# LABOUR MARKET CONCENTRATION, WAGES AND JOB SECURITY IN EUROPE

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# MOTIVATION

- Renewed interest for monopsony among academics (e.g. Manning, 2003, JOLE special issue 2010, JHR special issue, 2022) and policy-makers (e.g. US Horizontal Merger Guidelines, 2010, and HR guidelines, 2016, recent Vestager speech, Oct. 21).

- One stream of work focuses on labour market concentration and its effects on wages:
  - US: Arnold, 2021; Schubert et al., 2021; Azar et al., 2022; Rinz, 2022; Benmelech et al., 2022
  - Other countries: Martins, 2018; Abel et al., 2018; Dodini et al., 2020; Marinescu et al., 2021; Bassanini et al., 2021; Popp, 2021, OECD, 2021.

- However
  - Lack of cross-country comparability
  - No exploration of non-wage dimensions of job quality

# CONTRIBUTION

➢ Our study addresses these 2 limitations.

- We provide comparable estimates for multiple countries, obtained by using the same definition of local labour market, concentration measure, dependent variables and controls.
  - Wages: Denmark, France, Germany, Portugal.
  - Job security: France, Germany, Italy, Portugal, Spain.

- We provide the first ever analysis of the effect of labour market concentration on job security as proxied by the probability of being hired on a permanent contract and the probability of being converted to a permanent contract if hired on a temporary one.

- We use the strictest possible control for productivity and product market competition by including firm*municipality*time fixed effects (equivalent to plant*time fixed effect).

# OVERVIEW OF THE EMPIRICAL RESULTS

- The elasticies of wages to labour market concentration are strikingly similar across the 4 countries we study:
  - Range from -0.019 in Germany, -0.022 in France, -0.025 in Portugal to -0.029 in Denmark.
  - Implies that increasing labour market concentration by one standard deviation from the mean reduces daily wages by 3% in Denmark, 2.4% in France, 2.1% in Germany and 2.5% in Portugal.

    - The negative effect of labour market concentration on wages holds for:
      - Daily wages of full-timers, hourly wages of full-timers and of all employees
      - New hires and incumbents.

- Labour market concentration reduces job security: increasing labour market concentration by one standard deviation from the mean reduces the probability of:
  - Being hired on a permanent contract by 5% in France, 6% in Germany and 24% in Portugal. No significant effect in Italy and Spain.
  - Being converted to a permanent contract if hired on a temporary one by 28% in Italy and 8% in Spain.

# OUTLINE

- Data
- Empirical specification
- Results
- Policies
- Conclusion

# DATA

# DATA SOURCES

- Near-universe national administrative data for 6 European countries
  - Denmark: Integrated Database for Labor Market Research (IDA)
  - France: Social security records (DADS)
  - Germany: IAB Employment History (BeH)
  - Italy: Mandatory Communications (CO)
  - Portugal: Quadros de Pessoal (QP)
  - Spain: Contract database of the National Public Employment Service

- Different structure of the data. We observe:
  - FR & GE: all job matches during the year (not contract changes within a match)
  - DNK & PRT: job matches at one month of the year (Oct. for PRT and Nov. for DNK).
  - IT & SP: contracts (not job matches), with start and end date in IT but only start dates in SP.

# LOCAL LABOUR MARKETS

- Local labour market $l = (o, z)$ : 4-digit occupation $o$ in geographical area $z$.

- 3 types of geographical areas:
  - Functional Urban Areas (FUAs) = a city and its catchment area (OECD, 2012; Dijkstra et al., 2019).
  - NUTS-3 regions: cover the entire territory of each country and not only urban areas.
  - Functional Areas (FAs): FUAs + all NUTS-3 regions (excluding the municipalities that are part of a FUA) in which at least 70% of municipalities are not part of a FUA.

- 3 different measures of labour market concentration. Preferred one = based on FA.

# LABOUR MARKET CONCENTRATION

- Concentration measured with the Herfindahl-Hirschman index

$$HHI_{l,t} = \sum_{e=1}^{E} s_{e,l,t}^2$$

where

$$s_{e,l,t} = \frac{H_{e,l,t}}{\sum_{m=1}^{E} H_{m,l,t}}$$

  - $E$ is the total number of employers hiring in each market
  - Employer = firm*municipality.
  - New hires are defined as individuals who are in a firm*municipality at time $t$ and were not there at $t-1$.
  - Yearly frequency of measurement

Municipalities Firms

New Hires

# DATA WINDOW

- Observation periods:
  - DNK: 2010-2018
  - FR: : 2009-2017
  - GE & IT: 2012-2018
  - PRT: 2010-2019
  - SP: 2010-2017

- Exclusions:
  - Exclude self-employed and household employees
  - Drop agriculture and industries where the public administration is dominant .
  - Only keep workers with at least 1 month of tenure with their current employer.

# EMPIRICAL SPECIFICATION

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- Wages

$$\log\left(w_{i,f,l,t}\right) = \beta \log\left(HHI_{l,t}\right) + \gamma X_{i,f,l,t} + \mu_i + \mu_{ft} + \mu_l + \varepsilon_{i,f,l,t}$$

  - where $i$ indexes the worker, $f$ the firm*municipality, $l$ the local labour market and $t$ is the year.

- Permanent contracts/Conversions

$$S_{i,f,l,t} = \beta \log\left(HHI_{l,t}\right) + \gamma X_{i,f,l,t} + \mu_{ft} + \mu_l + \varepsilon_{i,f,l,t}$$

  - Estimated on the subsample of new hires

- Standard errors are clustered at the local-labour-market-by-year level

Dep vars

Controls

Sample

# INSTRUMENT

- Ideal instrument: source of exogenous variation in labour market concentration based on national rather than local changes in the occupation we consider.
  - Changes concentration in labour market concentration in an occupation resulting, for example, from mergers and divestitures of large national companies would be a good choice

- We instrument $\log(HHI)$ in local labor market $l = (o, z)$ at time $t$ with the average of:

$$\log(1/N_{o,z\prime,t})$$

  - Where $N_{o,z\prime,t}$ is the number of firms with a positive number of hires in all other geographical areas $z$' for the same occupation $o$ and time period $t$.

- Will discuss later the limitations of this identification strategy and how we address it

# RESULTS

# LABOUR MARKET CONCENTRATION

| HHI | Mean | Std Deviation | P25 | P50 | P75 | P90 |
|---|---|---|---|---|---|---|
| Denmark | .0587 | .1093 | .0096 | .0216 | .0544 | .1437 |
| France | .0657 | .1297 | .0055 | .0194 | .0604 | .1710 |
| Germany | .0591 | .1213 | .0057 | .0171 | .0511 | .1508 |
| Italy | .0635 | .1370 | .0046 | .0144 | .0528 | .1642 |
| Portugal | .0957 | .1686 | .0108 | .0311 | .0921 | .2654 |
| Spain | .0693 | .1477 | .0051 | .0167 | .0591 | .1776 |

*Note*: HHIs based on FAs and weighted by the number of new hires. Computed over the following time periods: 2011-2018 for Denmark, 2010-2017 for France, 2013-2018 for Germany and Italy, 2011-2019 for Portugal and 2011-2017 for Spain.

Distribution

# LABOUR MARKET CONCENTRATION AND DAILY WAGES OF FULL-TIMERS – IV ESTIMATES

| Dep. Var<br>Daily Wages | Denmark | France | Germany | Portugal |
|---|---|---|---|---|
| Log HHI | -.029***<br>(.007) | -.022***<br>(.002) | -.019***<br>(.002) | -.025***<br>(.009) |
| KP F Test | 32.1 | 708.9 | 271.4 | 14.6 |
| Observations | 5,486,000 | 8,269,375 | 11,050,435 | 15,086,998 |

OLS

Robustness checks

# ENDOGENEITY OF THE INSTRUMENT?

It may be affected by occupation-specific national trends in labour supply and demand.

First

- We augment our baseline equations by including the share of each 4-digit occupation in new hires at the national level

- Problem: this variable could be endogenous
  - However, if our instrument were strongly affected by national trends in supply and demand, we would expect that the introduction of the share of each 4-digit occupation in new hires should substantially modify our estimates.

# LABOUR MARKET CONCENTRATION AND DAILY WAGES OF FULL-TIMERS – IV ESTIMATES

## Controlling for the share of 4-digit occupations in new hires at the national level

| Dep. Var<br>Daily Wages | Denmark | France | Germany | Portugal |
|---|---|---|---|---|
| Log HHI | -.013***<br>(.003) | -.021***<br>(.002) | -.025***<br>(.002) | -.022***<br>(.007) |
| Share of occupation *o* in hiring at the national level | yes | yes | yes | yes |
| KP F Test | 85.5 | 921.9 | 338.3 | 24.0 |
| Observations | 5,486,000 | 8,269,375 | 11,050,435 | 15,086,998 |

# ENDOGENEITY OF THE INSTRUMENT?

Second

- We quantify the exogeneity violation that our models may tolerate using the plausibly exogenous instrument regression method proposed by Conley et al. (2012)

- We consider

$$Y_{i,f,l,t} = \beta \log\left(HHI_{l,t}\right) + \delta C_{i,f,l,t} + [\gamma Z_{l,t} + \eta_{i,f,l,t}]$$

where $Y$ is the outcome and $C$ the set of control variables including the fixed effects

- If the true value of $\gamma$ were known, $Z$ would be a valid instrument in:

$$Y_{i,f,l,t} - \gamma^* Z_{l,t} = \beta \log\left(HHI_{l,t}\right) + \delta C_{i,f,l,t} + \eta_{i,f,l,t} \qquad \text{(A)}$$

# ENDOGENEITY OF THE INSTRUMENT?

- First, we take 0 as the upper bound of the support of $\gamma$ (Z is exogenous).
  - Consider decreasing potential values of $\gamma^*$ one by one
  - Take them as given and estimate equation (A) by 2SLS, instrumenting $\log(HHI)$ with $Z$
  - Store confidence intervals for $\beta$ at every step

- This yields the lowest value of $\gamma^*$ that would still make $\beta$ significant at the 10% level.

- Second, to get a sense of how big the violation of exogeneity may be, we estimate the reduced form equation by OLS:

$$Y_{i,f,l,t} = \alpha Z_{l,t} + \delta C_{i,f,l,t} + u_{i,f,l,t}$$

and we express the lowest value of $\gamma^*$ as a share of $\alpha$.

# LABOUR MARKET CONCENTRATION AND DAILY WAGES OF FULL-TIMERS – PLAUSIBLY EXOGENOUS INSTRUMENT REG.

| Dep. Var<br>Daily Wages | Denmark | France | Germany | Portugal |
|---|---|---|---|---|
| (1) Reduced-form estimate of $\alpha$ from eq. (5) | -.0073***<br>(.0012) | -.0171***<br>(.0013) | -.0141***<br>(.0015) | -.0041***<br>(.0009) |
| (2) Minimum $\gamma$ for which $\beta$ is significant at the 10% level in eq. (4) using 2SLS | -.0054 | -.0148 | -.0113 | -.0023 |
| (2)/(1) | .74 | .87 | .80 | .57 |

# LABOUR MARKET CONCENTRATION AND HOURLY WAGES

| Dep. Var Hourly Wages | Denmark | France | Portugal |
|---|---|---|---|
| | Panel A. Full-Timers | | |
| Log HHI | -.033*** | -.016*** | -.023*** |
| | (.008) | (.002) | (.008) |
| KP F Test | 29.1 | 721.3 | 13.9 |
| Observations | 5,989,967 | 8,233,169 | 14,678,273 |
| | Panel B. All employees | | |
| Log HHI | -.026*** | -.014*** | -.024*** |
| | (.005) | (.002) | (.008) |
| KP F Test | 46.7 | 891.5 | 15.3 |
| Observations | 8,552,216 | 11,435,329 | 16,227,766 |

# LABOUR MARKET CONCENTRATION AND DAILY WAGES OF FULL-TIMERS – IV ESTIMATES – NEW HIRES/INCUMBENTS

| Dep. Var<br>Daily Wages | Denmark | France | Germany | Portugal |
|---|---|---|---|---|
| Log HHI*New hire | -.037*** | -.024*** | -.016*** | -.024*** |
| | (.007) | (.002) | (.002) | (.009) |
| Log HHI*Incumbent | -.028*** | -.022*** | -.020*** | -.025*** |
| | (.007) | (.002) | (.002) | (.008) |
| KP F Test | 16.1 | 354.5 | 135.5 | 7.3 |
| Observations | 5,486,000 | 8,269,375 | 11,050,435 | 15,086,998 |

# LABOUR MARKET CONCENTRATION AND PROBABILITY OF BEING HIRED ON A PERMANENT CONTRACT – IV ESTIMATES

## New hires only

| Dep. Var<br>Perm. contract | France | Germany | Italy | Portugal | Spain |
|---|---|---|---|---|---|
| Log HHI | -.0206***<br>(.0046) | -.0344***<br>(.0119) | -.0037<br>(.0066) | -.0504$^{+}$<br>(.0313) | .0022<br>(.0020) |
| KP F Test | 592.6 | 255.4 | 99.3 | 13.4 | 1126.1 |
| Observations | 3,530,660 | 4,167,918 | 16,645,917 | 1,039,792 | 4,875,973 |

# LABOUR MARKET CONCENTRATION AND CONVERSIONS FROM TEMPORARY TO PERMANENT CONTRACT – IV ESTIMATES

## New hires on temporary contracts only

| Dep. Var Conversion | Italy | Spain |
|---|---|---|
| Log HHI | -.0384*** | -.0039*** |
| | (.0091) | (.0011) |
| KP F Test | 59.1 | 993.3 |
| Observations | 8,927,725 | 4,089,355 |

# HETEROGENEITY BY GENDER AND AGE

- Employers with market power may also become more selective in hiring in case of asymmetric information on the labour market.
  - They may prefer job candidates with long work experience since their resume provides a more accurate signal of their productivity.
  - So, labour market concentration may be particularly harmful to women and youth, who have shorter work experience on average.

- To test this assumption: we interact $\log(HHI)$ separately with dummies for being a man or a woman on the one hand, and with dummies for being younger or older than 25 on the other hand, in our baseline equations.

➢ We find no systematic difference either across gender or age.

Results

# POLICIES

# POLICIES

- Our results suggest that firm monopsony power, at least when brought about by concentration, tends to have significant negative effects on various aspects of workers' welfare.

- Policy interventions curbing monopsony power (e.g. by limiting employer concentration) and/or its effects are therefore likely to improve labour market outcomes.

- Two types of possible interventions:
  - Regulatory interventions (mainly concerning antitrust authorities)
    - Enforcement interventions against collusion
    - Considering labour market effects when reviewing horizontal mergers
    - Regulation of occupational licensing
    - Regulation of non-compete agreements
  - Labour policy: Indirect interventions to counterbalance/reduce the effects of monopsony power

# LABOUR MARKET COLLUSION

- Competition law forbids collusion among buyers of intermediate goods or services, including labour services. Because of this, general statistics on collusion are difficult to collect, except in the case of franchising: vertical agreements
  - Collusion is more likely and possibly more damaging in concentrated markets
- Elements of effective enforcement:
  - Explicit guidance about labour market collusion
  - Whistleblower protection and adequate leniency programmes
  - Rely on public enforcement
- European difficulty:
  - Sectoral collective bargaining (wage-fixing agreements vs. coordination before/during negotiations)

# HORIZONTAL MERGERS

- Potentially colluding companies could avoid unlawful labour market collusion by simply merging.
  - Antitrust authorities and courts, however, have paid relatively little attention to the effects of mergers in the labour market
  - Role of threshold for high concentration in triggering attention. However, a recent literature, including this paper shows that negative effects occurs also at low concentration
- Elements of effective enforcement:
  - Explicit reference to effects in the labour market in HMG.
  - Consider also mergers where firms are not direct competitors in the downstream market
  - Invest resources in identifying the relevant labour market
  - Refrain from adopting a too cautious approach to evaluating non-measurable effects

# COLLECTIVE BARGAINING

- Bilateral monopolies can typically yield efficient bargaining results.
  - US evidence from the 1970s: strong unions plus concentration leads to efficient bargaining.
  - Recent studies show that the elasticity of wages to concentration is smaller in markets that are more unionized (USA, UK, France, Norway)
  - The wage elasticity has increased over time both in the USA and Europe, even if concentration has remained approx. constant.
  - Speculation (and avenue for further research): the decline of collective bargaining has led to stronger effects of concentration.

Chart

- Revamping collective bargaining to limit monopsony power:
  - Reverse government policy which has been partly responsible in the 1990s and 2000s of the decline in collective bargaining
  - Facilitate collective bargaining for workers in the grey area between employment and self-employment

# MINIMUM WAGE

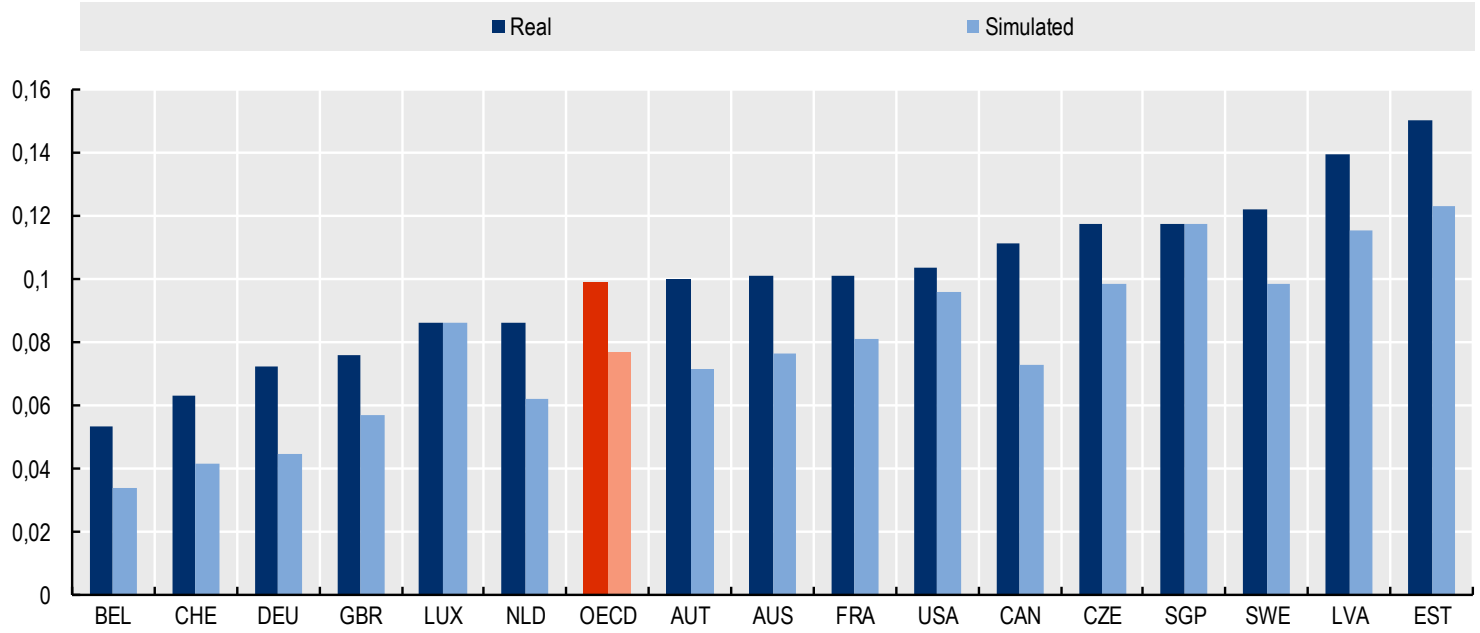
- Under monopsony, a moderate, binding minimum wage (MW) can increase both wages and employment (e.g. Manning, 2003).
  - Without MW, employment is lower than in the competitive equilibrium because the curve representing the marginal cost of labour is above (and steeper than) the supply curve.
  - Moderate levels of the MW shift down the marginal cost curve and make it flatter.
  - As a result, employment is higher than without MW and more reactive to labour demand.
- Empirical evidence:
  - Many studies have found no or small disemployment effects of MW increases when it is maintained at moderate levels (e.g. Dube – UK Treasury Review, 2019)
  - Azar et al. (2019) and Popp (2021) find lower disemployment effects in conc. markets.
  - Johnson and Lipsitz (2022) find lower disemployment effects in US states with more enforceable non-compete agreements

# IS REMOTE WORK THE PANACEA?

- Reducing barriers to mobility beyond the worker's travel-to-work area can expand the worker's set of outside options. Policies to promote remote work could do the same.
- How much remote work can reduce concentration? Small effect

**Simulated impact on avg. concentration if all teleworkable jobs could be practised remotely**

Herfindahl-Hirschman Index (HHI), and simulated HHI when occupations amenable to telework can search for job vacancies nationally rather than only locally



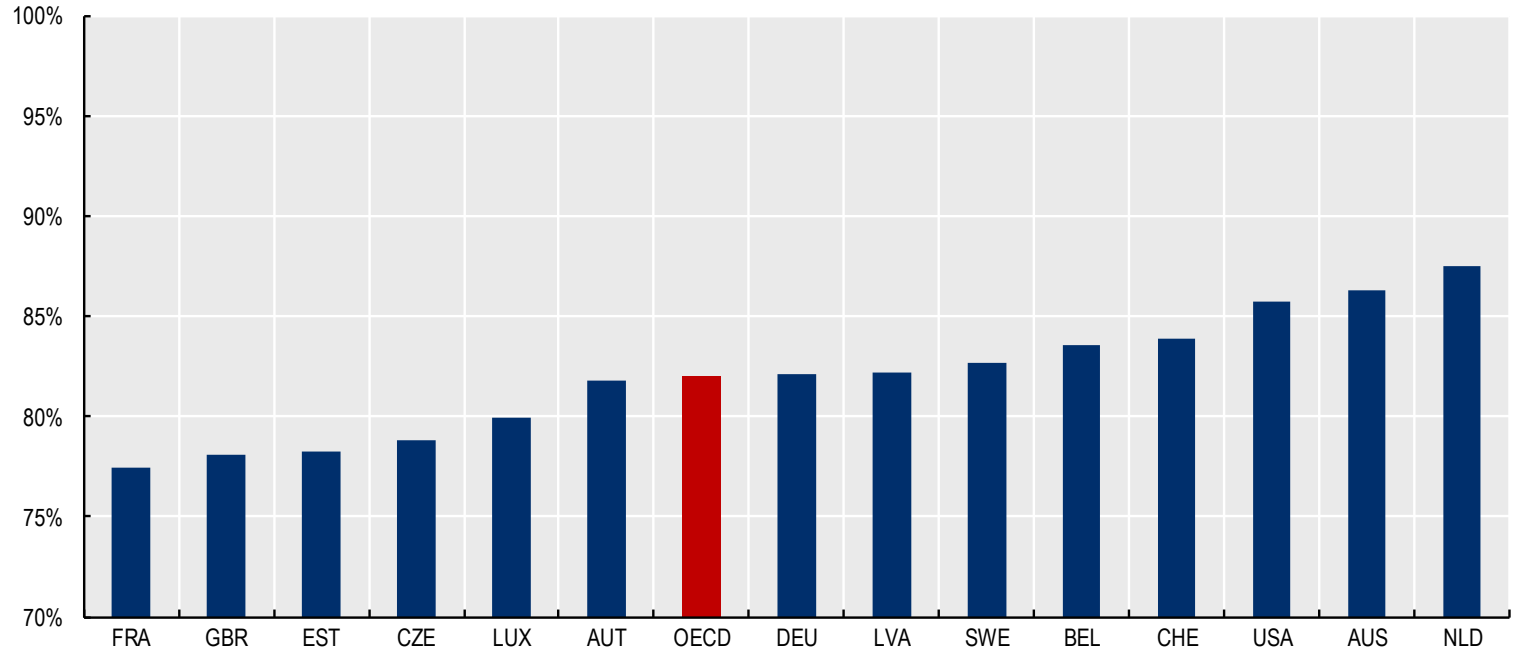

Source: OECD Employment Outlook 2022, based on Basso et al. (2022) and EMSI-BGT online job vacancy data

Chart

# SKILL POLICY CAN HELP BUT IT IS COSTLY IN THE SHORT-RUN

- Training for close but less concentrated occupations may enlarge outside options. OECD simulation exercise: training to the closest 3-digit occupations (if requiring less than 6 months of training & other conditions) enlarges the local labour market and reduces the avg. HHI by 18%
- However, possible only for 1/3 of occupations, for an average of 2.9 months of training.

Ratio of Herfindahl-Hirschman Index (HHI) and simulated HHI when it is possible to retrain and also seek employment in the occupation with the most similar skill bundle (within the limit of 6 months of retraining). 100%= Standard HHI.




Source: OECD Employment Outlook 2022

# CONCLUSIONS

# SUMMARY

- We show that:
  - The distribution of labour market concentration is similar across countries.
  - Despite different labour market institutions, the elasticities of wages with respect to labour market concentration are very similar across countries, ranging from -0.019 in Germany to -0.029 in Denmark.
  - Higher labour market concentration reduces the probability of being hired on a permanent contract in France, Germany and Portugal, with elasticities as large as -0.046, -0.051 and -0.234.
  - In Italy and Spain, we detect no significant effect of labour market concentration on the probability of being hired on a permanent contract. In contrast, we find that higher concentration significantly reduces the probability of being converted to a permanent contract once hired on a temporary one.

# CONCLUSIONS

- Our results suggest that labour market concentration not only negatively affects wages but also degrades other dimensions of job quality and, in particular, job security.

- Policy interventions limiting employer concentration and/or its effects are therefore likely to improve labour market outcomes. These may include:
  - Enforcement actions by antitrust authorities, such as taking systematically into account labour market outcomes in merger reviews and cracking down on labour market collusion.
  - Labour policy: facilitate collective bargaining, raising the minimum wage, and policies to improve mobility, incl. remote work and training.

- These policies are on the radar of most policy-makers. But there is still much scope for improvement along these lines in most European countries.

THANK YOU FOR YOUR ATTENTION !

# MUNICIPALITY SIZE

- Municipalities are of different sizes across countries:
  - France: 1,751 individuals on average
  - Portugal: 32,968 individuals
  - Denmark: 59,402 individuals

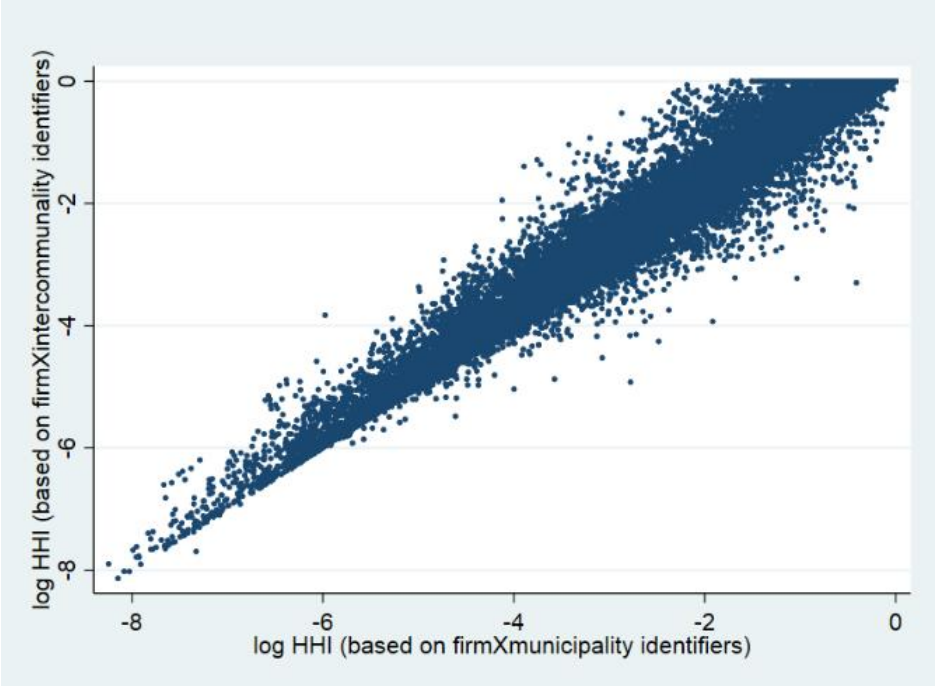
- HHIs computed based on firm*municipality identifiers not comparable?

- French data
  - *Cantons*: 33,579 individuals
  - *Intercommunalités*: 53,497 individuals

# CORRELATION BETWEEN LOG(HHI) CONSTRUCTED USING FIRM*MUNICIPALITY AND FIRM*OTHER GEOGRAPHICAL AREAS

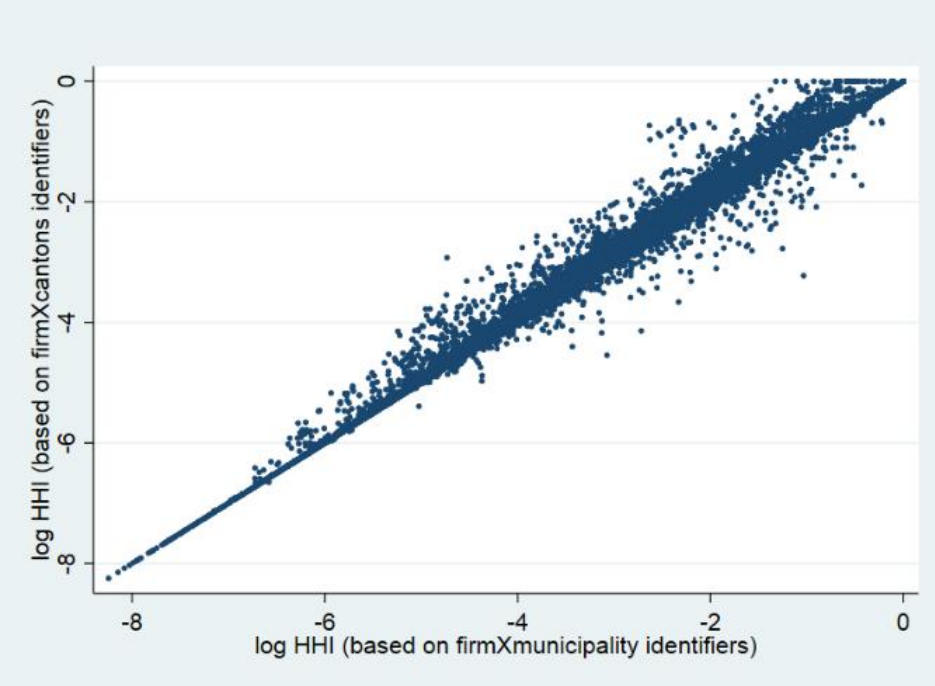
## France only

Panel A: Firm*_Intercommunalité_ identifiers




Regression coefficient: 0.9303887; R-squared: 0.9702

Panel B: Firm*_Canton_ identifiers




Regression coefficient: 0.9970262; R-squared: 0.9970

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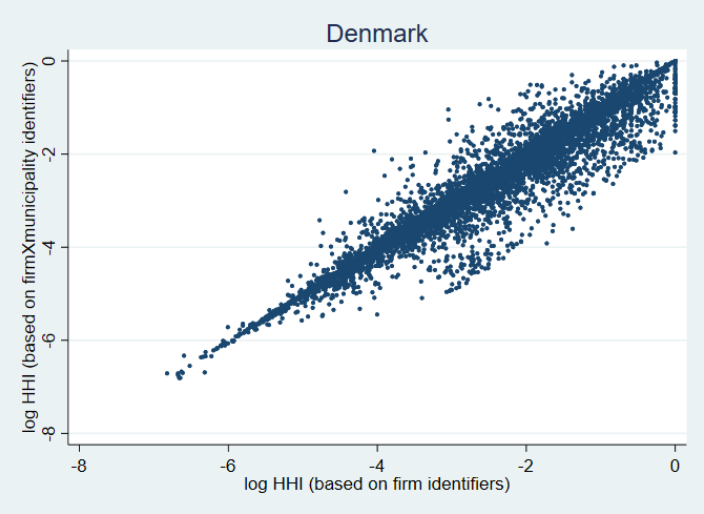
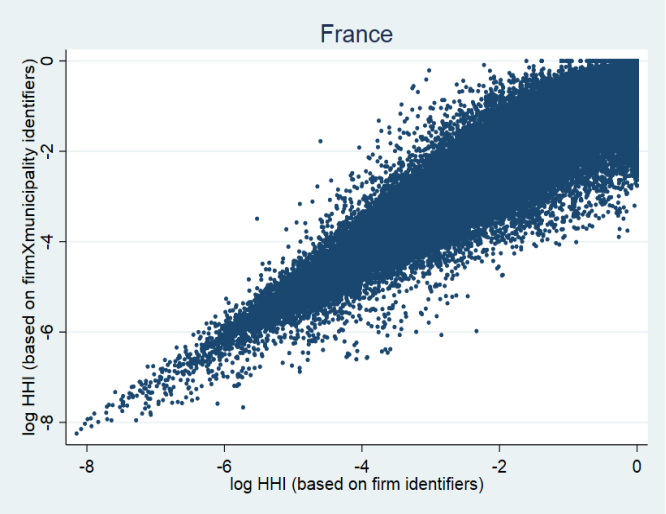
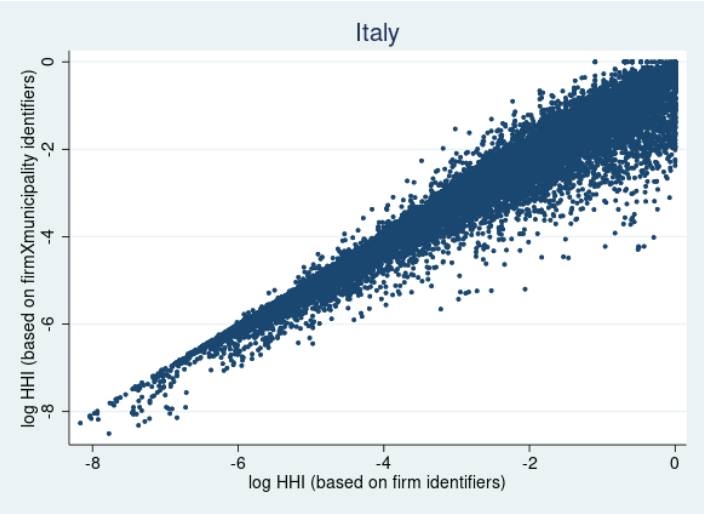
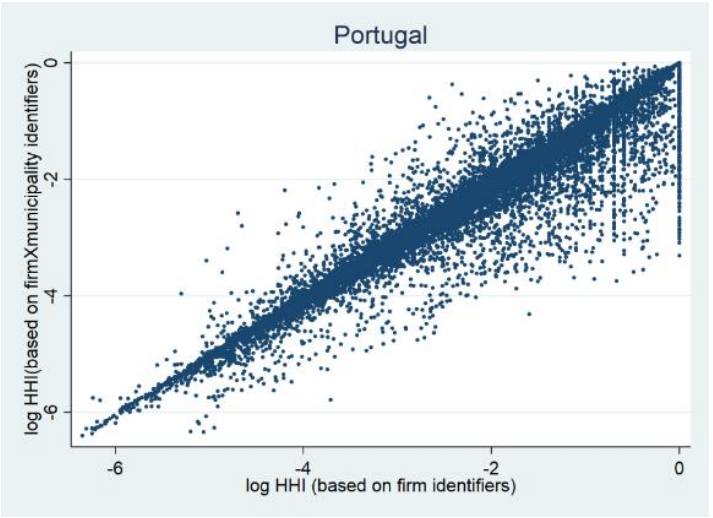
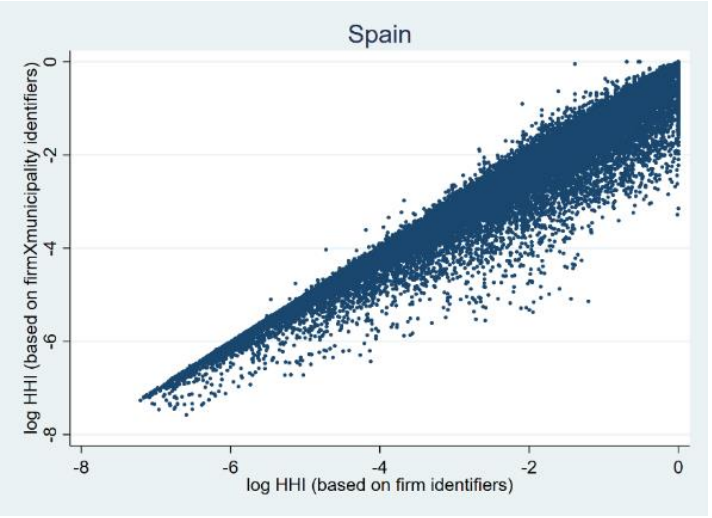
# CORRELATION BETWEEN LOG(HHI) CONSTRUCTED USING FIRM AND FIRM*MUNICIPALITY

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# DEFINITIONS OF NEW HIRES

- In France, Germany and Italy: an individual who is employed in a firm*municipality (with at least 1 month of tenure) at year $t$ and was not employed in the same firm*municipality at $t-1$.
- In Denmark: an employee who is employed in a firm*municipality in November of year $t$ (with at least 1 month of tenure by the end of the month) and was hired between December of year $t-1$ and October of year $t$.
- In Portugal: an employee who is employed in a firm*municipality in October of year $t$ and was hired between November of year $t-1$ and August of year $t$.
- In Spain: an employee who started a contract (whose expected duration was at least 1 month) at year $t$ and did not start a contract in the previous 12 months with the same employer.

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# ALTERNATIVE DEFINITIONS OF NEW HIRES

- In France, Germany and Italy: in main specification new hires = workers who are employed for at least 1 month at the firm*municipality in year $t$ and were not employed there in year $t-1$.
- Robustness check: we alternatively define new hires using a month*year concept, i.e. as workers who are employed at the firm*municipality in month $m$ of year $t$ (with tenure being at least 1 month) and were not employed by the same employer in the same month of year $t-1$.
- Reference month $m$ chosen for this exercise is December in Germany and November in France and Italy.
- Correlation coefficients between $log\ (HHI)$ computed for new hires defined on the basis of a month*year concept and $log(HHI)$ computed for new hires defined on the basis of a year concept are 0.99 for France and Germany and 0.97 for Italy.
- The point estimates obtained when regressing $log(HHI)$ computed for new hires defined on the basis of a month*year concept on $log(HHI)$ computed for new hires defined on the basis of a year concept are 1.005 for France, 0.992 for Germany and 0.945 for Italy.

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# WAGES AND WORK CONTRACTS

- Wages: DNK, FR, GE and PRT.
  - Daily wages for DNK, FR and GE; monthly wages for PRT. Full timers only.
  - Hourly wages for DNK, FR and PRT.
  - ➢ Trim top and bottom 1% of the distribution.

- Type of contract (permanent vs temporary) upon hiring: FR, GE, IT, PRT, SP
  - ➢ Dummy variable equal to 1 if hired on a permanent contract; 0 otherwise.

- Conversions from temporary to permanent contracts: IT and SP.
  - ➢ Dummy variable equal to 1 if the individual was hired on a temporary contract at year $t$ and started a permanent employment spell with the same employer by the end of the following calendar year; 0 otherwise.

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# REGRESSION SAMPLE

- HHI constructed using the entire population.
- But regressions sometimes run on random subsamples in FR (1/12), GE (10%) and SP (15%).
  - In the case of FR we are limited by the fact that panel information available only for the subset of workers born in October

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# CONTROL VARIABLES

- Main fixed effects: individual, employer(firmXmunicipality)Xtime, local labour market (geographical areaXoccupation)

- Control variables: age, gender and education, part time/full time, industry, establishment + whether employed the year before if new hire

D-Stats

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# DESCRIPTIVE STATISTICS – FULL SAMPLE

| Variable | DNK | FRA | GE | PRT |
|---|---|---|---|---|
| *Full-time work* | | | | |
| Mean | .7923 | .7233 | .6354 | .9345 |
| Standard Deviation | .4056 | .4474 | .4813 | .2475 |
| *New Hires* | | | | |
| Mean | .2682 | .3038 | .2145 | .2330 |
| Standard Deviation | .4430 | .4599 | .4105 | .4227 |

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# DESCRIPTIVE STATISTICS – NEW HIRES

| Variable | DNK | FRA | GE | IT | PRT | SP |
|---|---|---|---|---|---|---|
| *Employed year before* | | | | | | |
| Mean | .6789 | .7273 | .7171 | .6405 | .3819 | .2809 |
| Standard Deviation | .4669 | .4453 | .4504 | .4799 | .4859 | .4494 |
| *Permanent contract* | | | | | | |
| Mean | - | .4444 | .6693 | .3161 | .2157 | .1614 |
| Standard Deviation | - | .4969 | .4705 | .4650 | .4113 | .3679 |
| *Converted to permanent contract* | | | | | | |
| Mean | - | - | - | .1596 | - | .0570 |
| Standard Deviation | - | - | - | .3662 | - | .2318 |

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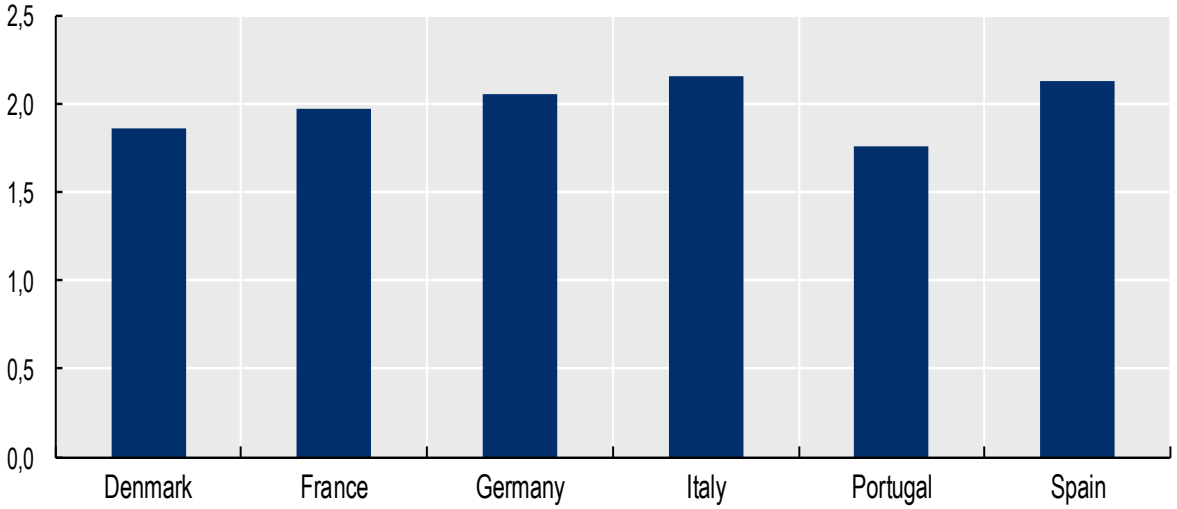
# RATIO OF THE STANDARD DEVIATION TO THE MEAN OF LABOUR MARKET CONCENTRATION

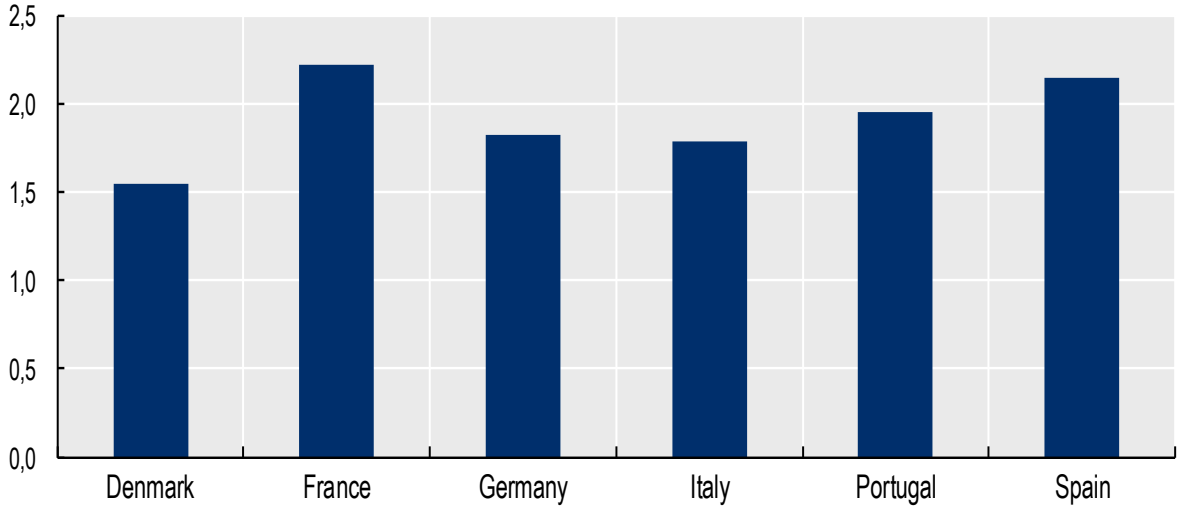
## Administrative data, this paper

HHI based on hirings, functional areas and annual data. Selected countries, 2010-2019




## Scraped vacancies, OECD/BGT data

HHI based on online job postings, NUTS3 regions and quarterly data. Selected countries, 2019

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# LABOUR MARKET CONCENTRATION AND DAILY WAGES OF FULL-TIMERS – OLS ESTIMATES

| Dep. Var<br>Daily Wages | Denmark | France | Germany | Portugal |
|---|---|---|---|---|
| Log HHI | -.0020<br>(.0006) | -.0007**<br>(.0003) | -.0003<br>(.0002) | -.0007***<br>(.0002) |
| Observations | 6,740,546 | 8,269,430 | 11,050,435 | 15,087,543 |

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# ROBUSTNESS CHECKS – DAILY WAGES

- Labour market concentration based on firm (rather than firm*municipality) concept.
- Local labour markets based on FUAs.
- Local labour markets based on NUTS3

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# LABOUR MARKET CONCENTRATION AND DAILY WAGES OF FULL-TIMERS – IV ESTIMATES – NATIONWIDE FIRMS

| Dep. Var<br>Daily Wages | Denmark | France | Portugal |
|---|---|---|---|
| Log HHI | -.051**<br>(.020) | -.024***<br>(.002) | -.021***<br>(.008) |
| KP F Test | 8.0 | 558.7 | 15.6 |
| Observations | 5,483,456 | 8,266,589 | 15,074,086 |

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# LABOUR MARKET CONCENTRATION AND DAILY WAGES OF FULL-TIMERS – IV ESTIMATES

## Local labour markets based on FUAs

| Dep. Var<br>Daily Wages | Denmark | France | Germany | Portugal |
|---|---|---|---|---|
| Log HHI | -.034***<br>(.008) | -.022***<br>(.002) | -.017***<br>(.003) | -.028***<br>(.009) |
| KP F Test | 35.5 | 540.9 | 214.9 | 17.5 |
| Observations | 3,640,305 | 6,973,615 | 8,472,227 | 9,902,973 |

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# LABOUR MARKET CONCENTRATION AND DAILY WAGES OF FULL-TIMERS – IV ESTIMATES

## Local labour markets based on NUTS3 regions

| Dep. Var<br>Daily Wages | Denmark | France | Germany | Portugal |
|---|---|---|---|---|
| Log HHI | -.030***<br>(.004) | -.023***<br>(.001) | -.021***<br>(.002) | -.017<br>(.011) |
| KP F Test | 86.3 | 2695.1 | 547.5 | 6.5 |
| Observations | 7,279,543 | 9,564,667 | 11,037,434 | 17,362,165 |

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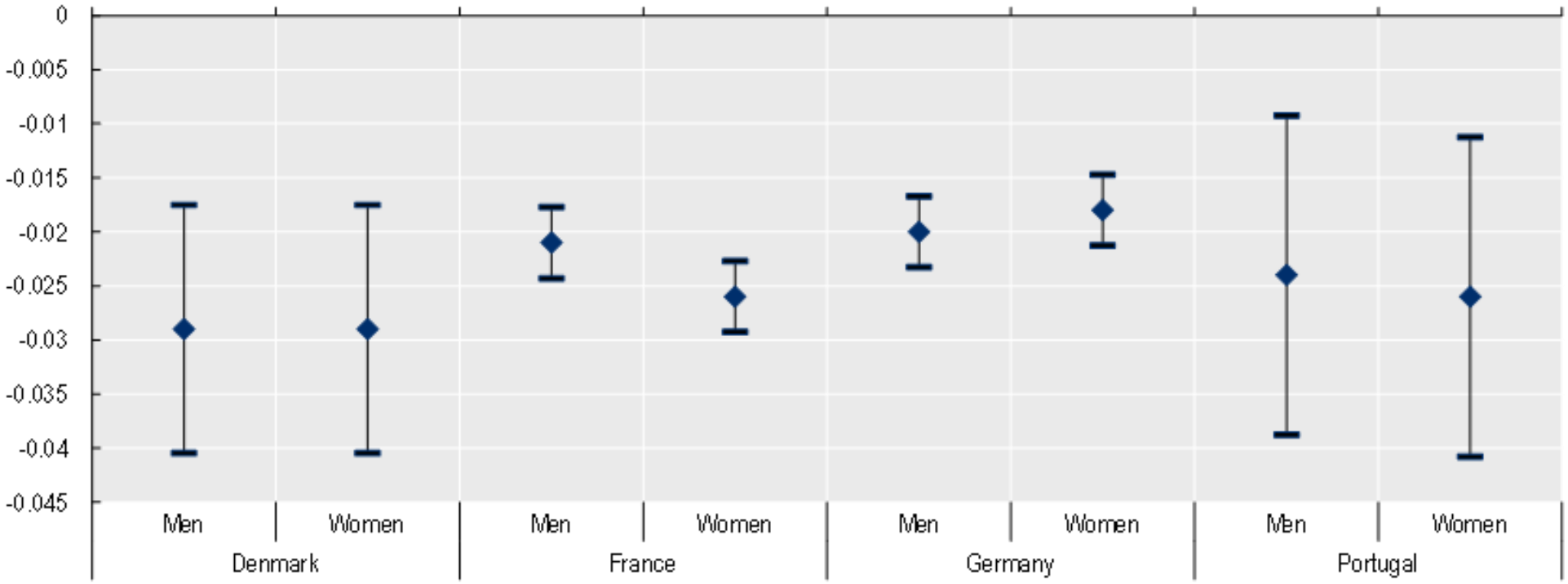
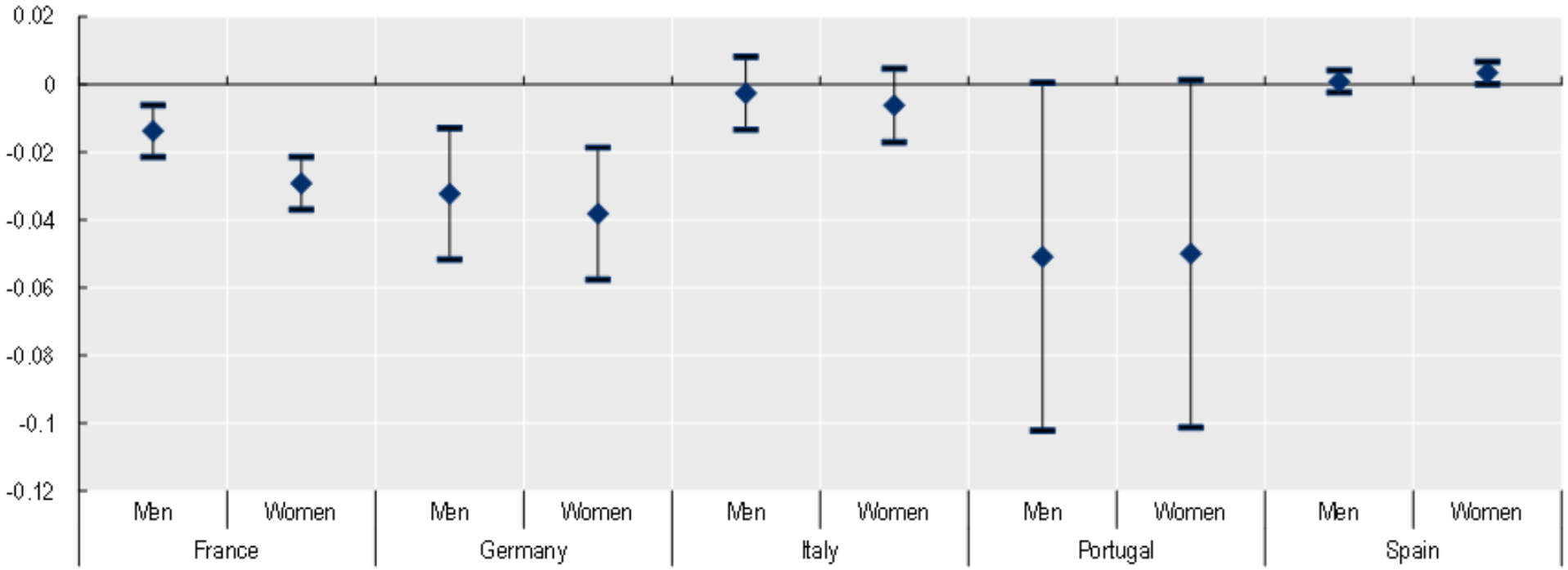
# EFFECT OF LABOUR MARKET CONCENTRATION BY GENDER

## Daily wages of full-timers



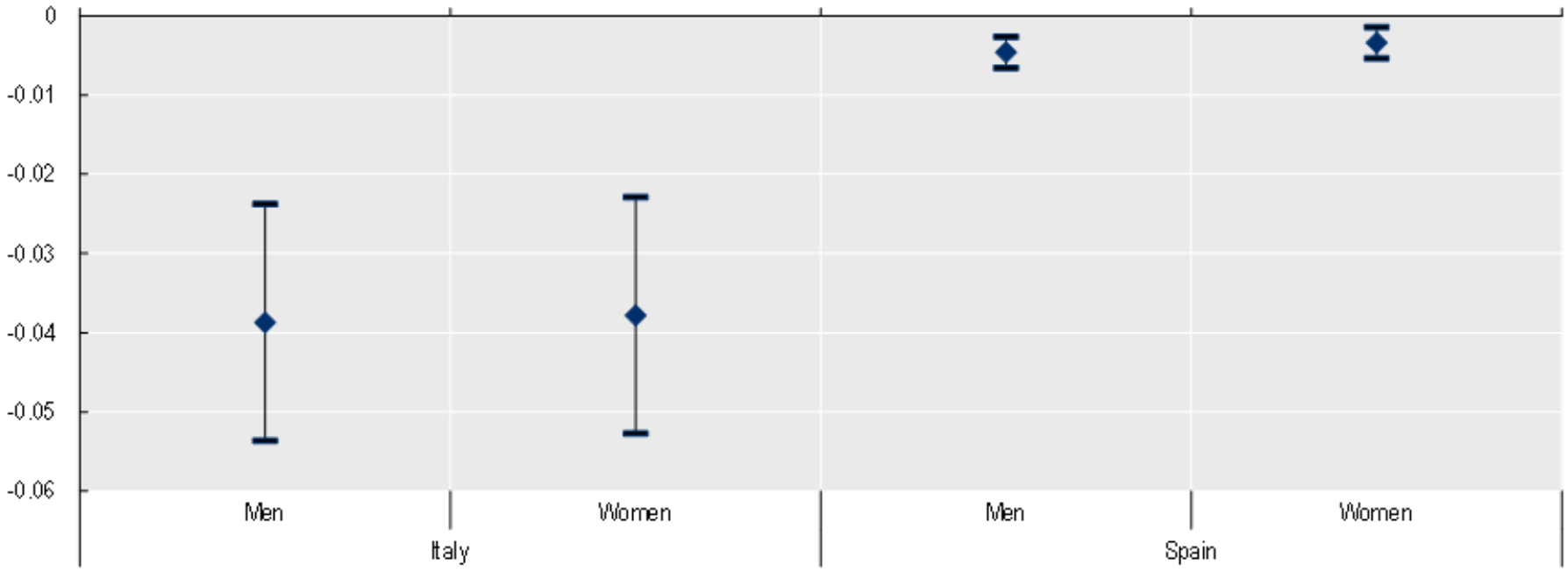
# EFFECT OF LABOUR MARKET CONCENTRATION BY GENDER

## Probability of being hired on a permanent contract (new hires only)



# EFFECT OF LABOUR MARKET CONCENTRATION BY GENDER

## Probability of being converted to a permanent contract (new hires on temporary contracts only)

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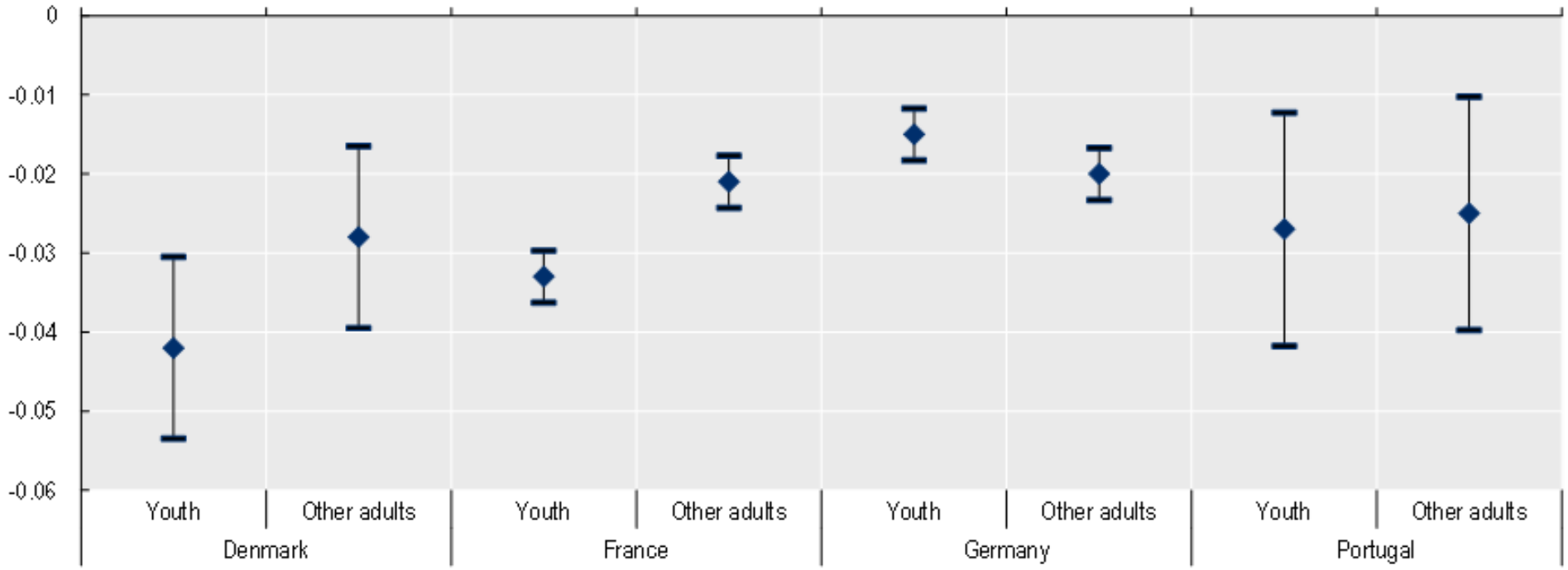
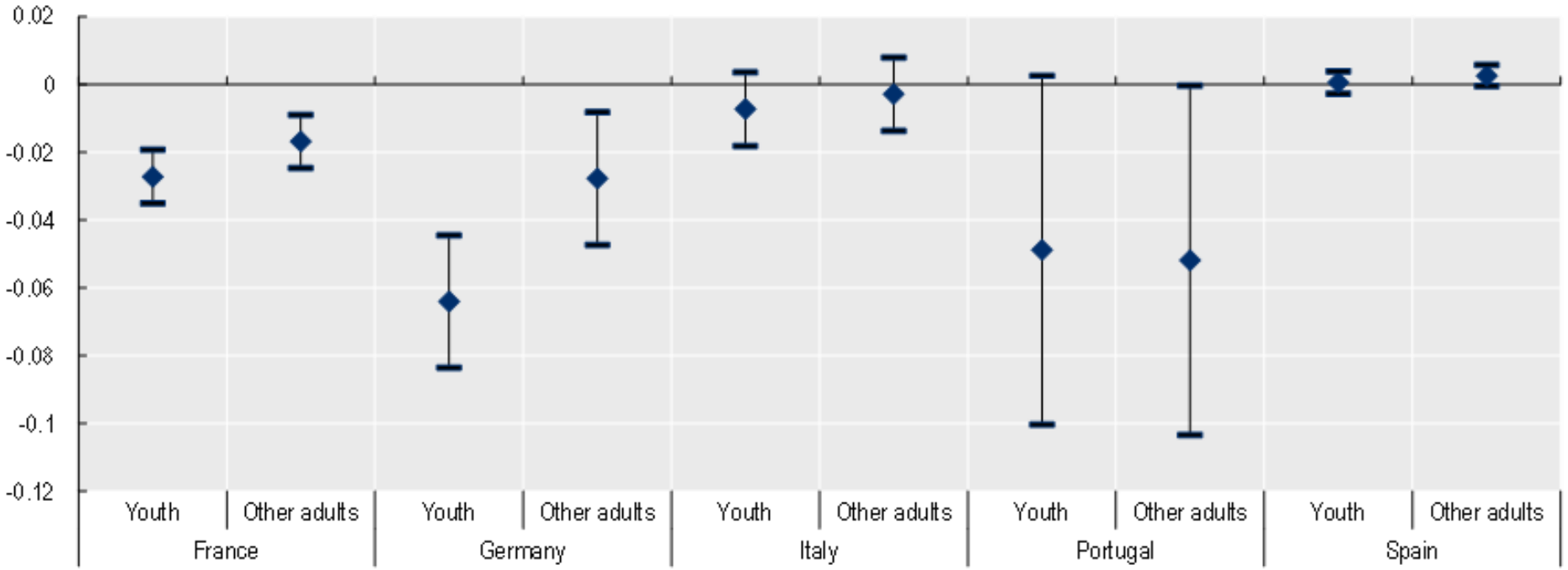
# EFFECT OF LABOUR MARKET CONCENTRATION BY AGE

## Daily wages of full-timers



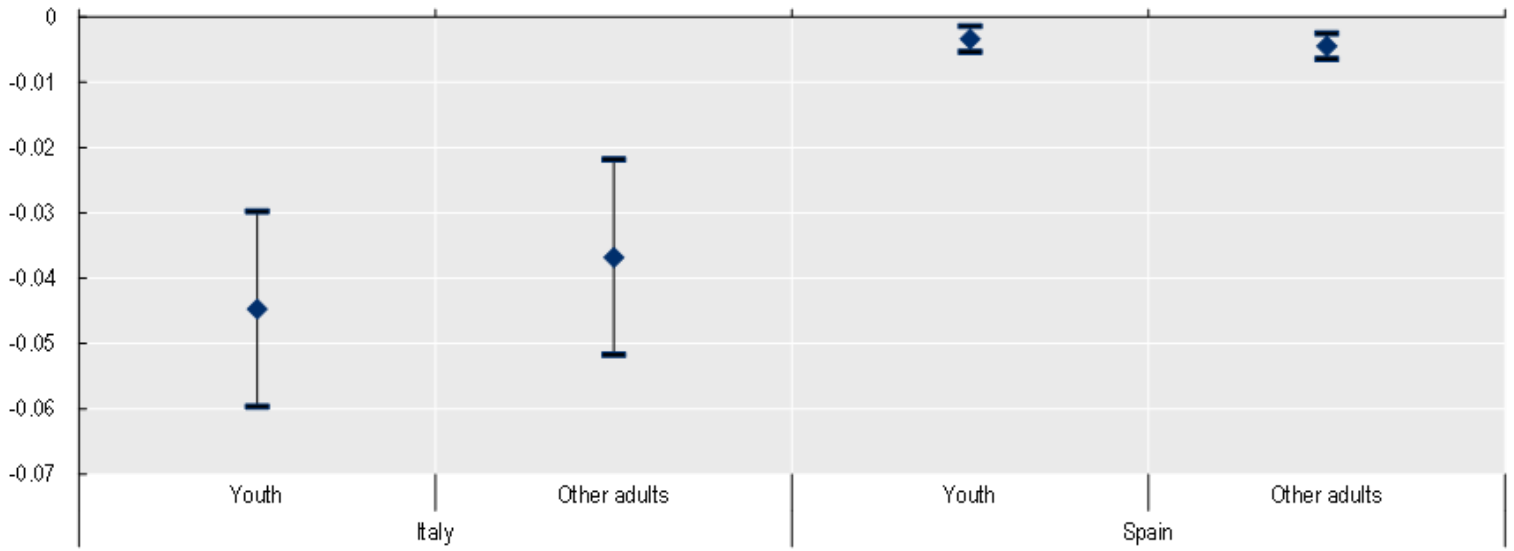
# EFFECT OF LABOUR MARKET CONCENTRATION BY AGE

## Probability of being hired on a permanent contract (new hires only)



# EFFECT OF LABOUR MARKET CONCENTRATION BY AGE

## Probability of being converted to a permanent contract (new hires on temporary contracts only)

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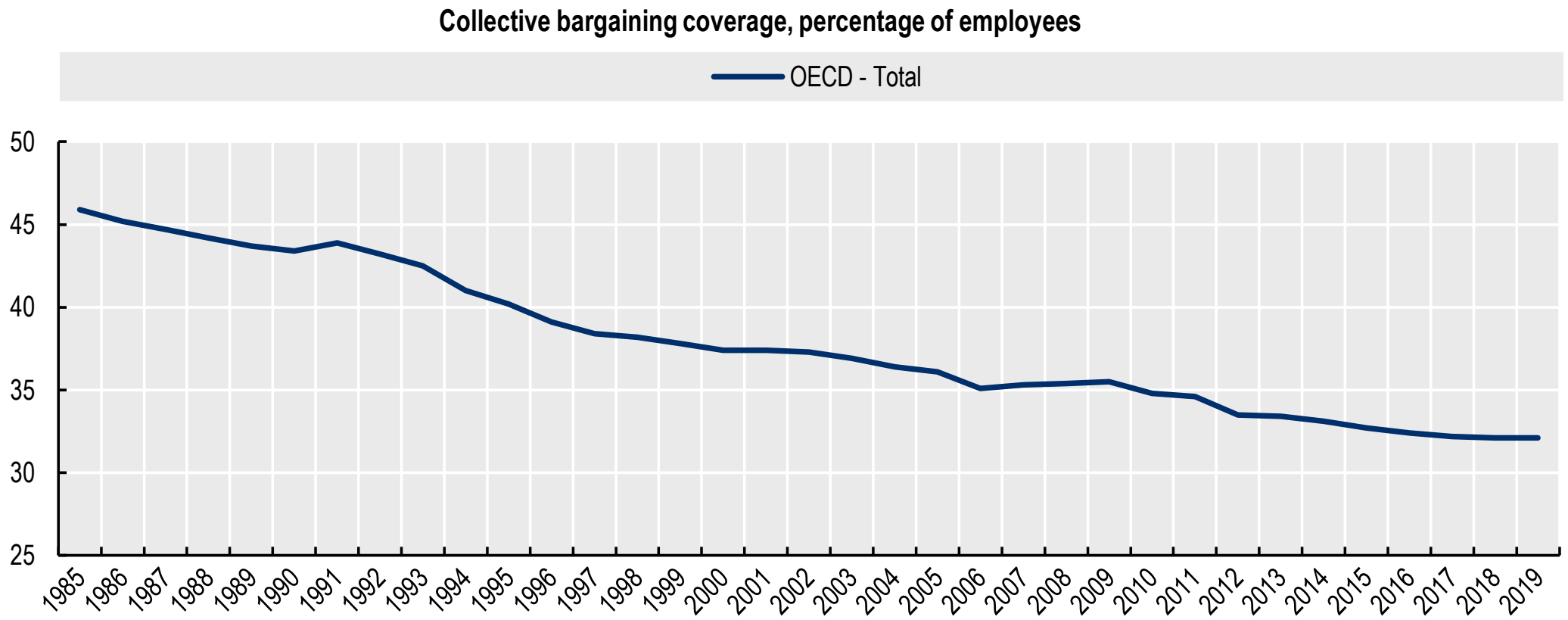
# DECLINE OF COLLECTIVE BARGAINING COVERAGE

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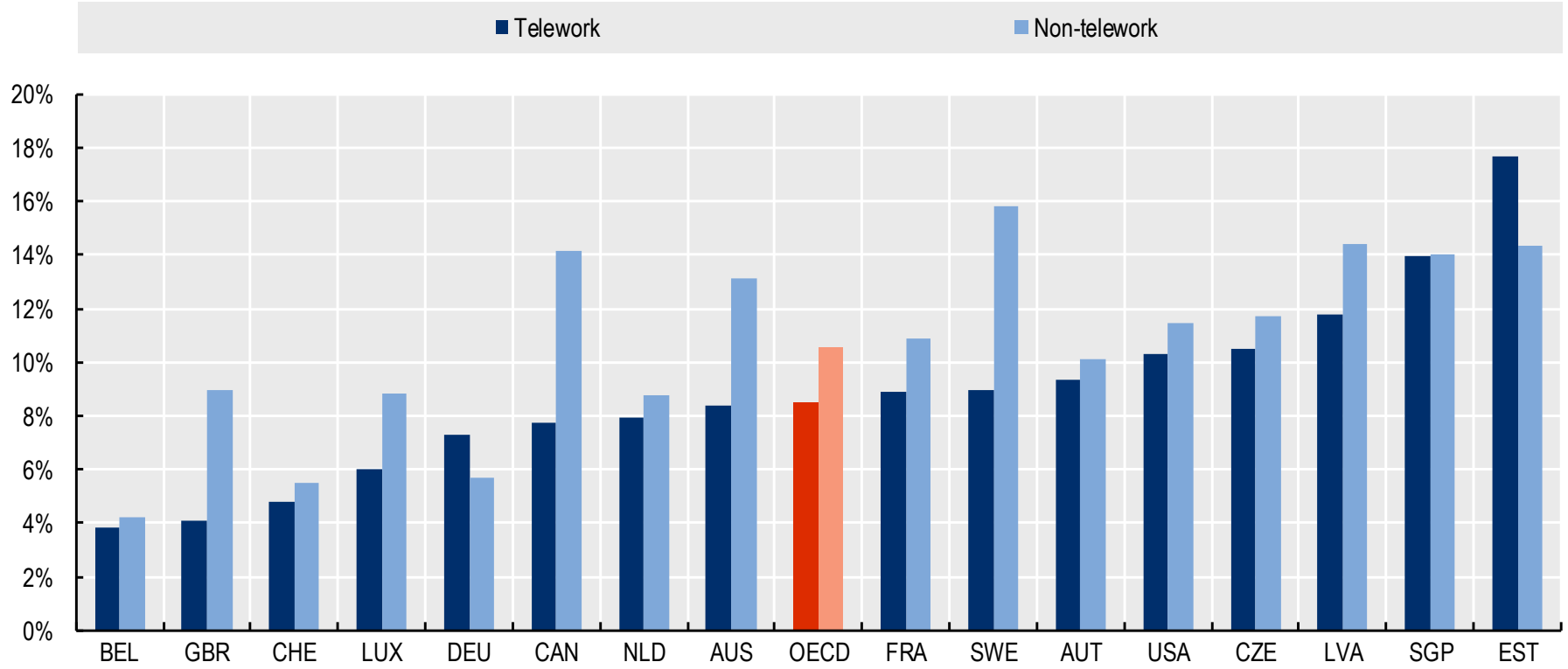
Source: OECD/AIAS ICTWSS collective bargaining database

# CONCENTRATION IN TELEWORKABLE OCCUPATIONS

## Workers who can telework face less concentrated labour markets

The share of employment in highly concentrated labour markets (HHI>0.25) in the business sector by whether the occupation is amenable to telework, 2019




Source: OECD Employment Outlook 2022, based on Basso et al. (2022) and EMSI-BGT online job vacancy data

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