

Uneven geographies of pay inequality across tasks and jobs

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Extended Abstract

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The pattern, persistence and causes of spatial inequalities has been an issue of study in economic geography and regional science for over 100 years. As a result, a wealth of literature exists that examines spatial inequalities (and the geography of inequality) across a large range of economic and socio-demographic outcomes, including health, wealth, education, industrial structures, accessibility, infrastructure, and even political attitudes and, of course, labour market outcomes.

In relation to the latter (labour market inequalities), the long-standing trends of automation and digitalisation, which more recently have accelerated – and indeed reshaped – by the COVID pandemic, create two important sets of new dynamics: on the one hand, disruptions in relation to the *functional* organisation of production, with automation and digitalisation (including the emergence of platform economies) disrupting the content (tasks), industrial organisation (flexibilisation) and relative importance (occupational hierarchies) of jobs; on the other hand, disruptions in relation to the *spatial* organisation of production, with the COVID pandemic accelerating pre-existing trends towards remote / mobile work and tele-working which alter the importance of location, agglomeration and spatial proximity, creating the potential for a significant reconfiguration of the geography of employment at various scales (urban-suburban, regional / core-periphery, national, global).

The study of the geography of (labour market) inequality in the fields of regional studies and economic geography / geographical economics has for long concentrated on aggregate area-level outcomes, concerning mainly wages/remuneration (including returns to skills or education) and employment/unemployment (including under-employment) comparisons across (groups of) local or regional labour markets. In other parts of regional science, and in the spatial and urban economics literature in particular, the focus is more on individual-level outcomes (and drivers of inequality), with emphasis on issues of spatial sorting and agglomeration or spatial equilibration dynamics (MAR externalities, transport costs, congestion diseconomies, etc).

In this paper we focus at the meso-level of jobs (defined as fine occupational classes within sectors of economic activity) to examine (a) how the geography of wage inequality varies across tasks (and,

inversely, how occupational pay inequality varies across space) and (b) how this has been affected over time by the two major sets of ‘disruptions’ related to the processes of automation and digitalisation (as described above).

To do so, the paper uses restricted-access data from the UK Labour Force Survey covering the period since the end of the Global Financial Crisis to the present. LFS data contain a wealth of information key characteristics of individuals and their jobs (including age, gender, employment status, education qualifications and years of schooling, region / local area of residence and work, marital and family status, etc; as well as type of contract, flexible / non-standard patterns of employment, sector of economic activity, detailed occupation class, remuneration, hours of work, and others). Using this information available in the UK LFS micro-data, the paper produces three alternative pay/wage measures at the individual level: (a) a measure of unconditional hourly wages; (b) a measure of conditional hourly wages (using a simple Mincerian wage equation to net out the contribution to wages of observational compositional characteristics, and (c) a measure of hourly wages which, in addition to the above, is also net of processes of selection / sorting (of individuals into a particular job-type and/or geographical area – using a Heckman-corrected Mincerian wage equation). This analysis produces an array of measures of hourly pay which are distributed across individuals in time (years) and space (geographical location along the UK travel-to-work areas).

At a subsequent stage, we proceed to classify individuals into detailed job-types, using two complementary dimensions – relating to the job content (type of work) and the employment relationship (type of contract). Specifically, we start by classifying each individual in our sample as belonging to one of two type of job contracts (‘standard’ and ‘flexible’ – the latter including non-standard forms of employment such as temping, part-time work, irregular hours, zero-hours contracts, home/tele-working, etc), drawing on the information available in the UK LFS. Following, we draw on the O*NET classification of job descriptions (generalised and detailed work activities) to group different jobs (as defined by the available occupational classification(s) in the LFS data – SOC2000) into specific categories according to their content (job-types). Combining this classification with the job-contract distinction referred to above, allows us to split each job-type (defined in terms of tasks / work content) into a ‘flexible’ and a ‘standard’ sub-type. The end result is an array of job-types which differ both by work content (O*NET tasks) and by work process (LFS job contracts). For each of these detailed job-types, we then use the information on hourly wages described earlier, to calculate average wages across each geographical location (UK Travel-to-Work Area) and year in our sample.

Equipped with these novel measures of pay across finely defined ‘jobs’ in the UK, we proceed with our empirical analysis. First, we produce a number of measures of dispersion (standard deviation, coefficient of variation) and spatial association (Global and Local Moran’s I), for each year in our sample and for each job type. We examine descriptively the differences across job types in their degree of (spatial and statistical) heterogeneity; and the evolution of this heterogeneity over time. We theorise that differences in the extent of dispersion (statistical) or concentration (spatial) will be driven by factors such as (a) each job-type’s level of skills (as proxied by the average years of schooling observed within each job-type and/or dummies for the occupational class), work content/structure (dummies for flexibility and cognitive/manual tasks) and pay (average hourly wage), (b) the type and geographical specialisation of the industrial sector in which each job-type is more prevalent (proxied by controls for the sector of economic activity) and (c) developments that

have to do with the processes of digitalisation and automation, as well as with transformation related to the COVID pandemic (which we proxy by a series of linear and non-linear time-trends and period fixed-effects). We examine empirically these conjectures by means of a panel data estimation, which makes the measure of dispersion/concentration (across time and space) a function of these characteristics. Extending this analysis, we also produce, separately, equivalent measures of dispersion *within* each local area (across job types) and run a similar econometric analysis seeking to explain variations in intra-area cross-job wage dispersion on the basis of cyclical (unemployment) and secular (population density, level of incomes) area characteristics (as well as temporal characteristics related to processes of automation, digitalisation and the pandemic).

The empirical work described above is still in progress and thus no empirical results are available for analysis or commentary here. However, it is important to note here the potential significance of the results emanating from this analysis. On the one hand, the analysis will produce a detailed picture of the geography of pay inequality in the UK across a uniquely – and very finely – defined set of different jobs and job-types. Assessing this geography, and its evolution over time, will provide useful information to academic research and interested policy-makers alike concerning sources and nature of pay-inequality in the UK, potentially pointing at patterns and developments that need addressing (for policy) or further exploration (for academic research). On the other hand, the more confirmatory analysis (based on the panel-data regressions) will allow us to highlight specific sectoral, occupational, institutional (job contracts) and area characteristics which contribute to pay inequalities within and across the geographical space of the UK, as well as the role that the major ‘disruptions’ of the recent period play for these. Again, unveiling such influences is expected to have significant implications both for policy and for academic enquiry relating to the issue of the geography of labour market inequality.