

# Job quality, innovation and employment outcomes in Europe: new evidence from **QuInnE**

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# Quality of Jobs, Innovation & Employment Outcomes

Horizon 2020: 2015-2018

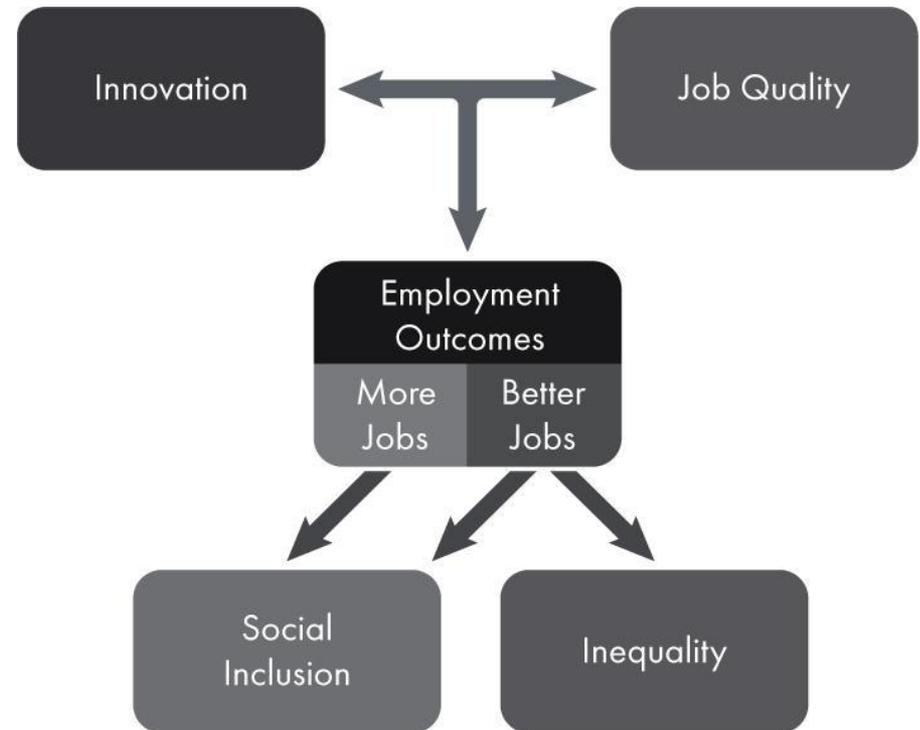
Partners in: Sweden, Spain, France, Hungary, Netherlands, UK, Germany

video on project:

<https://youtu.be/tqtZa3E-Qqk>

# QuInnE investigates mutual relationships

- Integrative **theoretical** framework
- Innovation **Policy** review & recommendations
  - EU level
  - National level
  - Corporate **strategy**
- **Quantitative** analysis
  - Country level
  - Industry level
  - Firm level
  - Individual level
- **Qualitative** analysis
  - National Industry profiles
  - Organizational level case studies
  - **Explore the mutually interacting causal mechanisms impacting innovation, job quality and employment**

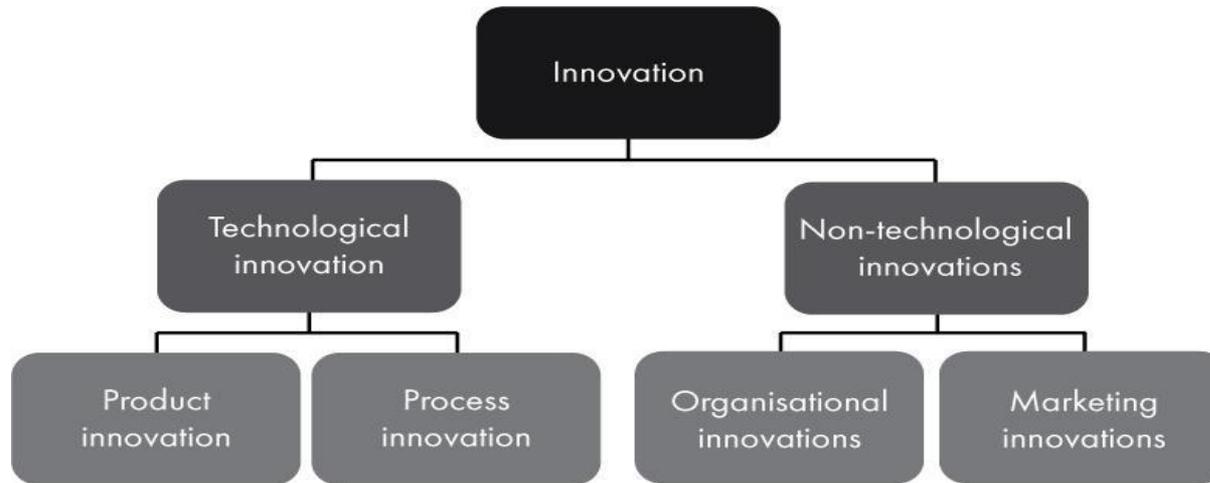


# QuInnE research questions

- Does job quality boost innovation and, if so, how?
- Does innovation boost job quality and, if so, how?
- Do innovation and job quality mutually interact to boost employment outcomes and, if so, how?
- Does boosting employment outcomes through innovation and job quality help address social exclusion and inequalities, and, if so, how?

# Innovation

Oslo Manual (OECD & Eurostat, 2005)



- **Product innovation** is the introduction of a good or service that is new or significantly improved with respect to its characteristics or intended uses.
- **Process innovation** is the implementation of a new or significantly improved production or delivery method.
- **Organisational innovation** is the implementation of a new organisational method in the firm's business practices, workplace organisation or external relations.
- **Marketing innovation** is the implementation of a new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing.

Dimension	Indicator
<b>Wages</b>	
	Pay level relative to national minimum pay and average for required qualifications
	Pay variability
<b>Employment Quality</b>	Permanent/Temporary Status
	Job Security
	Internal Progression Opportunities
	Predictability of Weekly Hours (Overtime – Zero Hours)
	Presence/Absence Involuntary Long Hour Work (40 +)
	Presence/Absence Involuntary Part-Time Work (<30)
<b>Education &amp; Training</b>	Learning Opportunities on the Job
	Training Incidence
	Training Quality
	Opportunities for General vs Specific Skill Acquisition (Transferability)
<b>Working Conditions</b>	
	Individual Task Discretion/ Autonomy
	Semi-Autonomous Teamwork
	Job Variety
	Work Intensity
	Health and Safety (Physical and Psychosocial)
	Supervisory Social Support
Peer Group Social Support	
<b>Work Life Balance</b>	Work Time Scheduling (Unsocial Hours)
	Hours of Work (Duration)
	Working Time Flexibility – Personal Control of Work Hours
	Working Time Flexibility – Provisions for Time Off for Personal Needs
<b>Consultative Participation &amp; Collective Representation</b>	
	Direct Participation re Organisational Decisions
	Consultative Committees-Works Councils
	Union Presence Union Decision-Making Involvement

# Outputs [all available on website: [quinne.eu](http://quinne.eu)]

## • Working papers

- Makó, C. & Illéssy, M. (2015) *Innovation policy review: National and European Experiences*
- Makó, C., Illéssy, M. & Warhurst, C. (2016) *The Evolution of EU Innovation Policy Relevant to Job Quality and Employment*
- Erhel, C. & Guergoat-Larivière, M. (2016) *Innovation and Job Quality Regimes: A Joint Typology for the EU*
- Muñoz-de-Bustillo, R., Grande, R. & Fernández-Macías, E. (2016) *Innovation and Job Quality. An Initial Exploration*
- Muñoz-de-Bustillo, R., Grande, R. & Fernández-Macías, E. (2017) *An approximation of job quality and innovation using the 3rd European Company Survey.*
- Duhautois, R., et al. (2018) *The employment and job quality effects of innovation in France, Germany and Spain: evidence from firm-level data*
- Gallie, D. (2018) *Quality of Work and Innovative Capacity: Implications for Social Equality*
- Jaehrling, K. (ed.) (2018) *Virtuous circles between innovations, job quality and employment in Europe? Case study evidence from the manufacturing sector, private and public service sector*

## • Tools

- Quinnemap [Diagnostic tool]  
<http://tools.quinne.eu/quinnemap/>
- Developmental tool:  
<http://178.62.198.40/> (soon with a link on the website)

# Quantitative analyses [Working Papers] based on pan-EU/European data

WP 3 “Innovation and Job Quality Regimes: A Joint Typology for the EU”

WP 4 “An Approximation to Innovation and Job Quality using the 3<sup>rd</sup> European Company Survey”

WP 5 “Innovation and Job Quality. An Initial Exploration”

WP 8 “Quality of Work and Innovative Capacity: Implications for Social Equality”

WP 9 “Is innovation obsession good news for employees?” [France only]

WP 13 “Innovation regime and vulnerable workers’ labour market inclusion and job quality”

# Main results: quantitative pan-European analyses

## A positive correlation between innovation and job quality

- Positive correlation is found between technological innovation and job quality at all the levels considered (country, industry, individual)
- Also true for a definition of job quality based on training and learning/task discretion and initiative/job security (Innovation conducive job quality).
- In the case of organisational innovation, the link is weaker, and the effect is non significant in several cases.
- Some other factors influence job quality: individual characteristics (gender, age, occupation/class, level of education); firms characteristics (size, employee representation) → inequalities among workers

# Findings from firm-level, longitudinal data: France, Germany and Spain

Source: Duhautois, R., et al. (2018) *The employment and job quality effects of innovation in France, Germany and Spain: evidence from firm-level data* [Working Paper 7)

# Findings: employment

- **Technological** innovation (i.e. product and/or process innovation) has a clear positive impact on employment at the firm level in all three countries.
- This positive effect holds true in the case of **product** innovation in all three countries but also in the case of **process** innovation (France, Spain) and **organizational** innovation (France, Germany).
- The result about **process** innovation is less expected theoretically as this type of innovation casts as labour saving (empirical results are mixed).

# Findings: job quality

Effects on job quality (in France and Germany – no data for Spain):

- Job quality effects **more mixed** across countries and vary with the type of innovation.
- In general, effects **more positive for technological** innovation than for organizational innovation; within technological innovation **product innovation** seems to be slightly more favourable to job quality than process innovation.
- In France and Germany, product innovation seems to generate **higher wages** and more **employment stability**, suggesting that firms **share the benefits** of product innovation with their employees.
- **Results are more mixed for process and organizational innovation:**
  - In France, process innovation impacts negatively the synthetic **index of job quality** and organizational innovation has a negative impact on **wages** and a positive impact on the number of **temporary contracts** (none on permanent jobs).
  - In Germany, process and organizational innovations increase **part-time** employment, which can be associated with labor saving encouraged through the use of short-time working during the GFC. Organizational innovation also seems to increase the number of **low-paid workers**.

# Findings: inequalities (skills)

Decomposing by skill (defined by education/occupation as a proxy):

- **Number of higher-skilled workers increases** following technological and organizational innovation; in most cases, no effect or negative effect on lower-skilled workers. In France, intermediate skill occupations' employment does not decrease following innovation.
- **Contradicts polarization thesis** at the firm level and rather **supports the skill-biased technological change hypothesis** and the literature on learning organizations and ICT use, which claims that new technology adoption requires higher skills and is less favorable to low-skilled workers
- **Wages by occupations (in France)**: technological innovation has no significant effect on the pay of managers and professionals but a negative effect on the pay of manual workers (and of technicians and associate professionals for radical product innovation) – however, organizational innovation has a negative effect on the pay of managers and professionals (and no effect on other workers' pay)

# Findings: inequalities (gender)

- Decomposing by gender:
  - **Technological** innovation increases employment **for both** men and women in France and Germany (no data for SP)
  - But in France **radical product innovation** increases **male** employment and male gross annual wage only
  - **Organizational** innovation also seems to have differentiated effects by gender: it only increases significantly **women's** employment in France and Germany and has a negative impact on men's wage in France (gender pay gap decreases)

## Findings: summary

- Overall positive effect of all types of innovation on total employment
- Rather positive effects of product innovation but more heterogeneous effects of process and organizational innovations on job quality
- Technological and organizational innovations tend to be more favourable to high-skilled (and medium-skilled) workers: SBTC but no polarization
- Radical product innovations seem more favourable to men and organizational innovations to women

# Findings from qualitative case studies

Jaehrling, K. (ed.) (2018) *Virtuous circles between innovations, job quality and employment in Europe? Case study evidence from the manufacturing sector, private and public service sector* [Working Paper 6]

# Qualitative case studies

	UK	FR	NL	SE	ES	HU	GER	Total number of case studies	Total number of interviews
<b>Manufacturing sector</b>									
<b>Aerospace</b>	1	3		2				6	78
<b>Automotive</b>						3	2	5	34
<b>Agri-food</b>					4	3		7	59
<b>Private Service Sector</b>									
<b>Computer games</b>	2		6	3			3	14	86
<b>Banking</b>		3			2			5	42
<b>Retail Logistics</b>		2	2				3	7	52
<b>(quasi) Public Sector</b>									
<b>Elderly / Home care</b>	3		2			3		8	56
<b>Hospitals</b>				4	2			6	54
<b>TOTAL</b>	6	8	10	9	8	9	8	58	461

# The impact of new technologies at occupational level: three scenarios

- **Sc 1: *Displacement*** (occupations replaced by new technologies); some cases, but more often reallocation of tasks and changes in job contents. (Retail log – shops to warehouses [not fully auto] & delivery)
- **Sc 2: *Skill enhancement and job enrichment*** (upskilling “skill biased” T.C); many illustrations of skill enhancement (Aero, Agrifood, Bank, Care, Hospitals...) with some positive impact on JQ; but often more ambiguous:
  - “Age bias” rather than “skill-bias” when new technologies require **new rather than higher skills** => different modes of adjustment, depending also on institutional contexts (e.g. Aero : France: early retirement schemes vs. Sweden: training)
  - What is seen as upskilling may in fact cover a shift from tacit knowledge/ craft skills to codified knowledge/more formalized skills => not seen necessarily by the worker as job enrichment; e.g.: skilled operators on Computer Numerical Control (CNC) machines
  - Codification of knowledge and standardization of procedures may facilitate external flexibility and outsourcing of work activity (i.e. worse employment conditions)
  - IT/CT – communication technologies – allow two-way communication – penetration of the “design” process = better JQ / better innov opportunity (Aero)

- **Sc 3: Digital Taylorism** => de-skilling; reduction in task discretion and autonomy => negative impact on JQ:
  - Some forms of (semi-)automation when full automation not yet profitable => very similar to the Taylorist assembly line; e.g. Logistics: very repetitive tasks, mandatory job rotation (nothing to do with job enrichment) to avoid musculoskeletal disorders
  - New tools to augment human capacities (e.g. “wearables” such as smart glasses; cobots..) .... But some may in fact rather turn humans in simple “*appendages of machines*” (Marx) => work activity highly prescribed, with some extreme cases where human are “robotized” (waiting for being replaced by robots) e.g. Logistics with “voice picking”; but less extreme examples in other industries (Aero, Automotive..);
  - “Digital monitoring” and “Management by indicators”; widespread across all industries; may concern all occupational levels (i.e. including managers, engineers, professionals – but **resisted in hospitals**); often associated with “lean” organizational principles

**But:** key finding of our research: no technological determinism: organizational/managerial choices matter

- Both **Sc 2** and **Sc 3** may be found in a given country / industry /even company
- A given technological tool/device can be used quite differently with contrasted impacts on JQ in different industries – by managerial choice. Employee power (via importance to production process, not collective rep) decisive (hospitals; computer games)

# Generally good news but a worrying trend: displacement and possible re-entry to firms

- How “upskilling” takes place.
  - Up – more advanced / sophisticated or just new?
- Age bias? Bias towards recent credentials and skills
- Accelerating rate of change?
  - Faster obsolescence cycles
  - Out of firms out of employment – out of touch
- Regulation – to mandate training and retaining workers with “inadequate skills” (difference between France and Sweden in aviation industry)
- Agreements– to mandate training and retaining workers with “inadequate skills”
- Employers / union training programmes
- State – regional training programmes (vocational)
- Back to universities – tertiary and vocational programmes

# A further worrying trend: *routine work outside employment*

not explored by QuInnE, but a scenario for “those displaced / left behind / never entering high-skill work”

- Work outside of firms – contracted or direct to clients / customers
  - Beyond the precariat and fixed-term contracts
  - Genuine and “false” self-employed
- Platform economy
  - IR concerns – negotiating with app companies; collective action; working conditions
  - Social security – self-employed/own-account work – insurances, pension
  - Skills development
  - Occupational and employment networks

# Rising on the agenda? A good hard look at life-long learning

- Where it should take place
- Who carries it out
- Whose responsibility it is
- How continuous
- How and to whom it is made available
- Who finances it
  
- *As close to the user (firms) as possible*
  
- More than "employability"?
- The "entrepreneurship option"