Upward convergence in working conditions

Annexes

Annex 1: Variables used to construct subdimensions of working conditions

Table A1: Physical environment

Subdimension	Variables used in the construction of the subdimension
Ambient risks	1. Job hazards (vibrations). Exposure to vibrations from hand tools, machinery, etc. 2. Job hazards (noise). Exposure to noise so loud that you would have to raise your voice to talk to people. 3. Job hazards (high temperatures). Exposure to high temperatures that make you perspire even when not working. 4. Job hazards (low temperatures). Exposure to low temperatures whether indoors or outdoors.
Biological and chemical risks	5. Job hazards (breathing fumes). Exposure to breathing in smoke, fumes (such as welding or exhaust fumes), powder or dust (such as wood dust or mineral dust), etc. 6. Job hazards (breathing vapours). Exposure to breathing in vapours such as solvents and thinners. 7. Job hazards (chemicals). Exposure to handling or being in skin contact with chemical products or substances.
Posture related risks	8. Posture-related issues (tiring positions). The job involves tiring or painful positions. 9. Posture-related issues (heavy loads). The job involves carrying or moving heavy loads. 10. Posture-related issues (repetitive movements). The job involves repetitive hand or arm movements.

Note: Variables 5 and 6 are combined in order to construct a homogenous variable along the whole period, since the exposure to vapours and fumes is not captured separately before 2005.

Table A2: Social environment

Subdimension	Variables used in the construction of the subdimension
Adverse social behaviour	1. Physical violence (exposure in the last year) 2. Bullying/harassment (exposure in the last year)
Social support	3. Colleagues help and support frequency 4. Manager help and support frequency

Table A3: Work intensity

Subdimension	Variables used in the construction of the subdimension
Quantitative demands	1. Pace of work (high speed). The work involves working at very high speed. 2. Pace of work (tight deadlines). The job involves working to tight deadlines. 3. Work pressure (time). Enough time to get the job done.
Pace determinants and interdependency	4. Pace factors (colleagues). Pace of work dependent on work done by colleagues. 5. Pace factors (customer demands). Pace of work dependent on direct demands from people such as customers, passengers, pupils, patients, etc. 6. Pace factors (production targets). Pace of work dependent on numerical production targets or performance targets. 7. Pace factors (machine speed). Pace of work dependent on automatic speed of a machine or movement of a product. 8. Pace factors (boss). Pace of work dependent on the direct control of your boss.

Table A4: Skills and discretion

Subdimension	Variables used in the construction of the subdimension
Cognitive discretion	1. Solving unforeseen problems 2. Carrying out complex tasks 3. Working with computers, smartphones and laptops, etc. (at least a quarter of the time)
Decision latitude	4. Ability to choose or change order of tasks 5. Ability to choose or change speed or rate of work 6. Ability to choose or change methods of work
Training	7. Training paid for or provided by employer over the past 12 months (or paid by oneself if self-employed) 8. Learning new things

Table A5: Working time quality

Subdimension	Variables used in the construction of the subdimension
Duration	1. Long working hours (48 hours or more a week)
	2. Very short working hours (10 hours or less)
	3. Long working day
	4. Long working days (10 hours or more daily)
	5. Involuntary part time
Atypical working time	6. Night work
	7. Saturday work
	8. Sunday work
	9. Shift work
Working time arrangements	10. Change in working time arrangements
Flexibility	11. Working hours fit in with your family or social commitments

Table A6: Prospects

Subdimension	Variables used in the construction of the subdimension
Career prospects	1. My job offers good prospects for career advancement
Job security	2. I might lose my job in the next six months
Employment status (type of contract)	3. Proportion of indefinite contracts

Table A7: Earnings

Subdimension	Variables used in the construction of the subdimension
Hourly earnings	1. Mean of hourly earnings
Share of low-wage workers	2. Proportion of workers considered within the low-wage group
Wage inequality	3. Gini Index (from hourly earnings)
Wage polarisation	4. Bipolarisation index of hourly earnings (Wolfson, 1994)

Dimensions and subdimensions	Year				
	1995	2000	2005	2010	2015
Physical environment	EU15	EU27	EU28	EU28	EU28
Ambient risks	EU15	EU27	EU28	EU28	EU28
Biological and chemical risks	EU15	EU27	EU28	EU28	EU28
Posture-related risks	EU15	EU27	EU28	EU28	EU28
Social environment	X	x	EU28	EU28	EU28
Adverse social behaviour	X	x	EU28	EU28	EU28
Social support	X	x	EU28	EU28	EU28
Work intensity	X	x	EU28	EU28	EU28
Quantitative demands	X	x	EU28	EU28	EU28
Pace determinants and interdependency	EU15	EU27	EU28	EU28	EU28
Skills and discretion	EU15	EU27	EU28	EU28	EU28
Cognitive discretion	EU15	EU27	EU28	EU28	EU28
Decision latitude	EU15	EU27	EU28	EU28	EU28
Training	EU15	EU27	EU28	EU28	EU28
Working time quality	x	x	EU27 (excl. MT)	EU28	EU28
Duration	x	EU26 (excl. MT, HR)	EU27 (excl. MT)	EU28	EU28
Atypical working time or unsocial hours	EU15	EU27	EU28	EU28	EU28
Working time arrangements	x	x	EU28	EU28	EU28
Flexibility	x	EU27	EU28	EU28	EU28
Prospects	x	x	EU27 (excl. MT)	EU28	EU28
Career prospects	x	x	EU28	EU28	EU28
Job security	x	x	EU28	EU28	EU28
Employment status	EU15	26 (excl. MT, HR)	27 (excl. MT)	EU28	EU28
Earnings	12 (excl. FI, LU, SE)	13 (excl. LU, SE)	23 (excl. BG, HR, LV, MT, RO)	EU28	EU28
Hourly earnings	12 (excl. FI, LU, SE)	13 (excl. LU, SE)	23 (excl. BG, HR, LV, MT, RO)	EU28	EU28
Share of low-wage workers	12 (excl. FI, LU, SE)	13 (excl. LU, SE)	23 (excl. BG, HR, LV, MT, RO)	EU28	EU28
Wage inequality	12 (excl. FI, LU, SE)	13 (excl. LU, SE)	23 (excl. BG, HR, LV, MT, RO)	EU28	EU28
Wage polarisation	12 (excl. FI, LU, SE)	13 (excl. LU, SE)	23 (excl. BG, HR, LV, MT, RO)	EU28	EU28

Annex 2: Construction of job-quality dimensions and subdimensions

The variables related to working conditions selected from the different data sources used in the analysis (see Annex 1) have been transformed to allow the construction of the 7 dimensions and 21 subdimensions of working condition as follows:

1. First, the data at the individual level have been combined and scaled to construct the different variables that make up the subdimensions.

    a) To avoid distortion in the construction of the means that would cause the existence of missing values, the categorical variables of each subdimension have been scaled by means of a Cronbach alpha (maximum-minimum mean) that takes into account the number of items that makes up the scale and gives internal consistency to the indicator. Afterwards, the index is constructed using the arithmetic mean.

    b) For the continuous variables, an arithmetic mean is constructed.

In both cases, missing values have been omitted from the analysis after verifying that the percentage of lost values was low and did not affected the results.

The outcome of these operations are indicators that vary, in all cases, from 0 to 100, with 0 always being the worst job quality and 100 the maximum job quality.

2. Secondly, the subdimensions are constructed as simple averages of the variables, again on a scale 0–100.
3. Thirdly, the dimensions are constructed as simple averages of the subdimensions, again on a scale 0–100.
4. Finally, the database constructed at the individual level (with workers as unit of analysis) is transformed to provide results at country level. The resulting database is the one used for the convergence analysis.

The specific details of the transformation of the EWCS, EU-SILC and EU-LFS variables are available from the authors upon request as well as recorded in the STATA working files used in the statistical analysis.

Annex 3: Replication of beta-convergence analysis with a balanced panel of countries

The balanced panel analysis is motivated by the need to balance two issues: the possible sample selection due to consideration of the different countries and periods of analysis, and the degrees of freedom available in the analysis. The main aim of the exercise is to determine the existence of convergence. Inevitably, the results can be affected by the sample of countries and time periods considered. The priority is to draw meaningful conclusions about whether there is a catch-up process. Therefore, a strategy of maximising the number of periods and countries is prioritised, to make the statistical power as high as possible. This means, for instance, that the results among dimensions (whose analyses sometimes comprise different set of countries and periods) are only fully comparable under the assumption of no sample selection bias.

In order to check the robustness of the approach followed, an alternative analysis was produced using a balanced panel for the shorter period 2005-—2015 with 23 Member States. The countries removed from the analysis for lack of data in one or more of the dimensions were Bulgaria, Croatia, Latvia, Malta and Romania.

Overall, the dynamics of upward convergence obtained with this balanced panel of countries are similar to the one shown by the larger sample (with expected differences due to the change in sample and period of analysis), confirming the validity of the empirical strategy followed. However, there are some changes in the speed of convergence, as seen in Physical environment, where the reduction of the analysed period by a decade reduces the value of beta. This reduction is especially intense for Skills and discretion, which now becomes, together with Earnings, the dimension with the slowest speed of convergence.

Table A9: Replication of the beta-convergence analysis with a balanced panel of countries 2005–2015, EU23, at the level of dimensions of working conditions

	Dimension	Beta for short period	Convergence	EU average annual mean rate of growth %	Characterisation	Beta for long period*
D1	Physical environment	-0.0651	Yes	0.22	Weak upward convergence	-0.0607
D2	Social environment	-0.1414	Yes	0.25	Weak upward convergence	-0.0014
D3	Work intensity	-0.0590	Yes	0.18	Weak upward convergence	-0.0472
D4	Skills and discretion	-0.0149	Yes	0.23	Weak upward convergence	-0.0292
D5	Working time quality	-0.0521	Yes	0.10	Weak upward convergence	-0.0490

D6	Prospects	-0.0542	Yes	Weak downward convergence	-0.0626
D7	Earnings	-0.0128	Yes	Weak upward convergence	-0.0182

(*) Beta coefficients corresponding to the longer period are included for comparison purposes.

Note: The following countries are excluded from the analysis due to data availability problems in one or more of the dimensions: Bulgaria, Croatia, Latvia, Malta and Romania.

Analysis replicated at the level of the subdimensions obtained similar results as the main analysis, with expected variations in the size of the beta coefficients resulting from the reduction of the study period for those dimensions with better data availability.

There are only four changes in terms of the characterisation of the convergence process: the change from strict upward convergence to weak upward convergence in the subdimensions of Biological and chemical risks and Adverse social behaviour, and from weak downward convergence to weak upward divergence in the subdimensions Pace determinants and interdependency and Decision latitude.

Table A10: Replication of the beta-convergence analysis, with a balanced panel of countries 2005–2015, EU23, at the level of the subdimensions of working conditions

Subdimension	Beta for short period	Convergence?	Characterisation	Beta for long period	Average annual mean rate of growth %
D1 Physical environment					
Ambient risks	-0.0741	Yes	Weak upward convergence	-0.0649	0.33
Biological and chemical risks	-0.0900	Yes	Weak upward convergence	-0.1315	0.06
Posture-related risks	-0.0506	Yes	Weak upward convergence	-0.0471	0.33
D2 Social environment					
Adverse social behaviour	-0.2191	Yes	Weak upward convergence	-0.2190	0.45
Social support	-0.1053	Yes	Weak upward convergence	-0.1016	0.05
D3 Work intensity					
Quantitative demands	-0.0568	Yes	Weak upward convergence	-0.0535	0.26
Pace determinants and interdependency	-0.0824	Yes	Weak upward convergence	-0.0989	0.15
D4 Skills and discretion					
Cognitive discretion	-0.0512	Yes	Weak downward convergence	-0.0554	-0.20

Subdimension	Beta for short period	Convergence?	Characterisation	Beta for long period	Average annual mean rate of growth %
Decision latitude	-0.0418	Yes	Weak upward convergence	-0.0400	0.21
Training	-0.0039	Yes	Weak upward convergence	-0.0231	0.83
D5 Working time quality					
Duration	-0.0371	Yes	Weak upward convergence	-0.0513	0.08
Atypical working time	-0.0602	Yes	Weak downward convergence	-0.0435	0.00
Working time arrangements	-0.0425	Yes	Weak upward convergence	-0.0195	0.16
Flexibility	-0.0622	Yes	Weak upward convergence	-0.0582	0.20
D6 Prospects					
Career prospects	-0.0430	Yes	Weak downward convergence	-0.0504	-1.32
Job security	-0.1041	Yes	Weak downward convergence	-0.1169	-0.11
Employment status	-0.0258	Yes	Weak downward convergence	-00227	-0.12
D7 Earnings					
Hourly earnings	-0.0344	Yes	Strict upward convergence	-0.0302	4.99
Share of low-wage workers	-0.0100	Yes	Weak upward convergence	-0.0314	0.14
Wage inequality	-0.0076	Yes	Weak upward convergence	-0.0451	0.08
Wage polarisation	-0.0023	Yes	Weak downward divergence	-0.0320	0.02

(*) Beta coefficients corresponding to the longer period are included for comparison purpose.

Note: The following countries are excluded from the analysis due to data availability problems in one or more of the dimensions: Bulgaria, Croatia, Latvia, Malta and Romania.

Annex 4: Semi-structured interview protocols

Expert interview schedule: Monitoring convergence in working conditions

Digital Single Market Strategy

Interviewer instructions

Thank interviewee.

Explain the purpose of the study:
1. To analyse long-term trends in working conditions/job quality in Member States in the EU;
2. To understand and contextualise the dynamics behind these trends
3. To explore appropriate policy instruments to help promote upward convergence.

The project is funded by Eurofound. The Principal Investigator (PI) is Professor Chris Warhurst at the Institute for Employment Research (IER) at the University of Warwick in the UK. It is a joint project involving teams at IER and the University of Salamanca in Spain.

Explain the conditions of participation: being interviewed is voluntary and confidential with all data anonymised unless express permission otherwise is formally granted. Ask to sign consent form.

Explain the focus (i.e. topic), structure and anticipated timing of the interview.

Interviewee background
1. Can you tell me about [name of organisation]?

2. Can you please tell me about your job/role with [name of organisation] and how long you've worked for [name of organisation]?

3. In terms of Digital Single Market Strategy, what is your main interest/function/activity?

Current situation
4. Do you think that digital skills are an issue at the moment? If so why?

5. Has this situation changed in recent years? If so, how and why?

*Prompt for **developments** (i.e. improved, worsened, no change) and **drivers** of change (digital economy, digital divide, digital illiteracy, recruitment challenges, new/more ICT jobs, labour market exclusion etc.)*

6. How effective do you think previous national or EU efforts to encourage development of digital skills have been?

Prompt: reasons for success/failure

Effectiveness

7. Who do you think will benefit from investments in/the Strategy on digital skills?

Prompt for e.g. particular types of workers, firms, industries, governments.

8. What do you think the benefits will be from investments in/the Strategy on digital skills?

Prompt for levels: individual, firm, country, EU e.g. individuals being job ready, boost to productivity, recruitment problems, more inclusive labour markets etc.

9. Do you think that the Strategy will improve: a) digital literacy, b) access to the labour market, c) more workers in better jobs?

*Prompt for **who**'s involved (e.g. role of firms, social partners, industry representative bodies, governments, NGOs) and **debates** about the Strategy (e.g. balance between Member States vs EU, subsidiarity on bargaining/skills development, demand for advanced digital skills vs basic digital literacy etc.)*

10. In your opinion, will the Strategy help drive an upward convergence of working conditions across the EU? If so, how? If not, why not?

Prompt: convergence in having more workers with digital skills vs digital skills as a lever of upward convergence

11. What (contextual) factors would enable the Strategy to deliver this upward convergence?

Prompt for actors, institutions, initiatives/developments etc.

12. What (contextual) factors might hinder the Strategy delivering this upward convergence?

Prompt for actors, institutions, developments etc.

Going Forward

13. What would be the measure of success for the Strategy?

14. Beyond the Strategy, are there additional actions or measures that the EU specifically could develop to help deliver a) more digital literacy, b) more advanced digital skills, c) more workers in better jobs?

15. Is there anything that we've not talked about either with the Strategy or upward convergence more generally that you think is relevant?

Prompt for other initiatives that could help foster upward convergence or avoid divergence of working conditions in the future?

Close of Interview

Thank interviewee. Remind interview of the conditions of participation and the consent form.

Let interviewee know that if s/he has any questions or queries about the project they can contact the research team via Sally Wright: S.A.Wright@warwick.ac.uk.

Expert interview schedule: Monitoring convergence in working conditions

2. Transparent and Predictable Working Conditions

Interviewer instructions

Thank interviewee

Explain the purpose of the study:
1. To analyse long-term trends in working conditions/job quality in Member States in the EU;
2. To understand and contextualise the dynamics behind these trends
3. To explore appropriate policy instruments to help promote upward convergence.

The project is funded by Eurofound. The Principal Investigator is Professor Chris Warhurst at the Institute for Employment Research (IER) at the University of Warwick in the UK. It is a joint project involving teams at IER and the University of Salamanca in Spain.

Explain the conditions of participation: being interviewed is voluntary and confidential with all data anonymised unless express permission otherwise is formally granted. Ask to sign consent form.

Explain the focus (i.e. topic), structure and anticipated timing of the interview.

Interviewee background

1. Can you tell me about [name of organisation]?

2. Can you please tell me about your job/role with [name of organisation] and how long you've worked for [name of organisation]?

3. In terms of The Directive on Transparent and Predictable Working Conditions, what is your main interest/function/activity?

Current situation

4. Do you think that transparent and predictable working is an issue at the moment? If so why?

5. Has this situation changed in recent years? If so, how and why?

   *Prompt for **developments** (ie improved, worsened, no change) and **drivers** of change (note: could be actors, trends, developments etc.)*

6. How effective do you think the previous Directive on Written Statements (from 1991) has been?

Effectiveness

7. Who do you think will benefit from the new Directive?
   Prompt for who might need it, who might benefit etc. e.g. particular types of workers, employers, governments.

8. What benefits do you think that the new Directive will bring?
   Prompt for levels: individual, firm, country, EU.

9. Do you think that the new Directive will improve transparency and predictability in working conditions?

   Prompt for: more secure and predictable employment; improved living and working conditions,

   *Prompt for **who**'s involved (e.g. role of firms, social partners, industry representative bodies, government, civic organisations) and **debates** about the Directive (e.g. limit flexibility, stifle job creation, more red tape for SMEs, subsidiarity and national cultures, too broad, imposition of minimum standards etc.)*

10. In your opinion, will the new Directive help drive an upward convergence of working conditions across the EU? If so, how? If not, why not?

11. What (contextual) factors would enable the new Directive to deliver this upward convergence?

    Prompt for actors, institutions, developments etc.

12. What (contextual) factors might hinder the new Directive delivering this upward convergence?

    Prompt for actors, institutions, developments etc.

Going Forward

13. What would be the measure of success for the new Directive?

14. Beyond the new Directive, are there additional actions or measures that the EU specifically could develop to help deliver upward convergence of working conditions?

15. Is there anything that we've not talked about either with the new Directive or upward convergence more generally that you think is relevant?

Close of Interview

Thank interviewee. Remind interview of the conditions of participation and the consent form.

Let interviewee know that if s/he has any questions or queries about the project they can contact the research team via Sally Wright: S.A.Wright@warwick.ac.uk.

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