economy over the environment.

Besides, the findings for the individual-level control variables are in line with previous findings. Higher levels of education and income are associated with a decrease in the likelihood that an individual prioritises the economy. While this is also true for females, younger individuals think the economy should be given priority. The estimate of living with children is in the expected direction, but not significant. Surprisingly, both the unemployed and non-employed are less likely to prioritise the economy over the environment. Most importantly, the results presented in Table 2 provide support for our argument that individuals who can transfer their skills with relative ease between occupations worry less about the economy, and therefore, oppose environmental policies less.

Moreover, Figure 3 shows that the effect size of having transferable skills is substantively meaningful: a standard deviation increase from the average level of skill transferability in our sample decreases the probability that an individual agrees or strongly agrees with the statement that we worry too much about the environment and not enough about the economy by 2 percent (the left-hand panel). As an illustration, this equals the difference in skill transferability between Danish labourers in mining, construction, manufacturing and transport on the one hand, and science and engineering associate professionals on the other hand. If we compare individuals at the extremes, those with specific skills to those with highly transferable skills, the probability of prioritising the economy reduces with 20 percent. Comparing this magnitude to the effects of education and income to flesh out its broader meaning (respectively, the middle and right-hand panel of Figure 3), confirms the substantive meaning of the effect. Overall, this indicates that skill transferability explains a substantial range of variation in our dependent variable. Indeed, such a pattern suggests that the possibility to transfer one's skills across occupations does a good job in explaining whether an individual feels at risk in the labour market, and thus, worries less about the economic effects of the green transition.[16] This is a finding that ties in well with previous literature showing the importance of transferable skills in other contexts (Iversen and Soskice 2001; Pardos-Prado and Xena 2019; Rehm 2009).

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[16] Note that the differences in effect size should be interpreted cautiously due to the different scaling of the three variables.

Table 2. Prioritising the Economy over the Environment

	M1	M2	M3
Skill transferability	-1.698***	-0.846***	-0.859***
	(0.077)	(0.099)	(0.103)
Brown occupation	0.381***	0.161*	0.215**
	(0.057)	(0.065)	(0.066)
Female		-0.228***	-0.252***
		(0.036)	(0.037)
Age		-0.209	-0.267
		(0.166)	(0.169)
Age²		0.033	0.041*
		(0.018)	(0.019)
Living with child(ren)		-0.030	-0.037
		(0.040)	(0.042)
Less than secondary completed		Ref.	Ref.
Secondary completed		-0.303***	-0.431***
		(0.042)	(0.046)
At least tertiary completed		-0.755***	-0.875***
		(0.055)	(0.059)
Below 20th income quintile		Ref.	Ref.
Between 20th and 40th income quintile		-0.192**	-0.154*
		(0.063)	(0.064)
Between 40th and 60th income quintile		-0.270***	-0.222***
		(0.063)	(0.064)
Between 40th and 60th income quintile		-0.427***	-0.373***
		(0.063)	(0.065)
Above 80th income quintile		-0.192**	-0.154*
		(0.063)	(0.064)
Unemployed		-0.270***	-0.222***
		(0.063)	(0.064)
Non-employed		-0.427***	-0.373***
		(0.063)	(0.065)
Student		-0.566***	-0.502***
		(0.069)	(0.070)
Retired		0.221**	0.100
		(0.082)	(0.083)
Cut 1	-1.015***	-1.465***	-1.678***
	(0.048)	(0.370)	(0.382)
Cut 2	-0.206***	-0.616	-0.805*
	(0.047)	(0.370)	(0.382)
Country and wave FE	No	No	Yes
Observations	17,189	14,537	14,537

Ordered logistic models. Standard errors in parentheses.
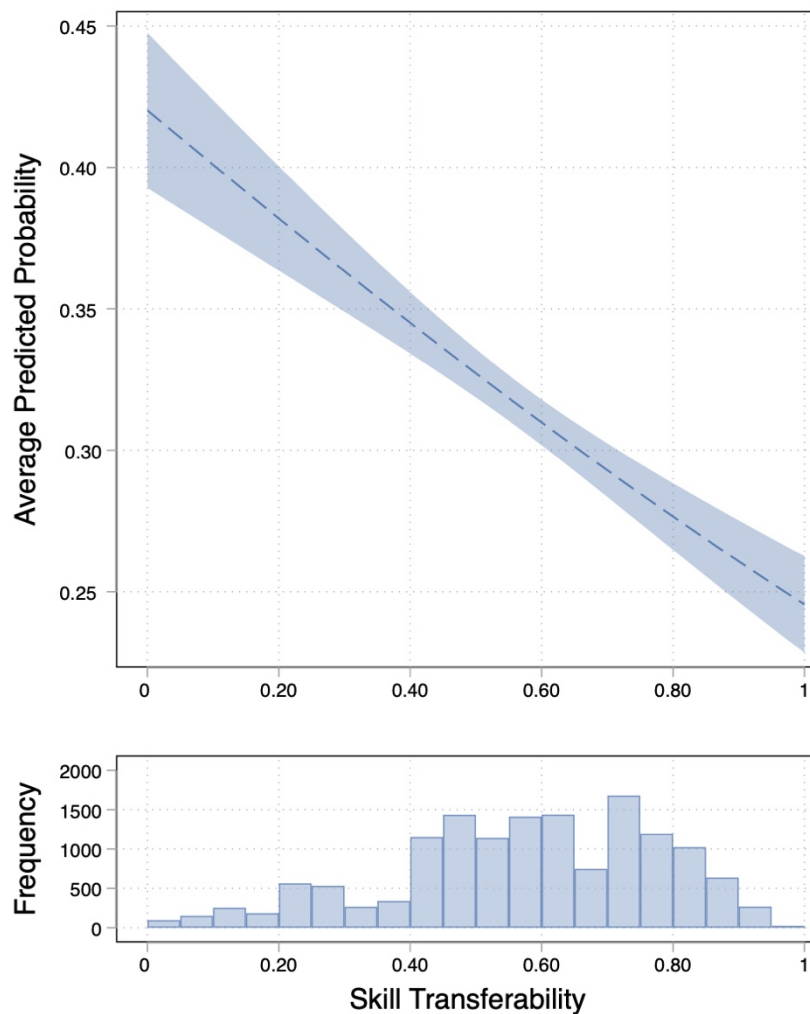* p<0.05 ** p<0.01 *** p<0.001

Figure 2. The predicted probability of prioritising the economy over the environment conditional on skill transferability, education, or income. Note: the blue area represents the 95% confidence intervals.

Are people in brown occupations with transferable skills also less likely to prioritise the economy over the environment? To test this relationship, we estimate the interaction effect of skill transferability and brown occupations on our dependent variable. Figure 4 shows the average predicted probabilities conditional on skill transferability for people in brown occupations and all other occupations. The results show that for both categories of occupations, transferable skills decrease the probability that people's economic concerns prevail over the environment. Moreover, Figure 4 shows that at low levels of skill transferability people in brown occupations are more likely to prioritise the economy over the environment than people in other occupations, but this difference turns insignificant at higher levels of skill transferability This provides support for our argument that transferable skills mitigate the occupational risks: people who can easily move from a brown occupation to another occupation have little to fear from adverse employment impacts stemming from environmental policies.
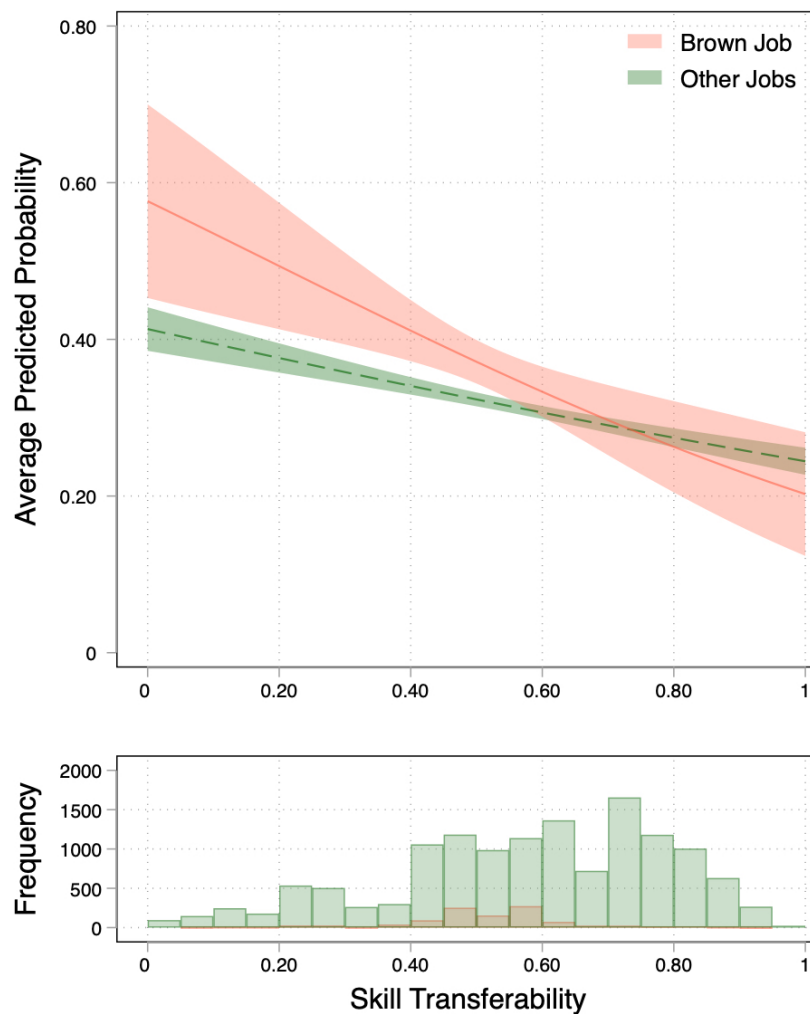
Figure 3. The predicted probability of prioritising the economy over the environment conditional on job type and skill transferability. Note: the areas represent the 95% confidence intervals.

Robustness Tests

Next, we assess the robustness of our results for the relationship between skill transferability and attitudes towards environmental policies. Table 3 shows the results of these robustness tests. First, we include a battery of additional control variables to address alternative explanations for attitudes towards climate policies put forward in the literature. This ensures that our results are not driven by the exclusion of potential confounders. For instance, Franzen and Meyer (2010) show that an individual's perceived environmental burden determines their environmental concern, and thus, should also affect the way the economic-environment scales tip. We address this by including people's perceived environmental burden indexing six items that capture how

dangerous an individual perceives five environmental risks.[17] Our results remain the same after including this variable.

Next, we control for people's ideology by including three different variables: left–right self-placement, union membership, and a number of dummy variables capturing the family of the party supported. These variables are not included in our main models as we consider people's ideology as endogenous to our dependent variables. However, including these variables does not change our results.

Furthermore, it is shown that class divides are still relevant in the politics of the knowledge economy (Häusermann et al. 2022), especially when it comes to issues that do not immediately serve their material self-interest (Oesch and Rennwald 2018; Iversen and Soskice 2019). Indeed, Parth and Vlandas (2022) find that the working class is less likely to support environmental action. We examine the sensitivity of our results to this issue by testing whether our results hold for including class categories.[18] Again, the results remain the same, which confirms the robustness of our results.

Then, we proceed testing the robustness of our results by controlling for labour market risks stemming from globalisation and technological progress. First, we include Walter's (2010; 2017) measure of an occupation's offshoring potential. She measures the potential of an occupation to be offshored based on two criteria in Blinder's (2009) offshorable index: the need for an individual to be physically close to his or her work, and the necessity of a work unit to be in the same country. The inclusion of this variable does not affect our results. Next, we include the routine task intensity (RTI) index from Goos et al. (2014), which is frequently used in the comparative political economy literature (Dermont and Weisstanner 2020; Milner 2021; Thewissen and Rueda 2018; Wu 2022). By distinguishing routine, manual and abstracts tasks, the index measures the relative importance of routine tasks compared to the other two. Subsequently, occupations which are relatively routine intense are defined as prone to automation. Again, our main results do not change. The same holds when we include three variables that capture job security: parttime employment, solo self-employment, and public-sector employment.

Subsequently, we test the sensitivity of our results to different model specifications, alternative operationalisations of our dependent variable, or sample definitions. We start by including occupational-country fixed effects. This implies that we no longer compare individuals relative to individuals in other countries, but to other individuals in other occupations and countries. Doing so, eliminates potentially unobserved heterogeneity

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[17] These risks include; air pollution caused by cars; air pollution caused by industry; pesticides and chemicals used in farming; pollution of the country's rivers, lakes and streams; and a rise in the world's temperature caused by the greenhouse effect.

[18] We include eight class groups following Oesch (2006). The groups include self- employed professionals and large employers; small business owners; (associate) managers and administrators; office clerks; technical professionals and technicians; production workers; sociocultural (semi-) professionals; and service workers.

between occupations. The results of the sensitivity analysis show that our original results are robust to the inclusion of this type of fixed effects. In the same vein, it might be that our results are driven by outliers: people in "elementary occupations" have substantially less transferable skills compared to people in all other occupations. To ensure that our results are not driven by this specific occupational group, we exclude them. Again, our results do not change.

Table 3. Robustness Tests for Main Results

	Skill transferability estimate	Standard error
Original result	-0.855***	(0.103)
Adding control variables		
R1 Environmental burden	-0.859***	(0.103)
R2 Left-right placement	-0.873***	(0.114)
R3 Union membership	-0.910***	(0.106)
R4 Party family support	-0.862***	(0.123)
R5 Class	-0.479***	(0.149)
R6 RTI	-0.869***	(0.113)
R7 Offshorable occupation	-0.841***	(0.105)
R8 Public-sector employment	-0.843***	(0.104)
R9 Part-time employment	-0.856***	(0.103)
R10 Solo self-employment	-0.838***	(0.104)
Alternative models, operationalisation and samples		
R11 Occupation-country FE	-0.455**	(0.217)
R12 Excluding "elementary occupations"	-0.901***	(0.134)
R13 Binary	-0.908***	(0.117)
R14 Binary – Strongly agree	-1.171***	(0.218)
R15 Higher taxes to protect the environment	0.218**	(0.100)
R16 Employed respondents only	-0.762***	(0.086)
R17 All OECD countries	-0.908***	(0.117)

The original support corresponds to M3 in Table 2. Standard errors in parentheses.
* p<0.05 ** p<0.01 *** p<0.001

Next, we operationalise our dependent variable differently. Recall that we use the following statement that is included in the ISSP: *"We worry too much about the environment and not enough about prices/jobs today"* and that we recode the answers into three categories. To assess the robustness of our analyses to the operationalisation of the dependent variable, we create two binary dependent variables to assess the robustness of our analyses to the operationalisation of the dependent variable. The first indicator is coded 1 if a respondent strongly agrees or agrees with the statement, the second indicator

is coded 1 if a respondent strongly agrees with the statement. Again, the estimates remain significant in both tests.

Our argument implies that people who have transferable skills are more likely to support environmental policies. To test the robustness of our results we also use an alternative question that is included in the ISSP waves on the environment, namely: *"How willing are you to pay much higher taxes in order to protect the environment?"* Respondents' answers range from (1) *Very unwilling* to (5) *Very willing.* The introduction of policies which increase the price of carbon are considered essential to limit global warming. However, higher tax burdens are generally also associated with negative consequences for employment. Even though workers may not be fully aware of the broader employment effects of such a tax, those who have skills that are relevant for a variety of occupations have relatively little to worry about when it comes to their job prospects. The opposite is true for individuals with relative specific skills. If they lose their job due to the broader employment effects of climate policies, they risk a substantial drop in income. When we use this dependent variable on the willingness to pay higher taxes, our results are largely replicated.

Finally, we use two different samples. In the first sample, we only include employed individuals. Our results are unaffected to using this smaller sample. The second sample includes all OECD countries that are both included in the PIAAC survey and the ISSP. Whereas we build on literature that focusses on Western advanced post-industrial economies, our results do not change if we include all OECD members.

To test the robustness of our interaction results, we calculate the average predicted probabilities of prioritising the economy for people in brown occupations and people in all other occupations with either specific or transferable skills, defined as the 10th or 90th percentile of the sample's skill transferability respectively. Subsequently, we use chi-square tests to examine whether people in brown occupations differ in their predicted probability from people in all other occupations If transferable skills indeed mitigate the labour market risks associated with holding a brown job, there should be a difference in the predicted probabilities between occupations in case of specific skills, but not when people have transferable skills. The results of these robustness tests are presented in Table 4. We would expect that the difference between people in brown occupations and all other occupations is only significant with specific skills. This is indeed the case for all tests. Together with the above, this leaves little doubt about the robustness of our results

MECHANISM AND UNDERLYING ASSUMPTIONS

In this section, we briefly test the two main assumptions underlying our theory using the two most recent ISSP waves on Work Orientations (2005 and 2015). First, we assume

that individuals with transferable skills should experience that the skills they used in their previous jobs still matter in their present job. To test this assumption, we use the following questions: *How much of your past work experience and/or job skills can you make use of in your present job?* and *If you were to look for a new job, how helpful would your present work experience and/or job skills be?* (the latter is only included in the 2005 wave). Respondents answer on a four-point scale, ranging from (1) *Almost none/Not helpful at all* to (4) *Almost all/Very helpful*. Table 5 presents the results for our ordered logistic models and provides evidence for our first assumption that individuals with transferable skills perceive the skills deemed relevant in their previous job also as more relevant in their current job or a potential new job (M4 and M5).

Table 4. Robustness Tests for Interaction Results

| | Brown versus all other occupations | |
	χ^2 Specific Skills	χ^2 Transferable Skills
Original result	9.04***	0.23
Adding control variables		
R1 Environmental burden	8.80***	0.27
R2 Left-right placement	6.49***	0.00
R3 Union membership	10.05***	0.68
R4 Party family support	7.04***	0.37
R5 Class	4.97**	1.98
R6 RTI	8.82***	0.35
R7 Offshorable occupation	9.42***	0.21
R8 Public-sector employment	9.09***	0.20
R9 Part-time employment	8.97***	0.21
R10 Solo self-employment	9.39***	0.16
Alternative models, operationalisation and samples		
R11 Occupation-country FE	3.73**	2.60
R12 Excluding "elementary occupations"	9.67***	1.23
R13 Binary	4.47**	0.07
R14 Binary – Strongly agree	2.84*	0.30
R15 Higher taxes to protect the environment	4.34**	1.46
R16 Employed respondents only	9.16***	0.13
R17 All OECD countries	6.95***	0.47

Standard errors in parentheses.
* p<0.05 ** p<0.01 *** p<0.001

Our second assumption is that individuals with transferable skills worry less about losing their job as their skill profile allows them to move relatively easy from one job to the next. Here, we rely on a question that is tapping into respondents' subjective labour market

risk l, which states: *To what extent, if at all, do you worry about the possibility of losing your job?* Again, respondents answer on a four-point scale, which ranges from (1) *I don't worry at all* to (4) *I worry a great deal*. The results of M6 in Table 5 support our argument that individuals with transferable skills worry less about losing their job. Together these results show that our measure of skill transferability is indeed an important determinant in explaining the way individuals perceive their potential occupational mobility and labour market risks.

Table 5. Perceived Relevance of Skills (M4 and M5) and Subjective Labour Market Risk (M6)

	M4	M5	M6
Skill transferability	1.292***	1.491***	-0.702***
	(0.180)	(0.304)	(0.178)
Female	0.008	-0.097*	-0.050
	(0.034)	(0.048)	(0.034)
Age	0.483*	0.293	0.134
	(0.199)	(0.285)	(0.205)
Age^2	-0.041	-0.054	-0.006
	(0.024)	(0.035)	(0.025)
Less than secondary completed	Ref.	Ref.	Ref.
Secondary completed	0.251***	0.171***	0.196**
	(0.045)	(0.063)	(0.044)
At least tertiary completed	0.412***	0.389***	-0.224***
	(0.052)	(0.075)	(0.053)
Below 20th income quintile	Ref.	Ref.	Ref.
Between 20th and 40th income quintile	0.109	0.110	-0.243***
	(0.065)	(0.098)	(0.068)
Between 40th and 60th income quintile	0.256***	0.177	-0.366***
	(0.063)	(0.092)	(0.065)
Between 40th and 60th income quintile	0.337***	0.414***	-0.540***
	(0.063)	(0.093)	(0.064)
Above 80th income quintile	0.596***	0.642***	-0.611***
	(0.065)	(0.095)	(0.067)
Cut 1	1.044*	-1.622*	-0.727
	(0.427)	(0.630)	(0.442)
Cut 2	2.553***	0.060	0.813
	(0.427)	(0.628)	(0.442)
Cut 3	4.037***	2.209***	2.257***
	(0.428)	(0.628)	(0.443)
Country and wave FE	Yes	Yes	Yes
Observations	12,031	6,725	12,359

Ordered logistic models. Standard errors in parentheses.
* p<0.05 ** p<0.01 *** p<0.001

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CONCLUSION

Over the past few decades, the literature on the relationship between economic risks and public opinion has made considerable progress. Research has shown how several structural economic changes impose risks for individuals and how these risks shape preferences regarding different types of public policy. In particular, shifts on the labour market are associated with an increased risk of unemployment and loss of income when workers have to change occupations. In the existing comparative political economy literature, it has been highlighted that the limited transferability of skills between occupations is the main factor underlying this risk. To assess the role of the transferability of skills in the analysis of public opinion empirically, we have introduced a new measure which captures the relative weight of the skills which are needed for an occupation.

The empirical results of our study show how labour market risk is related to attitudes regarding the green transition. When people have transferable skills, it is less likely that they prioritise the economy over the environment. The magnitude of the association shows that skill transferability plays a substantively meaningful role and a range of sensitivity analyses have shown that it is a robust finding. In addition, we find similar results for people who work in brown occupations. This suggests that even people who have jobs which might be negatively affected by environmental policies have more positive attitudes towards environmental policies when they have transferable skills.

Our findings provide further and more fine-graded empirical support for the theoretical notion that skill transferability constitutes an essential part of occupational risk (Iversen and Soskice 2001; Rehm 2009; Pardos-Prado and Xena 2019). When the skills which were useful in one occupation are less relevant in other occupations, an individual's occupational mobility is restricted. This implies a higher chance on incomes loss as a result of unemployment or a less productive job and hence a higher perceived economic risk.

In addition, we have examined the mechanism through which skill transferability is assumed to be linked to attitudes towards environmental policies. Our results show that people with transferable skills perceive the skills from their previous job as valuable in their next job and that they worry less about losing their job. This result provides additional insight into the relationship at the heart of this study and, additionally, contributes to the labour market risk literature by testing an essential assumption on people's awareness of their potential occupational mobility and subjective labour market risks and how they are linked to preference formation.

To the best of our knowledge, this study is the first empirical analysis of the linkages between occupational risk and attitudes regarding the green transition. This does not only introduce a novel and increasingly important source of risk into the study of labour market risks and public opinion, but it also adds a factor to take into account to the

literature on the politics of climate policies (Gaikwad et al. 2022; Mildenberger and Tingley 2019; Umit and Schaffer 2020; Beiser-McGrath and Busemeyer 2023). The implementation of climate policies faces significant obstacles due to public opposition, and understanding the reasons for this opposition is crucial for the development of effective policies. Our analysis shows that individuals with transferable skills have a lower probability of opposing climate policies that prioritize the environment over the economy. In contrast, individuals with specific skills which are less transferable face higher labour market risks and are more likely to oppose such policies.

Our findings suggest that it is important for policy-makers to take the labour market risks of individuals into account when designing the policies underpinning the green transition. Against this backdrop, it may also be worthwhile for future research to investigate how labour market institutions shape public opinion on the green transition. As the number of countries included in this study does not allow us to test the interplay between such institutions and workers' labour market risks, we test whether the latter drives public opinion about the green transition. However, future research may shed light on the question whether institutions like employment legislation or active labour market policies mitigate the labour market risks associated with the green transition for workers with specific skills and, subsequently, related attitudes.

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APPENDIX

Table A1. Skill categories and skills

Skill category	Skills
Communication skills	Exchanging information; teaching others; presenting; selling; consulting
Planning skills	Planning own activities; planning activities of others; organising own schedule
Persuasion skills	Influencing; negotiating
Creative skills	Solving simple problems; solving complex problems
Physical skills	Working physically for long hours; using fingers or hands
Literacy skills	Reading instructions; reading newspapers and magazines; reading professional publications; reading books; reading manuals; reading financial statements; read diagrams, maps, or schematics; writing letters, memos, or mails; writing articles; writing reports; filling in forms
Numeracy skills	Calculating costs or budgets; calculating shares or percentages; using calculator; preparing charts, graphs, or tables; using simple algebra or formula's; using math or statistics
ICT skills	Using e-mail; using internet for work-related information; using internet to conduct transactions; using spreadsheets; using Word; using programming language; using communication software

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Table A2. Skill categories by occupation at the ISCO08 two-digit level

Occupation (ISCO08)	Com. skills	Plan. skills	Pers. skills	Creative skills	Phys. skills	Literacy skills	Num. skills	ICT skills
11	0.137	0.128	0.068	0.058	0.042	0.276	0.118	0.175
12	0.121	0.115	0.058	0.058	0.031	0.289	0.133	0.196
13	0.125	0.118	0.059	0.062	0.042	0.291	0.126	0.176
14	0.151	0.128	0.070	0.054	0.075	0.252	0.139	0.131
21	0.094	0.110	0.038	0.064	0.043	0.306	0.145	0.199
22	0.148	0.119	0.057	0.070	0.089	0.313	0.089	0.116
23	0.163	0.132	0.060	0.062	0.054	0.307	0.080	0.142
24	0.112	0.106	0.052	0.057	0.030	0.298	0.136	0.209
25	0.098	0.102	0.033	0.075	0.034	0.299	0.102	0.257
26	0.125	0.128	0.063	0.071	0.055	0.311	0.068	0.180
31	0.129	0.120	0.042	0.065	0.083	0.295	0.137	0.129
32	0.152	0.109	0.053	0.066	0.110	0.312	0.091	0.105
33	0.119	0.106	0.057	0.058	0.043	0.303	0.130	0.184
34	0.159	0.137	0.061	0.075	0.098	0.270	0.073	0.127
35	0.106	0.093	0.036	0.073	0.061	0.312	0.091	0.228
41	0.106	0.109	0.030	0.053	0.050	0.320	0.123	0.208
42	0.153	0.081	0.060	0.064	0.059	0.311	0.114	0.157
43	0.110	0.109	0.036	0.057	0.080	0.290	0.151	0.166
44	0.133	0.120	0.039	0.067	0.112	0.292	0.085	0.151
51	0.194	0.132	0.056	0.066	0.172	0.220	0.114	0.045
52	0.217	0.095	0.064	0.059	0.119	0.226	0.148	0.072
53	0.153	0.157	0.067	0.083	0.158	0.290	0.043	0.049
54	0.165	0.095	0.063	0.077	0.101	0.359	0.036	0.106
61	0.134	0.194	0.032	0.064	0.233	0.210	0.090	0.043
62	0.203	0.147	0.024	0.081	0.293	0.162	0.060	0.029
71	0.151	0.141	0.045	0.078	0.237	0.214	0.102	0.032
72	0.142	0.118	0.038	0.079	0.181	0.275	0.111	0.056
73	0.149	0.124	0.029	0.065	0.166	0.254	0.132	0.082
74	0.129	0.132	0.042	0.076	0.134	0.297	0.083	0.107
75	0.160	0.132	0.036	0.062	0.211	0.231	0.113	0.055
81	0.158	0.105	0.026	0.075	0.251	0.243	0.106	0.036
82	0.158	0.091	0.029	0.072	0.271	0.240	0.108	0.033
83	0.143	0.118	0.037	0.075	0.193	0.317	0.087	0.030
91	0.120	0.227	0.024	0.057	0.358	0.164	0.033	0.015
92	0.139	0.159	0.034	0.068	0.371	0.134	0.086	0.009
93	0.190	0.108	0.031	0.082	0.292	0.193	0.073	0.031
94	0.246	0.109	0.039	0.076	0.317	0.139	0.062	0.012
95	0.130	0.189	0.130	0.044	0.221	0.186	0.093	0.006
96	0.167	0.161	0.036	0.065	0.239	0.225	0.073	0.034
Mean	*0.146*	*0.126*	*0.048*	*0.067*	*0.146*	*0.262*	*0.100*	*0.106*

Note that the angular distances presented here are sample averages. In the analysis, we use country-specific distances.

Table A3. The top and bottom 5 of potential occupational changes in our sample

Closest occupations			Most distant occupations		
Change from (…)	Change to (…)	AngDis	Change from (…)	Change to (…)	AngDis
(13)	(33)		(95)	(25)	
Production and Specialized Services Managers	Business and Administration Associate Professionals	0.999	Street and Related Sales and Services Workers	Information and Communications Technology Professional	0.493
(12)	(24)		(91)	(25)	
Administrative and Commercial Managers	Business and Administration Professionals	0.999	Cleaners and Helpers	Information and Communications Technology Professional	0.519
(81)	(82)		(24)	(94)	
Stationary Plant and Machine Operators	Assemblers	0.998	Business and Administration Professionals	Food Preparation Assistants	0.522
(11)	(13)		(94)	(25)	
Chief Executives, Senior Officials and Legislators	Production and Specialized Services Managers	0.998	Food Preparation Assistants	Information and Communications Technology Professional	0.525
(22)	(32)		(12)	(92)	
Health Professionals	Health Associate Professionals	0.998	Administrative and Commercial Managers	Agricultural, Forestry and Fishery Labourers	0.541

Note that the angular distances presented here are sample averages. In the analysis, we use country-specific distances. All angular distances are calculated using the 18 skill categories in the PIAAC dataset. The number in the parentheses correspond to the ISCO08 two-digit code of each occupation.

Table A4. Skill categories by occupation at the ISCO08 two-digit level

Occupation (ISCO08)	Skill transferability (Average angular distance)	Occupation (ISCO08)	Skill transferability (Average angular distance)
11	0.890	61	0.881
12	0.871	62	0.818
13	0.888	71	0.889
14	0.914	72	0.927
21	0.868	73	0.932
22	0.922	74	0.934
23	0.905	75	0.913
24	0.861	81	0.890
25	0.835	82	0.875
26	0.890	83	0.911
31	0.918	91	0.752
32	0.928	92	0.743
33	0.882	93	0.841
34	0.927	94	0.770
35	0.866	95	0.839
41	0.872	96	0.888
42	0.898		
43	0.901	*Mean*	*0.882*
44	0.926		
51	0.912		
52	0.903		
53	0.914		
54	0.899		

Note that the angular distances presented here are sample averages. In the analysis, we use country-specific distances.

Table A5. Correlation Matrix Skill Transferability, Education, and Income

	Skill transferability	Education
Skill transferability		
Education	0.232***	
Income (percentiles)	0.100***	0.331***