

# The impact of innovation on employment and job quality: results for a sample of French firms

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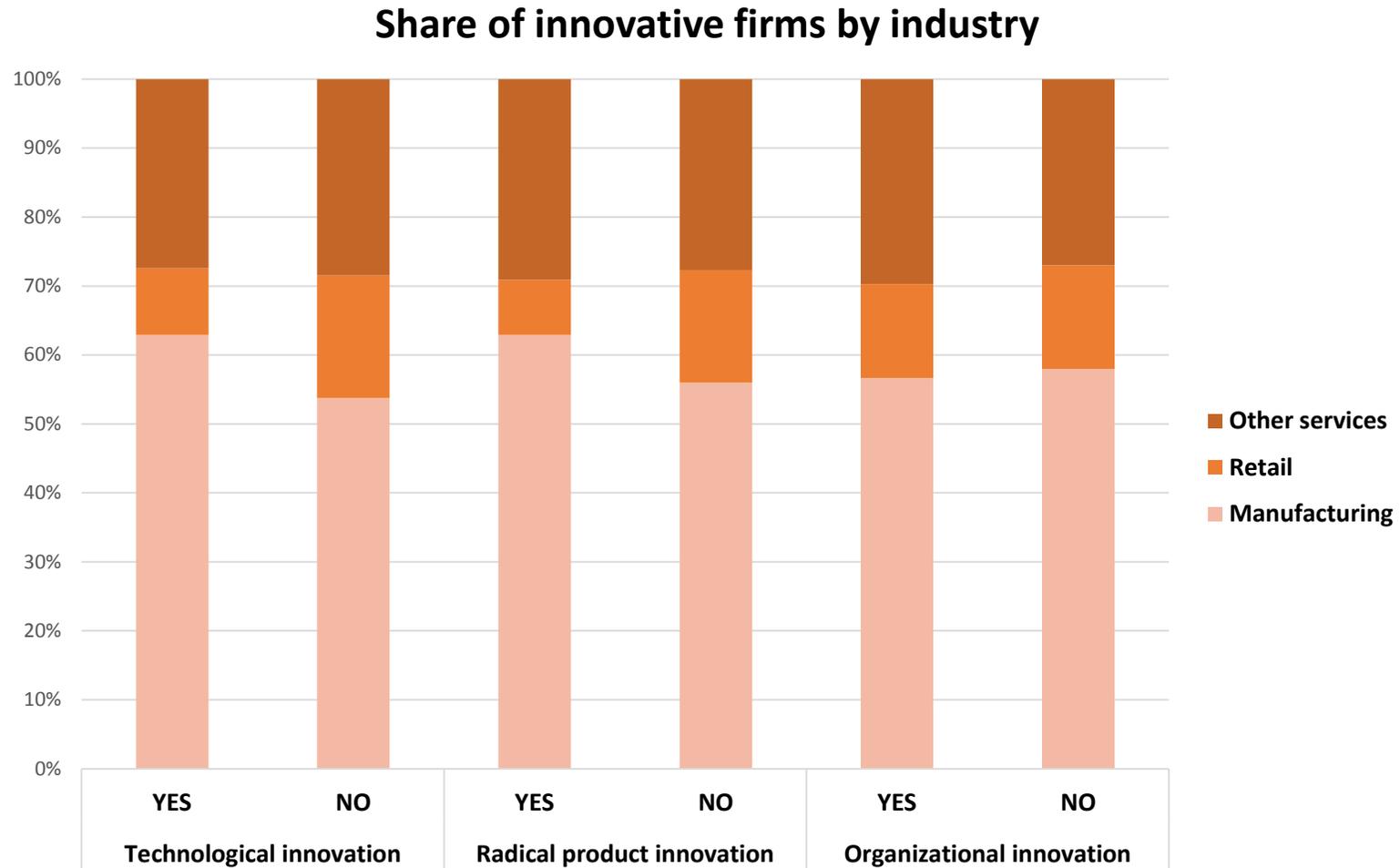
# Descriptive statistics

- Share of innovative firms

Innovation type	Share of firms
Technological innovation (product and/or process)	40,8%
Product innovation	30,5%
Innovation 'new to the market'	21,4%
Process innovation	29%
Organizational innovation	37,1%

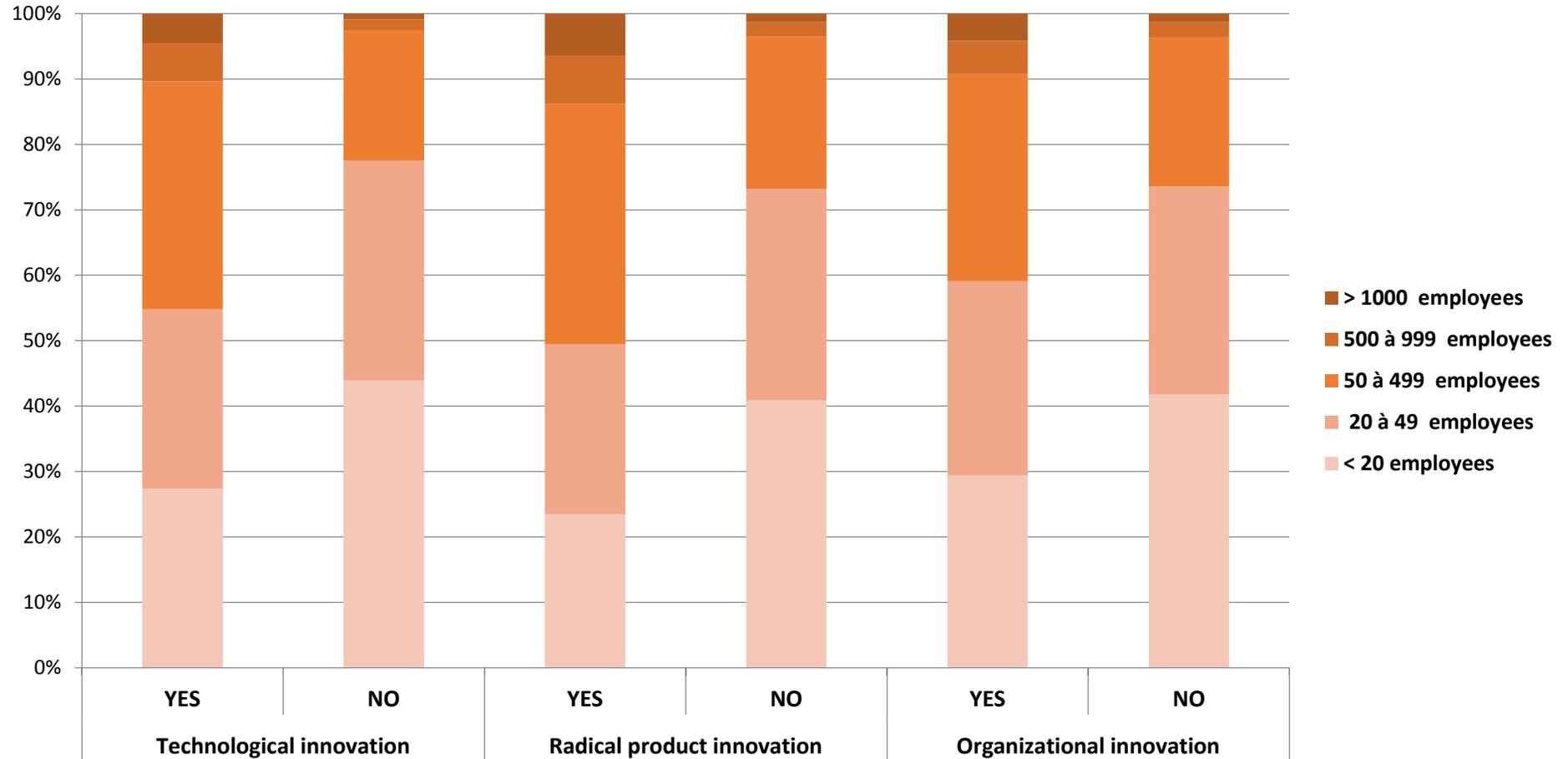
Source: CIS 2012-FARE 2009 2013-DADS 2009 2013, matched data, author's calculations, 14.204 firms

# Descriptive statistics



# Descriptive statistics

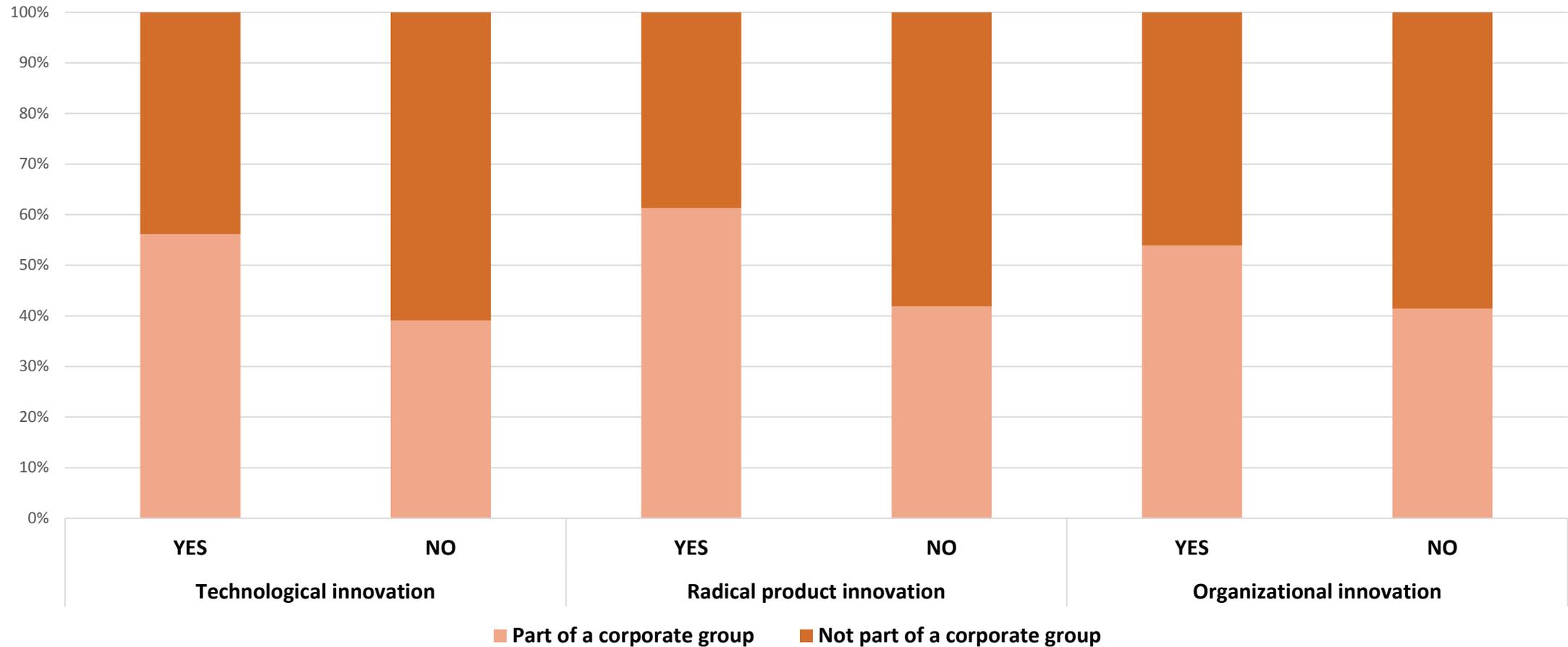
Share of innovative firms by size



Source: CIS 2012-FARE 2009 2013-DADS 2009 2013, matched data, author's calculations, 14.204 firms

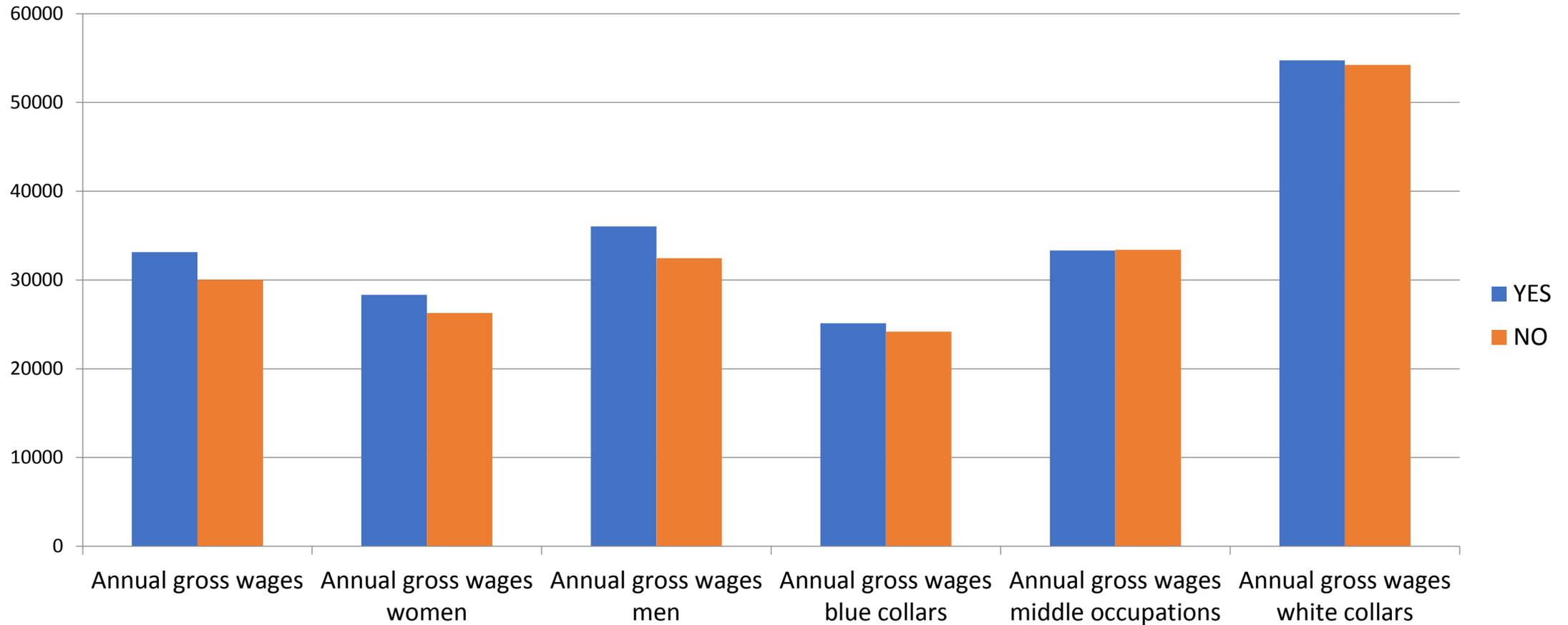
# Descriptive statistics

Share of innovative firms (part of corporate group or not)



# Descriptive statistics

Innovative vs. non-innovative firms



Source: CIS 2012-FARE 2009 2013-DADS 2009 2013, matched data, author's calculations, 14.204 firms

# Descriptive statistics

## Innovative vs. non-innovative firms



Source: CIS 2012-FARE 2009 2013-DADS 2009 2013, matched data, author's calculations, 14.204 firms

# Findings: firms' innovativeness generally

- Positive correlation between firm size and the probability of innovation
- Firms from the manufacturing sector are more likely to innovate
- Innovative firms are younger
- Belonging to a corporate group is positively correlated with innovation
- Firms with higher levels of productivity are more likely to innovate

# Findings: impact on employment

- Positive impact on total workforce of all types of innovation (including process and organizational)
  - In terms of employment by gender, innovation increases employment for both men and women except radical product innovation that increases male employment only.
  - Positive impact on workforce of managers and professionals and technicians and associate professionals (for all types of innovation)
  - More heterogeneous effects on workforce of manual workers: positive effect of process innovations, negative effect of product innovations (all or only radical ones) and no significant effect of organizational innovations
- Contradicts polarization thesis at the firm level
- Innovation seems more favorable to high-skilled (and medium-skilled) workers

# Findings: impact on job quality

- Wages: positive impact of technological innovations on the hourly wage, negative effect of organizational innovations on annual wage
  - Type of contract:
    - Positive impact of technological innovations (product, process, radical product) on permanent contracts, no significant effect of organizational innovations
    - Technological and organizational innovations also increase temporary employment (except radical product innovations!).
  - No significant impact on the average number of hours worked at the firm level
  - Synthetic index of job quality (open-ended contracts, hours of work, hourly wages and gender wage ratio W/M): positive impact of product innovations (all or radical) but negative effect of process innovations and non significant effect of organizational innovations
- In general, effects on job quality are more positive for technological innovation than for organizational innovation.
- Within technological innovation product innovation seems to be slightly more favorable to job quality than process innovation.

# Findings: inequalities across occupations

- Effects on the structure of the workforce at firm level :
    - Results support the skill-biased technological change hypothesis of innovation effects: technological and organizational innovation is more favorable to high-skilled workers while it has no significant and sometimes negative impact on low-skilled workers.
  - Wages by occupations:
    - 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)
    - On the contrary, organizational innovation has a negative effect on the pay of managers and professionals (and no effect on other workers' pay)
- Results for technological innovation are in line with the literature on learning organizations and ICT use, which claims that new technology adoption, coming from product innovation, requires higher skills and is less favorable to low-skilled workers.

# Effects of innovation on employment and job quality (DiD, France, 2009-2012, source CIS-DADS-FARE)

Dependent variables	Product or process	Product	Process	New to the market	Organisational
Variation of total workforce	+	+	+	+	+
Variation of open ended (permanent) contract employees	+	+	+	+	ns
Variation of fixed-term contract employees	+	+	+	ns	+
Workforce variation for managers and professionals	+	+	+	+	+
Workforce variation for intermediate professions	+	+	+	+	+
Workforce variation for blue collar workers	ns	-	+	-	ns
Workforce variation for men	+	+	+	+	ns
Workforce variation for women	+	+	+	ns	+
Variation of gross pay	ns	ns	ns	ns	-
Hourly wage (gross)	+	+	ns	+	ns
Variation of the average annual hours worked per employee	ns	ns	ns	ns	ns
Variation of gross pay (pay, salary, earning, wage) for men	ns	ns	ns	+	-
Variation of gross pay (pay, salary, earning, wage) for women	ns	ns	ns	ns	ns
Variation of gross pay for managers and professionals	ns	ns	ns	ns	-
Variation of gross pay for low skilled	-	-	-	-	ns
Variation of gross pay for int occupations	ns	ns	ns	-	ns
Variation of gender pay gap (men-women)	ns	ns	ns	ns	-
Variation of occupational group pay gap (highest - lowest)	ns	ns	ns	ns	-
Variation of synthetic Job quality index	ns	+	-	+	ns

# References

- Erhel C., Guergoat-Larivière M. (2016), “Innovation and Job Quality Regimes: A Joint Typology for the EU”, QuInnE WP, WP5,2, <http://quinne.eu/>
- Harrison R., Jaumandreu J., Mairesse J., Peters B. (2014), “Does innovation stimulate employment? A firm-level analysis using comparable micro-data from four European countries”, *International Journal of Industrial Organization* 35 (2014) 29–43
- Van Roy V., Vertesy D., Vivarelli M. (2015), “Innovation and Employment in Patenting Firms: Empirical Evidence from Europe”, *IZA Discussion Paper No. 9147*, June 2015

# CIS: innovation typology

- **Product innovation** : Goods : New or significantly improved goods (exclude the simple resale of new goods and changes of a solely aesthetic nature) / services: New or significantly improved services
  - Among which **new to the market**: Your enterprise introduced a new or significantly improved product onto your market before your competitors
- **Process innovation** : New or significantly improved methods of manufacturing or producing goods or services; New or significantly improved logistics, delivery or distribution methods for your inputs, goods or services; New or significantly improved supporting activities for your processes, such as maintenance systems or operations for purchasing, accounting, or computing
- **Organisational innovation**: New business practices for organising procedures (i.e. supply chain management, business reengineering, knowledge management, lean production, quality management, etc.) ; New methods of organising work responsibilities and decision making (i.e. first use of a new system of employee responsibilities, team work, decentralisation, integration or de-integration of departments, education/training systems, etc.) ; New methods of organising external relations with other firms or public institutions (i.e. first use of alliances, partnerships, outsourcing or sub-contracting, etc.)