Resolution Foundation

The power of place

The role of place in driving regional pay inequalities

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Executive Summary

Pay varies widely across England, with average wages in 2024 ranging from £610 per week in Liskeard to £1,130 per week in London. Why does pay vary so much? Are high-earning places like London populated with workers who would earn more no matter where they worked? Or would the jobs in London pay lots more to all kinds of workers?

The answer to this question is important for a huge range of government policies, from regional policy and industrial strategy to housebuilding and transport investment. For example, if workers will earn nearly the same wherever they work then it might make sense to build houses wherever it is cheapest to do so. This would be a world of large 'people effects', where the inequality in earnings between places is driven by the distribution of different types of workers. In contrast, if the jobs are much better in some places than others, it would make sense to build the houses within reach of them. This would be a world of large 'place effects'.

Previous research on the UK has found that earnings are unequal across labour markets mostly because high-earning workers cluster in certain labour markets – i.e. mostly because of 'people effects'. We use a new dataset and new techniques to revisit this question. We employ the Longitudinal Education Outcomes (LEO) dataset, which comprises nearly every worker born after 1985 who went to school and work in England and merges their educational records, their tax records and their employment history. We can follow these workers as

their earnings and careers progress and as they move across employers and between the 155 English commuting zones (so called 'Travel to Work Areas', or TTWAs, which we refer to interchangeably as places, regions and labour markets).

There are large differences in the pay available for the same early-career workers across English labour markets

We find that a typical full-time early-career worker (aged 22 to 36) moving from a low-paying labour market (such as Dudley at the 25th centile) to a high-paying one (such as Harrogate at the 75th centile) would get a pay rise of around £1,300 per year, or 5 per cent of earnings. More broadly, about one-third of the variance in regional average pay is due to 'place effects' – that is, employers paying higher wages in some places than in others to otherwise identical workers. This is much higher than the 1-12 per cent that previous studies have found. The difference is due to our focus on younger workers, new measurement techniques, and the fact that we are using a new, much bigger dataset than previous research.

These pay boosts are proportionally similar for both university graduates and non-graduates. What's more, they appear to be portable to some extent. For early-career workers, a worker who spends a year working in London and then moves to another major city can take a 10 per cent pay boost with them.

A further 42 per cent of regional pay inequality is driven by the sorting of the highest-earning-potential workers (with the highest 'people effects') into the highest-paying labour markets (with the highest 'place effects'). This is an important phenomenon in explaining regional pay inequality, but it has hardly any impact on average earnings (it leads to a boost of around 0.1 per cent).

Size matters, but less than you think

So we have found that place effects are important. But what in turn do these place effects represent? What drives them? In common with previous studies, we find that bigger labour markets pay higher wages to any given worker (part of the so-

called 'agglomeration effects'). But the effect is small: a doubling of the size of the labour market boosts the pay a typical worker will get by around 3.9 per cent. Labour market size only explains around 24 per cent of the variation in pay premia across TTWAs, so there is much else at play. For example, Cambridge is the same size as Leicester but pays its workers 23 per cent more.

Industrial composition and firm size do not account for which job markets pay well

Another reason for differences in pay across the country is that industries are unevenly distributed across labour markets – for example, high-paying finance jobs are concentrated in London, Slough and Heathrow and Luton, while low-paying hospitality is particularly important in Redruth and Truro, Bideford and St Austell and Newquay. If industries pay differently and are unevenly distributed, it could be true that industrial composition explains the variation in pay premia. But it doesn't: it only explains around 10 per cent, with worker sorting explaining 8 per cent. Instead, we observe that jobs in any given industry tend to pay more in high-paying labour markets. The same is true for firms of different sizes: bigger establishments pay more, but (again) it is differences in pay premia for firms of any given size that drive the inequality we see across labour markets.

So our new research tells us that the same workers earn very different wages in different labour markets, and this has little to do with how big the labour markets are or the industries they comprise. It's hard to unpack these place effects much more with the LEO dataset, but we can use other datasets and research from other countries to make progress.

It's the firms, stupid

One possibility is that workers in different places are in different occupations. Our work looked at how the industry mix of places explains regional pay differences, but industries, and the firms within them, comprise a wide range of jobs (or occupations). For example, everyone working in Tesco is in the retail industry,

but the jobs that workers do at their headquarters in Welwyn Garden City will be very different to those in their superstore in Wigan. The LEO dataset does not measure workers' occupations, but analysis of the Annual Survey of Hours and Earnings (ASHE) suggests that occupational composition explains only slightly more of the pay premium than industry does – around 14 per cent. However, the occupational classification in ASHE is not very granular – lumping a store manager in the same category as the CEO.

Other evidence strongly suggests that the type of firms and the jobs are key to explaining regional pay premia. First, we know that productivity varies hugely across firms – with firms in the top decile of productivity within a sector being typically more than eight times more productive than those in the bottom decile. Second, recent academic evidence from the US and France shows that the best firms cluster strongly together, and that it is those firms, not the amenities of the place they are in, that explain most of the pay premia in those locations. For example, there are few intrinsic differences between Cambridge and Leicester, but for historical reasons, employers like Arm or Darktrace have chosen to cluster in the former more than in the latter. Third, evidence from the US also documents how large firms have separated their functions across space, for example concentrating all their management or R&D functions in one place. Consistent with this, we show that the density of large corporate headquarters is correlated with labour market pay premia.

The importance of firms and place in explaining workers' pay means that we need to put more workers within reach of the best jobs, and change the tax system to spread the benefits more widely

Our main new finding – that typical workers earn much higher pay in labour markets with the best firms – implies that there are large benefits to moving workers into these top labour markets.early-career Pay and productivity are highly correlated, so raising total pay is not only important in and of itself, but will raise national GDP. And this suggests several points for policy

makers. First, a pro-growth approach to housebuilding would concentrate the new properties, as in recent government plans, in the best-paying labour markets. And these houses should be for workers of all kinds – not just the best-paid ones. In particular, it is important to build social and affordable housing in high-wage areas; to do otherwise would increase inequality with very little benefit in terms of total GDP. Lastly, while part of the higher wages that result will be eaten up in the form of higher housing costs, these are nonetheless worth paying, especially when the benefits for workers can be long-lasting. Moreover, a reformed property tax could capture these higher rents to pay for public services or tax cuts elsewhere.

But relocating workers can only go so far. To further reduce regional pay inequality, well-paying jobs would also need to move to the workers. This doesn't mean moving whole industries, but rather encouraging productive firms and especially the high-value functions within them – such as their headquarters – to spread to new locations in the country. This has been tried before with mixed outcomes. But our results suggest that the benefits are bigger than previously thought, so researchers and policymakers should revisit this question anew.

Section 1

Introduction

The UK has large and persistent wage and productivity gaps between places. The UK's regional inequalities have been shaped by the deindustrialisation of the past. The decline of manufacturing in the 1970s caused lasting damage to many industrial areas like Liverpool, Sheffield, and the West Midlands, which – after facing some of the largest employment shocks – all struggled with low employment rates for years. But those historic shocks don't fully explain today's inequalities. By the 2000s, there was little link between the original job losses and current employment or productivity. Some areas, like Southampton and York, adapted well to a services-based economy. Others, like East Kent and Lancaster, did not.[1]

Pay differences matter for living standards, but they do not fully explain why incomes vary between areas. Take Manchester for example: in 2019, average full-time earnings were £37,000, just £276 below the national average. Yet average disposable income per person was around £3,500 lower than the UK average. This gap is partly explained by a lower employment rate in Manchester compared with the UK-average (72.6 per cent compared to 75.8 per cent nationally), despite a similar share of working-age residents (63.6 per cent compared to 63 per cent). [2] Other factors, such as housing costs, benefit claims, non-wage income, and pensions, also contribute to the disparity. So while labour market outcomes provide only a partial view of income inequality, focusing on them is still justified: for most households, earnings make up the bulk of income. [3]

One way to think about this regional inequality is the differences in wages between different local labour markets. The ONS has divided the UK into 228 local labour markets or 'Travel To Work Areas' (TTWAs) which are, roughly speaking, self-contained commuting zones within which most people live and work.[4] Average full-time wages

1 This paragraph draws on: P Brandily et al., Bridging the gap: What would it take to narrow the UK's productivity disparities?, Resolution Foundation, June 2022.
2 For a discussion of the composition of GHDI see L Judge & C McCurdy, Income outcomes: Assessing income gaps between places across the UK, Resolution Foundation, June 2022.
3 P Brandily et al., Bridging the gap: What would it take to narrow the UK's productivity disparities?, Resolution Foundation, June 2022, showing what is needed to close productivity gaps between places – the prerequisite for reducing spatial disparities when it comes to labour market incomes
4 ONS, Travel to Work Areas (2011) Guidance and Information, June 2020.

vary widely between these areas, ranging from £31,692 per year in Liskeard to almost double this – £59,120 per year – in London in 2024.[5]

A very important question is: why do local wages vary so much? It could be that some labour markets are just more productive than others, because of their size, industrial composition, transport links, and so on, so that all firms in these places are more productive and can afford to pay higher wages (we call these 'place effects'). Or it could be that the high-wage labour markets are just full of high-wage workers: people who, due to their innate abilities and skills, could earn high wages anywhere in the country, but for some reason (other than the wage premia they can earn) all happen to be in one place ('people effects'). A third possibility is the interaction of the first two effects: that high-wage workers disproportionately move to high-wage places (known as 'sorting').

Previous work has found that most of the inequality in wages between UK regions is driven by the differences in the people who live in these commuting zones and, to a lesser extent, by sorting.[6] But this report re-examines these questions using a newly available dataset comprising administrative data on all early-career workers in England, including information on their education, earnings and employment since the early 2000s (see Box 2 for details on our dataset). We apply micro-level methods to explore how people, place and industrial composition each contribute to the England's large regional inequality. A forthcoming companion academic paper contains these and additional results.

Answering these questions is important for many areas of government policy. For example, if workers will earn nearly the same wherever they work then it might make sense to build houses wherever it is cheapest to do so. This would be a world of large 'people effects', where the inequality in earnings between places driven by the distribution of different types of workers. In contrast, if the jobs are much better in some places than others, it would make sense to build the houses within reach of them. This would be a world of large 'place effects'.

The rest of the report is structured as follows:

- Section 2 sets out facts about pay inequality across places.
- Section 3 decomposes these differences in earnings across places into contributions from people effects, place effects and sorting.
- Section 4 explores these estimated place effects to understand their underlying

5 2024 annual earnings of full-time workers in the ASHE

6 H Overman & X Xu, Spatial disparities across labour markets, IFS Deaton Review of Inequalities, 2022; S Gibbons, H Overman & P Pelkonen Area disparities in Britain: Understanding the contribution of people vs. place through variance decompositions. *Oxford Bulletin of Economics and Statistics, 76(5), 745-763., 2014*

economic drivers and correlates, looking at explanations such as industrial composition; differences in the tasks and occupations in different places; and differences in the amenities available to workers and firms.

- Section 5 considers the policy implications of our findings.
- Annex A contains more details of our methodology and findings. A forthcoming companion academic paper presents more details of our results.

Section 2

Pay is unequal across labour markets in England

The UK has high and persistent regional inequalities, and pay is a crucial driver of these, varying widely both within and between with local labour markets.

Our analysis is the first to use the Longitudinal Education Outcomes (LEO) admin dataset to examine these differences. We show that it matches up well to more established datasets. Consistent with other research, we find that most wage variation between areas is driven by high earners, while low paid workers – now paid the National Living Wage – are paid much more similarly throughout Britain.

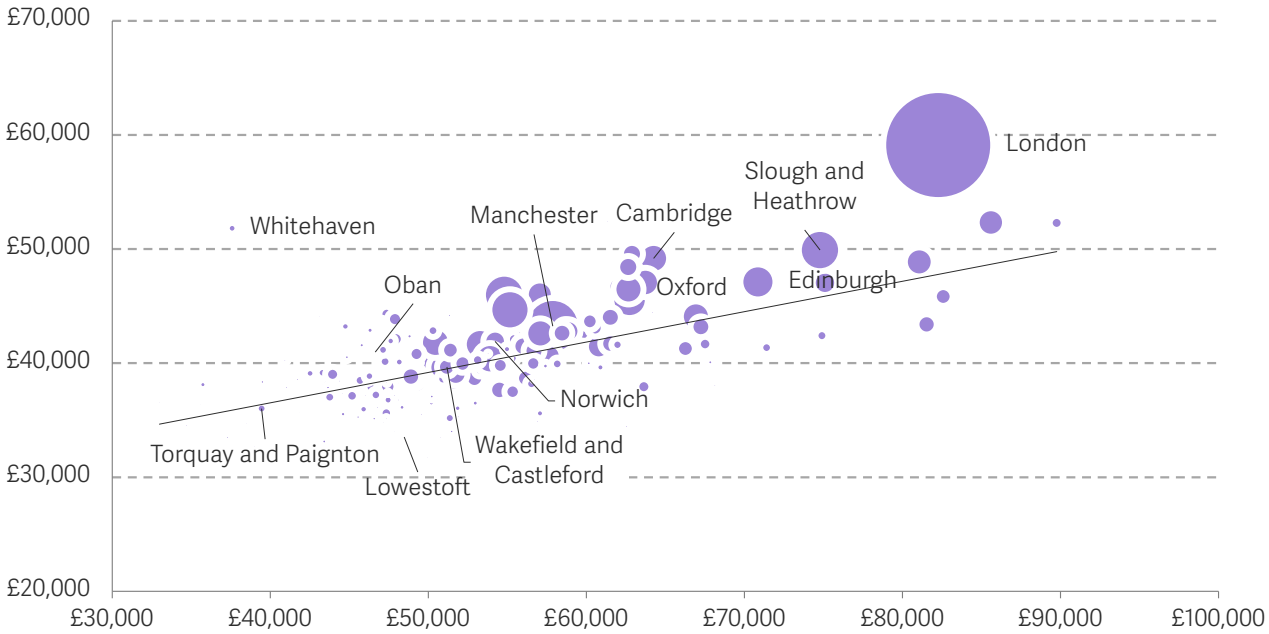
As we set out in the Economy 2030 Inquiry, output per worker and incomes are uneven across different parts of Britain.[7] The extent to which these differences are unusual compared with other advanced economies is debated.[8] But more than six-in-ten of the British public view these inequalities between richer and poorer areas as the most serious inequalities facing the UK, which has led to both regional inequalities and growth becoming a key focus for successive Governments.[9]

One aspect of this regional inequality is the differences in wages across local labour markets. The average worker in Bristol, a high-paying local labour market (at the 90th centile), as delimited by the ONS's Travel to Work Areas (Box 1), earned £45,560 per year in 2024, while the average worker in the Isle of Wight earned just £35,530 per year (at the 10th centile).[10] These wage differences reflect more than just varying living costs: they closely track local productivity, as Figure 1 shows.

7 Resolution Foundation & Centre for Economic Performance, LSE, Ending stagnation: A New Economic Strategy for Britain, Resolution Foundation, December 2023
8 The coefficient of variation between metro areas' productivity is no higher in the UK than it is in Germany. For further discussion, see: P Brandily et al., Bridging the gap: What would it take to narrow the UK's productivity disparities?, Resolution Foundation, June 2022.
9 R Benson et al., Attitudes to inequalities, Oxford Open Economics, Volume 3, Issue Supplement_1, 2024, July 2024.
10 Analysis of Annual Survey of Hours and Earnings. Labour markets not weighted by size.

FIGURE 1: **Wages are tightly related to the productivity of local labour markets**

Gross Value Added per filled job (horizontal axis) and average annual wages (vertical axis) by TTWA: UK, 2022/2024



NOTES: Bubbles sized by number of jobs in each TTWA. Average wages for full time workers.
SOURCE: Analysis of ONS, Annual Survey of Hours and Earnings and ONS, GVA per filled job.

While larger labour markets can benefit from agglomeration effects, the differences in productivity and pay between areas aren't just about the size of the labour market. For example, Leicester and Cambridge each had around 270,000 full time workers in 2024. Yet Cambridge was 22 per cent more productive, and average earnings were 23 per cent higher than in Leicester. These gaps suggest that factors other than scale play a key role in shaping local economic performance.

BOX 1: **What is a 'travel to work area'?**

The ONS defines local labour markets in terms of 'travel to work areas' (TTWAs), areas that are drawn so that each is broadly self-contained in terms of journeys to work. Each area includes three-quarters of all journeys to work, with a minimum working population of 3,500 per area.[11] National and global trends have steadily enlarged these commuting zones. In 1991 there were 308 TTWAs; by 2011, that number had shrunk to 228 due to more home-working, a shrinking share of workers in manufacturing jobs, increased car-use,

11 The current criteria (using 2011 Census data) require that at least 75 per cent of an area's resident workforce works in the area, and at least 75 per cent of people working in the area also live there. There is a slight relaxation of the self-containment threshold (down to ~66.7 per cent) for areas with a working population in excess of 25,000. ONS, Travel to work area analysis in Great Britain: 2016.

and a rise in dual-earner couples who cannot live near both workplaces. [12]

In practice, commuting patterns vary significantly across sectors and skill levels. In 2023, non-graduates commuted an average of 28 minutes to full-time work, nine minutes less than the 37 minutes travelled by graduates on average.[13] This means that TTWAs may understate the true size of functional labour markets for higher-skilled, professional jobs. For example, London, Britain's largest TTWA, was sliced in the 2011 update to create a new 'Slough and Heathrow' TTWA separate from the London TTWA, recognising a distinct western labour market. Yet London remains deeply interconnected with Slough and Heathrow, suggesting that such divisions may obscure more than they reveal. Meanwhile, Greater Manchester spans ten local authorities and contains parts of four TTWAs, yet commuting patterns often cut across these boundaries. As a result, Eurostat and the OECD prefer to use larger "functional urban areas" (FUAs) when comparing cities around the world, such as the Manchester FUA, which aligns with the administrative area of the Greater Manchester Combined Authority. At the other end of the spectrum, TTWAs may be too expansive for analysing lower-skilled workers, who tend to search for jobs closer to home.[14] Mindful of these issues, we use the 2011 TTWAs as our main unit of analysis in this report, but note that these might have limitations when it comes to understanding the differences between graduates and non-graduates.

Earnings of early-career workers mirror national pay patterns

So far, we have used data from the Annual Survey of Hours and Earnings (ASHE), a survey of pay and hours across the UK to understand the differences in pay across Britain.[15] To take the analysis further, we draw on the Longitudinal Education Outcomes (LEO) dataset, which provides administrative data linking workers to their employers across the UK since the early 2000s. This offers a more comprehensive view of people and their earnings in England than survey data, as it includes linked information on education, employment, and firms. The key limitation of the LEO data is that it captures only workers born since 1985. We discuss the LEO data, and how it compares to other datasets of UK earnings in Box 2.

12 ONS, Commuting to work, Changes to Travel to Work Areas: 2001 to 2011, December 2015.
13 Analysis of National Travel Survey.
14 CfC suggests that labour markets should be defined by graduate commuting workers only given this difference. A Breach, Devolution Solution: How fixing English local government will improve economic growth, July 2024.
15 ONS, Annual Survey of Hours and Earnings (ASHE), March 2025.

BOX 2: **Understanding the LEO data on early-career earnings**

Our research uses the Longitudinal Education Outcomes (LEO) dataset, which combines school and early years data from the National Pupil Database, higher education records from Higher Education Student Statistics (HESA), further education and apprenticeships data from the Individual Learner Record, and administrative earnings, benefits, and tax data from HMRC and DWP, as well as business information from the Inter-departmental Business Register.

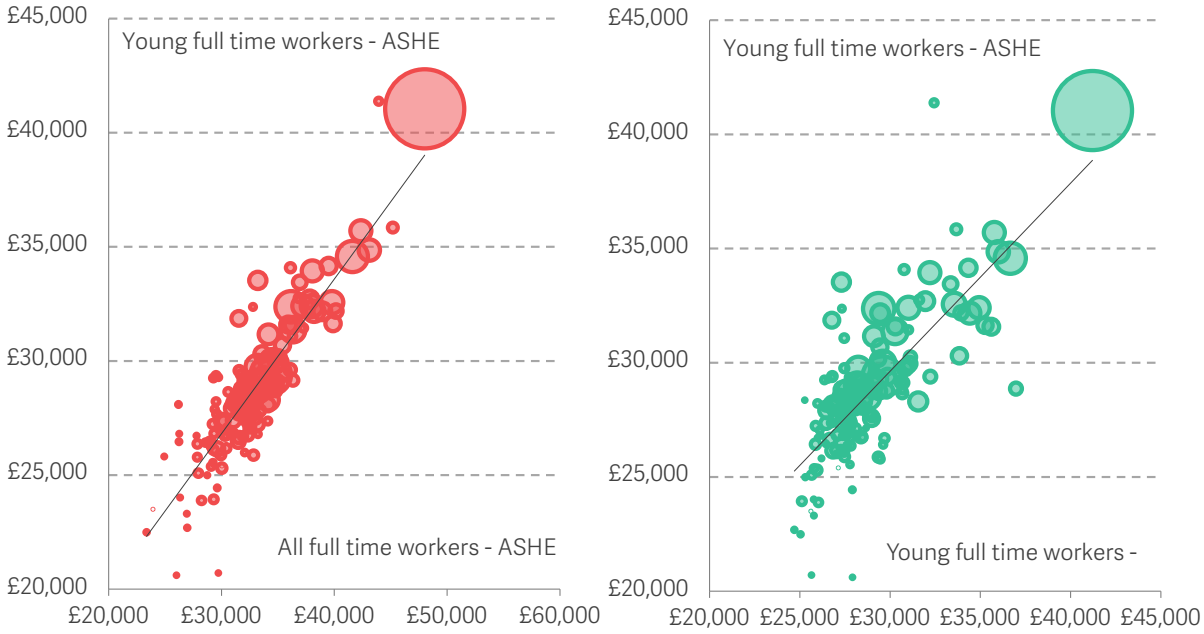
The dataset covers individuals born since 1985 and includes around 11.7 million individuals with earnings in England, providing data across multiple years. This offers a rich source of information with a large sample size and extensive demographic and educational data. After cleaning, our final sample includes 5.1 million individuals who were aged 22–36, in full-time employment, and living in England between 2013 and 2020.

While there are many advantages to the rich detail and complexity of the LEO data, it has some limitations compared with survey data such as the ASHE: it focuses only on young workers, lacks information on hours worked, excludes workers who have migrated to the UK but have not been educated here, and covers England only as opposed to the whole of the UK. Therefore, our results reflect the path of younger workers in England rather than the whole population.

Our prepared LEO data and ASHE are highly correlated in terms of average wages across TTWAs for full-time workers aged 22 to 36 (i.e. the age period common to both datasets), despite differences in how the data is collected (see the right panel of Figure 2). But we can also see from the ASHE data that average earnings for younger workers are highly correlated with earnings for all workers in the same TTWA (see the left panel of Figure 2). This suggests that the patterns observed among younger workers in LEO are broadly reflective of wider geographic trends in pay.

FIGURE 2: **The earnings of early-career workers in ASHE and LEO are highly correlated**

Mean wages for all full-time workers (horizontal axis) and mean wages for 22–36-year-olds (vertical axis) using ASHE (left panel) and mean wages for young full-time workers using LEO (horizontal axis) and mean wages for 22–36-year-olds using ASHE (vertical axis) (right panel): England, TTWAs, 2019



NOTES: Young workers in ASHE pooled across 2018-2019 to boost sample size. Wages in 2018 are in 2019 prices.
SOURCE: Analysis of Longitudinal Educational Outcomes and ONS, Annual Survey of Hours and Earnings.

Our data sample is restricted to early-career workers, a period when workers are most mobile, and accordingly when places policy may be most powerful. For example, in 2015-19, 5.8 per cent of 16-24-year-olds moved jobs per quarter, nearly five-times the rate of 55-to-64-year-olds (1.2 per cent).[16] Young workers are also much more likely to move occupations when they move jobs: from 2002 to 2020, 70 per cent of 25-year-olds' job moves involved changing occupation, compared to 55 per cent of 60-year-olds' moves.

Regional wage inequalities are only a small part of overall wage disparities

The LEO data confirms that average wages vary a great deal between local labour markets. As we showed in Box 2, the LEO data gives a similar impression of variation in wages across TTWAs to long-established data sources. For example, in LEO the median wage of a full time early-career worker in London, the highest-earning part of England, is £32,225, 46 per cent higher than in Penzance, which has the lowest median wages of £22,038.

16 N Cominetti et al., Changing jobs? Change in the UK labour market and the role of worker mobility, Resolution Foundation, January 2022.

But, although disparities in wages across labour markets receive significant attention, and are the focus this paper, it's important to remember that geography accounts for only a small proportion of the differences in average wages between people. This is because TTWAs encompass a wide range of wages, occupations, and types of employment. Within an average TTWA, the 90th centile early-career worker earns more than double (150 per cent more) the 10th centile early-career worker.

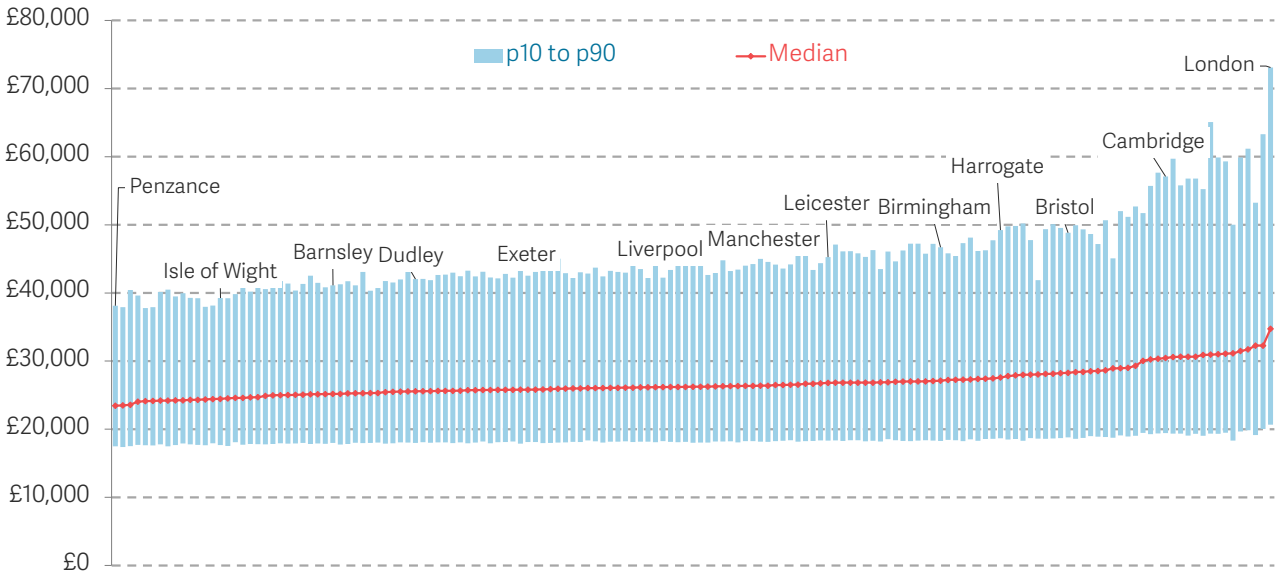
This within-area inequality means that, as shown in Figure 3, there is overlap between a higher paid worker in a lower paid area, and a median worker in the highest paid area. For example, early-career workers at the 90th centile of earnings in Penzance are paid 10 per cent more than the median earnings in London.

Finally, there is more similarity between places at the bottom of the pay distribution than at the top because the national minimum wage creates a wage floor for full-time workers. The 10th centile early-career full time wage in London, the highest-earning region, is only 18 per cent higher than in Penzance, the lowest-earning region. By contrast, pay is more dispersed at the top of the distribution: the 90th percentile wage in London is 93 per cent higher than in Penzance.

This means that ensuring more places can be at the cutting edge of the UK economy could shrink regional productivity gaps. But in doing so, within-region inequality could widen – a richer Greater Manchester would have less poverty, but more higher earners too.

FIGURE 3: **There is a lot more variation within local labour markets than between them**

Median wages and p10 to p90 by travel to work area: England, 2019



NOTES: CDF showing the distribution of median, P10, and P90 wages across TTWAs in England in 2019.
SOURCE: Analysis of Longitudinal Educational Outcomes (LEO).

But it is not enough to just observe these long-standing inequalities in pay across the UK. The key for policy is to understand why pay varies so much across UK labour markets, which remains less well understood. For example, do some places just pay higher wages to everyone? Or are they populated with workers who'd earn lots anywhere? In the next section, we break down what is driving these wage gaps across Britain's local labour markets.

Section 3

The role of people and place in regional inequality

Past research on the UK has found that wages are unequal across regions mostly because workers with high-earnings-potential cluster in certain locations, rather than their wages being boosted by the places themselves. This would mean that the same person moving from a low wage TTWA to a high wage TTWA would receive nearly the same pay.

However, our new estimates imply the impact of place is higher than previously thought. For example, our work suggests that an early-career full-time worker moving from a TTWA with a pay premium at the 25th centile (e.g. Dudley) to one at the 75th (e.g. Harrogate) would earn £1,300 more each year.

We also find that 'sorting' –whereby high-earnings-potential workers people move to high-pay-premium places – plays a big role in explaining differences in wages across areas, with more than 40 per cent of the variation due to sorting. However, while entirely removing sorting would reduce regional inequalities by 40 per cent, it would only reduce national average wages by 0.1 per cent. So, sorting boosts pay inequality a lot but average pay only a little.

In line with other work, we find that overall experience is a strong predictor of pay, but we also find that where that experience was gained matters even more. For example, a year spent working in London can raise wages by 10.2 per cent for workers who move to another major city than if they had not spent that year in London.

This section explores different explanations for regional pay inequalities in the UK. It is useful to think of three main causes (which are not mutually exclusive):

- It could be that in some labour markets, firms are more productive and can afford to pay higher wages (we call these 'place effects').
- It could be that high-wage places are populated by more people with innate abilities and skills that allow them to earn high wages anywhere ('people effects').

- The interaction of these effects could also drive regional inequality: this would happen when high-earnings-potential workers concentrating in high-paying places (known as 'sorting').

The answer to this question is important for a huge range of government policies, from regional policy and industrial strategy to housebuilding and transport investment. For example, if workers will earn nearly the same wherever they work then it might make sense to build houses wherever it is cheapest to do so. This would be a world of large 'people effects', where the inequality in earnings between places is driven by the distribution of different types of workers. In contrast, if the jobs are much better in some places than others, it would make sense to build the houses within reach of them. This would be a world of large 'place effects'.

The relative importance of place and people effects is contested

In this report, we present new estimates that decompose regional wage inequality into the three effects of people, place and sorting. Using the LEO admin data, we follow workers as they change jobs and move around the country. When that happens, we observe how their pay changes which enables us to estimate the people and place effects using an 'AKM' model.[17] This is an equation that breaks a worker's wage down into contributions from (potentially unobserved) personal characteristics and from where they work. Once we have these effects, we can average them within a particular area and then assess the relative importance of people, place and sorting with a method called variance decomposition.[18] More details on the methodology can be found in Annex 1.

This report builds on previous work from the UK and US decomposing regional wage inequalities and is the first to apply this approach using the LEO administrative data. There is still no clear consensus on how much each of these factors explains regional wage differences as Table 1 shows. Previous research on the UK has found that regional wage inequality persists mostly because high earners cluster in certain locations . For example, Overman and Xu found that just ~10 per cent of the local labour market variation in wages are due to place effects, with 52 to 58 per cent due to the people that live in those areas.[19] But, research from the US using admin data has found that a greater share of the variance is due to place effects when using firm level data. For example, Card, Rothstein & Yi found that 12 to 30 per cent of the variation in wages is due to place effects, with 30 to 64 per cent due to the types of people you find in different areas.

17 A Abowd, F Kramarz and D Margolis, High Wage Workers and High Wage Firms, Econometrica 67(2), March 1999, pp 251-333. See Annex 1 for more details.
18 D Card, J. Rothstein & M Yi, Location, location, location, American Economic Journal: Applied Economics 17(1), January 2025, pp. 297–336.
19 H Overman & X Xu, Spatial disparities across labour markets, IFS Deaton Review of Inequalities, 2022.

TABLE 1: **Previous research on the UK has found that wages vary because high earners cluster in particular locations**

Role of individual and area effects in explaining regional wage inequality in key papers in the UK and US

Paper	Focus	Methodology	Estimates
Gibbons et al. (2014)	UK – Sample of 1% workers - Hourly earnings	Mincerian wage model - Variance decomposition	Individual effects: 55 -85%, Area Effect: 1 -6%
Overman and Xu (2022)	UK – Sample of 1% workers - Hourly earnings	AKM wage model - Variance decomposition	Individual effects: 52 -58%, Area Effect: 9 -12%
Card et al. (2025)	US – Admin data of 95% workers - quarterly earnings	AKM wage model + Firm FE	Individual Effect: 30 – 64% Area Effect: 12 - 30% (establishment)
Bauluz et al (2024)	UK – Sample of 1% workers - Hourly earnings (+other countries)	Only variances of wages	Area Effect 7-8%

SOURCE: Summary of Gibbons et al. (2014); Overman and Xu (2022); Card et al. (2025); Bauluz et al (2024).

Our new estimates imply that place explains one third of the variance in pay across TTWAs

Our new estimates imply that place effects, measured as the employment-weighted average of the wage premia of local firms, drive far more of the UK's regional pay gaps than earlier work suggests.

In a specification following the Overman & Xu method of using area fixed effects, but with the LEO data, we find that 23 per cent of the variation in average earnings across travel-to-work areas comes from place effects. This compares with 38 per cent explained by the mix of workers including both factors which don't change (time-invariant factors), as well as those which change with individuals over time, such as gaining experience or changing job roles to ensure we are not mistaking ordinary career progression for the effect of moving location (i.e. people effects). This is shown by the middle bar of Figure 4).[20] The remaining 39 per cent reflects sorting, where high-skill people match with high-pay firms.

20 See Appendix 1 for full information about the specification, and for full tables of results.

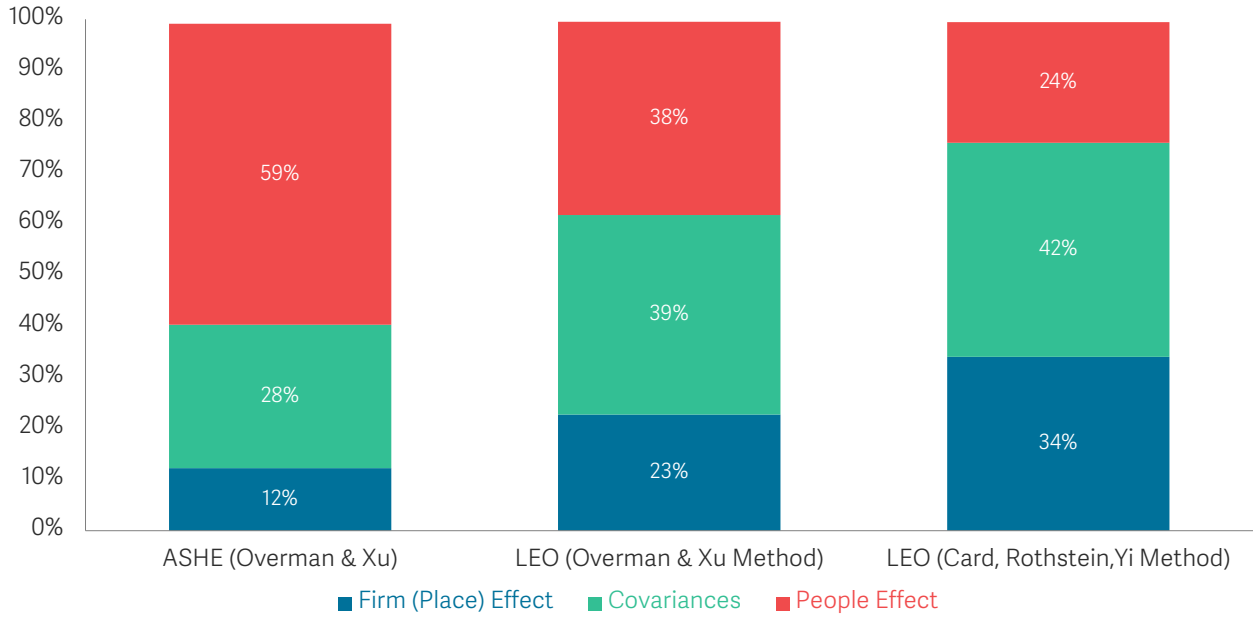
When we move to a method following Card, Rothstein & Yi which takes the employment-weighted average of firm effects in that place, allowing the place effect to be related to the types of firms that are there, the results show an even greater place effect.[21] Place effects increase to explain 34 per cent of regional wage dispersion, the people effect falls to 24 per cent, and the sorting effect rises slightly to 42 per cent. The result suggests that much of the pay gap between places reflects which companies operate in each area. We use this specification for the remainder of this report.

This is our central finding: even after accounting for people's changing characteristics, one-third of the pay differences between labour markets stem from places themselves, rather than the people within them. In short, where the jobs are and how generous their wage structures are matters at least as much as who takes them.

To illustrate this, we consider a worker moving to from a 25th centile TTWA (e.g. Dudley) to a 75th centile TTWA (e.g. Harrogate). Assuming this is a typical worker, our results imply a that an early-career worker's pay would rise £1,300 – a boost of more than 5 per cent.

FIGURE 4: **Place effects explain almost half of regional pay gaps**

Variance decomposition of log earnings across TTWAs, using different methods: GB / England



NOTES: See Appendix 1 for full methodology.
SOURCE: Analysis of Longitudinal Educational Outcomes (LEO), 2013 to 2020; H Overman & X Xu, Spatial disparities across labour markets, IFS Deaton Review of Inequalities, 2022.

21 Typically, people are grouped where they live. However, rather than grouping people by where they live, we use firm-based controls because pay differences between local employers are closely tied to where people move for work. This gives a clearer picture of the role of firms in shaping pay outcomes. See D Card, J. Rothstein & M Yi, Location, location, location, American Economic Journal: Applied Economics 17(1), January 2025, pp. 297–336.

Our results differ from previous findings for two main reasons. First of all, our data covers different people. Our data are restricted to early-career workers. It is possible that younger workers, with less accumulated experience, are more similar to each other than older workers and so have smaller people effects, increasing the relative contribution of place effects. Our dataset is also close to the population of young workers in England, rather than a sample. It may be possible to measure place and people effects more precisely in a big dataset with lots of job moves. You can see this in the difference between the left-hand and middle columns in Figure 4.

Second, granularity matters, too. Due to data limitations, earlier work treated each travel-to-work area as a homogenous area. This can bias downward the contribution of place effects. Evidence from the US shows that workers who move to higher-paying TTWAs typically move from a relatively high-paying firm in their old low-paying TTWA to a relatively low-paying one in the new high-paying TTWA, and vice versa.[22] This means that place effects are measured to be smaller than they really are. The LEO data allows us to look at the pay premia of individual firms, thereby controlling for the 'rank' of the firm the employee has moved to. The result is bigger measured place effects. This is the difference between the middle and right-hand columns in Figure 4.

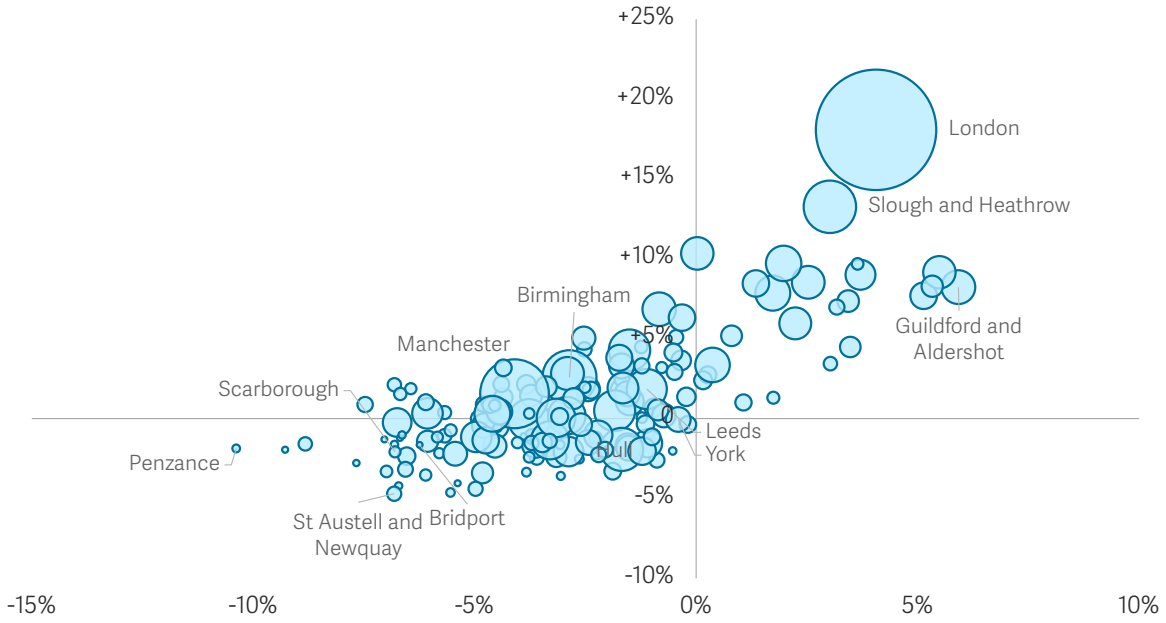
High-wage workers sort into high-wage places, explaining much of the pay gap between areas

The people and place effects discussed above aren't all that matter for the gaps in wages across places. Our results also find that the sorting effect – when high-earnings-potential workers concentrate in high-paying places – is also important for making wages unequal across regions. As shown in Figure 5, there is a clear correlation between the productivity of the area and the earning power of the people there, especially in high productivity areas, Our estimates imply that this is responsible for 42 per cent of the differences in wages across TTWAs.

22 D Card, J. Rothstein & M Yi, Location, location, location, American Economic Journal: Applied Economics 17(1), January 2025, pp. 297–336.

FIGURE 5: **Sorting plays a key role in wage inequalities, as people and area effects are highly correlated**

Scatter of area effects (horizontal axis) and people effects (vertical axis), by TTWA: England, 2013-2020



NOTES: We show the results from the AKM without time variant individual controls. For full methodology, see Annex 1. Bubble size reflects number of jobs in each area
SOURCE: Analysis of Longitudinal Educational Outcomes (LEO), 2013 to 2020.

A Britain without sorting – where workers are equally distributed across areas – would have less regional wage inequality. If we allocated workers evenly across TTWAs, then the variance of average wages between areas would shrink by 40 per cent. There would also be a small price to pay in terms of average pay, but this effect would be very small: we estimate only 0.1 per cent. This number is small because place effects boost the wages of all workers by the same proportion, so only affect the average to the relatively limited extent that they are worth more in cash terms to high-wage workers than low-wage workers. So the fact that the highest-earning-potential workers are more likely to be found in the highest-paying locations makes a big contribution to increasing regional inequality but only a small contribution to increased total pay.

You can take the worker out of London, but you can't take the London out of the worker

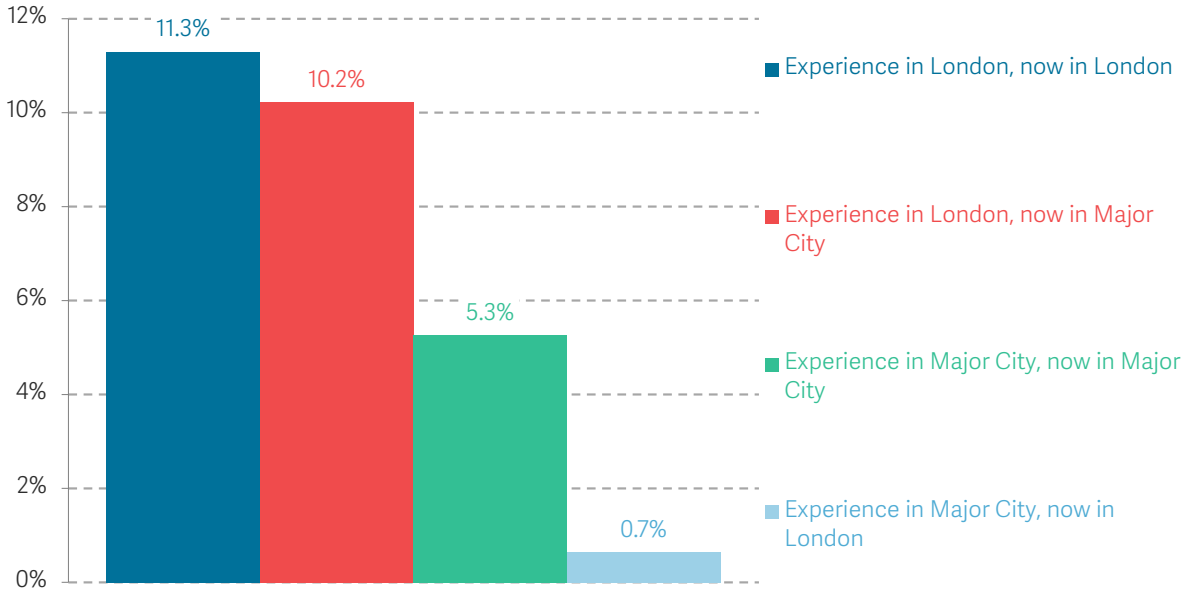
Our model of wage differences across England reveals that an additional year of experience results in 23 per cent higher earnings for early-career workers. This is likely higher than for the workforce as a whole, but that is to be expected early on in life. But our results imply that it is not just how much experience someone acquires that matters, but also where they acquire it and how that shapes their future earnings.

Our work can follow individual workers as they move in and out of England's cities and track their wages as they do so. We find that experience matters for pay, but the location of that experience matters even more. For example, a year spent working in London raises subsequent wages by 11.3 per cent for workers who are in London, and by 10.2 per cent for those who move to another major city (Figure 7) with not spending a year in London, holding constant other factors (and on top of gaining another year of experience). Experience gained in Manchester, Birmingham and other large cities also boosts pay, but to a lesser degree: an extra year there raises wages by 5.3 percent when the worker continues to live in a major city, but by just 0.7 per cent if they lived in a major city but now live in London, compared to if they had lived elsewhere.

This enduring wage premium attached to time spent working in London suggests that early-career workers could benefit from time spent gaining experience in London – and larger cities in the UK – before taking that experience with them to other parts of Britain.

FIGURE 6: **Workers take the pay boost from experience in London with them**

Estimated impact of one year of experience in London on average wages compared to not working in London: England, 2013-2020



NOTES: Major cities include, Birmingham, Manchester, Leeds & Liverpool. London includes London, Slough and Heathrow.
SOURCE: Analysis of Longitudinal Educational Outcomes (LEO), 2013 to 2020.

So, as Figure 4 shows, place effects are the most important factor in explaining inequality in pay between areas for early-career workers. While individual characteristics still matter, they account for a smaller share of wage differences between areas than previously found. But what is causing these place effects – is it differences in size? the industrial or occupational composition? or something else? We answer this In Section 4.

Section 4

What lies behind 'place effects'?

Place is the most important factor in explaining inequality in pay between areas for early-career workers, but there are competing ideas about why this is the case. One suggestion is that there is considerable variation in the size of labour markets, ranging from just 5,000 workers in Whitby to 3.2 million in London. Larger, thicker labour markets are likely to have greater knowledge spillovers and better job matching, examples of a phenomenon known as agglomeration. Our new results suggest that labour market size matters in England, but less than one might think: across all workers, doubling the size of a labour market increases its productivity by only 3.9 per cent. We also find that most high-paying labour markets are located in a geographically contiguous 'Greater South East', suggesting that agglomeration may happen at a higher level. But, as measured, the variation in the size of local labour markets accounts for only a quarter of the dispersion in place effects.

This leaves much of the place effect unexplained. A little bit of the place effect occurs because certain places have more jobs in larger firms, a bit more because of the distribution of high-paying industries (e.g. finance), and slightly more because of higher-paying occupations. There is also a small interaction effect - there is a tendency for well paid industries within a TTWA to be overrepresented in that TTWA (as suggested by agglomeration models). But most of the variation in place effects cannot be explained in this way and instead comes from the fact that jobs in particular locations just pay well, across all industries, occupations, or firm sizes.

Evidence from the UK, US and France suggests that the quality of firms within industries, and their decisions of where to locate themselves and their high-value functions is most important for explaining the differences in place premia.

The previous section showed place effects are a key factor in explaining inequality in pay between areas for early-career workers. In this section, we look what is causing these place effects. We look at several hypotheses – the size of the labour markets; the industrial composition of labour markets; their occupational composition; the

distribution of firm sizes. We conclude that the sorting of the best firms into certain locations is the key driver of place effects.

Agglomeration effects are smaller than you might think

One possible cause of place effects is the variation in local labour market size. England's TTWAs range from just 5,000 full time workers in Whitby to 3.2 million in London, giving different areas very different opportunities for worker-employer matching, different thickness of business services markets, and innovation through knowledge sharing. The productivity benefits that arise from cities taking advantage of their scale is known as the 'agglomeration effect'.

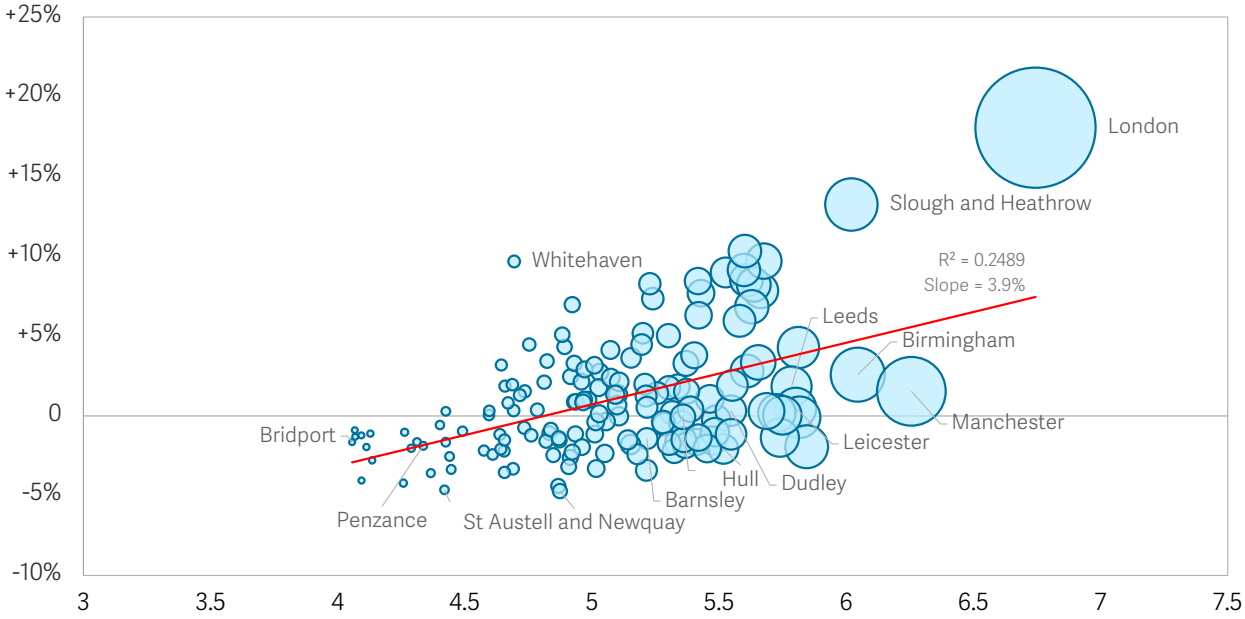
Our results suggest that agglomeration plays a role in explaining the UK's regional wage differences, but a smaller one than you might think. As shown in Figure 8, doubling the size of a labour market is estimated to boost wages by 3.9 per cent. This result is in line with other work which has found that agglomeration plays a surprisingly limited role in UK productivity differences between TTWAs.[23] Consistent with previous work, our work also shows that Manchester and Birmingham – England's second and third largest TTWAs – punch below their weight when it comes to pay levels, with average pay being substantially lower than we might expect for cities with such large labour markets.[24] In other words, their pay premia are much smaller than one would expect given their large size.

23 The average effect from 47 international empirical studies, including some of the UK, is 4.6 per cent is reported in: D Graham & S Gibbons, Quantifying Wider Economic Impacts of agglomeration for transport appraisal: Existing evidence and future directions, Economics of Transportation, September 2019.

24 P Brandily et al., A tale of two cities (part 1): A plausible strategy for productivity growth in Birmingham and beyond, Resolution Foundation, September 2023.

FIGURE 7: **Size matters, but less than you might think: doubling the size of a labour market boosts earnings by about 4 per cent**

Scatter of place effects (vertical axis) and log size of local labour market (horizontal axis): England, 2013 - 2020



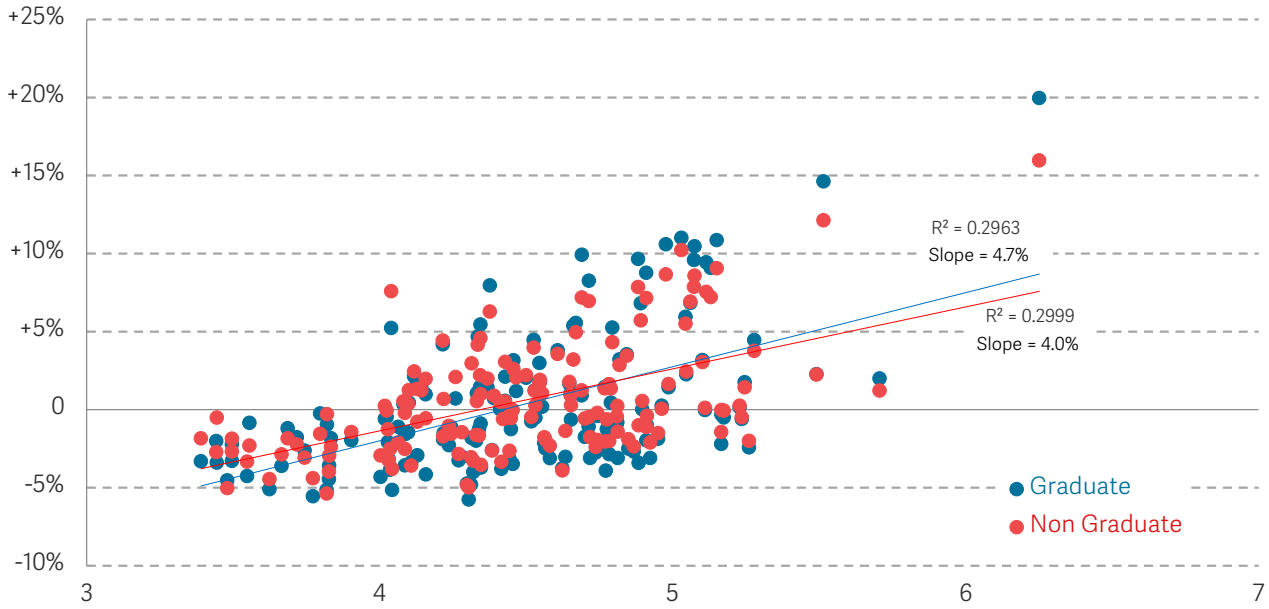
NOTES: We show the results from the AKM without time variant individual controls. For full methodology, see Annex 1. Bubble size reflects number of jobs in each area
SOURCE: Analysis of Longitudinal Educational Outcomes (LEO), 2013 to 2020.

In line with previous work, we find that agglomeration effects are slightly more important for graduates than non-graduates.[25] As shown in Figure 8, we find that the agglomeration impact for gradates is 4.7 per cent when you double the size of a labour market, compared with 4.0 per cent for non-graduates. But the differences are small, and they are relatively small for workers in both categories.

25 A Stansbury, D Turner & E Balls, Tackling the UK's regional economic inequality: binding constraints and avenues for policy intervention, Contemporary Social Science, August 2023. X Xu, The changing geography of jobs, November 2023. In the US, the evidence suggests that the formerly robust urban wage premium paid to non-college workers has eroded, D Autor, The Faltering Escalator of Urban Opportunity, MIT, July 2020.

FIGURE 8: **Agglomeration boosts graduates' pay more than non-graduates'**

Scatter of graduate place effects and non-graduate place effects (vertical axis), and log size of labour market (horizontal axis): England



NOTES: We show the results from the AKM without time variant individual controls. For full methodology on the returns to education across places, see Annex 1. Horizontal axis shows log size of early-career labour market by TTWA.
SOURCE: Analysis of Longitudinal Educational Outcomes (LEO), 2013 to 2020.

High wage places are concentrated in the 'Greater South East'

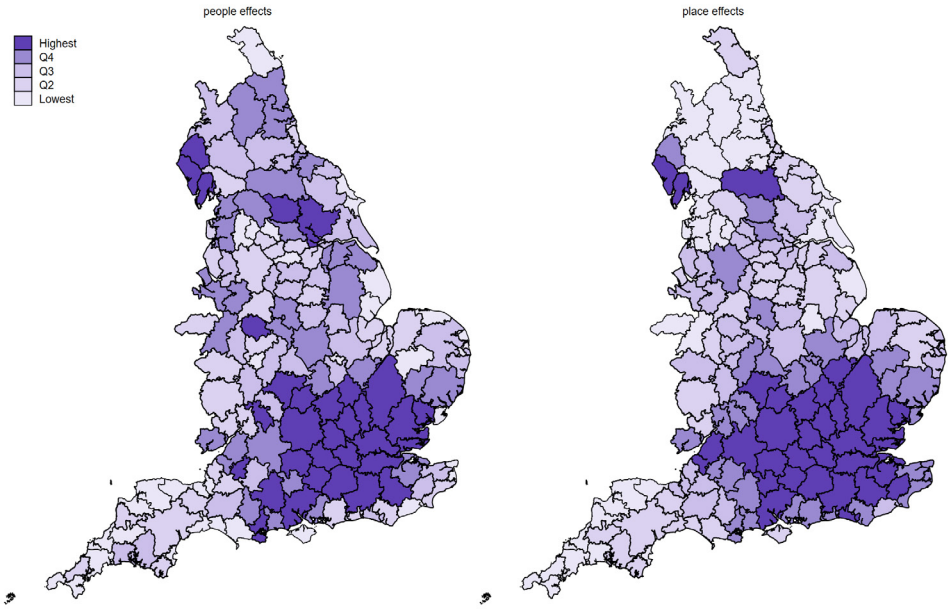
Work on agglomeration from the US and Europe suggest that agglomeration can have larger effects than we observe in the UK. But one key difference is that the size of a typical local labour market in the US is much larger than in the UK: there are many labour markets in the US with more than 1 million workers. In England, just one TTWA has more than 1 million workers (London). But it is possible that, at the national level, the 'Greater South East' forms a cluster of high-paying areas. We show this in Figure 9, which plots people and place effects across England. So it could be that there are bigger agglomeration effects happening in the UK on a much larger scale than TTWAs. This is consistent with tradable services (such as insurance, legal services and consulting), which the UK specialises in, benefitting from wider agglomeration effects.[26] We return to the question of industrial composition below.

Another possibility comes from the fact that we measure workers where they live, rather than where they work. TTWAs are intended to make this distinction unimportant, by defining places where the vast majority both live and work. But it is possible that place effects bleed across TTWA borders because of this measurement error.

26 J De Lyon et al., Enduring Strengths: Analysing the UK's current and potential economic strengths, and what they mean for its economic strategy, at the start of the decisive decade, Resolution Foundation, April 2022. P Brandily et al., A tale of two cities (part 1): A plausible strategy for productivity growth in Birmingham and beyond, Resolution Foundation, September 2023.

FIGURE 9: **High-paying firms and high-earning workers tend to be concentrated in the 'Greater South East'**

Quintiles of people and place effects across TTWAs: England 2013 - 2020



NOTES: We show the results from the AKM without time variant individual controls. For our full methodology, see Annex 1.
SOURCE: Analysis of Longitudinal Educational Outcomes (LEO), 2013 to 2020.

Differences in industry mix do little to explain pay gaps across areas

Place effects could potentially vary across TTWAs because industries pay different premia and are concentrated in different locations. For example, do place effects vary between Luton and Penzance because the former is full of professional services and the latter over-indexes in hospitality? We can answer this question by decomposing the place effects into three parts using a method developed by Card, Rothstein & Yi. [27] This tries to explain whether an area pays more because of what industries the jobs are in and how well they typically pay, how much better a job in any given industry pays in the that labour market, and an interaction effect:

- **The industry composition.** First, we look at industry composition: some areas may simply have more jobs in high-paying sectors like tech or finance.
- **The industry premium.** Second, we ask: are jobs in this area better paid than jobs in other areas but in the same industry? This is 'the industry earnings premium', which may reflect stronger productivity or more competitive labour markets which force firms to pay workers a bigger share of what they produce.

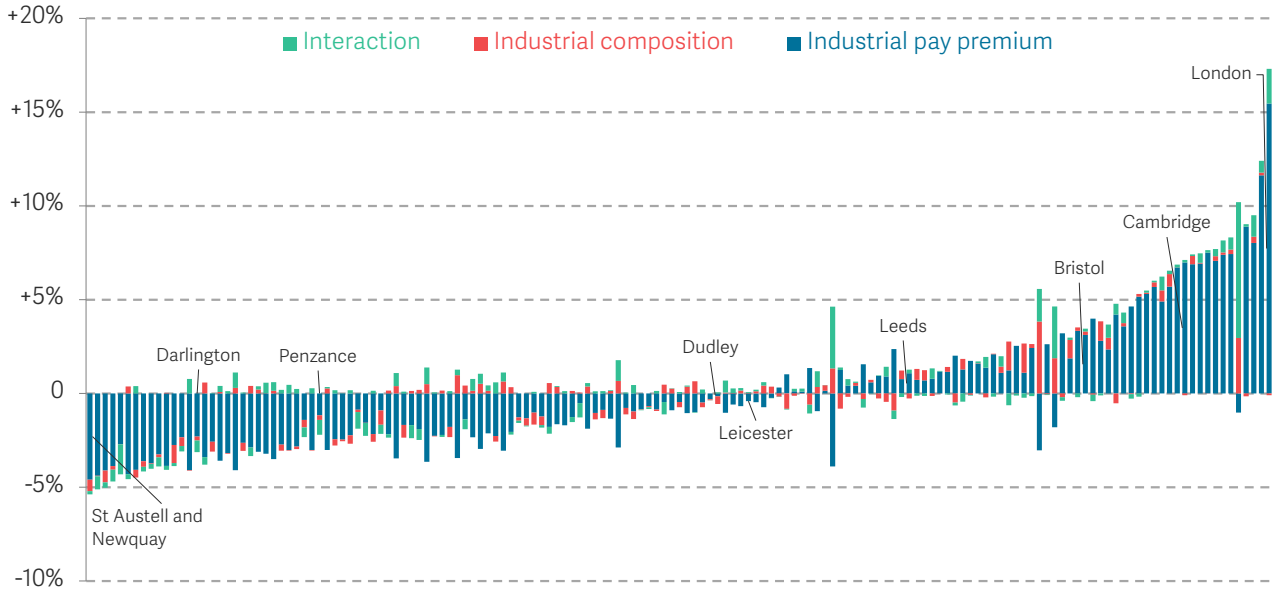
27 D Card, J Rothstein & M Yi, Location, location, location, American Economic Journal: Applied Economics 17(1), January 2025, pp. 297–336.

- **Their interaction.** Third, we examine the interaction between the two to answer the question: do industries that pay more locally than the national average for that industry also employ a large share of the local workforce?

Our results are that industry composition explains only about 10 per cent of the variance in the place effect. Instead, the main reason wages differ is because firms in certain places tend to pay more than firms in the same industry elsewhere, accounting for 82 per cent of the local earnings premium (Figure 10). For example, two TTWAs with large textile industries will both produce cloth, yet workers in one area may earn more because factories there use better equipment, higher-quality inputs, or newer software to sell it. The interaction between industry mix and local pay practices adds a very small 1.6 per cent, since in a few places the high-paying industries also employ a large share of workers, giving those areas a small additional wage advantage. Composition is more important in places like Swindon, Andover & Barrow in Furness, but overall the large share for the industry premium means that we have not really explained the place effect with industry composition.

FIGURE 10: **Four-fifths of the local earnings premium is caused by within-industry pay differences**

Decomposition of the local earnings premium by TTWA: England



NOTES: For full industrial decomposition methodology, see Annex 1.
SOURCE: Analysis of Longitudinal Educational Outcomes (LEO), 2013 to 2020.

Occupations matter – but they are not the whole story

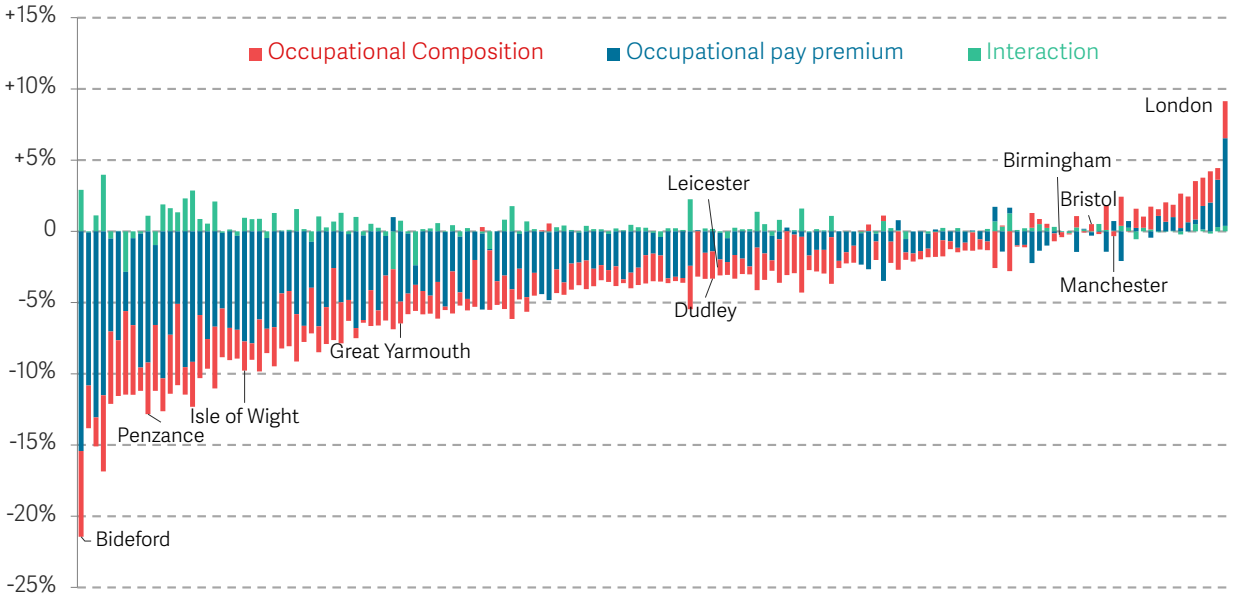
Another possibility is that the occupational composition of available jobs varies across labour markets. We turn to ASHE data which includes more detailed information about occupations. This lets us test whether the pay differences can be explained more by a focus on occupation (which is not available in the LEO data) than industries. We do this by replicating the industry decomposition using occupations, to quantify how much of the spatial variation in wages is due to:

- **The local occupation pay premium**, which reflects whether, within a given occupation, workers in certain TTWAs tend to earn higher wages than workers elsewhere;
- **The occupational composition of each area**, which reflects the fact that that some areas may have more jobs in high-paying occupations; and,
- **The interaction** between the occupation pay premium and the occupational composition, which would be important if occupations paid a bigger premium in a given TTWA also form a relatively larger share of the workforce.

Of these three, we find the occupation pay premium accounts for the largest share of the variation in the place effect (69 per cent) suggesting, as with the industrial composition, that the majority of the variation in the place effect is because, say, managers are paid more in some areas than others (Figure 12). However, the occupational composition effect contributes 14 per cent, higher than the industry composition effect, suggesting that way that jobs of different occupations are arranged unequally across the country is of more importance for regional wage differences that the that different types of industries are distributed unequally across TTWAs. The interaction term, revealing whether areas with higher-paying occupations also tend to employ more people in those roles, remains a modest 8 per cent.

FIGURE 11: **Occupational composition explains a greater share of the place effect than industry composition explains**

Decomposition of the occupational pay premium by TTWA: England



NOTES: For full occupational decomposition methodology, see Annex 1.
SOURCE: Analysis of Longitudinal Educational Outcomes (LEO), 2013 to 2020.

So both occupational and industrial composition leave the vast majority of place effects unexplained: it's not so much what jobs people do, but how those jobs are rewarded in different places that drives local wage differences.

Firm size also does not explain place effects

So, given that only small shares of the place effects can be put down to industrial and occupational composition, we next consider if the local pay premium can be explained by different areas having differently-sized firms . Given that larger firms tend to be more productive and to pay more, it might be the case that large firms are all concentrated in one part of England, thereby making that area look well paid. We do another decomposition to explore this, dividing firms into ten buckets by the number of early-career workers, to perform an analogue of the industry pay decomposition.[28] In particular, we can quantify how much of the spatial variation in wages is due to:

- **the local pay premium for firms of a given size**, which reflects whether firms in certain TTWAs tend to offer higher wages than similar-sized firms elsewhere;
- **the size distribution of firms in each area**, combined with the extent to which big firms pay more; and,

28 Our data do not tell us how big the firms are, just how many of the sample work there.

- **the interaction** between the two – i.e. labour markets with lots of large firms paying the employees of large firms relatively more.

We find that nearly all (97 per cent) of the variance in the pay differences between areas come down to differences in pay within similarly sized firms. In other words, it's not the case that some areas have only large or small firms. Instead, the place effects we found earlier exist because firms in an area are paying different wages compared to firms of the same size in different TTWAs. This is unsurprising: a ten-person high-growth start-up, for example, bears no resemblance to a ten-person corner shop in terms of output or earnings potential. This mirrors research showing that there are large productivity gaps between firms, with weak performers trailing far behind the leaders.[29] For example, in 2022, 71 per cent of UK workers worked for firms with labour productivity below the mean.[30]

We summarize the findings across the industry, occupation and firm size decompositions in Figure 13. As we showed, the overwhelming majority of the variation in pay between TTWAs occurs within industry, and within firms of a similar size. Occupation is a little different: the majority of the variation in pay between TTWAs is still explained by variation within occupations, but a greater share is explained by different occupations being particularly prevalent in different areas.[31]

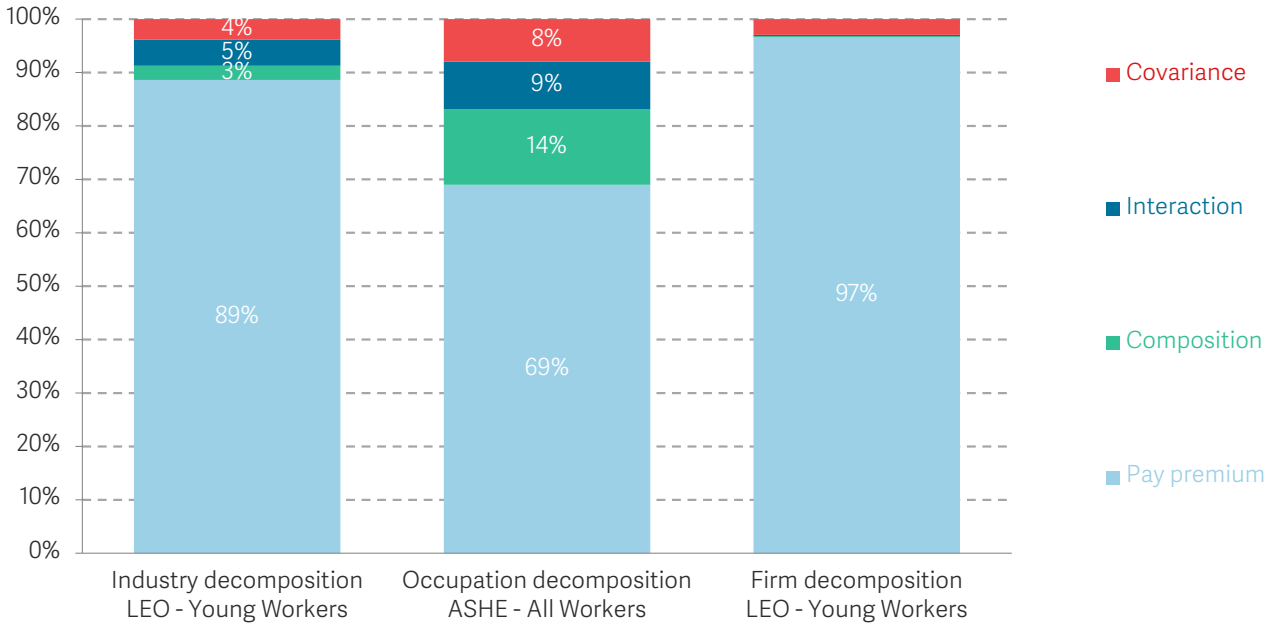
29 See: R Davies, N Hamdan and G Thwaites, Ready for change: How and why to make the UK economy more dynamic, Resolution Foundation, September 2023; J De Loecker, T Obermeier & J Van Reenen, Firms and inequality, IFS Deaton Review of Inequalities, March 2022.

30 ONS, Trends in UK business dynamism and productivity: 2024, December 2024.

31 A small share of the overall variance is explained by a covariance term (the red bars). This term represents the contribution to the variance in place effects that comes from the premium, interaction and composition effects being correlated across labour markets. For example, in the middle column, it is driven by a tendency for high-wage occupations (e.g. management) to concentrate in labour markets that pay high wages to all occupations (e.g. London and the South East). It is different to the 'interaction term', which represents the boost to the place effect from the tendency of occupations paid relatively more within a TTWA (e.g. managers being paid more in London) to be overrepresented in that TTWA (e.g. there being relatively many managers in London).

FIGURE 12: **Most pay variation across places occurs within industries and within firms of a similar size, but occupational composition matters more**

Comparison of decompositions of industry, occupation and firm size: England / GB



NOTES: For full occupational decomposition methodology, see Annex 1.
SOURCE: Analysis of Longitudinal Educational Outcomes (LEO), 2013 to 2020 & Annual Survey of Hours and Earnings (ASHE).

It seems likely that the location of the best firms drives pay inequalities

We have shown that firm size, occupational composition and industrial composition do not explain place effects. So what else can it be? The balance of available evidence suggests that place effects are driven by the clustering of high-paying firms, across many industries, in particular locations. There are several reasons for this conclusion. First, we know that productivity varies hugely across firms, with firms in the top decile of productivity in a sector typically more than eight-times more productive than those in the bottom decile.[32] Second, recent research on the US and France uses a similar method to ours but is also able to track firms that relocate. It finds that pure 'place effects', distinct from the firms within them, are tiny, and the large regional variation in pay premia is driven by the clustering of high-paying firms.[33] Third, new research, again on the US, has found that firms with multiple sites account for most of the increase in the variance of wages across and within firms since the 1980s. These firms have tended to put all their management or R&D functions in relatively few of their sites, leaving the rest to just produce the services the firms make (e.g. retail or hospitality).[34] Taken together, these all

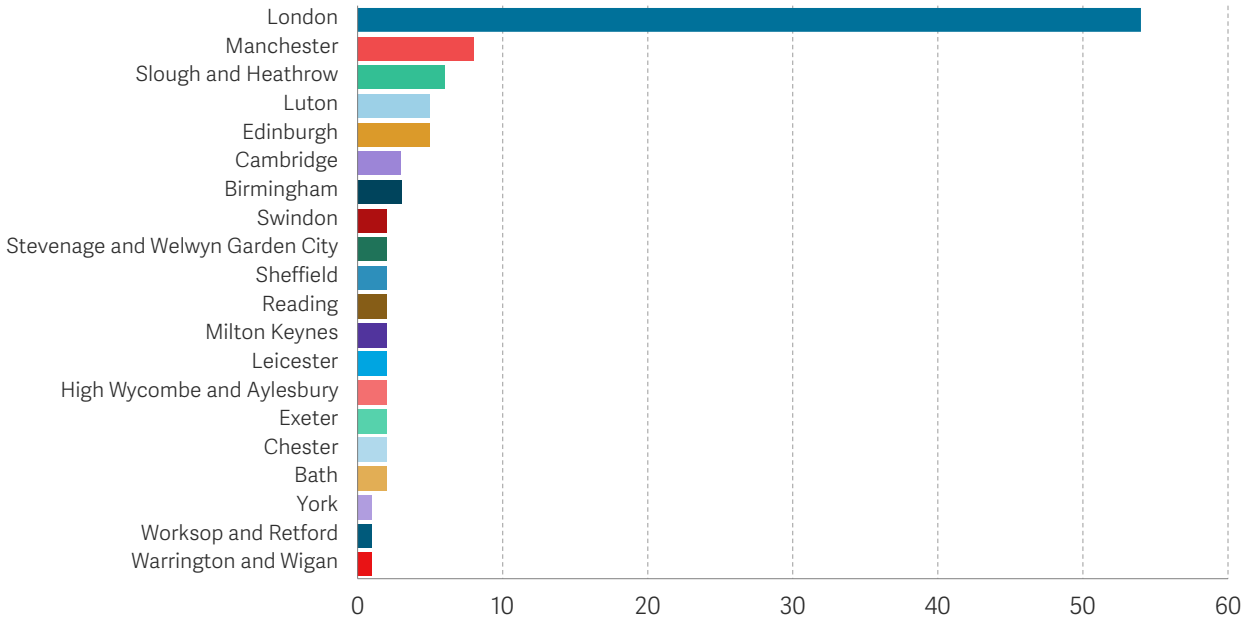
32 R Davies, N Hamdan and G Thwaites, Ready for change: How and why to make the UK economy more dynamic, Resolution Foundation. September 2023
33 P Carry, B Kleinman & E Nimier-David, Location Effects or Sorting? Evidence from Firm Relocation, NBER Working Paper, May 2025.
34 B Kleinman, Wage Inequality and the Spatial Expansion of Firms, mimeo., July 2024.

suggest that the clustering of high-productivity firms and functions is very important in generating regional pay inequality.

What we can tell for the UK suggests that the same trends are in play. In the UK, 2.1 per cent of businesses (58,050) operate at multiple sites, with just 0.2 per cent (5,600) operating with more than 10 local units.[35] But these firms are disproportionately large, productive employers, and their headquarters functions are geographically highly concentrated. In the UK, more than two-fifths (43 per cent) of the firms in the FTSE 100 and 250 are headquartered in London (see Figure 14), and 52 per cent of FTSE firms are headquartered in the TTWAs of London, Slough and Heathrow, or Luton.[36] In contrast, only 2.4 per cent of firms are headquartered in Birmingham, and 4 per cent in Edinburgh. The domination of London as the centre of Britain's headquarters is likely to be linked to Britain's regional wage inequalities.

FIGURE 13: **Head offices are clustered in London**

Top 20 travel to work areas by number of FTSE headquarters: UK



NOTES: Within the FTSE 100 and FTSE 250 we were able to match 126 firms' headquarters to a TTWA. The number of matches is smaller than 350 largely because (1) many listed firms are not headquartered in the UK and (2) we drop firms which appear to be listed investment trusts.
SOURCE: Analysis of London Stock Exchange and Companies House data.

This section has shown that the composition of TTWAs in terms of occupation, industry or firm size only drives a small fraction of the place effects in England. This

35 ONS, UK business; activity, size and location: 2024, September 2024.
36 Within the FTSE 100 and FTSE 250 we were able to match 126 firms' headquarters to a TTWA. The number of matches is smaller than 350 largely because (1) many listed firms are not headquartered in the UK and (2) we drop firms which appear to be listed investment trusts.

suggests that the UK's regional inequalities cannot be addressed simply by moving, say, managers or the professional services industry to other parts of England, or by ensuring that a particular size of firm is located everywhere. We move to discussing the policy implications in the following Section.

Section 5

Policy implications

The presence of large place effects in different parts of the country has important policy implications for a Government looking to raise living standards and narrow regional gaps. In particular, it suggests that there are big benefits to be gained from workers moving into the best labour markets where they can be more productive. This means that housebuilding plans should be tilted, as in recent government plans, towards the best-paying labour markets. Any new properties should be for workers of all kinds – not just the best-paid ones – because the benefits of sorting workers into the best labour markets appear to be small. It is likely that part of the higher wages that result will be eaten up in the form of higher housing costs, but these are worth paying when the benefits for workers can be long-lasting. The resulting gains for landlords in strong labour markets can be taxed away to pay for public services or tax cuts elsewhere.

But relocating workers will only go so far – it is not feasible to concentrate the whole of the UK workforce in just a few labour markets. To further boost total GDP, as well as reduce regional disparities, well-paying jobs will also need to move to the workers. This doesn't mean moving industries, but rather productive firms and the high-value functions within them – especially their headquarters – growing new clusters of good jobs. This has been tried before with mixed outcomes. But our results suggest that the benefits are bigger than previously thought, so researchers and policymakers should revisit this question.

This report has shown that the wide variation in regional average wages for early-career workers across England is driven to a large extent – and larger than previously thought – by some local labour markets paying higher wages than others to people who would otherwise earn the same as each other. The rest of the variation is driven by the fact that high-earning people cluster in certain labour markets and, to a greater extent, by that clustering being particularly likely to be in the highest-paying labour markets. But the role of 'place' is the single biggest one, and bigger than previous studies have found. In this final section, we consider the policy implications of these findings. Before doing so,

we should note that, given the methods used in our work, and what we know about the causes and consequences of job matching and economic agglomeration, our findings are most reliable when considering incremental rather than wholesale changes to economic geography.[37]

Moving workers to good jobs

The existence of large 'place effects' suggests that we can increase overall GDP if we can move workers from the low-wage labour markets to higher-wage labour markets. So it is important to put workers within reach of the most productive firms. This means that place-based policies which alter the geographic location of economic activity – where firms and workers locate – can have a large effect on national productivity, as well as on spatial inequalities.

To get a sense of the rough magnitudes, consider the impact of relocating 10 per cent of the workers in the bottom-paying quartile of labour markets to the top-paying quartile. The average difference in the wage premium between these two places is 13 per cent. Raising the wages of 2.5 per cent of the workforce by 13 per cent would raise the total wage bill by 0.3 per cent. On the assumption that wages are roughly proportional to productivity, GDP would rise by a similar amount.

As we have previously argued, this creates a strong rationale to concentrate housebuilding in the most productive labour markets, rather than the least affordable parts of the country.[38] Other measures that increase the ability of workers to reach the high-wage labour markets, such as skewing the occupation of the existing housing stock towards people more likely to participate in the labour force, or improving transport so that more workers can commute, would also raise GDP in a similar fashion.

We have seen that there is a strong trade-off between the location and total amount of economic activity. Moving a bigger fraction of the workforce within reach of the best jobs will raise GDP. But there is no aggregate benefit to skewing the existing number of workers and encouraging greater sorting by, for example, encouraging only high-wage workers into high-wage labour markets. Doing so would increase regional inequality but would have very little impact on overall GDP. A related but distinct point is that place effects are roughly equally important for graduates and non-graduates. The policy implication is that, while it is important to get more workers into the best labour markets, this is true for a wide variety of workers; our results provide no rationale for emptying

37 Our estimates of worker and place earnings premia come from observing the movement of workers across firms in different places, assuming that the firm pay premia don't change when this happens. This is a reasonable assumption to make for small movements of workers. But the fact that workers and firms cluster together strongly suggests that they benefit from co-location. As a result, any attempt to relocate very large numbers of firms or workers cannot be guided by the results in this study.

38 E Fry & G Thwaites, Growth Mindset: Sizing up the Government's growth agenda, Resolution Foundation, September 2024.

high-wage labour markets of low-wage workers. So the additional dwellings to be built in the strongest labour markets should be of types that will accommodate all kinds of workers and not just the highest-paid ones.

Spreading the benefits over time and across the country

Wages are substantially higher in the better-paying labour markets, but living costs – especially housing – are typically also higher too, such that the differences in disposable income for a given worker are much smaller.[39] This means that, looked at solely from the perspective of real wages in a given year, there might seem to be only a small benefit to a given worker from moving to the best labour market. This is in line with the prediction of standard models of worker choice between labour markets: wages and costs adjust so that wages adjusted for the local cost of living are about the same everywhere, choking off any further internal worker migration flows.[40]

However, these static considerations miss two important concerns. First, we have shown that the benefits of experience in the best labour markets persist long after the worker has left. This means that putting up with a few years of expensive housing in, say, London can be a sensible investment if the worker can later move to a cheaper area but keep a part of the London pay premium.

Second, expensive housing is a private cost but it is not a social cost. This means that it is not the case that high rents in London are removing all the productivity and pay benefits of working there: instead, the housing market is moving those gains from the renting worker to the landlord or from the purchaser to the vendor. If this is leading to undesirable distributional consequences or the gains to landlords are seen as windfalls, then these (actual or economic) rents can, with a properly designed tax system, in principle be fully taxed away with no costs in terms of distorting or discouraging economic activity. So even if the workers themselves see a smaller rise in their real wages because of moving into high-cost area, the high land rents that lie behind these high costs can be captured and shared with well-designed property taxes.

Moving good jobs to workers

There is much to be gained by moving more workers into the locations with the best jobs. But it is not practical to concentrate the totality of the UK workforce in very few locations. Policymakers will always be interested in how to generate more high-paying jobs and how to distribute them more evenly across the country. The question is how.

39 H Overman & X Xu, Spatial disparities across labour markets, IFS Deaton Review of Inequalities, 2022
40 J Roback, Wages, Rents, and the Quality of Life, Journal of Political Economy, 90(6): 1257–1278, 1982.

Our results indicate that there is little to be gained, in terms of regional inequality, by reallocating jobs at the level of broad industries from one part of the country. It's true that finance pays more than hospitality, and that finance jobs are more common in some places than others, but these facts together do not explain much of the inequality we see across regions. Rather, inequality comes from the fact that jobs in (say) Slough and Heathrow tend to pay more than those in Birmingham both in finance and other industries. So reallocating finance firms, rather than any others, out of Slough and Heathrow is unlikely to have much effect on regional inequality.

Of course, the standard industrial classifications used in our research are broad. They conceal a wide range of differences in the types of jobs and activities performed within them. For example, a cashier and an equity analyst both work in the financial industry, perhaps even in the same bank, but are paid very different premia. Consistent with this, what seems to be more important in explaining regional pay gaps is the type of work done within a given firm and, even more so, the nature of the firm itself. We have long known that there is huge dispersion in productivity at the firm level.[41] More recent evidence shows that there is also wide dispersion in productivity across locations within a given firm, and that the separation of large firms' functions across locations is a big driver of regional wage inequality.[42] Finally, we saw in Section 4 that recent evidence from the movement of firms across locations in the US and France suggests that pure 'place effects', derived from the physical attributes and amenities of locations, are very small, and most of the dispersion in observed place effects (such as those identified in our research) is in fact due to high-paying firms clustering together. If this is true in the US and France, it is likely to be true in the UK too.

The implication is that the way to relocate good jobs to less advantaged parts of the country means relocating high-paying firms, or the high-paying functions within them. The fact that firms move infrequently and that high-paying ones cluster so strongly together attests to some combination of high intrinsic costs of changing location or strong complementarities with the location decisions of other firms.[43] The latter represents a form of collective action problem that public policy can address.

To concentrate minds, let's consider Birmingham and Manchester, two metropolitan areas that contain large numbers of workers but that have a much lower pay premia than one would expect given their size (see Figure 7 above). As some of us have set out in previous work, these pay gaps are costly, for both local workers and the whole country.

41 R Davies, N Hamdan and G Thwaites, Ready for change: How and why to make the UK economy more dynamic, Resolution Foundation, September 2023.
42 B Kleinman, Wage Inequality and Spatial Expansion of Firms, mimeo., July 2024.
43 Department for Business, Energy and Industrial Strategy, Drivers of Firm Relocation, May 2018.

Bringing these cities' pay premia up to the regression line would raise wages by an average of 3 per cent in those places and 0.1 per cent for England as a whole.

In previous work, the Resolution Foundation has advocated increasing the effective size of the labour markets in these twin second cities – through housebuilding, densification and investments in radial transport.[44] These are worthwhile interventions and may well be necessary conditions to fully exploit the available agglomeration externalities in these potentially large but poorly interconnected labour markets. However, our new evidence tells us that these interventions will only raise wages substantially if they are accompanied by the arrival of higher-value corporate activity. This activity could be in the form of highly productive firms or the high value activities within firms, either home-grown or relocated from elsewhere.

Interventions to encourage firms to relocate have a chequered history,[45] but our finding that place effects are bigger than previously thought, combined with recent evidence from elsewhere about what makes them co-locate, brings new urgency to the question of how best to make this happen.

44 P Brandily et al., A tale of two cities (part 1): A plausible strategy for productivity growth in Birmingham and beyond, Resolution Foundation, September 2023.
45 See What Works Centre for Local Economic Growth, Area based initiatives can have positive impacts on local growth outcomes, updated May 2025.

Annex 1: Details on Estimating Equations and Variance Decomposition

Estimating Equations

We begin our analysis by following the recent urban economics literature that estimates individual and area effects on earnings using modified versions of the Abowd, Kramarz, and Margolis model (hereafter, the AKM model).[46] This approach allows us to quantify the contribution of workers', firms', and places' characteristics to earnings inequality using the AKM models from the 2022 Overman and Xu paper as well as 2025 Card Rothstein and Yi paper.[47] Using LEO data, we track the same individuals over time as they move across different areas in England, using a two-way fixed effects framework. We also include controls on individual characteristics such as age.

The estimating equation is specified as follows:

$$\ln(y_{it}) = \rho_0 + \alpha_i + \delta_{f(i,t)} + \beta X'_{it} + \lambda_t + \varepsilon_{it} \quad (1)$$

where:

- $\ln(y_{it})$is the logarithm of annual earnings for individual i in year t;
- α_i represents individual fixed effects, capturing time-invariant characteristics;
- $\delta_{f(i,t)}$ denotes firm f fixed effects, representing the firm employing individual i in year t;
- X'_{it} is a vector of time-varying individual characteristics, including age, experience, and tenure;
- λ_t accounts for year t fixed effects; and,
- ε_{it} is the idiosyncratic error term.

46 J M Abowd, F Kramarz, & D N Margolis, High wage workers and high wage firms. Econometrica, 67(2), 251-333, 1999.
47 H Overman & X Xu, Spatial disparities across labour markets, IFS Deaton Review of Inequalities, 2022. D Card, J Rothstein, & M Yi, Location, location, location. American Economic Journal: Applied Economics, 17(1), 297-336, 2025.

These two studies will be referred to throughout the appendix.

Variance Decomposition

To understand spatial disparities rather than just individual-level inequality we decompose differences in mean earnings across Travel-To-Work Areas (TTWAs), building on the work by Gibbons, Overman and Pelkonen[48] and Card, Rothstein and Yi. Using the estimated components from the AKM model, we express average earnings in area level means as:

$$\bar{y}_c = \bar{\alpha}_c + \bar{\psi}_c + \beta \bar{X}'_c \quad (2)$$

where:

- $\bar{\alpha}_c$ is the average individual fixed effect;
- $\bar{\psi}_c$ is the area-specific wage premium derived as the weighted average of the estimated fixed-effects $\delta_{f(i,t)}$ for all the employers located in each TTWA; and,
- $\beta \bar{X}'_c$ is the average of observed worker characteristics.

We then decompose the variance in equation 2 across areas as follows:

$$var(\bar{y}_c) = var(\bar{\alpha}_c) + var(\bar{\psi}_c) + var(\beta \bar{X}'_c) + 2cov(\bar{\alpha}_c, \bar{\psi}_c) + 2cov(\bar{\alpha}_c, \beta \bar{X}'_c) + 2cov(\bar{\psi}_c, \beta \bar{X}'_c)$$

This decomposition allows us to quantify the contribution of unobserved worker characteristics, observable worker characteristics, area wage premia, and their covariances to spatial earnings disparities.

Table A1 presents the results of this variance decomposition at the TTWA level. It uses the correlated variance share method to decompose the variance in TTWA-level mean earnings into people effects, firm effects, individual observables, and the correlations between these components. The columns correspond to four regression specifications, each adding further controls. The first row shows the total variance in TTWA-level earnings, which is constant across specifications at 0.004.

People effects explain approximately 23–24 per cent of the variance, while firm effects account for a larger share, ranging from 31.6 per cent to 37.3 per cent across specifications

48 S Gibbons, H Overman, & P Pelkonen, Area disparities in Britain: Understanding the contribution of people vs. place through variance decompositions. Oxford Bulletin of Economics and Statistics, *76(5), 745-763., 2014.*

Table A1: TTWA level earnings variance decomposition of AKM estimates

	(1)	(2)	(3)	(4)
Variance (Earnings)	0.004	0.004	0.004	0.004
Person Effect	0.236	0.227	0.238	0.243
Firm Effect	0.340	0.373	0.316	0.328
Individual Observables	0.000	0.009	0.170	0.154
Correlations (2 x covariance)				
Person Effect, Firm Effect	0.404	0.422	0.254	0.227
Firm Effect, individual observables	0.000	-0.014	0.184	0.205
Person Effect, Individual Observables	0.000	-0.003	-0.152	-0.147
Fixed-Effects	Yes	Yes	Yes	Yes
Employee Experience	No	Yes	Yes	Yes
Local Labour Market Experience	No	No	Yes	Yes
Local Labour Market Experience x (Urban)	No	No	No	Yes

SOURCE: Analysis of Longitudinal Educational Outcomes (LEO), 2013 to 2020.

Sources of Area Effects

We then explore the potential drivers of the variance in area effects across TTWAs following the approach in the Card, Rothstein and Yi paper

$$\psi_c = k + \underbrace{\sum_j s_j(\psi_{cj} - \bar{\psi}_j)}_{1} + \underbrace{\sum_j (s_{cj} - \bar{s}_j)\bar{\psi}_j}_{2} + \underbrace{\sum_j (s_{cj} - \bar{s}_j)(\psi_{cj} - \bar{\psi}_j)}_{3} \quad (3)$$

where

- ψ_c is the average wage effect in TTWA;
- ψ_{cj} is the average wage effect in industry j within TTWA;
- $\bar{\psi}_j$ is the national average wage effect in industry j;
- s_{cj} is the employment share of in industry j within TTWA;
- s_j is the national employment share in industry j; and
- k is the constant term.

term 1 captures the Industry Earnings Premium, that is the extent to which earnings vary within the same industry across places;

term 2 reflects Industry Composition variation due to the concentration of high- or low-paying industries in different TTWAs; and,

term 3 represents the Interaction indicating industry agglomeration effects.

Table A2 presents a decomposition of the variance in the local wage premium. The (ψ) (c) Industry Earnings Premium accounts for over 80 per cent of the variance. The Industry Composition contributes less than 1 per cent, while the Interaction Effect accounts for a small but non-negligible share (up to 1.6 per cent).

Table A2: Variance decomposition of the local earnings premium

	(1)	(2)	(3)	(4)
Area Effect (Standard Deviation)	0.037	0.039	0.036	0.037
Industry Earnings Premium	0.841	0.834	0.814	0.821
Industry Composition	0.004	0.003	0.005	0.005
Interaction Effect	0.012	0.013	0.005	0.016
Correlations (2 x covariance)				
Industry earnings premium, Industry Composition	-0.003	-0.002	0.005	0.005
Industry earnings premium, interaction	0.139	0.143	0.005	0.136
Industry Composition, interaction)	0.002	0.002	0.005	0.005

SOURCE: Analysis of Longitudinal Educational Outcomes (LEO), 2013 to 2020.

Annex 2: Data citations

- Longitudinal Education Outcome (LEO) (data overview here):
  - Department for Education; HM Revenue and Customs; Department for Work and Pensions; Higher Education Statistics Agency, released 01 November 2023, ONS SRS Metadata Catalogue, dataset, Longitudinal Education Outcomes SRS Iteration 2 Standard Extract - England, https://doi.org/10.57906/pzfv-d195
- Annual Survey of Hours and Earnings (summary page here):
  - Office for National Statistics, released 08 February 2024, ONS SRS Metadata Catalogue, dataset, Annual Survey of Hours and Earnings - GB, https://doi.org/10.57906/x25d-4j96

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