Recent changes in British wage inequality:
Evidence from firms and occupations

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Abstract

Using a linked employer-employee dataset, we present new evidence on the role of firms in British wage inequality trends over the past two decades. The extent of differences between firms in the average wages they paid did not drive these trends. Between 1996 and 2005, greater wage variance within firms accounted for eighty-six percent of the total increase in wage variance among British employees. In the following decade, wage inequality between firms continued to increase, whereas overall wage dispersion fell. These British data contain detailed descriptions of employee occupations. Approximately all of the contribution to inequality dynamics from estimated firm-specific factors, throughout the employee wage distribution, disappears after we account for the changing occupational content of wages. The modestly increasing trend in between-firm wage inequality can be explained by a combination of changes to between-occupation inequality and the occupational composition of firms and employment. These results are robust to using weekly, hourly or annual measures of pay.

Research questions

- Is the contribution of firm-level wage inequality to overall trends large, like in other countries?
- Does a firm-level analysis rule out some of the frequently mentioned explanations for large increases in wage inequality? Such as skill-biased tech. change or the renumeration of managers/execs?
- Do occupations tell us anything about the source of between-firm inequality changes?

Data & Methodology

Dataset: New Earnings Survey Panel Dataset (NESPD), 1997-2015 - Approximate 1% random and representative sample of all British employees [employee panel, without attrition]. Survey is unusually accurate, with a legal requirement of employers to respond with respect to payroll. Contains detailed records of all components of pay, incl. annual earnings and hours worked, as well as employer occupation descriptions (4-digit classification). We identify firms from administrative records.

Analysis sample (baseline): By year, we select firms which have at least 10 observations of full-time employees in the NESPD — these are on average very large, and represent approx. 40% of total employment. Overall inequality trends in this sub-sample of firms are similar to the whole economy.

Actual* vs *Unobservable* employee wages:** We look at ***Actual employee pay, accounting for hours worked. But we also consider trends in ***Unobservable*** the log wages of employees i in firms j, which we estimate in each year from 1996 to 2016 using least squares:

$$w_{ij} = \mu + \beta \mathbf{x}_{ij} + \underbrace{\alpha_{J(i)} + \varepsilon_{ij}}_{\text{unobs. - } \psi_{ij}}, \quad \text{with} \quad E\left[\varepsilon_{ij} | \mathbf{x}_{ij}, \alpha_j\right] = 0 \tag{1}$$

where in each wage regression we include a minimum set of controls in the vector $\mathbf{x}_{ij}$ for sex, age and its square, and the region of employment, and β contains coefficients which vary by year. The unobservable part of the wage is given by ψ_{ij}, and includes an estimated firm-specific component α_j and the remaining heterogeneity ε_{ij}. We use the estimated values $\hat{\psi}_{ij}$ for each year to study how additional controls included in $\mathbf{x}_{ij}$, in particular for occupations, could allow us to more precisely determine the sources of wage inequality trends.

Decomposition methods: First, we decompose overall employee wage variance changes, accounting for the *between-firm* component, as opposed to a *within-firm component* (see paper for results). Second, we analyse *Actual* and *Unobservable* wage inequality changes throughout the distribution of employee wages (see below), accounting for the roles of firms and occupations.

Main results - changes to the employee wage distrib.

Actual wages: (see opposite for interpretation)

Figure 1: Change 1997-2007 in the average real log weekly wage by percentile of employees, and the contribution from firms

Figure 2: Average real log weekly wage of employees in selected ventiles, relative to 1996, and contributions from firms

Unobserved wages - controlling for changing occ. wage premiums & the occ. structure of firms:

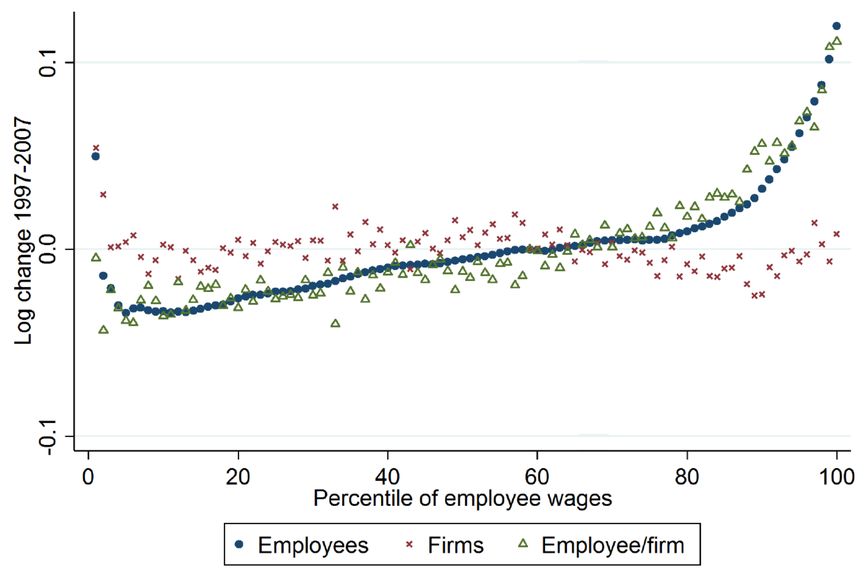

Figure 3: Change 1997-2007 in the average real unobservable log weekly wage by percentile of employees, and the contribution from firms

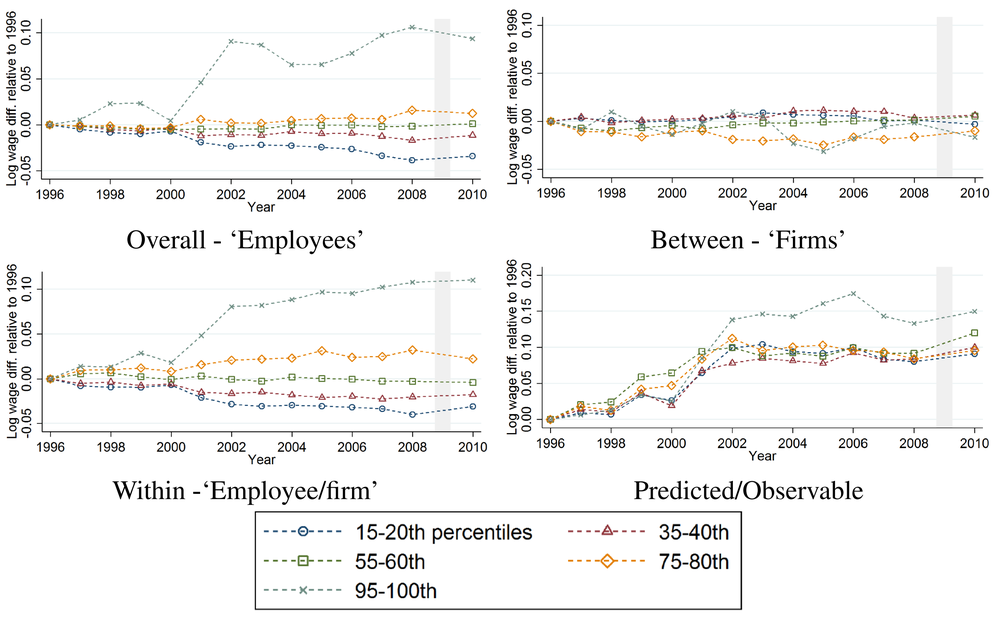

Figure 4: Average real (un)observable log weekly wage of employees in selected ventiles, relative to 1996, and contributions from firms

Interpretation

Figures 1 & 2: Increasing within-firm inequality can account for the majority of the rise in *Actual* employee wage dispersion in this period

– In Figure 1, the **blue series** gives the difference between average wages at each percentile of the 1997 and 2007 cross-sectional employee wage distrib. The **red series** gives the contribution from changes to the average wages of firms employing the workers in each percentile. The **green series** gives the residual, or the amount contributed by changes to the differences between employee wages and their firms' averages. An increasing slope across percentiles implies (a contribution to) rising inequality in that part of the distribution. In Figure 2, we track wage changes relative to 1996, for the whole period: firms contributed to some of the increase in wage dispersion at the top of the employee wage distrib., but most was accounted for by greater inequality within firms.

Figures 3 & 4: Firm average wage changes did not contribute to any of the rise in *Unobservable* weekly wage inequality: the between-firm contribution in Figures 1 & 2 is accounted for by changing occupational wage premiums and the types of jobs in firms and the labour market.

Robustness

Main results always qualitatively unchanged - see paper for checks: all employees vs full-time only; annual vs weekly vs hourly wages; private sector only; larger or smaller firms; time period; more precise identification of firm/enterprise in sub-period; controls in $\mathbf{x}_{ij}$, diff. occ. classifications; excluding firm-fixed effects from wage regression.

Contribution

- Extend the description of British wage inequality trends using employer-employee linked data for the first time.
- Analyse annual, weekly and hourly measures of pay.
- Show that for employees in mostly very large firms in Britain, between-firm inequality changes play a small role overall - unlike recent findings for several other countries.
- Highlight the role that changes to occupational pay premiums, and the distrib. of occupations across firms, can have in the measurement of how much firm-specific wage differences actually matter.

Related literature

US: Davis & Haltiwanger (1992), Barth el al. (2016), Song et al. (2016); **Brazil:** Benguria (2015), Alvarez et al. (2016), Helpman et al. (2016); **West Germany:** Card et al. (2013); **Sweden:** Nordström Skans et al. (2009), Akerman et al (2013); **Portugal:** Cardoso (1997,1999); **Britain:** Faggio et al. (2010), Mueller et al. (2015), Lee (2016)

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