Variation in the impact of Explicit Oligopsony by Occupation

Matthew Dey and Elizabeth Weber Handwerker

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Background

- Great interest in why wages have not been rising faster
- Explosion of recent empirical work measuring explicit employer oligopsony power
  - Azar, Marinescu, & Steinbaum (2017 now 2019); Benmelech, Bergman, & Kim (2018 now 2019); Azar, Marinescu, Steinbaum, & Taska (2018); Lipsius (2018); Rinz (2018); Hershbein, Macaluso, & Yeh (2019); Qiu & Sojourner (2019); Berger, Herkenhoff, & Mongey (2019); Schubert, Stansbury, & Taska (2019); Azar, Marinescu, & Steinbaum (2019)
  - These (and other) papers show:
    - Oligopsony power is associated with lower wages, BUT
    - Explicit oligopsony power is pretty low in highly-populated areas of the US
    - On average, explicit oligopsony power has been falling in the last couple of decades (except in manufacturing)
- We examine heterogeneity by occupation—which have high levels of explicit oligopsony power? Which see it rising? In which does it matter more for wages?

Outline

- Using BLS Microdata to Measure Local Employer Concentration (Explicit Oligopsony power)
- Heterogeneity by occupation in local concentration levels
- Heterogeneity by occupation in trends
- Wage regressions and heterogeneity by occupation

Data Construction

- Use the confidential microdata of the Occupational Employment Statistics (OES), a very large employer survey, for May 2005 – May 2017
  - Sample size of 400,000 establishments per year
  - occupational distribution (6-digit) by wage group collected from employers
- Measuring labor market concentration requires universe data on employment by occupation by employer for each geographic area
  - Use OES sample frame: Quarterly Census of Employment and Wages (QCEW)
    - The QCEW includes location, industry, & total employment size by quarter for nearly all civilian establishments in the U.S., with EIN as best-available employer identifier
    - We borrow the geography of the OES sample: MSAs and "Balance-of-State" areas
  - Use QCEW information to impute OES responses for all non-responding *and non-sampled* establishments

Impute with nearest neighbor matching

- Impute occupation and wage distribution for non-responding establishments and similarly for non-sampled establishments
  - If available, use OES response from the previous two and a half years, as long as industry is unchanged and size is similar (8% of establishments, 28% of employment)
  - Otherwise, use establishments with the same EIN, same detailed industry, similar size, and same MSA or Balance-of-State-Area, (7% of establishments, 3% of employment)
  - Otherwise … same detailed industry, similar size, and same MSA or Balance-of-State-Area (52% of establishments, 31% of employment)
  - Otherwise … same detailed industry and similar size within the same state (27% of establishments, 22% of employment)
  - Otherwise … same detailed industry and similar size from out of state (6% of establishments, 17% of employment)

Measuring Employer Power

Follow Azar et al., Qiu & Sojourner: Local occupation concentration

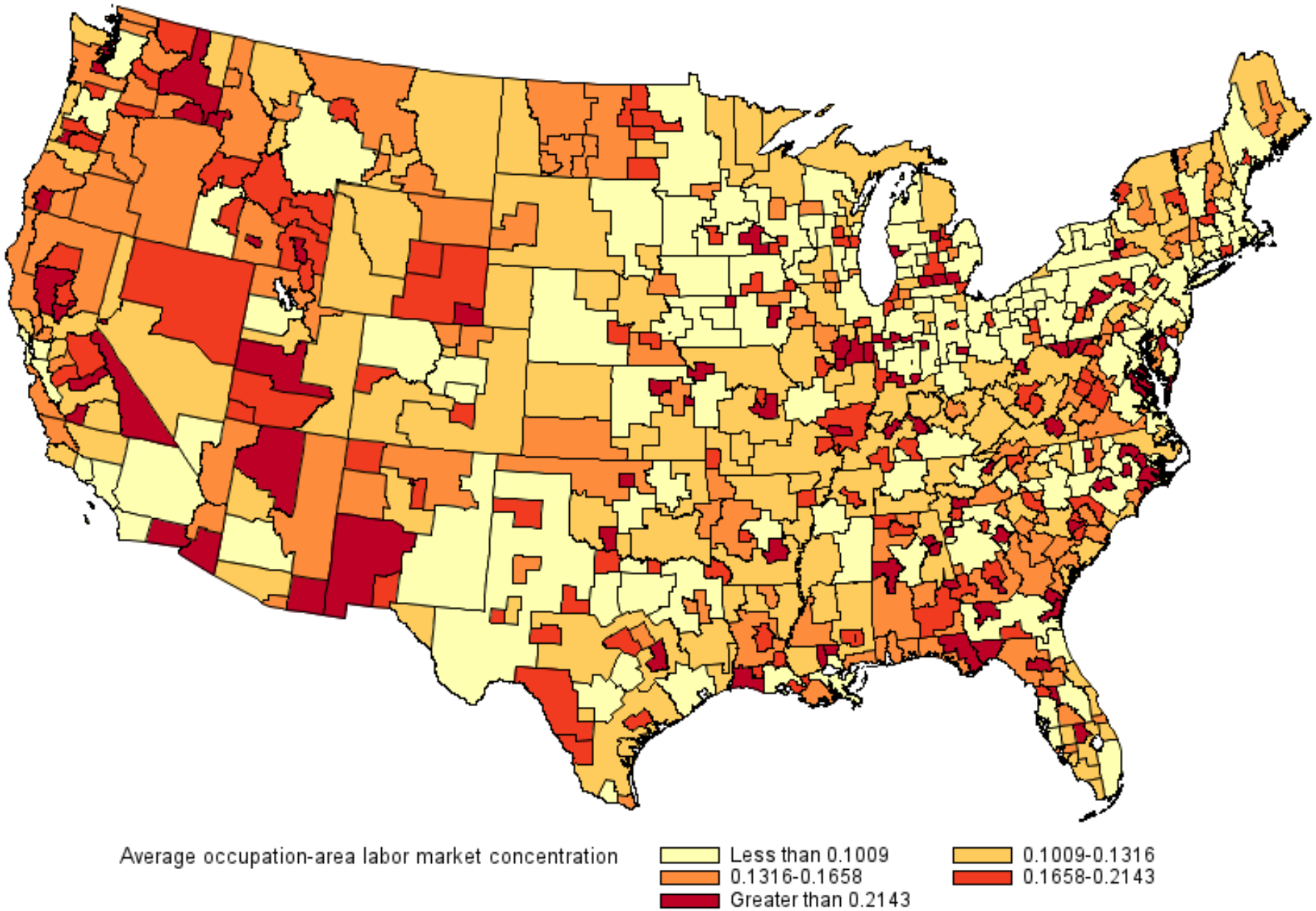
- HHI index by occupation for each geographic area
  - But as suggested by Berger, Herkenhoff, & Mongey, use payroll shares rather than employment shares:

$$HHI_{og} = \sum_{e \in \Omega} \left(payroll\ share_{e\ o\ g} \right)^2$$

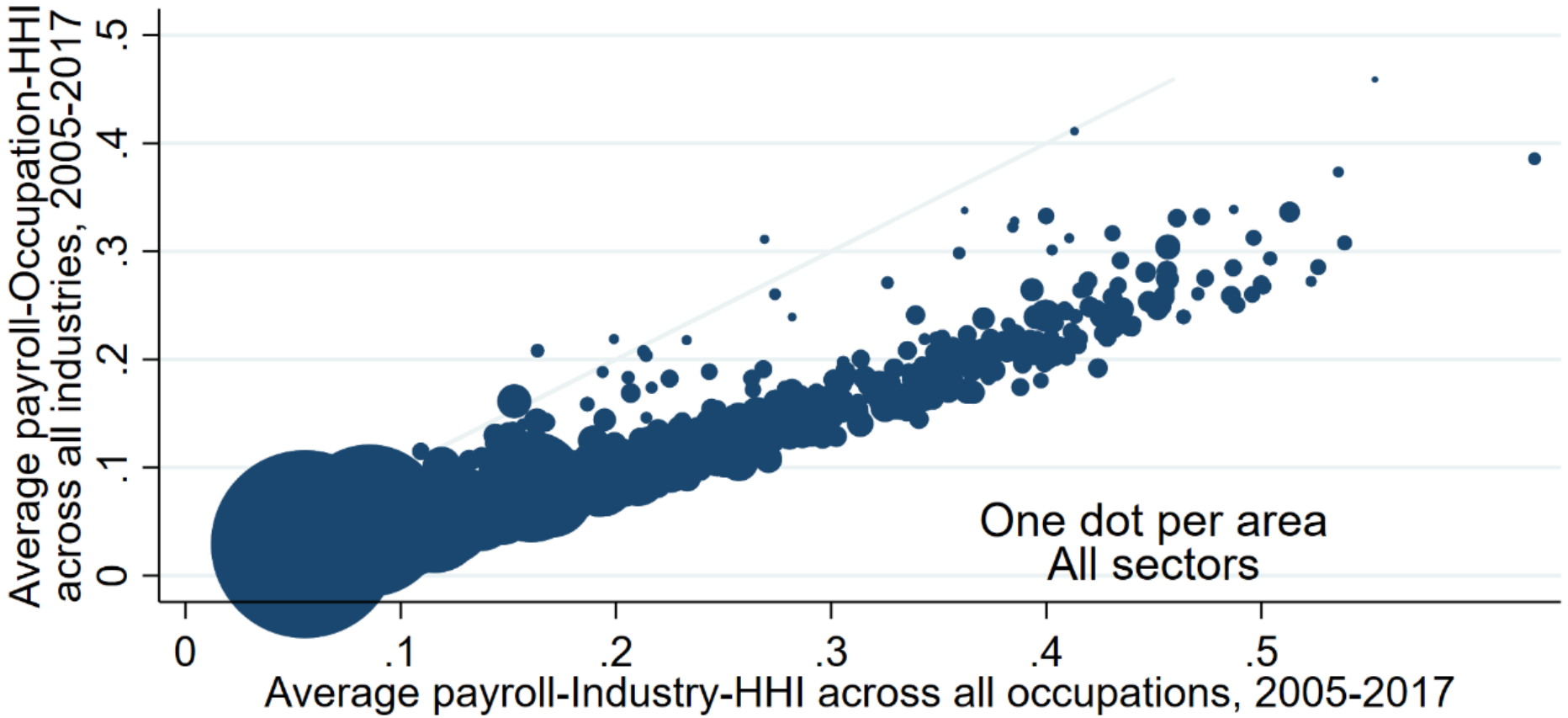
- Combine 41 occupations that have no entry requirements (according to O*Net)

  Fast food workers, cashiers, plasterers, meat trimmers, rock splitters, taxi drivers

2017 Average occupation-level HHI by CBSA/BOS, based on payroll shares



Industry & Occupation-level HHIs are *highly* correlated for areas



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Among Large Private-sector Occupations, 2017

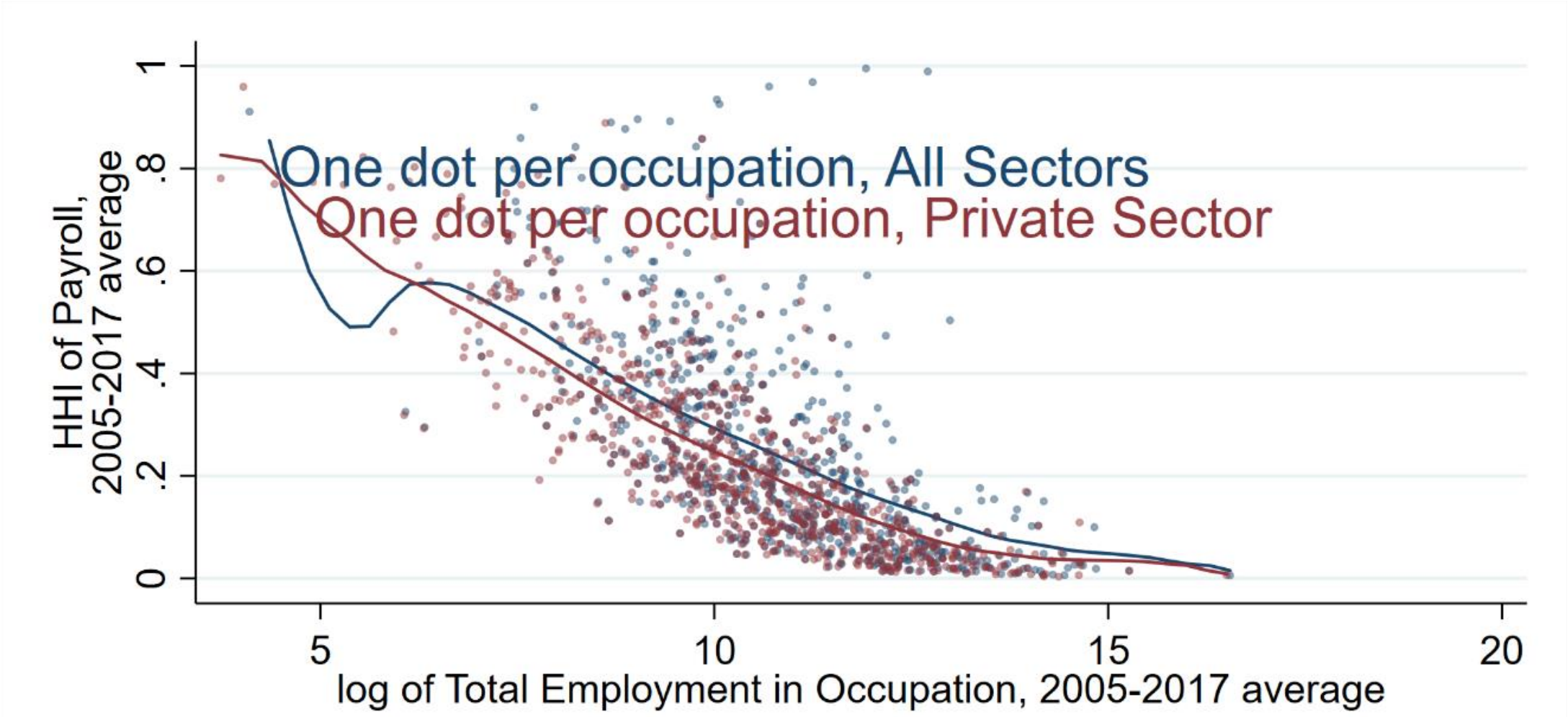
Highest Avg Concentration Levels

1. 49-3011: Aircraft Mechanics and Service Technicians
2. 53-7063: Machine Feeders and Offbearers
3. 43-4181: Reservation and Transportation Ticket Agents and Travel Clerks
4. 41-9041: Telemarketers
5. 49-9052: Telecommunications Line Installers and Repairers
6. 39-9021: Personal Care Aides
7. 17-2072: Electronics Engineers, Except Computer
8. 29-2010: Clinical Laboratory Technologists and Technicians

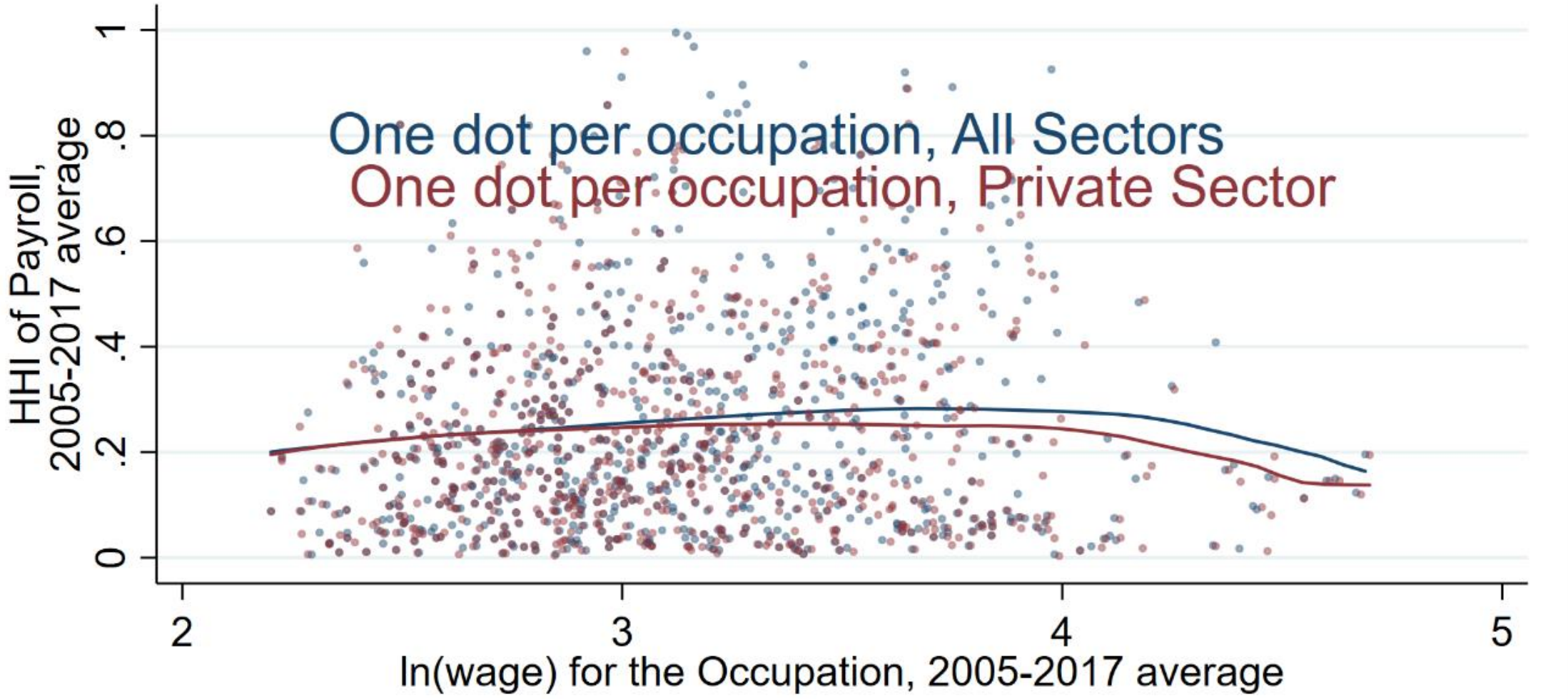
Lowest Avg Concentration Levels

1. 11-1021: General and Operations Managers
2. 43-3031: Bookkeeping, Accounting, and Auditing Clerks
3. 43-9061: Office Clerks, General
4. Occupations with no entry requirements
5. 43-6014: Secretaries and Administrative Assistants, Except Legal, Medical, and Executive
6. 35-1012: First-Line Supervisors of Food Preparation and Serving Workers
7. 41-4012: Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products
8. 35-2014: Cooks, Restaurant

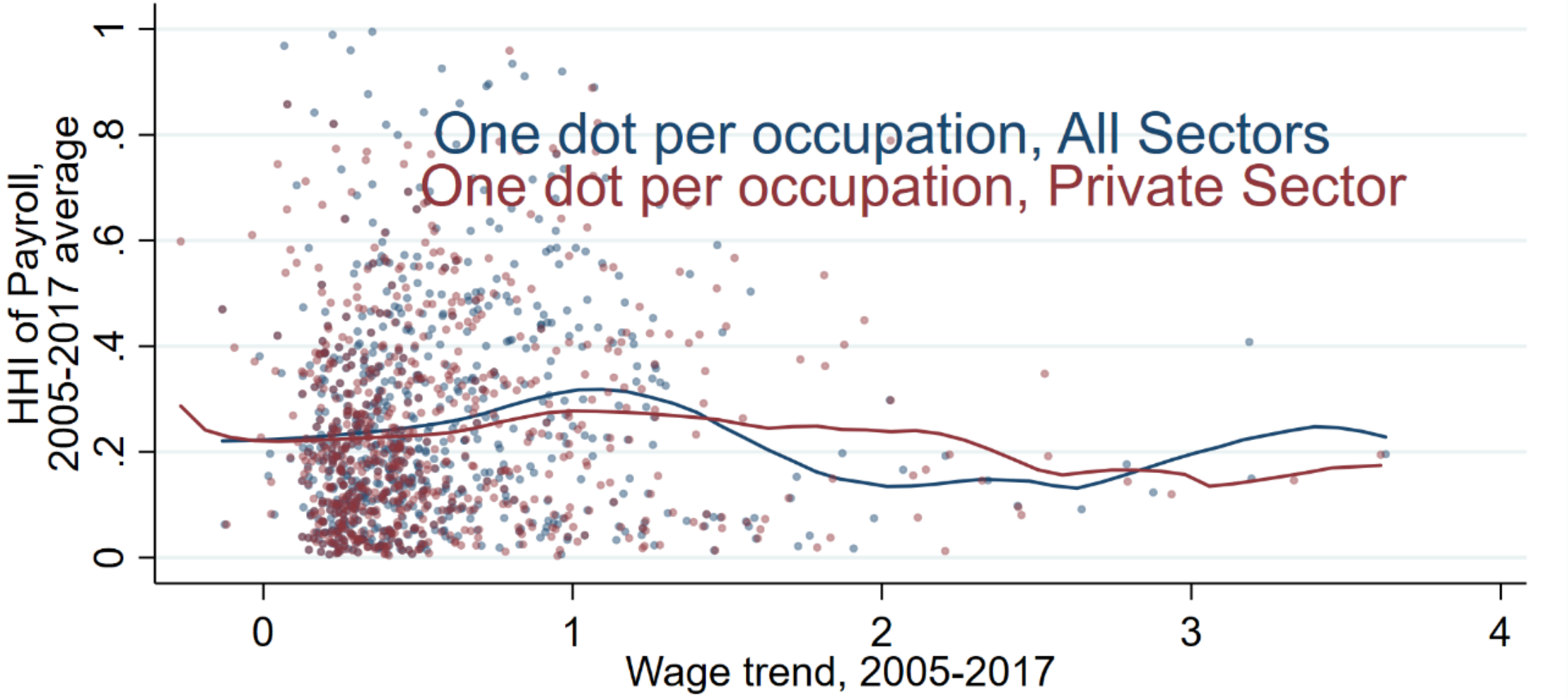
Occupation size is related to HHI levels



Average wage not so much



Nor wage trends



So which occupation characteristics matter?

- Occupation size, Average Wage and Wage Trend?
- Schubert, Stansbury, and Taska's measure of the 'Probability of Leaving' an occupation-area for another occupation or area?
  - Based on Burning Glass resume data
- Dey & Loewenstein's Occupation factors?
  - They use factor analysis to group 163 O*Net variables into 13 skills and job tasks
  - Every occupation gets a score for each skill and task
    - Supervisory tasks, Working with machines, Decision making, Physical strength, etc.
  - Their paper will be presented right here in the 10:15 session

Average HHI level

	All sectors	All sectors	Prvt sector	Prvt sector
Probability_of_leaving	-0.191***	0.138***	-0.039**	0.141***
Wage_level		0.003***		0.001***
Wage_trend		-0.091***		-0.018***
Working_outdoors		0.006*		-0.003*
Supervisory_tasks		-0.038***		-0.014***
Analytical_tasks		-0.014***		0.000
Physical_tasks		0.030***		0.015***
Interacting_with_the_public		-0.007***		-0.017***
Work_with_machines		0.017***		0.012***
Decision_making		-0.048***		-0.023***
Speaking_and_listening_skills		0.021***		0.023***
Sensory_skills		0.004		0.005**
Cognitive_skills		0.054***		0.018***
Physical_strength		-0.024***		-0.008***
Manual_dexterity		-0.032***		-0.010***
Math_and_reasoning_skills		-0.009***		-0.009***
Occupation_size_category		-0.081***		-0.065***
Constant	0.130***	0.601***	0.072***	0.488***
R-squared	0.008	0.419	0.001	0.534
N	9589	9589	9537	9537

* p<0.05, ** p<0.01, *** p<0.001

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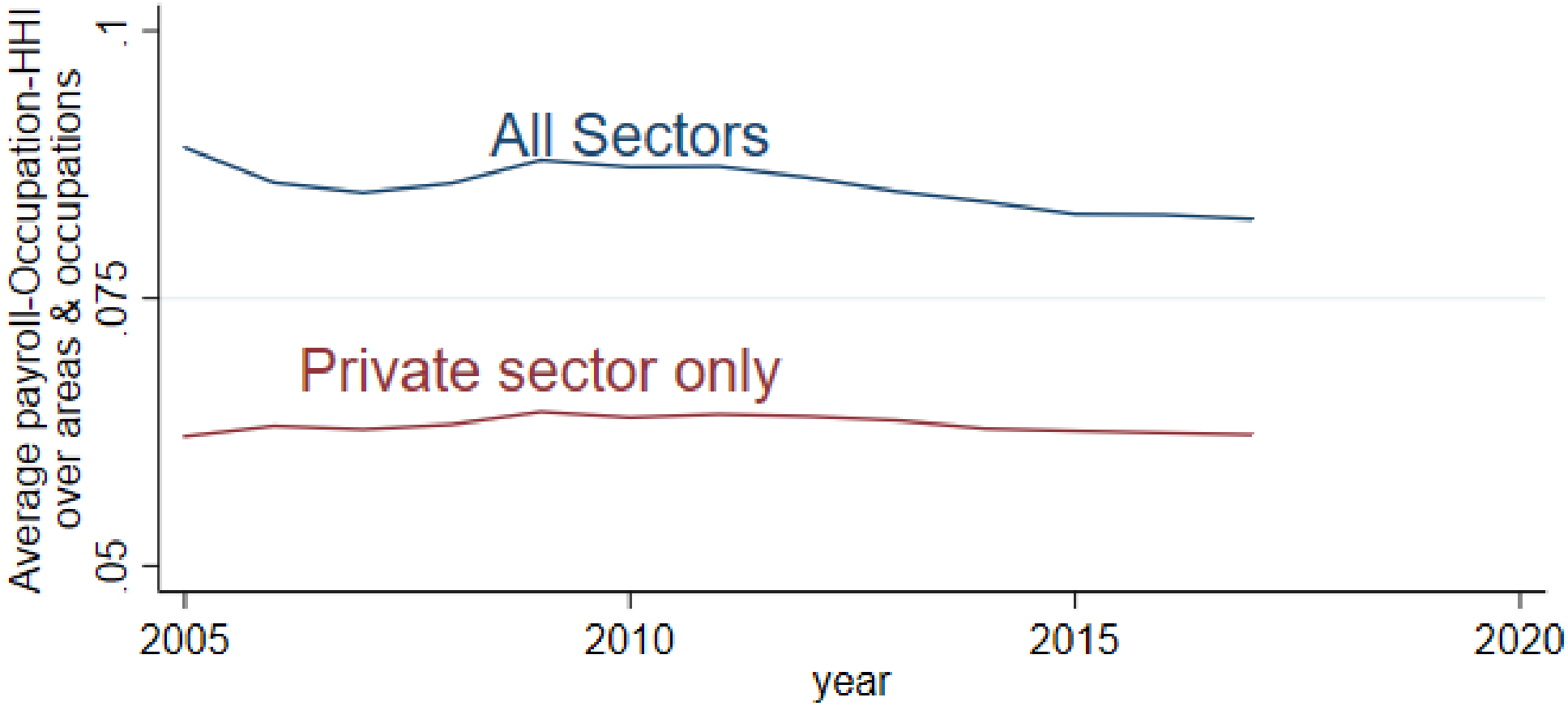
Overall trend of decreasing local concentration

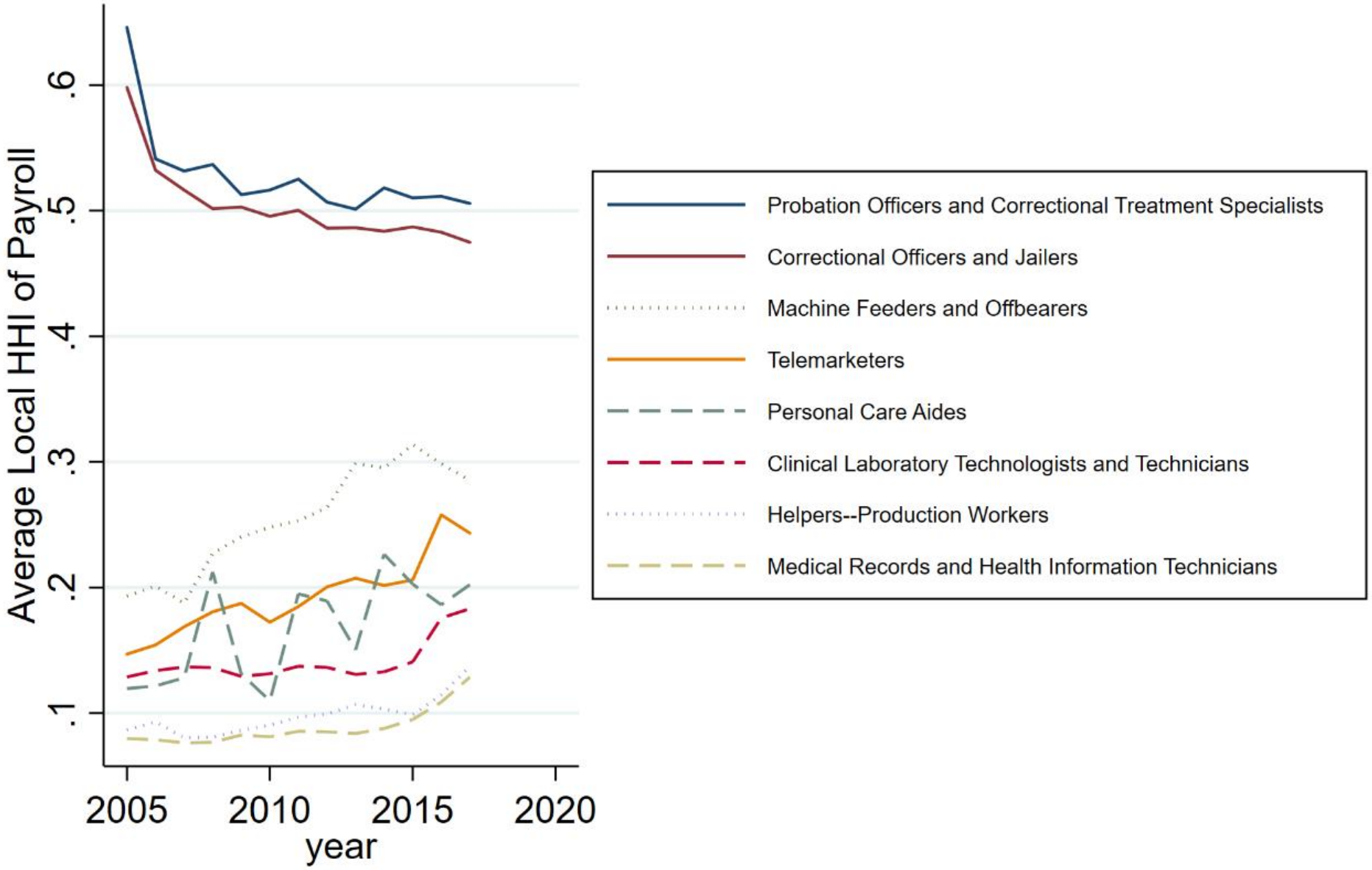


But trends vary (hugely) by occupation

- Overall, of 745 occupations, 364 (representing about 43% of workers) have increased local concentration from 2005-2017
- Within the private sector, of 740 occupations, 385 (representing about 46% of workers) have increased local concentration from 2005-2017

Employment Concentration of Selected Large Occupations

Actual time trends averaged over all areas, All sectors



BLS

Are characteristics correlated with HHI trends?

HHI trends	All sectors	All sectors	Prvt sector	Prvt sector
Probability_of_leaving	0.0047**	-0.0012	0.0038*	-0.0001
Wage_level		0.0000		0.0000
Wage_trend		0.0014*		0.0013*
Working_outdoors		0.0009***		0.0007**
Supervisory_tasks		-0.0003		-0.0004*
Analytical_tasks		0.0003		0.0005*
Physical_tasks		0.0007**		0.0006**
Interacting_with_the_public		-0.0006**		-0.0006***
Work_with_machines		0.0010***		0.0008***
Decision_making		-0.0008***		-0.0008***
Speaking_and_listening_skills		0.0004		0.0006**
Sensory_skills		-0.0009***		-0.0007**
Cognitive_skills		-0.0006*		-0.0006*
Physical_strength		-0.0000		0.0002
Manual_dexterity		-0.0008***		-0.0008***
Math_and_reasoning_skills		0.0004*		0.0003
Occupation_size_category		-0.0002		-0.0003*
Constant	-0.0013**	0.0008	-0.0008*	0.0016
R-squared	0.009	0.093	0.007	0.101
N	738	738	734	734

* p<0.05, ** p<0.01, *** p<0.001

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Concentration and Wages across Occupations

- Consensus of literature that ↑ concentration is associated with ↓ wages
  - Other estimates rely on either merger histories or IV
    - IV in the literature uses concentration in all other geographic areas as an instrument
    - This varies little within occupation. So we can't use that instrument to study heterogeneity of wage relationships for each occupation
  - Instead: we use concentration by occupation in similar areas as an instrument
    - Results across all occupations:
      - For the private sector only: Leave-one-out instrument shows ↓ wages; similar areas instrument shows ↓ wages
      - For all sectors: Leave-one-out instrument shows ↓ wages; similar areas instrument shows ↑ wages
- Studies that include OLS regressions show that overall, ↑ concentration is associated with ↑ wages in OLS regressions.
  - We also find this overall ↑ wage relationship in OLS regressions
  - However, if we add establishment fixed effects, we get a ↓ OLS relationship

Estimating wage relationships by occupation

$$\ln(wage)_{ejsgt} = \beta_0 + \boldsymbol{\beta_{1j} I(j) * ln(HHI_{jg})} + \beta_3 size_e + \sum_j \beta_{4j} I(j) + \sum_{sg} \beta_{5sg} I(s)\, x\, I(g) + \sum_t \beta_{6t} I(t) + \varepsilon_{ijsgt},$$

for employer e, occupation j, year t, industry s, and area g

- We run these regressions 5 ways:
  - OLS and 2SLS estimates of HHI
  - All data and private-sector only
  - Area x industry fixed effects and establishment fixed effects
    - Current version of establishment fixed effects is only valid in the private-sector
    - Still working on 2SLS estimates with establishment fixed effects

Some persistence in occupational sorting

Always very ↑ wage relationship

1. 53-6031: Automotive and Watercraft Service Attendants
2. 53-7063: Machine Feeders and Offbearers
3. 29-1051: Pharmacists
4. 31-1011: Home Health Aides
5. 39-3011: Gaming Dealer

Always very ↓ wage relationship

1. 41-9022: Real Estate Sales Agents
2. 23-1011: Lawyers
3. 11-1021: General and Operations Managers
4. 47-2031: Carpenters
5. 11-3031: Financial Managers

2SLS Wage relationships with NAICS x MSA FEs

	All sectors	All sectors	All sectors	Prvt sector	Prvt sector	Prvt sector
Probability_of_leaving	0.085***		0.068**	0.111***		0.088***
Wage_level		-0.001**	-0.001*		-0.000	0.000
Wage_trend		0.021**	0.019*		-0.001	-0.002
Working_outdoors		0.001	-0.000		0.004	0.002
Supervisory_tasks		-0.005**	-0.006**		-0.007***	-0.008***
Analytical_tasks		0.000	0.000		-0.002	-0.002
Physical_tasks		0.011***	0.012***		0.014***	0.014***
Interacting_with_the_public		0.003	0.004*		0.002	0.004*
Work_with_machines		0.002	-0.000		0.006**	0.004
Decision_making		-0.013***	-0.013***		-0.018***	-0.017***
Speaking_and_listening_skills		0.002	0.001		0.002	0.001
Sensory_skills		-0.006*	-0.004		-0.007**	-0.005*
Cognitive_skills		0.002	0.004		0.002	0.005
Physical_strength		-0.001	-0.002		-0.005	-0.006*
Manual_dexterity		0.001	0.002		-0.003	-0.001
Math_and_reasoning_skills		0.000	-0.000		0.001	0.000
Occupation_size_category		0.001	0.001		0.001	0.002
Constant	-0.005	0.016	-0.007	-0.024***	-0.007	-0.036***
R-squared	0.020	0.326	0.332	0.041	0.447	0.462
N	734	740	734	734	740	734

* p<0.05, ** p<0.01, *** p<0.001

Conclusions and Next Steps

- Employer concentration levels, trends, and wage associations vary widely between occupations
  - Small occupations involving cognitive skills have high concentration
  - Workers in occupations representing more than 40% of employment have increasing Local Labor Market Concentration on average, for a variety of reasons
  - Different estimation strategies yield different overall relationships between concentration & wages—but some occupations always have positive and some always have negative relationships
- Next Steps:
  - Continuing work on which occupations are *affected* most by labor market power and their characteristics
  - Further study of selected example occupations

Thank you

Although the OES and QCEW microdata cannot leave BLS, BLS welcomes visiting researchers. More information is available at https://www.bls.gov/rda/home.htm