Uneven geographies of economic recovery and the stickiness of individual displacement

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Abstract

How far do economic recoveries help those whose employment potential was most affected in times of crisis to clamber back – and under what regional conditions? We examine this issue drawing on individuals' employment histories from the UK Household Longitudinal Study. We find that -with the notable exception of the London economy- loss of occupational status is 'sticky', with evidence of limited 'bouncing back' for those 'bumped down' the occupational ladder during the crisis. London's exceptionalism is consistent with expected metropolitan advantages (denser/larger- labour markets) but we find no evidence of a broader North-South divide; while comparisons across regions outside London reveal no significant associations with general indicators of the form/intensity of economic recovery.

JEL Codes: R23; R11; J24; J62

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Introduction

The global financial crisis of 2007-2008 initiated recessions of a scope and depth beyond any since the 1930s, with massive impacts in all continents, though of varying intensity both between supra-national 'regions' and sub-nationally (Kitson et el, 2011; Monastiriotis, 2011). Overall recoveries from this recession have generally been strong, at least in employment terms, albeit over a prolonged period. In the UK in particular, where the initial fall in employment was less than anticipated, there has been sustained growth in job numbers, which since 2012 yielded a steady reduction in unemployment rates so that by 2019 they were not only below pre-crisis levels but also close to 'full employment', making headlines about Britain's 'job miracle'.[i]

Although the impact of the crisis on national and local economies, as well as on labour market inclusion and individual's employment opportunities, has well been documented in the literature,[ii] much less is known about how local economic *recoveries* relate to the labour market position of individuals who were hard-hit by the crisis but did not become long-term unemployed. There are two questions that are of interest to us in relation to this. First, whether the damage done to the economic position and capacities of individuals is being substantially undone, or whether the main casualties remain in marginal positions, being overtaken by those (including new entrants) who were not scarred by adverse individual outcomes during the crisis and/or had assets that gave them more resilience during that period. Second, whether there is a particular geography in the extent to which this happened, related either to fixed characteristics of each place (e.g., high agglomeration or 'resilient' areas) or to the particular type of recovery experienced in each place (e.g., high/low productivity growth and changes in labour market tightness).

On aggregate, of course, economic expansions should be associated with improved employment opportunities overall and thus potentially declining labour market exclusion and inequality – as, with declining unemployment, those previously excluded from the labour market are able to (re-)enter employment. However, the increased frequency -and intensity- of economic crises seen since the end of the 'Great Moderation' raises questions about whether, or to what degree, such 'bounce backs' actually happen. If people affected in times of crisis are not able to fully recover their status/positions in times of economic recovery, it

follows that economic disadvantage accumulates over the cycle and patterns of inequality and labour market exclusion can intensify even if *on aggregate* the economy expands. This, in turn, raises questions about the possibility of achieving inclusive growth in post-crisis periods, given that post-crisis growth policy is being seen as a crucial mechanism for addressing the inequalities which arise from these crises.

In this paper we attempt to fill a significant gap with regard to our knowledge on this issue. Our distinctive focus is on the so far unaddressed question of how far those who managed to stay in employment during the crisis by moving down the occupational ladder have managed to regain their past occupational positions with the economic recovery, thus bringing back into effective use the levels of personal (human and social) capital that they evidenced before recession disrupted their economic engagement. Using the available longitudinal information on individuals' jobs between 2007 and 2016 from the British Household Panel Study and its successor UK Household Longitudinal Study, we seek to offer some empirical light on this question, both in relation to individual outcomes (how far people have managed to 'bounce back' as labour demand strengthened) and to patterns of inter-regional variation in this.

The paper is organised as follows. The second section provides a conceptual discussion of the processes of job competition and the potentially asymmetrical way in which these may be expected to operate in periods of deficient demand and in subsequent years of economic recovery – as well as to how regional contextual factors and the type of economic recoveries experienced across local economies may relate to these. The third section focuses on the particular context of the UK experience through the post-2008 recession and recovery, sketching patterns of change in the national, regional and occupational labour markets. The fourth and fifth sections present the results from our empirical analysis. The first of these addresses the question of how much bounce-back has actually been achieved since the recession by those bumped down during it. The fifth section follows this up by looking at the geographical dimension, examining in particular how the incidence of bouncing back varies across regions with different characteristics and paths to economic recovery. The last section concludes, with a discussion of the lessons and implications arising from our empirical results.

Bumping down and (maybe) bouncing back

Economic shocks can impact on individuals' position in the labour market not only *quantitatively* (moves to unemployment/inactivity), but also *qualitatively* – involving downward shifts (or relinquished upward shifts) in occupational status.

Such qualitative shifts in times of recession (occupational downgrading) have traditionally been linked in the literature to a process known as bumping down.[iii,iv] This is a process through which labour market slack leads to some -better qualified- workers previously employed in one occupational tier finding work in a lower tier, initiating a displacement chain that concentrates a large part of that slack in the bottom tier of the occupational hierarchy – and (consequently) a disproportionate share of unemployment among those whose last job was in this occupational category (Buck and Gordon, 2000; Buck et al, 2002).

The process requires that, for at least a large segment of jobs available in the labour market (the primary sector of Doeringer and Piore, 1971), where employers are concerned with securing the loyalty of their workforce they pre-fix the wage rates of a job and select among applicants on the basis of their perceived suitability for the role ('job competition') – rather than pre-specifying requirements and choosing among an eligible pool on the basis of the cheapness of their wage demands ('price competition'). In this setting, in times of recession, job losses/recruitment freezes in any segment of the occupational ladder create a larger pool of job applicants that 'trickles down' to jobs with lower job (skill) requirements. For those firms still with vacancies, a better 'quality' of recruit can be then expected, including ones who in better times would have gained positions higher up the occupational hierarchy. As a result, applicants who would otherwise have a competitive edge for these jobs now have to consider jobs further down the occupational ladder. This process tends to generate chains of relatively 'short-distance' moves down the hierarchy and an accumulating surplus of the least desired workers within its lower tiers -the secondary labour market- where 'price competition' is more likely to prevail and downward wage adjustment can mitigate the scale of movement into unemployment.

In this account, in times of economic recovery, as demand conditions reverse -and in the absence of externalities or other 'imperfections' e.g., scarring and stigma effects, information problems, search frictions, etc (Léné, 2011)-, those bumped down or displaced ought to (eventually) get fully restored into their 'original' positions (or have a statistical expectation

of doing so – Fujita and Moscarini, 2017; Haltiwanger et al, 2018). In other words, recoveries ought to be associated with strong tendencies of 'bouncing back' for those individuals who were previously 'bumped down' (and/or 'bumped out') compared to those individuals who managed to keep their jobs (presumably at the level where their skills matched their job requirements) – even if occupational upgrading ought to be increasing for all.

In reality, of course, there are numerous reasons why this may not happen fully or quickly enough – at least except in the tightest of labour market conditions. First, prolonged periods of recession may lead to a loss of motivation and confidence for those bumped down and/or those with discontinuous employment, possibly amplified by psychological stress factors related to income loss and heightened income/job insecurity (Gordon, 2015; Lim et al, 2016; Burdett et al, 2020). Second, (prolonged) spells spent in less demanding roles or outside one's core skill type may lead to some depreciation/obsolescence of existing skills, making the individual less suitable for their original role even as job-creation for such roles accelerates (Edin and Gustavsson, 2008; Ortego-Marti, 2017). Third, occupational downgrades may lead to an adverse signalling effect, as more recent spells in one's work history get seen as more typical and downgrades are seen as containing information about a worker's 'true type'– thus lowering employers' expectations about an applicant's capabilities (Arulampalam et al, 2001; Van Belle et al, 2018). Last, the extent of bounce-back may also be hindered by the emergence of new sources of supply during times of recovery (including via rising immigration), which add to the job-competition pressures (e.g., new/young labour market entrants who may overtake those previously bumped down in the job-competition ladder) (Furlong, 1990; Eichhorst et al, 2014).

Despite these theoretical expectations, surprisingly little is known from systematic empirical work about how these processes of bumping down and bouncing back work in practice at the (national or sub-national) economy-wide level. More importantly, no systematic evidence exists across the literature that connects the two processes, at the level of the individual, over the economic cycle. With regard to transitory experiences of unemployment, there is limited evidence from the 1990s for the UK. In particular, Buck et al (2002) suggests successful bounce-backs (regaining one's position in the occupational hierarchy) when demand conditions improve and unemployment spells are short, but with extended experience of unemployment (or inactivity for females) essentially cancelling out the otherwise positive

effects of a past occupational record for future occupational moves. But with regard to experiences of occupational downgrading (bumping *down*), there is practically no knowledge about: the numbers making downward (and upward) shifts during recessions and times of recovery; the different 'distances' of such occupational moves; and the extent to which upgrades in 'good' times are more likely for those with positive past occupational records (so that experiences of bumping down are 'sticky' at the individual level even in times of economic recovery). And, of course, no knowledge exists about the particular geography of this – despite the extensive work in the field on issues concerning the 'stickiness' of unemployment and the geography of economic resilience at the aggregate and individual levels (see, inter alia, Martin, 2012; Doran and Fingleton, 2015; Martin et al, 2016; Iammarino et al, 2018).

Conceptually, there are two distinctive reasons why geography may matter for the extent of bounce-back -in other words, why workers in some types of regions may display a stronger bounce-back than those elsewhere- besides of course the expected variations that may occur for purely compositional reasons (e.g., differences in qualification levels or job mixes). The first one relates to the effect of differing degrees of *labour market tightness* on the chances of a person with a specific configuration of characteristics being considered, and then accepted, for a more demanding and highly rated job. The second one relates to *agglomeration economies* of two kinds, involving both higher rates of vacancy creation in denser labour markets (Buck and Gordon, 2000) and stronger representation in high density areas of kinds of less-routinised activities offering ready opportunities for on-the-job acquisition of human capital (Gordon, 2015).[v] The first of these effects implies that rates of post-recession recovery in job status (bounce-backs) should be faster (and stronger) in regions where past demand-deficiencies are eliminated more rapidly (faster employment growth, faster declines in unemployment and/or faster increases in vacancy rates). The second should also be straight forward with more chances for those with an ambition to bounce-back being able to do so – *provided* there is a reasonable pressure of demand for labour.

There is another process which may account for regional differences in the probability of bounce-back, linking to spatial variations in the extent of labour hoarding during the crisis (the tendency for firms to hold on to their valued labour) and of labour redeployment

subsequently, and impacting on the extent of downgrades (and non-upgrades) during the crisis and the type of economic recovery experienced in each region (in relation to patterns of productivity and employment growth). If, in some regions, employers opt to 'hoard' more of their labour during a downturn (for example because of firm-specific or state of the art skills and/or greater optimism about post-recession growth), measured productivity there will decline more than elsewhere during the downturn -and bumping down will be less. In these regions, the expectation during the recovery phase will be a reversal of this- with expansion achieved through productivity growth, more limited gains in terms of employment and less scope (or need) for bouncing back. Intuitively then, one might expect bounce-backs to be stronger in regions where the recovery was more strongly associated with expansions at the extensive margin (employment growth) than in regions where the recovery was more strongly associated with expansions at the intensive margin (productivity growth).

The UK labour market context for bumping down and clambering back

The 'Great Recession' came to the UK as a particular shock after an extended boom period, lasting from the late 1990s onwards. Real output fell in 5 successive quarters with a drop of 4.5% between 2007 and 2009. In contrast to the recession of the early 1990s, however, total employment fell by only 1.7%, two thirds of the contraction taking the form of lowered overall productivity – suggesting at least some degree of labour hoarding during the crisis, possibly enabled by the long sequence of good years that had preceded it. In the following three years when output recovered to 0.5% above its 2007 level, aggregate employment recovered similarly as did output per head (Figure 1).[vi]

[Figure 1 here]

Unemployment rate responses to crisis and recovery – signalling changing degrees of labour market slack – have broadly followed this dynamic. Nationally the rate rose steeply as net employment growth turned to decline, rising from 5.3% in 2007 to 7.6% in 2009 and peaking at 8.1% in 2011. This was not immediately reversed as employment growth rates picked up (since 2012). Rather, the rate more or less levelled out for about 3 years, only starting to fall significantly from mid-2013. Still, the UK's unemployment adjustment was proportionately

one of the more impressive recoveries in Europe (Monastiriotis and Laliotis, 2019), with a fall in the unemployment rate by over 40% over 5 years, from 8.1% in 2011 to 4.8% in 2016, reaching levels below those prevailing in the pre-crisis years and continuing to fall since then (an overall unemployment rate of 3.9% in 2019 according to official ONS figures).

Despite this, productivity growth in the country has not recovered fully. Real terms productivity growth (on an hours worked basis) averaged just 0.4% p.a. between 2013 and 2018, as compared with rates of around 2% p.a. in the decade before the crisis (ONS, 2020). This decline in trend productivity growth may have something to do with depressed confidence levels for investment, as well as other longer-term factors (see, e.g., Haldane, 2017; Crafts and Mills, 2020). But the dynamics of employment change, as also illustrated in Figure 1, suggest that the weaker productivity performance post-crisis might be related to factors that have to do with a bias among new jobs toward low pay/quality and flexible employment forms, including zero-hour contracts (ONS, 2018; Farina et al, 2019) and a continued subduing of wage growth after the prolonged recession.

The pattern of employment change during these periods had a differentiated footprint across broad occupational groups. According to LFS estimates, job losses between 2008 and 2010 were particularly concentrated among administrators, skilled trades, and plant operatives – with less among managers, sales and elementary occupations and none for professionals/associates and caring/other service occupations. During the immediate recovery years (2010-12) the biggest increases were in professionals/associates, sales and elementary occupations, with continued job losses among administrative skilled manual and operatives. These patterns partly reflect longer term trends, notably the growth of the professional/managerial class and of personal service jobs, alongside reductions in administrators, skilled workers and operatives. But differences are also evident in cyclical responsiveness, of which there was no evidence either for professionals (who seem to have been the main beneficiaries of labour hoarding) or for personal service workers (many of them in publicly supported social services and/or operating in the flexible secondary labour market). Speed of recovery of employment levels seems to have been much more extended for administrative, skilled trade and operative jobs.

Important differences were also registered in terms of geography. The most fundamental of these was between London and the rest of the country – with the capital's core (central

London) exhibiting *no* job loss in the crisis years (Gordon, 2016), the bulk of the job gains in the early recovery period, and continuing faster growth through to 2018. Elsewhere in the south the aggregate employment downturn was relatively modest, but it was particularly strong, and recovery slower, in Scotland and the North East. In relation to productivity changes (where relative performance varies from year to year) there is no real link between growth in employment and in productivity, as most regions have very similar rates of employment growth but quite disparate rates of productivity growth (Figure 2, left graph). Instead, a positive relationship is obtained between productivity growth and the rate of change in unemployment (Figure 2, right graph): regions which experienced smaller drops in unemployment had on average higher rates of productivity growth.[vii] As happened nationally, productivity growth in the recovery period was significantly lower compared to the pre-crisis period. However, differences in the extent of recovery varied sizeably, from a halving of pre-crisis productivity growth rates in London (which however remained amongst the best performers) to a decline by a mere 20% in the West Midlands; while between the pre- and post-crisis periods, the regional dispersion in productivity growth rates increased by 50%.

[Figure 2 here]

The dynamics of unemployment decline were more homogenous. At its peak in 2011, unemployment rose to near or above 9% in London, the North East, West Midlands and Yorkshire but to only between 6.0% and 6.6% in the South East, South West and the East of England. With the recovery, the latter group of regions achieved the lowest rates of unemployment (between 3.0% and 3.4% in 2018), while the former group maintained comparatively higher unemployment (between 4.7% and 4.9% in 2018). Proportionately, the largest declines were registered by Wales, the South East, East Midlands and the North West (by over 40% between 2012 and 2016); while in London the rate of unemployment declined at a rather average pace (but more sizeably in absolute terms), despite its significantly superior performance in terms of employment growth.[viii] Still regional dispersion in unemployment rates declined significantly with the economic recovery.

This is a largely familiar picture from an accumulation of research on the labour market dimension of the Great Recession and its evolving implications for (regional and individual) economic resilience and for work, pay and productivity in particular – including (what we

identify as) the quantitative dimension of underemployment. Important examples include: one pair of analyses of the dynamics and structural influences on regional employment levels in successive UK recessions/recoveries (Martin, 2012; Martin et al., 2016); and another focused on urban/sub-regional incidence of unemployment and non-employment in this recession (Lee, 2014; Kitsos and Bishop, 2018). These dynamics can be seen as part of a long history of geographically uneven growth in the UK economy, involving asymmetric patterns of shock, adjustment and resilience. For example, in their analysis of the responses to the four major recessions in the UK between 1971 and 2015, Martin and Gardiner (2019) found increasing differences between northern and southern cities in the severity of job losses in the down swing and the subsequent rate of employment growth. They argued the relation between these had a cumulative effect, creating path-dependencies concerning future exposure/resilience to shocks and the long-run growth paths of cities. Sunley et al (2019) have shown that such cumulative effects on growth disparities between the two sets of cities operate to a large degree via human capital dynamics – with high-skill cities becoming increasingly more skilled and attracting greater concentrations of the faster growing types of high-skilled cognitive occupations; and medium/large-sized former industrial cities (typically, in the north) recording only limited degrees of 'resurgence' post-recessions.[ix] The advantage of London (and the Wider South East region) has been argued to have an adverse impact on the rest of the country, especially on the north of England, as in McCann's (2016) extensive study – with negative effects on growth performance in the north, reflecting less favourable sectoral and occupational mixes, being amplified by specific policy choices (notably infrastructure investment and macroeconomic policies favouring the London economy).

The significance of these patterns for our analysis is twofold. On the one hand, the cumulative disadvantage of particular regions, especially in the north, and the partial 'decoupling' of the London economy from the rest of the country suggest that patterns of bumping down and of clambering back can be markedly different between London and the rest of the UK. On the other hand, the observation of a much more modest impact of the last recession on employment levels (with evidence of labour hoarding during the downturn and of a weak link between employment and productivity growth during the recovery) suggests a substantially weaker trigger for the bumping down process than in previous recessions and perhaps a more limited scope for bouncing back subsequently, across the UK economy.

With these observations in the background, the empirical analysis that follows investigates whether individuals who were adversely affected by the crisis on this qualitative margin (incidence of occupational downgrade, or bumping down) have managed to recover to sufficient degrees their position in the occupational hierarchy with the economic recovery; or whether the general observation, from the literature cited earlier, that a return to near-full employment has left many behind in (quantitative) underemployment also applies on the qualitative dimension to those who got bumped down the occupational ladder during the recession. The fourth section presents our analysis of this at the national level, while in the fifth section we investigate the particular geography of this.

Labour market detachment and the drivers of bumping up during economic upswings

Our particular concern with the degree to which individuals who have experienced occupational downgrading following a general economic recession are able to regain their position as more employment opportunities re-appear and labour market slack is eliminated requires a longitudinal data source with individual level information on jobs in which people were employed for at least three points in time. The source on which we rely is the harmonised BHPS/BHLPS (Fumagali et al, 2017) following sample members from the British Household Panel Study (which concluded in 2008) who were included within the enlarged sample of its successor UK Household Longitudinal Study. Specifically, we use the 2007 and 2008 waves of the former and the 2010-2016 waves of the latter.[x]

To monitor moves up and down an occupational ladder, a scale was constructed which took average hourly earnings for employment niches (defined in terms of occupation interacted with managerial/supervisory status) as an indicator of levels of human capital required of and deployed by workers in that niche (following Nickell, 1982). More specifically the classification for individuals at particular points was based on the 3-digit consolidated SOC 2000 group (with 85 categories), which together with declared managerial/supervisory responsibility yielded 229 actual positions. Earnings data were derived from the Labour Force Survey's very much larger sample -and though part-time workers and the self-employed were included in the analysis- only earnings of full-time workers were used. These were expressed in log terms, so

the averaged values approximated to those of a median worker in the niche. Estimates were based on pooled data from the 2001-9 waves of the LFS, but with fixed effect controls for both date and region of employment to minimise biases (as in Gordon, 2015).[xi]

What has been the experience with regard to occupational moves, during the two periods of crisis and recovery? We provide an initial descriptive answer to this in Table 1. The table depicts the proportion of individuals who experienced occupational downgrading and upgrading in any time during the crisis (2008-2011) compared to the pre-crisis year (2007) and in any time during the recovery (2013-2016) compared to the pre-recovery year (2012), as well as the proportion of individuals who experienced an(y) unemployment spell in the two periods.[xii] For the total working-age population (first row), we see that more than a fifth of individuals (amongst those holding a job in 2007 and having at least one incidence of employment in 2008-2011) experienced an adverse labour market outcome during the crisis, with some 22% experiencing occupational downgrading and about 8% experiencing at least one unemployment spell. As should be expected, these percentages fell during the upswing (by 11% and 36% respectively), although the incidence of occupational downgrading remained quite high. Between the two periods, the main difference seems to be in the incidence of occupational upgrades (which may include in-job promotions as well as upward job-to-job moves). In our data, the incidence of these was 29% during the crisis but rose to 41% during the recovery, suggesting that the biggest part of the story concerning occupational shifts during the crisis had to do not with occupational downgrades (bumping down) but with supressed occupational upgrades.

[Table 1 here]

The incidence of occupational moves (both downgrading and upgrading) is somewhat smaller when we restrict our sample to those who fall outside the legal retirement age and the early years of employment, where job churn is of a different nature (those aged 30-54 years old in the base year – second row of Table 1); while the incidence of unemployment in significantly lower but only in the crisis period. The general patterns, however, remain: occupational downgrades have been common in both periods; quite naturally, the incidence of unemployment changed significantly between the two periods; the incidence of downgrades declined with the recovery but only marginally; while the main difference during the crisis is

the sizeably lower incidence of occupational upgrades, presumably as seniority-based promotions and individuals' job-ladder related moves (Burdett and Mortensen, 1998) were put on hold.

The apparent cyclicality of occupational upgrades, vis-à-vis the much more modest shifts in occupational downgrades, may be taken to suggest that processes of bumping down have not been particularly important during the crisis. If that were the case, then we should expect to see no relation, at the individual level, between the experience of an occupational downgrade during the crisis and that of an occupational upgrade during the recovery. In what follows we examine directly this postulation, by investigating the extent to which individuals who had been adversely affected by the crisis have been able, with the economic upswing, to recover their position in the job (occupational) ladder after an episode of bumping down (occupational downgrading) during the crisis.

To do so, we implement two tests. First, we examine whether an individual's *probability* of occupational upgrading during the recovery is statistically associated with their bumping down (occupational downgrading) or bumping out (unemployment spell) experience during the crisis (Table 2). Second, we examine the association in the *extent* of an individual's occupational movement between the crisis and recovery periods (Table 3). In both cases, occupational moves are calculated on the basis of the hierarchy of occupations described previously, which we match to each individual in our longitudinal data, thus creating a cross-section of occupational histories (moves) across individuals. We derive a measure of the incidence of occupational down/upgrading, as a dichotomous variable taking the value 1 if there is a change (downward or upward) in occupation and zero otherwise; and a measure of the extent of occupational change (bumping down or up), as the change in the rank of the individual's occupation between the base year and the year at the end of the reference period (2011 and 2016 for crisis and recovery, respectively).

More specifically, for our analysis of the probability of occupational upgrades we estimate the following employment-history model, drawing on a cross-section of individuals for who we have uninterrupted longitudinal information in our data:

$$Y_{i,\{2013-16\}} = b_0 + b_1 D_{i,\{2008-11\}} + b_2 U_{i,\{2008-11\}} + b_3 X_i + \varepsilon_i \quad (1)$$

where $\boldsymbol{Y_i}$ takes the value of 1 if individual ***i*** experienced an upgrade in any year during the period 2013-2016 relative to their occupation in the year 2012 (formally, if max{R_{2013}, R_{2014}, R_{2015}, R_{2016}}>R_{2011}, where R is the inverse rank of the individual's occupation in any particular year) and zero otherwise; ***D*** takes the value of 1 if the individual experienced a downgrade in any year during the period 2008-2011 relative to their occupation in the year 2007 (formally, if min{R_{2008}, R_{2009}, R_{2010}, R_{2011}}<R_{2007}) and zero otherwise; ***U*** takes the value of 1 if the individual experienced an(y) unemployment spell (of any duration) during the period 2008-2011 and zero otherwise; $\boldsymbol{\varepsilon}$ is a random error and ***X*** is a vector of individual characteristics that includes age, gender, education (college degree), region of residence (Government Office Region) and the individual's detailed occupation group in the base year. In this model, which we estimate using the maximum likelihood probit estimator, the size of coefficient $\boldsymbol{b_1}$ (appropriately transformed into a marginal effect, calculated at mean sample values) gives the additional contribution of a past downgrade (during the crisis) to an individual's probability of experiencing an upgrade during the recovery. In this sense, a positive and statistically significant value for $\boldsymbol{b_1}$ can be interpreted as direct evidence of a bounce-back mechanism, whereby past downgrades are systematically associated with future upgrades. More importantly, the size of the coefficient can tell us something about the extent of bounce-back: with values closer to zero showing limited bounce-back and values closer to 1 showing almost full individual recoveries. A similar interpretation applies for the case of the unemployment variable.

Our analysis of the link between the intensity of past and future occupational moves relies on a similar model, of the form:

$$\Delta R_{i,\{2012-16\}} = c_0 + c_1 \Delta R_{i,\{2008-11\}} + c_2 X_i + v_i \qquad (2)$$

where $\boldsymbol{\Delta R_i}$ is the change in the rank of an individual ***i***'s occupation in any particular period (with periods defined as per our discussion above) and ***X*** is the same vector of individual characteristics as before. This model is estimated with OLS, as our dependent variable is continuous and we are dealing with a cross-section of individuals for whom all right-hand-side variables are predetermined and thus temporally exogenous. In all cases, population weights are used in the estimations to account for sampling differences across types of individuals in our dataset.

Starting with the first column of Table 2, we see that occupational upgrades during the recovery seem to be strongly associated, in a statistical sense, with the probability of experiencing occupational downgrading during the crisis.[xiii] In contrast, experience of job loss (unemployment) during the crisis does not appear to be associated with a reduced probability of experiencing occupational upgrading during the upswing: the estimated marginal effect is not different from zero statistically and, if anything, comes with a positive sign. The coefficient on the bumping down variable suggests that experience of downgrade during the crisis raises an individual's probability of occupational upgrade in the recovery period by 10 percentage points. Compared to the average prediction of upgrades during the period (34.8% – lower part of Table 2), this is an improvement of 25.8% from the average. Still, this remains far from a value that would suggest full (or near-full) recovery (in the 'qualitative' dimension) for those individuals – implying that occupational downgrades in times of crisis are nowhere near fully restored in times of full employment.

[Table 2 here]

The second column in Table 2 reinforces the point by showing that, despite the higher propensity for upgrades found for previously bumped down individuals, the occupational standing of such individuals in generally did not improve (in fact, it deteriorated) by the end of the period under analysis. Specifically, when looking at the position of an individual in 2016 relative to her best position 5-8 years ago (during the crisis), we find that past bumping down is strongly and significantly associated with a *lower* probability of occupational upgrading. The average predicted probability of occupational upgrading (lower part of Table 2) is still high (42%), but this time the average prediction for individuals who experienced bumping down is halved compared to the total sample (42.08%-21.57%=20.51%). In addition, in this case we also find a significant negative effect from the experience of unemployment spells during the crisis – in line with evidence found elsewhere in the literature for previous episodes of crisis and recovery (Buck et al, 2002). According to our estimate, even 5-8 years after experiencing an unemployment spell, an individual is found to have a sizeably lower probability to have experienced occupational upgrading since the 2007-2011 period (by 19.5 percentage points). Whether this is due to a scarring effect of unemployment or it is rather linked to patterns of within-job occupation mobility at different job-tenure profiles[xiv], the finding indicates that the

experience of unemployment puts individuals at a disadvantage with regard to their chances of upward occupational mobility during the recovery. The remainder of the table shows, quite interestingly, that the probability of upgrades does not vary across key individual characteristics (gender, age, education) over the cycle, although the overall occupational trajectory (column 2) does appear to be highly dependent on age (with career progression being lower for older individuals).

Similar conclusions emerge from the analysis of the degree of occupational change, presented in Table 3. As shown in column 1, an occupational move by one position in the rank during the crisis is associated with an occupational move *in the opposite direction* by 0.25 positions during the economic upswing – in other words, for the average individual who has experienced bumping down during the crisis, only a quarter of this qualitative loss had been recovered during the economic upswing. The relationship is far from random (*p*-value=0.0001) and it applies with equal force when we restrict the sample to prime-age individuals (column 2). More importantly, the effect applies specifically to occupational downgrades during the crisis and it is not driven by possible downward adjustments during the upswing for people who experienced occupational upgrading during the crisis. Indeed, as is shown in the reminder of the Table, the elasticity for past downgrades (column 3) is practically indistinguishable from that found for the full sample of occupational changes (column 2); while the incidence of a past downgrade appears to be associated with an additional improvement in the occupational ladder during the economic recovery of about 16 ranks (column 4).[xv] It is interesting to note that the intensity of upgrades during the economic recovery, unlike what was found for the incidence of upgrades in Table 2, is lower for females, older workers and those with below-tertiary education. Our further exploration (results not shown but available upon request) suggests that gender and education, although significant for an individual's probability of upgrade during the recovery, do not play a role for an individual's probability of bumping up, i.e., they do not affect the elasticity of future upgrades to past downgrades. In contrast, age seems to affect the probability of upgrade solely via its effect on this elasticity: when we interact an individual's age with their extent of past downgrades, the level effect for age becomes totally insignificant statistically and the interaction term obtains a very strongly negative value.

[Table 3 here]

All of our results point to the same direction: the economic recovery, although beneficial to those who have been affected by the crisis comparatively more (vis a vis others who had not been affected), is nowhere near sufficient to restore the 'qualitative' losses inflicted onto individuals during the crisis. In the next section we examine whether there is any particular geography to this.

The geography of 'bouncing back' and its link to the geography of post-crisis recoveries

To examine the geographical picture of the extent of individual bounce-back during the economic recovery we rely on our analysis of the intensity of bounce-back (as depicted for the national level in Table 3). Specifically, we re-estimate equation 2, this time introducing a full set of interaction terms between the indicator variable for individuals' occupational downgrades during the crisis and each individual's region of residence. This produces a separate estimate for the intensity of bounce-back in each region (the elasticity of occupational upgrading in the recovery to the degree of occupational downgrade during the crisis). These estimates are reported in Table 4 which depicts, for each region (as well as nationally), the incidence of downgrades during the crisis (col.1 – analogous to col.1 in Table 1) and our estimates of the impact of occupational moves on future upgrades (columns 2 and 3 – analogous to columns 2 and 4 in Table 3). It also reports four regional performance indicators which relate to our earlier discussion in the second section: two measures of labour market tightness (vacancy rates and the rate of unemployment), a measure of job-density (agglomeration index) and the rate of productivity growth.

As can be seen, the incidence of occupational downgrades during the period 2008-2011 (first column) was not uniform across the UK regions – ranging from 16.4% in London to over one-and-half times that in the North East (28.5%) and the North West (26.6%). Linked to the context discussed in the second section, although striking, this finding is hardly surprising: the specific sectoral-occupational mix of London, and the policy-infused advantages accruing to it, allowed for much greater resilience during the crisis (see, on this, Gordon, 2016) in contrast to developments in the north (see, inter alia, Dawley et al, 2014). Besides this observation, however, the geography of the depicted patterns is not fully clear. Broadly, downgrade

frequencies appear higher in the north (especially the North West and North East) and lower in the more urban regions of London and the West Midlands, consistent with our earlier observations about the geographical patterns of urban/regional resilience in the country (McCann, 2014; Martin and Gardiner, 2019). But high values also appear in the south (South East, South West, East of England) and low values are also observed in more rural areas (Wales, Yorkshire), suggesting a much more complex and nuanced picture overall.

[Table 4 here]

A similar picture is obtained with regard to our estimates of bounce-back during the recovery. The estimated elasticities for all occupational moves (column 2) range from -0.1 (non-significant statistically) in the South East to over seven times that (about -0.76 and statistically significant) in London (with West Midlands not showing statistically significant bounce-back and East Midlands showing in this case the highest values outside London). The estimated elasticities for past occupational downgrades (column 3) return no evidence of any bounce-back in the South East, Northern Ireland, Wales, the East of England and the West Midlands and very strong evidence of bounce-back in London and secondarily in the East Midlands and the South West. But although the majority of regions return statistically significant bounce-back coefficients, as was the case nationally, in none of the cases is the estimated coefficient close to the value of 1. The only exception to this is London, which is found to have a very high bounce-back elasticity in the full sample and one which is evidently above 1 for the case of downgrades. This suggests that, uniquely in the London economy, the past experience of occupational downgrading during the crisis constituted an advantage, leading to faster climbing-back along the occupational ladder during the economic recovery – with individuals overtaking the positions they had lost during the crisis.

[Figure 3 here]

Whereas this may be partly related to the fact that, as is shown in column 1, London experienced the lowest incidence of occupational downgrades during the crisis, the broader characteristics of the London economy may also be a key factor accounting for its unique pattern of bounce-back during the economic recovery. Indeed, as was noted in the third

section, the London economy saw substantially higher rates of employment growth during the economic recovery and experienced one of the largest declines in unemployment in absolute terms, maintaining the highest levels of labour productivity even if at a significantly subdued rate of productivity growth. It is reasonable to conclude that the recovery in London offered a qualitatively different environment to those who were bumped down during the crisis for upward occupational mobility.

For the rest of the regions, the patterns of bouncing back appear to be largely un(cor)related to their economic performance or position.[xvi] As is depicted in Figure 3, despite our expectations discussed in the second section, the intensity of bounce-backs across regions seems to bear no association to the incidence of occupational downgrading during the crisis or to the regions' performance with regard to the different types of economic recovery (productivity growth and employment growth). It also correlates poorly to our various measures proxying for labour market tightness (vacancy rates at the start of the period, unemployment at the end of the period, and the rate of change of unemployment during the period of recovery – in all cases, the associated *R*-squared is below 0.12) and, if anything, suggests a counter-intuitive relation whereby bounce-backs are higher in regions where demand pressures are more subdued. Correlation with our measures of agglomeration (last row of graphs in Figure 3) is stronger, but it is again going in the opposite direction compared to our expectations. Regions with higher levels or densities of jobs seem to have less intensive bounce-backs (again, excluding London) but the relationship is very weak statistically. The relationship is much stronger (R^2=0.45), but still negative, with regard to the level of productivity of regions. Contrary to our expectations, this seems to suggest that regaining one's position in the occupational ladder is easier in regions of lower economic density and sophistication – with the important exception of London noted. All in all, the correlations depicted in Figure 3 suggest that differentiation in bounce-back intensities across the UK regions, the London economy aside, have very little to do with economic fundamentals or with past divisions (e.g., the so-called North-South divide) which had characterised variations in economic performance and recovery from (or, resilience to) crises in the past. We pick up on this point in our discussion in the concluding section.

Discussion and conclusions

The period after the global financial crisis has seen a rather impressive performance in terms of unemployment and employment growth in the UK – with employment growth picking up at least since 2012 and unemployment declining to levels close to 'full employment' more recently. Still, the UK labour market is far from the so-called 'jobs miracle' as there is mounting evidence that economic recovery has been combined with intensifying labour market precariousness, rising inequalities and various form of under-employment. In this paper we have set out to examine one particular form of under-employment and sustained labour market disadvantage, in the 'qualitative' dimension, concerning the persistence in times of 'economic recovery' of adverse individual shifts experienced in times of crisis along the occupational ladder (occupational downgrading, bumping down).

Our analysis provided strong evidence -uniquely in the literature but in line with intuition- that individual economic shocks are to a large degree 'sticky', also in this 'qualitative' dimension. Despite the evidence that the crisis was mostly associated with supressed occupational upgrades, than with an explosion of occupational downgrading, our estimates show that individuals who experienced some occupational downgrading (bumping down) during the crisis were nowhere near able to re-gain -neither fully nor sufficiently- their position in the occupational hierarchy with the economic recovery. Previously bumped down individuals were found to have only a 10 percentage points higher probability of experiencing an occupational upgrade during the economic recovery compared to others; while in terms of the intensity of bounce-back, we found that individuals who experienced some bumping down during the crisis were able to recover on average only between a quarter and a third of their position in the occupational ladder. The experience of bumping down seemed also to have a long-term scarring effect (similar to that of unemployment), compressing an individual's occupational trajectory even some 5-8 years after the event of bumping down.

Our conceptualisation of the processes that lead to (bumping down and) occupational bounce-backs suggested a strong role played by pressures of demand and agglomeration forces (labour market tightness, job density) and secondarily by the type of recovery experienced in the labour market (extensive versus intensive growth). We attempted to explore the validity of these postulations by exploiting the regional variation in the intensity of bounce-backs. The latter showed no evidence of spatial divisions along known axes (e.g.,

North-South divide) with the exception of the London economy which registered significantly lower rates of bumping down during the crisis and significantly greater extents of bouncing back during the recovery. In this regard, it appears that the 'qualitative dimension' examined here, in relation to the global financial crisis, does not fit well with the patterns of cumulative disadvantage and lacking resilience found with regard to more 'quantitative' dimension (employment, unemployment) in previous crises (Martin and Gardiner, 2019; Sunley et al, 2019). On the other hand, the experience of London offers support to postulations that indicate an important role of agglomeration/labour pooling and the availability of opportunities for career/occupational progression for the probability of individuals to recover their labour market status following adverse shocks (Gordon, 2015; McCann, 2016). Indeed, the London economy showed greater degrees of labour market churn both during the crisis (rising flows into unemployment with fewer occupational downgrades) and afterwards (higher rates of employment growth and of bouncing-back). Outside this, however, evidence that labour market tightness, the density of jobs and expansions in the intensive margin (productivity growth) facilitate the reinstatement of individuals into their pre-crisis positions was, if anything, thin. Although perhaps partly due to the limited number of data-points available for our analysis, the evidence we found suggested that the type and intensity of economic recovery did not play a role -across space- in this regard. Instead, the intensity of bounce-backs appeared to be higher in regions with lower productivity – a finding which perhaps signals that individual bounce-backs are easier in less 'competitive' places. Besides this, our results seem to echo those of Martin et al (2016), who find that economic recoveries/resilience are largely driven by region-specific idiosyncratic factors: in our analysis, while these factors remain unexplored, they appear to go beyond aspects such as labour market tightness, agglomeration, or indeed occupational mixes.

On the whole, our evidence points to the following conclusion. Economic downturns have 'scarring effects' that go beyond the incidence of unemployment and extend to the 'qualitative' dimension, be it in the form of occupational downgrading and bumping down or in the form of supressed occupational upgrading. Economic recoveries cannot sufficiently 'undo' the damage done to individuals during times of crisis: in contrast to the modern rhetoric about the inclusivity of pro-growth policies, our evidence shows that growth -whether in its extensive or in its intensive margin- is not sufficient for the successful re-

inclusion in the labour market of previously affected individuals. Local economic conditions do matter for the re-inclusion of individuals, as is shown by the observed spatial variation in bounce-back intensities in our data, but these seem to have to do more with nuanced regional specificities than with processes relating to the type and intensity of economic recoveries across locations.

In our view, these findings imply an active role for policy not only in times of crisis but also -if not especially- in times of economic recovery. The successful reintegration in the labour market of individuals after -seemingly increasing in frequency- economic downturns and, from a societal perspective, the successful redeployment of their skills and productive capacity, seems to require much more than a pro-growth policy framework. Given the 'stickiness' of disadvantage documented here, even in places where pressures of demand have been very high, it would appear to us that reintegration requires targeted investments and policies to support the re-skilling of individuals (addressing the skill-maintenance and signalling problems associated with occupational downgrading) as well as incentives for upward occupational mobility (e.g., through the tax/benefit system). And for regional policy in particular, attention should be paid to the regional differences in the intensities of bounce-back in times of economic recovery so as to ensure that the social (as well as efficiency) costs of occupational downgrading, and thus of 'qualitative' underemployment, do not accumulate disproportionately in some parts of the spatial economy.

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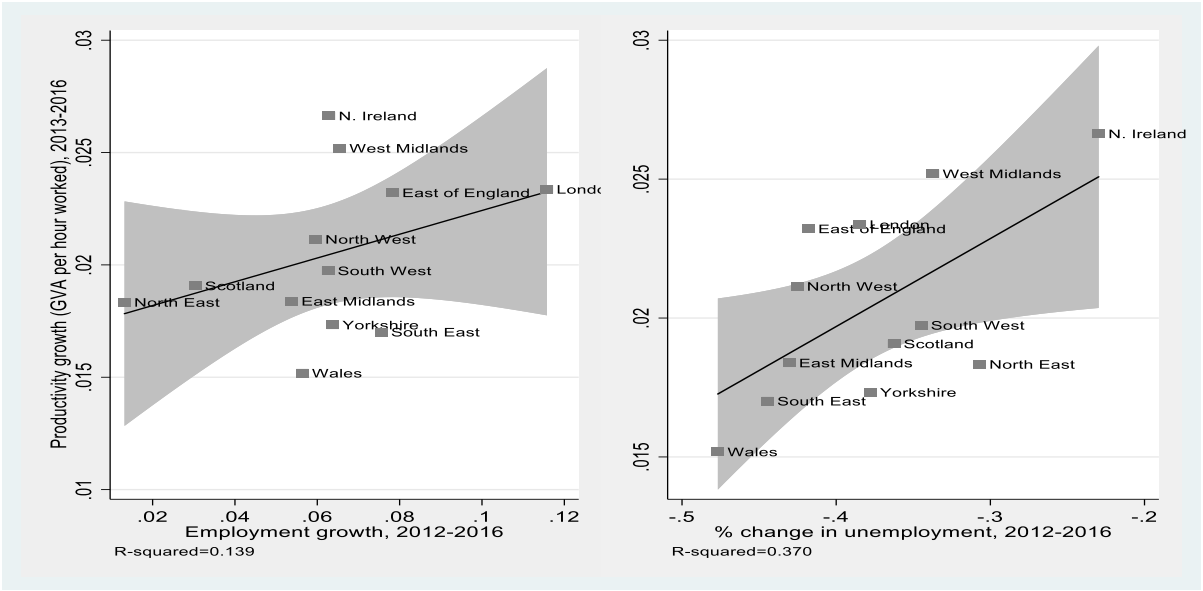
Figures & Tables

Figure 1: The Relation of UK Annual Employment and Productivity Changes 1985-2018

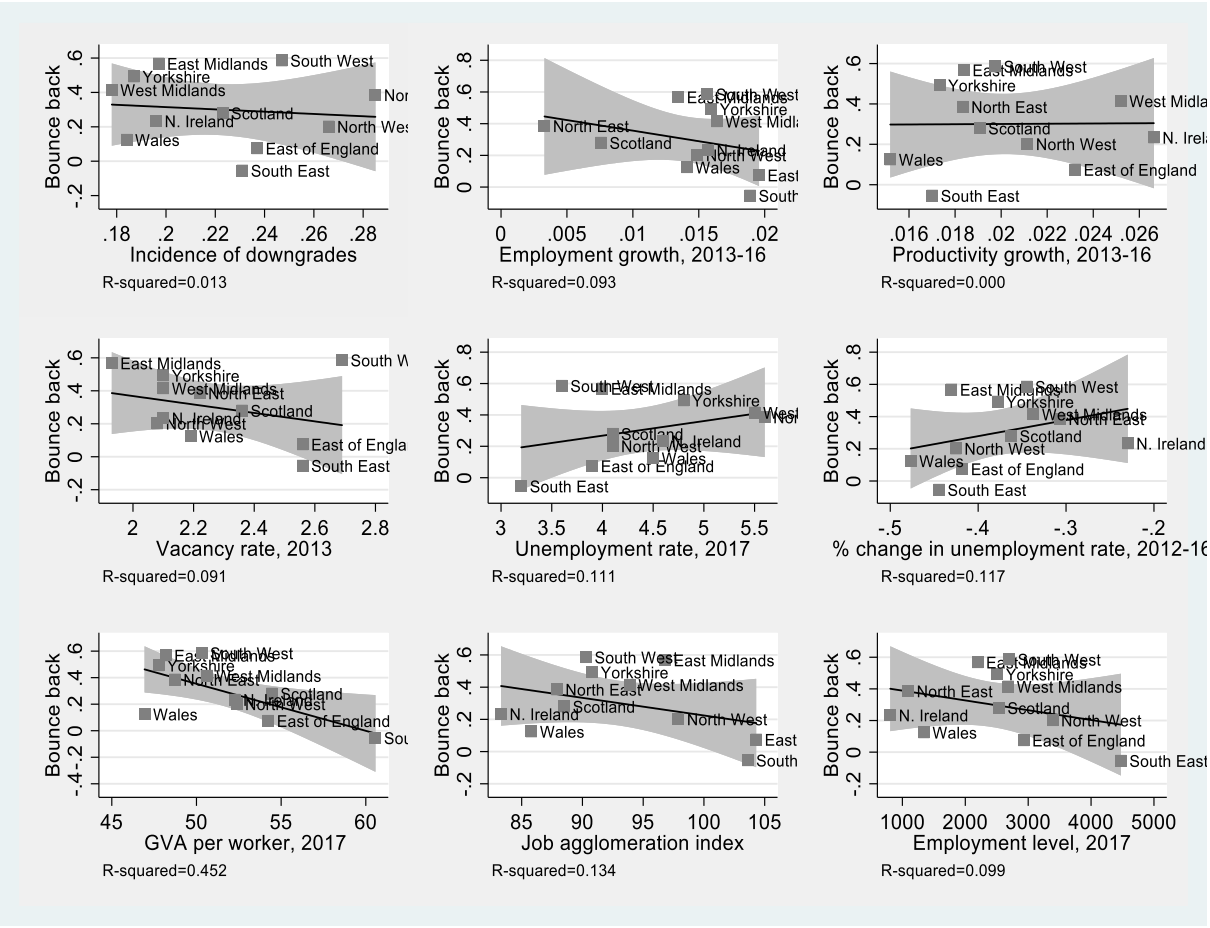
Source: ONS: The productivity index is a ratio of a chained volume series to total employment.

Figure 2. Productivity growth and unemployment change across the UK regions



Source: UK Office for National Statistics; authors' calculations.

Figure 3. Incidence of 'bounce-back' and regional indicators of performance / recovery



Notes: Fitted lines from OLS regressions. Shaded areas represent 95% confidence intervals. Bounce-back is the estimated elasticity of occupational upgrades to past downgrades as reported in column 3 of Table 4.

Table 1. Descriptive patterns of bumping down, out and up over the cycle

	During crisis			During upswing		
	Downgrade	**Upgrade**	**Unemploy-ment spell**	**Downgrade**	**Upgrade**	**Unemploy-ment spell**
	(2008-2011 relative to 2007)		(2008-2011)	(2013-2016 relative to 2012)		(2013-2016)
All ages	22.0%	29.5%	8.4%	19.6%	41.2%	5.4%
sample size		*2,367*			*2,422*	
30-54 in base year	21.6%	26.1%	6.1%	19.1%	35.2%	5.0%
sample size		*1,683*			*1,674*	

Source: UKHLS/harmonised BHPS, authors' calculations. Sample sizes in *Italics*. Reported frequencies are calculated separately for each period. For definitions of the depicted measures see the main text.

Table 2. Bumping down/out and the probability of occupational upgrading in upswings

	Upgrade during 2013-2016 relative to 2012	**Upgrade in 2016 relative to max of 2007-2011**
Downgrade in 2008-2011 relative to 2007 (bumping down)	0.1008***	-0.2157***
	(0.035)	(0.034)
Unemployment spell in 2008-2011 (bumping out)	0.0135	-0.1954***
	(0.070)	(0.071)
Female	0.0484	-0.0317
	(0.034)	(0.032)
Age	-0.0020	-0.0055***
	(0.002)	(0.002)
College degree	0.0057	0.0119
	(0.035)	(0.033)
Average prediction (at sample means)	0.3484***	0.4208***
	(0.013)	(0.013)
Raw probabilities		
Observed upgrades	0.3485	0.4207
Observed downgrades	0.2084	0.2044
Sample	1,456	1,443

Notes: Marginal effects from probit estimations, calculated at mean sample values using the –atmeans– option in Stata. Standard errors in parentheses. *, ** and *** show significance at 10%, 5% and 1% respectively. All models include additional controls for region of residence (Government Office Region) and occupation (see text for details). The sample is restricted to those aged between 30-54 in 2011.

Table 3. Bumping down and the extent of occupational upgrading in upswings

Dependent: Extent of occupational shift in 2012-2016	**All employees**	**Prime age employees (35-54 years old in 2011)**		
Change during crisis (2007-2011)				
Extent of occupational shifts	-0.2525***	-0.2664***		
(all occupational shifts)	(0.025)	(0.031)		
Extent of occupational shifts			0.2619***	
(downgrades only)			(0.045)	
Incident of a downgrade				15.9597***
(dichotomous dummy)				(3.014)
Individual characteristics				
Gender (female)	-7.5315***	-7.5226***	-7.6137***	-6.4992**
	(2.466)	(2.794)	(2.858)	(2.849)
Age (continuous)	-0.3885***	-0.2257	-0.1304	-0.0881
	(0.100)	(0.168)	(0.171)	(0.171)
Education (tertiary)	9.4851***	9.5963***	6.8623**	6.3550**
	(2.493)	(2.840)	(2.864)	(2.866)
Occupation dummies	Y	Y	Y	Y
Regional dummies	Y	Y	Y	Y
Constant	-14.0464	-23.2296	-23.8958	-26.5435
	(16.394)	(17.989)	(18.376)	(18.490)
Observations	1,533	1,154	1,154	1,154
R-squared	0.177	0.196	0.165	0.161

Notes: Standard errors in parentheses. *, ** and *** show significance at 10%, 5% and 1% respectively. All models estimated by OLS using population weights.

Table 4. The geography of economic recovery and bouncing back

GOR	Indicators of occupational change			Performance indicators			
	Incidence of downgrade	Impact on future upgrade		Vacancy rate, 2013	Unemploy-ment, 2017	Job agglomera tion index	Productivit y growth (2013-16)
		All moves	Downgrades				
North East	28.5%	-0.304**	0.386*	2.22	5.6%	87.9	1.83%
North West	26.6%	-0.271***	0.202**	2.08	4.1%	97.9	2.11%
Yorkshire	18.7%	-0.379***	0.493***	2.10	4.8%	90.8	1.73%
East Midlands	19.7%	-0.481***	0.568***	1.93	4.0%	96.8	1.84%
West Midlands	17.8%	-0.176	0.415	2.10	5.5%	93.9	2.52%
East of England	23.7%	-0.252***	0.075	2.56	3.9%	104.3	2.32%
London	16.4%	-0.759***	1.484***	3.12	5.3%	105.6	2.34%
South East	23.1%	-0.105	-0.054	2.56	3.2%	103.6	1.70%
South West	24.7%	-0.273***	0.586***	2.69	3.6%	90.3	1.97%
Wales	18.4%	-0.208**	0.125	2.19	4.5%	85.8	1.52%
Scotland	22.3%	-0.198***	0.280***	2.36	4.1%	88.5	1.91%
N. Ireland	19.6%	-0.179	0.234	2.10	4.6%	83.3	2.66%
UK	21.7%	-0.2664***	0.2619***	2.43	4.3%	100	2.14%

Notes: Column 1: frequencies as described in the text. Columns 2-3: *, ** and *** show significance at 10%, 5% and 1% respectively; models estimated by OLS analogous to columns 2 and 4 in Table 3; reported coefficients are from the interaction terms between the reported variable (moves, downgrades) and regional fixed effects. Columns 4-7: Vacancy rates from the ONS Employer Skills Survey 2013; the agglomeration index is derived from the 2010 Labour Force Survey as the logged average of jobs in the Consolidated City Region (source: Gordon et al, 2015; figures for NI are authors' estimates). productivity growth measured by GVA per hour worked (source: Table 4, ONS, 2020); unemployment rates refer to individuals aged 16+.

Endnotes

[i] See, for example, https://www.telegraph.co.uk/business/2019/03/19/jobs-miracle-defies-brexit-employment-hits-new-record-high. The term was originally coined in 2015 by then Prime Minister David Cameron. By late 2019 unemployment levelled off at about 3.9%, which (with the subsequent onset of the Covid19 outbreak) represents the effective endpoint of the recovery. As we discuss later, the recovery in terms of productivity growth has been much more subdued.

[ii] See, inter alia, Lee (2014) on the geography of unemployment increases in Britain and Verick (2011) on the impact of the crisis on vulnerable groups internationally. The crisis also gave rise to an extensive literature on the economic resilience of places and the factors influencing the ability of local economies to weather the shock of crises (see ESPON, 2014, Fratesi and Rodriguez-Pose, 2016, Doran and Fingleton, 2016, Martin et al., 2016, Giannakis, and Bruggeman, 2017, Kitsos and Bishop, 2018, and Monastiriotis and Laliotis, 2019).

[iii] For the origins of the idea see Watson (1963), Reder (1964) and Thurow (1973). Versions have subsequently been taken up by neo-classical labour economists to account for concentrations of unemployment among those workers with less education (e.g., Teulings and Koopmanschap, 1989; Gautier, 2002).

[iv] It is of course possible that recessions are also linked to supressed occupational upgrading, as employers facing adverse demand conditions may freeze scheduled promotions for their personnel. Indeed, as we show later (see

Table 1), the incidence of occupational upgrading appears much more cyclical than that of occupational downgrading.

[v] Evidence for the importance of these two factors for job movers within and across regions (Gordon, 2015) shows near-immediate benefits for those who migrate from slacker to tighter labour markets ('elevator effect') and greater prospects of occupational progression for workers in more populous city-regions, particularly those with concentrations of high-level occupations and knowledge-based/dynamic industries ('escalator effect').

[vi] By contrast, in the early 1990s when the output fall over 2 years was less than 1%, employment fell by 5.5% – continuing to do so for a third year and only regained its former level in 1998, 8 years after the onset of the recession – while productivity growth carried on unabated (as Figure1 Illustrates).

[vii] Combined, the patterns depicted in Figure 2 put in question the earlier postulation that the lower productivity growth post-crisis may be linked to an expansion of low-quality / low-productivity jobs at the same period. As employment expansion does not seem to have been detrimental to productivity growth, the observed trade-off between gains in productivity and gains in terms of unemployment can be seen instead as suggestive of a heightened role played by labour supply adjustments (including changes in inactivity and through migration).

[viii] Supply side changes might have played some role here, with continuing international migration into London facilitating faster employment growth there. This was notably strong in many upmarket jobs (Gordon, 2016), thus again putting in question the low-job-quality postulation – despite the more limited downward adjustment in unemployment rates. At the national level, continuing net inflows from overseas underpinned an upward trend in the working age population, resulting in employment *rates* reaching pre-crisis levels only in 2015.

[ix] See also Dawley et al (2014) who offer evidence consistent to this for the particular case of the collapse of Northern Rock in the North East of England during the early stages of the global financial crisis. A capital city advantage in terms of resilience in economic shocks has been found also in other contexts – for example, for the case of Greece in the context of the Greek debt crisis of 2010-2016 (Monastiriotis and Martelli, 2020).

[x] The 2009 wave was omitted for technical reasons.

[xi] Specifically, time fixed effects control for changes in average wages over the economic cycle while the regional fixed effects remove the influence of compositional factors (e.g., if a particular occupation is disproportionately concentrated in high/low-wage regions).

[xii] Here and in the analyses that follow, we define the period 2013-2016 as the period of economic upswing as in this period unemployment started to decline fast (by 0.4 percentage points in 2013 and by 3.1 percentage points cumulatively to 2016) and productivity growth picked up (from an annual average of 1.4% in 2009-2012 to an annual average of 2.1% in 2013-2016). Data availability restricts this part of our analysis to 2016. The nature of the results is not altered when we define these periods differently (e.g., 2007 vs 2008-2012 for the crisis and 2013 vs 2014-2016 for the recovery).

[xiii] By comparison, we find no relationship between past downgrades and subsequent downgrades (in the recovery) or between past upgrades and either subsequent downgrades or subsequent upgrades. The latter test is particularly important given that, as we saw in Table 1, much of the difference between crisis and recovery is not so much on the downgrades as it is on the upgrades (which seem to have been much suppressed during the crisis). Our analysis shows that the absence of an upgrade during the crisis bears no statistically significant effect on the experience of an upgrade (or, for that matter, a downgrade) during the recovery. This reinforces the point that the effect captured by the "past downgrade" elasticity reported in column 1 concerns indeed a bounce-back mechanism of people part-recovering post-crisis their positions in the occupational ladder after having experienced bumping-down during the crisis.

[xiv] For example, if occupational mobility occurs mainly within-jobs without change of employer, it is possible that individuals with long(er) job tenures will have de facto higher upgrade probabilities. We thank an anonymous referee for turning our attention to this possibility.

[xv] In our sample the average drop in the occupational ladder for those experiencing a downgrade during the crisis is of 50 positions. Thus, the estimated coefficient corresponds to a recovery of some 32% of the original downgrade.

[xvi] The analysis that follows is admittedly tentative, as it is constrained by two factors. On the one hand, the small sample size (number of regions) which does not allow us to pursue a structural analysis of (the geography of) the incidence of bounce-back. On the other hand, the fact that our dependent variable is a derived elasticity which unavoidably is estimated with noise that varies in degree across regions.