



The regional geography of new graduate labour in the United Kingdom

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10 The regional geography of new young graduate labour in the United Kingdom
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Abstract

Using a newly-constructed database of UK undergraduates' previous residences, universities and first employment this paper develops a framework to model the flows between these locations. Graduates recruited by any labour market are classified into four recruitment pathways. The model is then applied to the UK regional system for four successive graduating cohorts from 1998/9. We identify clear winner and loser regions in graduate recruitment, the different roles of the four pathways and the effect of degree class. We then explain these markedly different regional outcomes and suggest the policy prescriptions for regions that currently lose potential graduate workers in this process of inter-regional interaction.

Graduate labour recruitment United Kingdom Regional analysis

Participation rates Higher education capacity University catchments

Anthony Hoare & Mark

Corver "flows" 1998-1999

University catchments Le géographie régionale du recrutement diplômé au Royaume-Uni.

A partir d'une nouvelle base de données au sujet des anciens lieux de résidence, universités et premiers emplois des diplômés au R-U, cet article cherche à construire un cadre qui sert à en modéliser les flux. Dans un premier temps, les diplômés recrutés sur n'importe quel marché du travail sont classés sous quatre moyens de recrutement. Dans un deuxième temps, on applique le modèle au système régional du

1
2 R-U pour quatre cohortes de diplômés successives en l'année universitaire 1998-99.
3 On identifie des régions gagnantes et perdantes évidentes dans le recrutement des
4 diplômés, les divers rôles des quatre moyens et l'importance de la mention. Puis, on
5 cherche à expliquer ces résultats régionaux tout à fait différents et proposent des
6 politiques destinées aux régions qui perdent actuellement une main-d'oeuvre
7 diplômée éventuelle suite à ce processus d'interaction interrégionale.
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10 Recrutement diplômé / Royaume-Uni / Analyse régionale / Taux de participation / Capacité
11 d'accueil de l'enseignement supérieur / Secteurs de recrutement universitaires
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14 **Die regionale Geografie von neuen, jungen Arbeitnehmern mit** 15 **Hochschulabschluss in Großbritannien**

18 Abstract

19 Mit Hilfe einer neu entwickelten Datenbank der bisherigen Wohnsitze, Universitäten
20 und ersten Arbeitsplätze von Studenten in Großbritannien entwickeln wir in diesem
21 Beitrag einen Rahmen zur Modellierung von Strömen zwischen diesen Standorten.
22 Hochschulabsolventen, die von einem Arbeitsmarkt angeworben werden, werden
23 nach vier verschiedenen Anwerbungswegen klassifiziert. Anschließend wird das
24 Modell für vier aufeinanderfolgende Absolventenkohorten im Zeitraum von 1998 bis
25 1999 auf das regionale System Großbritanniens angewandt. Wir identifizieren klare
26 Gewinner- und Verliererregionen bei der Anwerbung von Hochschulabsolventen, die
27 unterschiedlichen Rollen der vier Wege und die Auswirkungen der Abschlussklasse.
28 Anschließend erklären wir die ausgeprägten Unterschiede bei den Ergebnissen der
29 Regionen und schlagen politische Maßnahmen für Regionen vor, die in diesem
30 Prozess der interregionalen Wechselwirkungen momentan potenzielle Arbeitnehmer
31 mit Hochschulabschluss verlieren.
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34 Keywords:

35 Anwerbung von Arbeitnehmern mit Hochschulabschluss
36 Großbritannien
37 Regionalanalyse
38 Teilnehmerzahlen
39 Hochschulkapazität
40 Einzugsgebiete von Universitäten
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44 **La geografía regional de nuevos jóvenes universitarios en el mercado** 45 **laboral del Reino Unido**

48 Abstract

49 Con ayuda de una nueva base de datos recién creada sobre las residencias
50 previas, las universidades y el primer empleo de universitarios británicos, en
51 este artículo desarrollamos un estructura para modelar los flujos entre estos
52 lugares. Los universitarios contratados en cualquier mercado laboral se
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clasifican en cuatro rutas de contratación. El modelo se aplica luego al sistema regional británico para cuatro cohortes sucesivas de universitarios de 1998/9. Identificamos claramente regiones ganadoras y perdedoras en la contratación de universitarios, las diferentes funciones de las cuatro rutas y el efecto de la clase de diploma. Luego explicamos los resultados de estas diferencias marcadas entre las regiones e indicamos las prescripciones políticas para las regiones que actualmente pierden posibles empleados con estudios universitarios en este proceso de interacción interregional.

Keywords:

Contratación laboral de universitarios

Reino Unido

Análisis regional

Tasas de participación

Capacidad de estudios superiores

Captación universitaria

JEL classifications:

H75 – health, education and welfare

J2 – demand and supply of labour

J24 – human capital

R23 – regional migration

1. Introduction

In recent years the UK government has attached importance to more people entering higher education (HE) not just for the social benefits of wider and deeper participation but also the economic benefits of more highly educated

1
2 workforce. A recent official example of this thinking is Lord Leitch's report on
3
4 long-term skills needs (H.M.Treasury, 2006) which argued for a wholesale
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6 uplift in adult skills, including raising those with at least graduate skills from
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8 29% in 2005 to 40% by 2020. Although some have questioned sending more
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10 people to university (Anon,2004; Alpin and Shackleton, 1998; Dolton and
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12 Vignoles, 2000; Wolf, 2002), most commentators would argue that a more
13
14 university-educated population makes for a more humane, cultured, and
15
16 socially-responsible citizenry and adds materially to the life-long earnings of
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18 the individual and the wealth-generating capacity of the nation (Bynner et al,
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20 2002).

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22 Where the economic role of higher education has been considered at a
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24 regional level it has usually (for example, Boucher et al, 2003; HEFCE 2001;
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26 Kitgagaw, 2004, Thomas, 2002) focussed on two lines of argument. First, that
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28 universities serve as 'basic' economic sectors, 'importing' jobs and income
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30 that cycle and recycle around the regional environments (see Bleaney et al
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32 (1992), Brownrigg, 1973, McNicholl, 1993, Sanders, 2002); and second,
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34 through their research capacity entrepreneurial talent is 'spun off' beyond
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36 campus boundaries and into the region beyond (Deilmann, 1992; Farrant,
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38 2001; Howells, 1986; Howells et al, 1998; Keeble, 1989; Passos et al, 2004;
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40 Oh, 2002; Westhead and Storey, 1995). In both respects some regions are
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42 better served with universities in proportion to their size than others. Thus
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44 pressures mount first to 'fill the gaps in the maps', exemplified in the United
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46 Kingdom by lobbies for further HE investment in Cornwall, Cumbria,
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48 Lincolnshire and the Highlands and Islands (eg Hills and Lingard, 2004 ;
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Utley, 2003), and, second, to achieve critical mass in research capacity through consortia of regional (Fazackerley, 2005a, 2005b; Wojtas, 2005). Our concern in this paper is with a third facet of the HE-regional economic interface - the recruitment of graduate labour - that seems less frequently considered (though Hartshorn and Sear 2005 provide a recent exception). Here too some regions are relatively better placed than others, in ways and for reasons we focus on in the remainder of the paper. Section 2 outlines a simple model of home-university-labour-market transitions (our 'HULT' model) which Section 3 compares to current research evidence and to contemporary debates in the UK. This is also the context for our empirical exploration of the HULT model, using a novel dataset outlined in Section 4 and producing the results of Section 5. These describe the important flows and explore which component(s) of the HULT pathways might be most effectively changed to yield an increase in graduate labour. Section 6 provides a summary, some implications and extensions.

2. Framework for Analysis

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Consider the simplest possible HULT system, with just two hypothetical regions, North and South (Figure 1a). Each is a source of undergraduates who enrol at universities in either region from where they subsequently move to graduate employment, again in either region. Four 'H-U' enrolment streams can thus be identified with an 'Hxx'- type label, thus HSN is the stream of previously- Southern (S) residents who enrol in North's (N) university. Similarly four 'U-L' employment streams of 'Lxx'- type labels, similarly derived, link both universities' graduates to their first-job labour regional market : so

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2 the LNN stream represents Northern graduates who remain there to work. We
3
4 can pair enrolment and employment streams into 'pathways' combining their
5
6 H,U and L designations. From each of the South and North home bases four
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8 such separate 'H-U-L' pathways can be traced, as recast in Figure 1b in two
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10 matrices, one for each home base.

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14 We can also view these pathways from the perspective of the recruiting labour
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16 markets. North and South again have four separate pathways from which they
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18 can recruit graduates. Using the Southern labour market as the example we
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20 can classify these as follows :

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24 • **the Locals pathway** (Cell 1 of Figure 1b : stream HSS + stream LSS) :
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26 these are home students from the South who also studied there before
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28 also taking a job in the South.
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33 • **the Returners pathway** (Cell 2 : HSN + LNS) : those originally from the
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35 South but studying in the North, before returning South for work.
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39 • **the Stayers pathway** (Cell 5 : HNS + LSS) : Northerners who decide to
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41 remain in the South after studying there.
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45 • **the Outsiders pathway** (Cell 6: HNN + LNS) : these take a Southern job,
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47 despite their home and study experiences being from the North.
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3 The absolute numbers recruited through each pathway are the product of the
4 number of graduates who are potential Southern workers multiplied by the
5 rate at which these convert to Southern rather than Northern jobs. More
6 formally, these '**potential**' and '**conversion rate**' elements are respectively
7 defined for each pathway as follows, the first term representing the potential
8 and the second the conversion rate:
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$$15 \text{ Locals} = (\text{cell 1} + \text{cell 3}) \times (\text{cell 1} / (\text{cell 1} + \text{cell 3}))$$

$$16 \text{ Returners} = (\text{cell 2} + \text{cell 4}) \times (\text{cell 2} / (\text{cell 2} + \text{cell 4}))$$

$$17 \text{ Stayers} = (\text{cell 5} + \text{cell 7}) \times (\text{cell 5} / (\text{cell 5} + \text{cell 7}))$$

$$18 \text{ Outsiders} = (\text{cell 6} + \text{cell 8}) \times (\text{cell 6} / (\text{cell 6} + \text{cell 8}))$$

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37 Students exercise choice in where to work, and we assume that personal
38 familiarity, either from experiences prior to, and/or while at, university should
39 be *positive* factors. Assuming the locals pathway benefits from the pull on job-
40 choice of *both* 'home' and 'study' we predict its conversion rate will be the
41 highest of the four. On similar logic, that for outsiders should be the lowest,
42 having neither of these pulls, and those of the stayers and returners
43 intermediate between them.
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2 We also identify as a region's '*gain rate*' the graduates it attracts at the 'L'
3 stage compared to those it generated in the same cohort at the 'H' stage. For
4 each region this is the sum of their four graduate pathways divided by the sum
5 of the four employment streams they attract divided by the sum of the four
6 enrolment streams they generated, as follows:
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14 South gain rate = ((cell 1 + cell 2 + cell 5 + cell 6) / (cell 1 + cell 2 + cell 3 +
15 cell 4)) x 100 %
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20 North gain rate = ((cell 3 + cell 4 + cell 7 + cell 8) / (cell 5 + cell 6 + cell 7 + cell
21 8)) x 100%
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26 Where the gain rate exceeds 100 the region is a graduate 'winner', recruiting
27 more than it generates, and where below 100 a 'loser' region with the
28 opposite characteristics.
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34 For empirical application, of course, this two-regional model has to work in an
35 N-regional context. However, for simplicity of analysis in the UK case to follow
36 (where N = 12) we maintain the same 4-fold classification of recruitment
37 pathways and conversion rates by amalgamating all regions other than the
38 one under consideration, and ignoring the 'internal' flows among them of
39 enrolling undergraduates and recruited labour. So for those graduates
40 recruited by the South West region, for example, locals would be its 'home'
41 students also studying there, returners would be its 'home' students studying
42 in the UK anywhere outside the South West, stayers those whose home
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2 region is elsewhere but studying in the South West, and outsiders those with
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4 no prior South Western associations of residence or study.
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8 But before that, we review what we know of such HULT-type mobility thus far
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10 in the UK and beyond, and its role in current debates on regional economic
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12 growth in Britain.
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15 16 17 18 **3 : Contexts** 19

20 21 22 3.1 : Academic 23 24

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26 The key underlying principles to our investigation – that education facilitates
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28 geographical mobility which in turn is characterised by geographical
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30 disequilibria – is, of course, part of the received wisdom of the social
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32 sciences. Differential regional economic growth is far too complex to be
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34 'explained' by just one factor (migration) let alone one sub-factor (graduate
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36 migration), but there is a case for believing the latter to have become
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38 relatively more important. A detailed overview of the geography of migration in
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40 late 20th century Britain portrays internal migration (our focus here too) as
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42 being of the young, highly educated, start-of-career or early-career
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44 professionals (Champion and Fielding, 1992). As regional specialisation has
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46 shifted to one structured on occupation rather than industrial categories so
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48 only certain locations can provide the high-flier career opportunities these
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50 migrants seek, and the training capacity for them. This reinforces the virtuous
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2 cycle of growth of favoured regions and, in the zero-sum-game geography of
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4 Britain's regions, a vicious one of the draining-away of human capital in
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6 others. So regional inequalities widen. Neoclassical regional theory may
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8 depict migration as a force for inter-regional equilibrium, but contemporary
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10 realities are very different.
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14 More recent work (Champion et al 2007) sharpens the focus on the 'graduate
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16 process' in such internal migration flows, and thereby on the population
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18 growth of major British cities. Analysis of longer-distance migration from the
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20 2001 Census shows the important role here of the movement of full-time
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22 students to university, although their levels and patterns of migration after
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24 graduation cannot be traced so surely. The authors nevertheless believe their
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26 results underline the role of mobile, high-skilled graduate workers in
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28 supporting the growth points of the modern 'information economy', particularly
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30 in London. London's gain is others' loss, so these highly mobile, intending and
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32 actual graduates add further to these upwards and downwards cycles, in the
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34 HE sector (see for example, Hoare, 1995).
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39 But this recent evidence only sheds partial light on the realities of the HULT
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41 system. The same is also true of other evidence derived from a range of other
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43 geographical contexts. Table 1 provides a summary of significant
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45 contributions. Many are international in scale – the often-called 'Brain Drain'
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47 investigations – although inter-regional examples within national confines
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49 arise as well, again highlighting the differential economic benefits and
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51 disadvantages such flows imply. Most focus on either the H-U or the U-L legs
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2 in isolation. The training and practice of doctors is the single most popular
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4 research sector, as a comparatively accessible study population and one with
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6 obvious wider social consequences.
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10 But as far as our present focus is concerned - continuous time-series tracking
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12 across H-U-L of the same individuals and within a national set of regions –
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14 few precedents exist. Kodrzycki's first study from Table 1 (Kodrzycki, 2000)
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16 adopts a variety of source materials to examine New England's performance
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18 and apparent decline over time in generating, training and attracting graduate
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20 workers compared to other regions. Her second (Kodrzycki, 2001) uses one
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22 of them, the US National Longitudinal Survey of Youth (1979-1996), to follow
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24 high school migrations to college and then for the first 5 years of employment.
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26 Graduates subsequently emerge as more mobile than non-graduates.
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28 Migration rates *to* college (H-U) are lower than *after* college (U-L), but the
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30 former also differentially encourage the latter. Clear winner and loser regions
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32 emerge in the graduate job league, rationalised by differences in their labour
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34 markets dynamism and amenity attractions.
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38 The first UK study (Osborne et al, 1987) traces the early employment
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40 experiences of Northern Ireland students entering HE in 1979, whether there
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42 or beyond the region, noting the roles of gender, religion, academic subject
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44 and degree class. The Province emerges with a serious net loss of graduate
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46 labour from that cohort, and for our purposes it is pertinent that this is
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48 especially so for those attaining high class first degrees (upper seconds or
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50 better). The other UK HULT-type study (Belfield and Morris, 1999) adopts a
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2 wider geographical remit in tracking two panels of full- and part-time
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4 graduates (of 1985 and 1990) to their first employment. These migrations
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6 again are unbalanced, and their statistical modelling and follow-up
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8 investigations suggest some of the personal and regional characteristics
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10 encouraging mobility. Interestingly, those migrating to study (ie the H-U leg)
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12 tend to be *less* satisfied with their courses. However, their results depend on
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14 limited samples (35% response rates from 20% of British universities) and
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16 their transitions are analysed as a set of separate legs (H-U;U-L;H-L) rather
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18 than as a continuous process. Since then the relevant datasets have
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20 improved, and the financial climate in which British students study has also
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22 changed significantly.
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26 3.2 : Political

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30 So have the ways in which regional labour-forces are politicised into related
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32 economic strategies. Since 1997 nine Regional Development Agencies
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34 (RDAs) have added a new and energetic component to economic analysis
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36 and policymaking in England, building on experience of equivalents in Wales
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38 and Scotland. In pursuit of their task 'to co-ordinate regional economic
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40 development and regeneration, enable the English regions to improve their
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42 relative competitiveness and reduce the imbalances that exists within and
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44 between regions ' (ODPM, 2005) a set of regional reports (appearing around
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46 2000) were produced where the paramount activity was medium-term (usually
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48 to about 2010) regional economic strategies. And *their* single most prominent
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2 issue, common to every such strategy, was the regional resource of labour
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4 skills.
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9 At the most basic level this meant upgrading literacy, numeracy and the
10 culture for learning amongst the low and unskilled. At the 'top end' the focus
11 was on specialist and high-level skills. Universities represented the major
12 source of these, as some RDAs explicitly appreciated in their strategy
13 pronouncements. Thus that for the North East region underlined the need for
14 '[p]lacing universities and colleges at the heart of the region's economy' (ONE
15 NorthEast, 2000), in part precisely because they are a source of training and
16 skills among the workforce. This is the closest the RDAs have come to the
17 symbiosis between labour market needs and the HE sector advocated by
18 Goddard and Chatterton (1999), giving them an explicit 'third role' alongside
19 their traditional contributions to teaching and research. The neighbouring
20 North West stressed the importance of retaining graduates for its own
21 economic benefit in its Skills and Learning Strategy (Northwest Development
22 Agency, 2000). And the East Midlands furthered its vision of transforming the
23 region's educational providers into 'a dynamic strategic force for economic
24 development' (East Midlands Development Agency, 2000a), partly through its
25 then on-line '*Getonwithgraduates*' scheme (East Midlands Development
26 Agency, 2000b) which paired, intra-regionally, the career paths of relevant
27 graduates with the needs of employers.
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49 The former Department for Education and Employment's HERD (Higher
50 Education and Regional Development) Fund also aimed 'to increase higher
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2 education's contribution to regional competitiveness by developing its
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4 responsiveness to local or regional employment markets' (DfEE, 1999).
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6 Partners to its supported ventures included universities among other
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8 educational establishments, and private and public sector representatives (1).
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10 But however formalised through public policy, regional stocks of skilled labour
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12 depend on significant inflows and outflows at different stages in the HULT
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14 process. In an inter-regional, zero-sum-game context, there will inevitably be
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16 regional winners and losers. However, one could be forgiven for overlooking
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18 this in the cascade of words in RDA publications and web-sites. There we find
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20 scant awareness of these inter-regional flows, let alone how well (or badly) a
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22 particular region fares from them.
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27 **4. Data sources**

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29 So both empirically and politically the case for a more rigorous HULT-type
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31 analysis seems clear. Our application of it to the reality of the UK experience
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33 for the first time, rests on a fundamental advance in the structure of available
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35 time-series data. The recent linking together of hitherto separate UK data sets
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37 focussing on the 'H-U' and 'U-L' segments of our model is part of a wider
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39 transformation of the scope and accuracy of HE sector statistics. The first
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41 graduate cohort to be so treated – the 1998/99 graduates – is also our starting
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43 point.
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48 The basic approach is to use multi-stage matching across a range of personal
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50 data from individualised records to produce a matrix of links between (and
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52 within) datasets, before resolving these links into a logically consistent
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2 longitudinal data set (HEFCE, 2005 pp 168-170). Starting with algorithms
3 developed by one of us for determining undergraduate non-completion rates
4 and university access statistics (HEFCE, 1999), this approach has been
5 extended to launch studies of participation patterns (HEFCE, 2005a; 2005b)
6 and undergraduate progression (HEFCE, 2003). Our analyses here take a
7 first look at a hitherto unexplored aspect of these new data sets – the linked
8 geographies of undergraduate origin, study and first employment.
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11 The first two geographies derive from the HESA (Higher Education Statistics
12 Agency) student records. This individual level data set provides course and
13 personal details, including the postcode of the pre-admission residence. We
14 supplement the student personal details by linking to the Universities and
15 Colleges Admissions Service (UCAS) data sets. Whilst this linking does raise
16 the (already high) valid postcode coverage for young entrants to around 99
17 per cent (HEFCE 2005b, p 179) its main advantage is in the elimination of
18 term-time postcodes sometimes erroneously returned on the HESA record.
19 These residence postcodes, in combination with the location of the university
20 attended, form the basis of a 'H-U' classification. The 'H' here really is the
21 'home' location, rather than that of school. The two are usually geographically
22 close, though not necessarily so for boarding schools. Occasionally a
23 student's term-time address will be elsewhere (notably for Home Counties,
24 home-based students studying in London) while some universities have
25 locations for first-degree study in other regions (HEFCE 2004), but neither
26 should make a material difference to the broad patterns of H-U-L transitions
27 we identify. Our first look at the data neglects these complications.
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4 The data source for the U-L leg is the HESA First Destination Survey (FDS)
5 (HESA 2003), an annual postal survey to discover the employment status of
6 recent full-time graduates shortly after graduation. For those reporting
7 themselves as in full-time employment the geographical location of the
8 employer (not the graduates' residence) is recorded. With a typical response
9 rate of around 80% — 86% for the young degree graduates that we consider
10 in this paper — the FDS provides a comprehensive early snapshot in the
11 evolving employment history of recent highly qualified labour. After 2001/2 the
12 FDS was replaced by the Destination of Leavers from Higher Education
13 (DLHE) survey (HESA 2004), so our analysis too ends with the 2001/2
14 graduating cohort.
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28 A review of FDS identified some weaknesses, such as inconsistency in how
29 and when first employment was recorded and in the practice of universities in
30 exhorting selected recent graduates to respond. This led to improvements to
31 the FDS for 2000 such as a common survey reference date and more data
32 quality cross-checks by HESA. Our analyses span the pre- and post-review
33 period, but the stability of results suggests this has not been a major break in
34 the series. Bias may persist for our purposes if the differential energies of
35 universities in chasing their FDS respondents and keeping sound records
36 map onto different H-U-L profiles. It is also the case that the FDS response
37 rates vary across groups of graduates, for example graduates who go on to
38 postgraduate study are more likely to respond (HEFCE 2005b, pp 231-232).
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51 It seems likely that a similar response bias would exist between, for example,
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2 those in 'proper' graduate occupations and those in more temporary jobs,
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4 which could distort our view of the H-U-L profiles.
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8 The four cohorts of UK domiciled first degree graduates from Higher
9 Education Institutions between 1998-1999 and 2001-2002 total some 969,000
10 (around 1,400 EU domiciled first degree graduates are recorded as working in
11 the UK on the FDS, but are not included in this analysis). But we are only
12 concerned with a sub-set of these, obtained through a sequence of
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18 restrictions:
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22 a) they are full-time first degree students
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24 b) they qualify (from the same institution as they started in) three or four
25 after starting, with no previous HE experience
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28 c) they entered their course aged 18 or 19 (defined relative to their school
29 year : HEFCE 2005b, p 172)
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34 Applying restrictions (a) and (b) leaves some 671,000 graduates. The further
35 stipulation that they be young on entry reduces the total again to 525,000
36 graduates. The effect of these restrictions is to remove geographical
37 compilations (such as those who have transferred between institutions, and
38 those who are having a second chance at HE) and to focus on young full-time
39 degree graduates. This group is the numerically dominant component of all
40 graduates and is of particular use to us since it is likely to be especially mobile
41 geographically, making it a sensitive testing ground for the potential spatial
42 transitions underpinning our HULT model. These particular graduates offer
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2 interpretative and pragmatic attractions too. Their youth means that their
3
4 'home' location is likely to have been more than transient and their rapid
5
6 progress through their courses (compared to part-time students) means each
7
8 cohort is responding to a common national economic context. Furthermore,
9
10 the participation geography of young people is better known than for other
11
12 groups (HEFCE 2005a; 2005b). This is not to deny the importance and
13
14 interest attached to other sub-sets of graduates (or those attaining other HE
15
16 qualifications, perhaps through study in Further Education Institutions, a
17
18 particularly important route in Scotland), but they likely behave differently, are
19
20 more difficult to measure and less responsive to the regional patterning of
21
22 employment opportunities.
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27 Our analysis requires further cuts to this population of 525,000 young
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29 graduates:

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33 d) they need to have responded to the FDS (451,000)
34
35 e) and report 'full-time paid employment' as their main activity (261,000)
36
37 f) and be working in the UK (250,000)
38
39 g) and provide sufficient detail on their 'H', 'U' and 'L' geographies to allow
40
41 the assignment of a region in each case (225,000)
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45 Clearly, we can only analyse those for whom we have FDS information. Of
46
47 those, our interest is in those who go straight into full-time paid employment:
48
49 the eventual employment geographies of those who go on to postgraduate
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51 study or take longer to find employment are neglected in this paper. The final
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restriction is the condition of allocating each qualifier into our chosen spatial framework of UK regions (Figure 2). Although the full postcode derived 'H' and 'U' geographies could be specified in many ways this is not the case for the FDS sourced 'L' destinations which are referenced by full postcode, partial postcode or country in 24 per cent, 74 per cent and 2 per cent of cases respectively. The country level of location would be assigned where the respondent had not provided sufficient postcode information so, for example, "Bristol" would be coded to England. Since Scotland, Wales and Northern Ireland are regions in our analysis that also enjoy country status, the graduates employed there are more likely to assigned a valid 'L' geography than those in England. Almost all the 25,000 graduates removed at stage g) above are those where the 'L' location is recorded as 'England'; thus graduates working in England are under-represented slightly in our population.

Using regions for our spatial framework allows us to assign as many as possible to a valid geography and avoids the difficulties of finer-grained ones that might be readily spanned by a commute. Whilst it is easy to criticise regions for being too coarse an analytical framework, it keeps the first, largely descriptive, step in our HULT analysis, manageable. More positively, as we have seen, it is also the scale at which much sub-national policy-making over jobs, people and homes takes place. Our final population of 225,000 represents 23 per cent of all the first-degree graduates in this period, some 43 per cent of young graduates and (depending on how the FDS non-

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2 respondents differ from the respondents) probably around 75-80 per cent of
3
4 the young graduates going directly into the labour market.
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8 In this present, exploratory, paper we deliberately take a simplified view of this
9
10 innovative dataset, distinguishing its population neither by type of degree
11
12 subject nor by awarding university, although it might be argued that each may
13
14 affect their quality, employability and mobility to attain employment. If we had
15
16 individual university-level data (which we haven't) allowing for such inter-
17
18 university variation in degree-level training would still be problematic. But by
19
20 working at the region scale we are using a framework which, in each region,
21
22 amalgamates universities of very different character and 'status', hopefully
23
24 smoothing over any sharp site-to-site variations in educational quality.
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28 It is also important to stress that we are not attempting to model the flows in
29
30 our HULT dataset in any optimal, distance-minimising sense. Our interest is in
31
32 describing, analysing and considering some policy options based on the real-
33
34 world geographical interactions that arise, for better or worse, among homes,
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36 universities and workplaces.
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39 40 41 **5. Analysis**

42 43 44 45 ***The structure of the HULT system***

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49 In this first, descriptive, section we start by examining the gross outcomes of
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51 the HULT system through regional gainers and losers. Second, we quantify
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2 the recruitment pathways that underlie these broad-brush outcomes. Finally,
3
4 we explore the role of degree class, to see whether quality, as well as
5
6 quantity, differences characterise the UK's geography of graduate labour
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8 recruitment. Throughout, one general outcome is the uniformity of these
9
10 results across the four graduating cohorts: any year-to-year differences are
11
12 usually of detail rather than substance. Thus for presentational simplicity one
13
14 year's results can sometimes stand for all four. Another is the reassurance,
15
16 not least for policy-relevant purposes, that the contemporary geography of
17
18 graduate recruitment is largely consistent over time.
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20 21 22 5.1 : Winners and losers 23

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26 We identify these based on *net* differences between start and end positions
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28 for any cohort : in a region with an arithmetic balance of providing
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30 undergraduates and recruiting graduates (ie gain rate = 100), substantial
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32 numbers of the former could still take jobs extra-regionally, as long as these
33
34 were matched by inflows of 'stayers' and 'outsiders' to the regional labour
35
36 market.
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40 Table 2 shows an outcome clear and consistent over time and space. Only
41
42 two regions – Scotland and Yorkshire and the Humber – approach this
43
44 balance, each being either in modest surplus or deficit depending on the
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46 cohort concerned. The single, and emphatic, winner region is London, which
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48 recruits about twice or more first degree graduates as it provides home
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50 students to the system. There may be a hint of some *relative* decline over
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2 time, but this is a detail secondary to the capital's dominance in the
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4 geography of graduate recruitment.
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8 The necessary counterbalance comes in the remaining nine regions, all of
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10 which are consistently losers. Overall, the smallest such deficits are,
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12 predictably enough, in the South East: the region shares something of the
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14 economic strength of the London which partly offsets the draw of *its* home
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16 students to the capital's adjacent labour market. At the other extreme, Wales,
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18 Northern Ireland and the East of England are overwhelmingly loser regions in
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20 all four years, in some of which they fail to recruit the numerical equivalent of
21
22 three graduates for every four they send to university.
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26 A simple measure of consistency over time is the behaviour of the regional
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28 *gain rates* (defined above), which show a high degree of stability as mapped
29
30 in Table 2. Its histograms cannot easily convey the rank orders of regional
31
32 gain rates, but these also change little over time, as measured by the '*shift*'
33
34 scores shown. These record the total change in rank position for each region
35
36 over three inter-cohort comparisons, the theoretical maximum being 33 and
37
38 the minimum, obviously, zero for no change in rank position. The *highest* shift
39
40 scores are only 6, in the North East, which has raised its bottom-of-the-pile
41
42 1998/9 gain rate (75%) to a 6th ranked 90%, the recently improving East
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44 Midlands (to 5th in 2001/2) and the South East. The last's recent downturn (to
45
46 10th position -only Northern Ireland and the East of England being worse)
47
48 might reflect the same depressurising the overheated parts of the national
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50 space economy as the possible London trend noted two paragraphs earlier.
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2 At the other extreme, seven regions have not changed position by more than
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4 one rank (and sometimes by none) at any stage over four years.
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8 5.2 : Catchments, conversion rates and pathways
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11 **University catchments** focus on the H-U flows and determine the numbers
12 of potential graduates on each recruitment pathway, to which their respective
13 conversion rates apply. For present purposes we can summarise the
14 catchments for most of the 12 regions as belonging to two broad groups
15 (Table 3). Members of the leading group each year have larger outflows of
16 home-residents to university places than they have opposite inflows, and
17 these in turn exceed numbers of home students studying within the region.
18 For the smaller group, the first two flows are reversed in size, but the locals
19 stream is again the smallest. The most peripheral university regions display
20 their well-known high dependence on intra-regional student recruitment,
21 although the inflow – outflow balance differs, while the northern English
22 regions show relatively more balance across the three components, and some
23 changes over time.
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41 Turning next to the U-L flows, Table 4 displays regional **conversion rates**
42 across the four pathways, taking 2001/2 as typical. As predicted earlier, locals
43 always produce the highest conversion rates, in every region and for each
44 cohort. This is never below 70%, and over 90% in the most peripheral regions
45 (Scotland, Northern Ireland). At the other extreme, and again predictably, the
46 outsiders pathways generate the lowest conversion rates, in every case. In
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2 terms of its size, London's outsiders conversion rate is clearly exceptional, -
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4 over 11%. They otherwise never breach 5%, and in four peripheral ones –
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6 Scotland, Northern Ireland, the North East and Wales - fail even to reach 1%.
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10 However, the two middle categories are more clearly differentiated than our
11
12 previous discussion suggested. Of the two recruitment pulls exercised by any
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14 region – that of being at home there and that of studying there – the former is
15
16 the more powerful, usually by some way. So in eight cases the returners
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18 conversion rates normally exceed the stayers equivalents by over 15
19
20 percentage points, across the four cohorts. Northern Ireland is an exception,
21
22 but its stayers conversion rate is based on a very small inflow of university
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24 students studying there from outside. The only other exception is in Scotland,
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26 where in three cohorts (2000/1 is the exception) the middle rates are reversed
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28 from their normal order: in-migrant students are more likely, albeit by a small
29
30 amount, to be recruited to Scottish jobs than are those previously living in
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32 Scotland but now studying outside the region.
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36 Further stability is to be found in the *ranked positions* of the regions on each
37
38 of the four conversion rates across the survey years. Out of 48 'region x
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40 pathway' cases only four vary by more than two ranked positions across the
41
42 four cohorts and one third are constant in each year. Table 5 shows what
43
44 these ranked positions are, through their mean values by pathway and region.
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46 Some regions perform very differently depending on the pathway – potential
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48 locals from the South East seem to develop a preference for jobs elsewhere
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50 (probably in London) but this region has high conversion rates otherwise,
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2 while the South West and East of England have similar, if less extreme,
3 tendencies. The peripheral regions, and particularly Scotland and Northern
4 Ireland, show the opposite trend. Each is much more attractive to locals than
5 outsiders, and more effective at retaining those who have already decided to
6 move to the region for study than former residents who have left for university
7 elsewhere. Finally, the very different experiences of the neighbouring North
8 East and North West are notable in the light of the concern of the latter's RDA
9 in raising levels of graduate recruitment, reported earlier.
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21 London is different again: whatever the pathway, its performance is
22 impressive against regional competitors. There seems no sign of weakness in
23 its ability to attract newly qualified, highly qualified, labour, at least within
24 Britain.
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30 The *absolute numbers* of graduates recruited by each pathway are obviously
31 the product of the university catchments, (generating potential recruits) , and
32 conversion rates of 'potentials' into 'actuals' (Table 6) : their roles are
33 sometimes conflicting and sometimes complementary. In practice, although
34 the local pathway has universally the highest conversion *rates*, only four
35 regions consistently draw their largest single *volumes* of graduates from it -
36 the North East, Wales, Scotland and Northern Ireland. In the last two the
37 percentage of home-origin students who also study in the region is particularly
38 high, compared to those studying elsewhere or to outsiders studying in the
39 region, so university catchments and conversion rates reinforce each other. At
40 the other extreme, London uniquely draws its biggest volume of graduate
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2 labour from those with no prior familiarity with the region at all, as its
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4 exceptionally high 'outsiders' conversion rate is applied (inevitably) to the very
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6 large absolute number of students in that category. In the central English
7
8 regions returners consistently generate the most graduate labour. Just two
9
10 regions show any changes over time. Yorkshire and the Humber depends
11
12 most on stayers for the first two years, but these are narrowly edged out by
13
14 locals from 2000/1. The North West, also becomes reoriented towards locals
15
16 in later years.
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18 19 20 5.3 : The importance of degree class 21

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24 What of the role of degree class? Over the four years between about 55% and
25
26 60% of students in the dataset were awarded first or upper second class
27
28 degrees ('high' graduates) as opposed to lower seconds or below ('low'
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30 graduates). Conversion rates can be calculated separately for these two sub-
31
32 groups, with the outcomes shown in Table 7. Again the results are very
33
34 emphatic, and again they separate the performance of the London graduate
35
36 labour market from those in other regions. In all but two 'region x cohort'
37
38 cases (2) the locals pathway generates a higher conversion rate for low than
39
40 high graduates. So the likelihood that those who have studied in their home
41
42 region will also be recruited there is greater the less well they perform in their
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44 first degree, consistent with the Osborne et al (1987) finding noted earlier. In
45
46 the great majority of the returners and stayers cases the same also applies:
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48 out of 96 such cases (2 pathways x 12 regions x 4 cohorts) only 14
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50 exceptions arise. And of the 16 total exceptions over all three of these
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2 pathways - where *high* graduates are recruited relatively more frequently by a
3 region - no less than nine arise in London, out of its total of 12 cases (3
4 pathways x 4 cohorts). Only with the outsiders (a very small conduit for
5 graduate recruitment in absolute terms away from the capital) are regional
6 conversion rates generally greater for high than low graduates. So when
7 converted to absolute numbers again (Table 8) the problem for many regions
8 of being a loser rather than a winner in graduate recruitment is compounded
9 by their also being disproportionately dependent on those who, on the
10 evidence of degree class, are the lower attaining and less valued segment of
11 the graduate labour force (Owen, 2003).
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25 So London bucks this trend, as it did earlier ones. It recruits disproportionately
26 more high than low graduates in all but three of its 12 pathway x cohort
27 cases over the study period, as well as enjoying higher conversion rates in
28 general than rival regions.
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35 ***Diagnosis and prescription***

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38 We now turn from description to a deeper understanding of the very different
39 performances of the 12 regions in recruiting graduate labour, focussing on
40 controlling factors susceptible to medium-term intervention through public
41 policy in the education sector.
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49 Four such factors are identified, as follows:
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- i) *HE participation rates* – The participation rate of young people in higher education varies by region (HEFCE 2005). The regional participation rates for our study period varied from about 36% in Scotland to 24% in the North East. Our analysis supposes that a proportional change in a regional participation rate would bring about a similar proportional change in the number of our database population from the 'H' region. This is a reasonable approximation though the exact relationship between the two will also depend on factors including non-completion rates, course length, participation in Further Education Institutions and the share of young graduates that fall within the analysis .
- ii) *Regional HE capacity*, in relation to the generation of undergraduates from each region – in 2001/2 universities in the East of England took in only 44% as many students as that region generated, forcing many of them to study outside its boundaries for that reason alone, whereas its neighbour, the East Midlands, had an equivalent 30% oversupply of places.
- iii) *University catchments* – the more a region's students attend its local universities and those universities recruit local students, the more will students pack into cell 1 of our model (Figure 1b), maximising the likely graduates recruited locally. In 2001/2 91% of Scottish students studied there, comprising 84% of students in

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2 Scottish universities, the comparable figures for the South West
3
4 being only 31% and 33%.
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- 8 iv) *Conversion rates* – we have seen how these vary, and self-
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10 evidently the higher they are, *ceteris paribus*, the higher will be
11
12 regional graduate recruitment.
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15 16 5.4 : Diagnosis 17

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19 We now estimate the contribution of each of these factors by setting them
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21 separately and in turn to appropriate national benchmarks, and observing how
22
23 regional gain rates change for a given cohort. In the case of i), iii) and iv) this
24
25 involved substituting the cohort national average equivalent, based on the
26
27 unweighted means of the 12 regional figures, for the respective, observed
28
29 region-specific values. For ii) each region's HE capacity was set to the
30
31 number of students that region generated for a given cohort, so each could be
32
33 self-sufficient in terms of crude demand for and supply of HE places. For iii)
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35 and iv) these changes can be made without affecting the remainder of our
36
37 HULT model, but for i) and ii) it is necessary also to allow regional HE
38
39 capacity and participation rates respectively to respond subsequently, to avoid
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41 unfilled places or unsatisfied students (3).
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47 The results again testify to the stability of the HULT system over time. For
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49 eight of the 12 regions taken separately the relative effects of the four
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51 separate estimates of graduate recruitment are consistent over all four
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2 cohorts (although different among the regions – see below) and for each of
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4 the remainder only one cohort breaks ranks. Equally, the effect of the
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6 diagnostic changes is almost always in the same direction (upwards or
7
8 downwards) for each cohort, and in the exceptions the impact is marginal.
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12 Table 9 summarises the diagnosis for the 12 regions. It identifies the factor(s)
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14 most responsible for their current observed recruitment status (Col. 1) when
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16 compared to that which the application of national benchmarks would
17
18 generate, those from which they would benefit most (Col 2) against current
19
20 outcomes, and to some lesser extent (Col 4), if these same national norms
21
22 were to apply. The additional graduate labour recruitment the dominant-
23
24 change (Col 2) factor would generate appears in Col 3. The results are very
25
26 varied, testifying to the complex ways in which a small number of controls can
27
28 affect regional graduate recruitment. Consistent with what we saw before, the
29
30 dominant winner (London) benefits massively from its conversion rates and
31
32 suffers only modestly from being below self-sufficiency in HE capacity. In
33
34 contrast, for seven regions HE capacity is their major strength while almost all
35
36 would also benefit from national conversion rates. The North West would gain
37
38 most from improved participation rates and Northern Ireland from a more
39
40 normalised pattern of student flows and university catchments. Its potential
41
42 gain here is a massive one, too, which would almost have doubled its
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44 recruitment in one cohort. Wales and the North East also have substantial
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46 benefits to reap from national conversion rates.
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51 5.5 : Prescription
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4 To provide more realistic policy prescriptions about increasing absolute
5 numbers of graduates in regional labour markets we now make two further
6 modifications. First, whereas our diagnosis assumed *simultaneous* changes in
7 each controlling parameter *across all regions*, policymaking may well prioritise
8 individual changes by and in specific regions. Second, the scale of changes
9 needed to raise some regions to national norms in the previous section can
10 be unrealistically large.
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21 So now we model the effects of each factor separately for each region
22 (keeping the remaining 11 unchanged) in stepwise increments of 5% for :
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- 26 • HE participation rates
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- 31 • regional HE capacity
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- 35 • conversion rates for :
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- 39 i) locals and returners combined
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- 41 ii) locals and stayers combined
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- 45 • university catchments :
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49 The last two require further explanation. The first conversion rate modification
50 assumes that policymaking targets students from a home region, wherever
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2 they study, and the second that the focus is the region's HE provision,
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4 irrespective of students' origins. It is less clear how it could target either more
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6 cells, or fewer (eg locals only), although our approach is adaptable to such
7
8 cases.
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12 The catchment modification is based on repositioning a tranche of students,
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14 numerically equivalent to 5%, 10%, 15%... of the locals cell on Figure 1b,
15
16 such that a region's total undergraduate-generating and -attracting capacities
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18 are unchanged. This involves increasing cell 1 by the specified percentage,
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20 then increasing cell 4 and decreasing cells 2 and 3 by the same absolute
21
22 amount. In practice, the outcomes of the conversion rate modifications are
23
24 identical to some other controls, through not of course in the underlying
25
26 processes – variant i) duplicates the participation rate and ii) the HE capacity
27
28 effects. Results for any factor are also simple linear functions of the input
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30 changes – those for the '25% case' being five times the 5%, for instance.
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35 Table 10 concentrates on those regions identified earlier as in graduate deficit
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37 (ie 'losers'), and summarises the volume of factor-change necessary to effect
38
39 a 10% increase in graduate labour. In every case a given (eg x%) change in
40
41 participation rates is more effective than the same change in HE capacity,
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43 which in turn is considerably more so than a similar change in university
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45 catchments for constant generation and capacity levels. Of course, we cannot
46
47 automatically assume the same sequence applies in cost-effectiveness terms
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49 (an x% rise in participation levels/conversion rate i) may be much expensive
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51 than an x% increase in university places/conversion rate ii)). But the ratio of
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Cols 1 and 2 (shown in Col 3) gives an indication of regional variations in the *relative* attractiveness of these two strategies : the North East, and Northern Ireland are the best positioned to benefit from capacity expansion/conversion rate i), for example, and the East of England and South East the least so. Similarly, the relative attractiveness of changing catchments (Col 4) is stronger in Wales and the North East and particularly unattractive in the South East where massive redistributions of enrolment streams into and out of the region are necessary before any significant effect on graduate recruitment appears.

The Table also identifies those regions where a given policy initiative is likely to be more or less effective. For both participation rates and HE capacity Northern Ireland, the North West, the North East and Wales are the most attractive contexts. In contrast, the leverage effects of participation rate increases are much weaker in the East Midlands, South East and South West, and, of changed HE capacity, in the West Midlands, South East and East of England. For any programme of encouraging more students to study locally and universities to recruit locally, the North East and Wales reap the greatest returns and the South East the least. Northern Ireland even produces a negative return, given its comparatively high conversion rates for stayers (4).

6. Discussion

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4 To summarise so far, some simple descriptive and modelling exercises have
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6 been undertaken on a uniquely compiled set of data on recent graduate
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8 employees, tying together, for the first time, their regions of pre-HE origin, of
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10 HE education and of First Destination of full-time employment (the 'HULT'
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12 system). While there are some hints of time-trends, the overwhelming
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14 impression is of a consistent geographical structure over all four cohorts. In
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16 the competition for the first destination of the young graduates the UK shows
17
18 a large number of loser regions, two which break even and one dominant
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20 winner region (London). It also has a clear regional pattern of university
21
22 catchments, conversion rates and pathways of graduate labour recruitment.
23
24 Almost all regions consistently show greater rates of recruiting of students
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26 with prior familiarity through home or study, and particularly both, although
27
28 this does not necessarily mean that the locals pathway is the most important
29
30 one for absolute graduate recruitment. At one date or another, each of these
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32 is dominant in at least one regional setting, although there is a clear
33
34 geographical split between more peripheral regions most dependent on locals
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36 and more central ones on returners. The disadvantage experienced by loser
37
38 regions becomes greater still once the degree class of graduates is taken into
39
40 account, since these tend to recruit disproportionately more of those with
41
42 lower class first degrees.
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47 In many of these analyses London is the glaring exception. It is the
48
49 overwhelming winner region for graduate recruitment, if marginally less so
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51 than it was. It enjoys high conversion rates across the pathways and is the
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1
2 only region to depend most on the outsider pathway for its graduate
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4 recruitment. It is also the only one which draws proportionally higher class
5
6 degree students from across the pathway spectrum, and not just from
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8 outsiders, as is commonplace elsewhere.
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12 Finally, our analysis turns to rationalising these HULT outcomes in terms of
13
14 factors explicit or implicit the HE system, and the effects of policy initiatives to
15
16 change these and thus effect expansion in graduate labour in particular
17
18 regions. We find that the prime reasons loser regions generate more
19
20 undergraduates than they recruit graduates are very varied, as is the scale of
21
22 the resultant shortfalls. When we look to some simple prescriptions via more
23
24 policy-realistic modelling we find that changing any loser region's HE
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26 participation rate is more effective in graduate labour changes than
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28 manipulating the other factors. We can also differentiate among regions both
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30 in terms of the size of the leverage effects of particular factors and the also
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32 relative attractiveness of different ones.
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36 We acknowledge that what we have done has its clear limitations. Within the
37
38 boundaries of the datasets we have used we could (and shall) extend our
39
40 HULT analysis to a range of other variables. One set would give greater
41
42 attention to the nature of students – perhaps considering their age, sex,
43
44 ethnicity, entry qualifications and some classification of the type of
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46 neighbourhood where they lived before entry. Another set would look more
47
48 carefully at the course studied. Subject studied might be important (perhaps
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50 contrasting career-specific training degrees - lawyers and engineers – and
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2 more general purpose ones) and the 12% of degree qualifiers who study part-
3
4 time will presumably have tighter geographical ties prior to and during their
5
6 studies. Disaggregating our regional HE data by specific universities would
7
8 defuse the inevitable criticism that our analysis groups together universities
9
10 very different in academic profile, wider mission and embeddedness in their
11
12 local communities (eg same-city research-oriented pre-1992 universities and
13
14 former polytechnics), although it would reopen questions of the inter-university
15
16 comparability of academic qualifications
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20 Another attractive option, though less easy and going beyond our dataset, is
21
22 to follow graduate labour geographically beyond its first destination. Our
23
24 earlier supposition that the geography of first jobs influences that of
25
26 subsequent ones seems reasonable but other factors are likely to also be
27
28 important. With ever more mobile labourforces, both spatially and between
29
30 jobs, occupations and employers, any assumption that first destinations
31
32 represent jobs and labour markets for life is clearly never less tenable than
33
34 now, even aside from the criticism levelled at the FDS data themselves (Utley,
35
36 2003). The new DLHE series which has replaced the FDS holds the promise
37
38 of tracking graduate employment at two snapshot dates. Until then, Alumni
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40 records of individual universities are not only confidential but patchy, as
41
42 former students show less need and interest in maintaining contact as the
43
44 years pass. And while national longitudinal panel-sourced databases may
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46 seem attractive (Ruspini, 2002), none at present has the express purpose of
47
48 tracking graduates into, through and beyond Higher Education. Those
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50 currently in the UK suffer from their fairly coarse data on educational
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2 experience (including its location) and/or the small number of panel
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4 respondents who have moved through the relevant pre-HE and HE stages
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6 into extended periods of post-degree employment.
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10 We turn finally to the broader implications of our study. In many ways it is
11 clear that the geography of graduate recruitment, seen quantitatively and
12 qualitatively, reflects that of other aspects of the national HE system (Hoare
13 1994b, 1995), and of the UK space economy more widely, in its centre-
14 periphery structure. London stands head and shoulders above all other
15 regions in its powers of attraction on newly-qualified graduate labour and it is
16 easy to see its advantages as self-reinforcing and cumulative. London
17 dominates the geography of many graduate occupations, the further training
18 capacity that serves sector-wide employers, and related professional
19 institutions. All this bolsters its 'institutional thickness' and thus the external
20 economies of scale and scope of the nation's World City economy. At first
21 glance this seems 'bad news' for the other UK regions, but at least the unique
22 labour opportunities of London may keep able and ambitious recent graduates
23 who otherwise would have taken jobs abroad within the national system, with
24 a greater chance of some subsequent internal redistribution.
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43 In Massey's (2007) recent 'world city' essay on London she writes
44 persuasively on similar lines. Here the nation's key 'escalator region', its
45 upwardly spiralling growth encouraged by national government, has its
46 inevitable flip-side in the draining of skilled, graduate labour from 'the regions'
47 for which they are held to blame by the same ministers. Her typically radical
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2 responses go well beyond the narrower parameters of our perspective.
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4 Nevertheless, despite its simplicity, our modelling framework demonstrates
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6 how regional outturns of young graduate recruitment can and do arise in a
7
8 variety of different ways, both through the pathways that generate them and
9
10 the forces relevant to HE policy that underlie these and could alter them. To
11
12 change outcomes we need some indication of the relative and absolute
13
14 effectiveness of alternative intervention devices. If we decide these tested
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16 here are too expensive or impractical we have to look elsewhere for solutions,
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18 perhaps to regional and sub-regional housing allocations, a revitalised
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20 regional top-jobs policy and forced decentralisation of the public sector.
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24 Understanding a system is a pre-requisite for improving it and hitherto we've
25
26 understood little about how potential and actual graduates move about the
27
28 country. Our paper is intended to move things on.
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40 **References**

41
42
43
44 Abbott, A. and Leslie, D. (2004), Recent trends in higher education
45
46 applications and acceptances, *Education Economics*, 12, 67-86.
47
48
49
50

1
2 Alpin, C. and Shackleton, J.R. (1998), Over- and undereducation in the UK
3 graduate labour market, *Studies in Higher Education*, 23, 17-34.
4
5

6
7
8 Alston, M (2004), 'You don't want to be a check-out chick all your life' : the
9 out-migration of young people from Australia's small rural towns, *Australian
10 journal of Social Issues*, 39, 299-313.
11
12

13
14
15 Anon (2004), Social mobility ; what's it worth ? *The Economist* 17th January,
16
17 23.
18
19

20
21
22 Baer, L.D., Ricketts, T.C., Konrad, T.R. and Mick, S.S. (1998), Do
23 international medical graduates reduce rural physician shortages ? *Medical
24 Care*, 36, 1534-1544.
25
26
27

28
29
30 Barnett, J.R. (1992), How long do General Practitioners remain in any one
31 location ? regional and urban size variations in the turnover of foreign and
32 new Zealand doctors in general practice, 1976-90, *New Zealand Medical
33 Journal*, 105, 169-171.
34
35
36
37

38
39
40 Belfield, C. and Morris, Z. (1999), Regional migration to and from Higher
41 Education Institutions : scale, determinants and outcomes, *Higher Education
42 Quarterly*, 53, 240-263.
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2 Bleaney, M.F., Binks, M.R., Greenaway, D, Reed, G.V. and Whynes, D.K.
3
4 (1992), What does a university add to its local economy, *Applied Economics*,
5
6 24, 305-311.
7

8
9
10 Boucher, G., Conway, C. and Van der Meer, E. (2003), Tiers of engagement
11
12 by universities in their region's development, *Regional Studies*, 37, 887-897.
13

14
15
16
17
18 Brandi, M.C. (2001), Skilled immigrants in Rome, *International Migration*, 39,
19
20 101-131.
21

22
23
24
25 Brownrigg, M. (1973), The economic impact of a new university, *Scottish*
26
27 *Journal of Political Economy*, 20, 123-139.
28

29
30 Bynner, J., Dolton, P., Feinstein, L., Makepeace, G., Malmberg, L and Woods,
31
32 L. (2002), *Revisiting the Benefits of Higher Education*, Centre for Research on
33
34 the Wider Benefits of Learning, Institute of Education, London.
35

36
37
38 Campbell, S. (1993), Interregional migration of defense scientists and
39
40 engineers to the Gunbelt during the 1980s, *Economic Geography*, 69, 204-
41
42 223.
43

44
45
46
47 Champion, T. and Fielding, T. (Editors), (1992) *Migration processes and*
48
49 *Patterns : Volume 1 – research progress and prospects*, Belhaven press,
50
51 London.
52

1
2
3
4 Champion, T., Coombes, M., Raybould, S., and Wymer, C. (2007), Migration
5 and Socioeconomic Change : a 2001 Census analysis of Britain's larger cities,
6 Joseph Rowntree Foundation, York.
7
8
9

10
11
12 Chang, S.L. (1992), Causes of brain-drain and solutions – the Taiwan
13 experience, *Studies in Comparative International Development*, 27, 27-43.
14
15
16

17
18 Croot, D. and Chalkley, B. (1999), Student recruitment and the geography of
19 undergraduate geographers in England and Wales, *Journal of Geography in*
20 *Higher Education*, 23, 21-47.
21
22
23

24
25
26 Danell.,R and Persson,O. (2003), Regional R & D activities and interactions in
27 the Swedish Triple Helix, *Scientometrics*, 58, 205-218.
28
29
30

31
32 Davis, J.C. and Patterson, D.M. (2000), Regional mobility of economists,
33 *Journal of Labor Research*, 21, 641-647.
34
35
36

37
38 Desbarats, J.M. (1977), Estimating external constraints to migration,
39 *Professional Geographer*, 29, 283-289.
40
41
42

43
44 Desbarats, J.M. (1983), Constrained choice and migration, *Geografiska*
45 *Annaler B* 65, 11-22.
46
47
48
49
50

1
2 Deilmann, B. (1992), The role of universities and research institutes in the
3 regional development of East Germany, *Geographische Zeitschrift*, 80, 245-
4
5
6 263.
7
8
9

10
11
12 DfEE [Department for Employment and Education] (1999), *Catalogue of*
13
14 *HERD Projects 1999*, www.dfee.gov.uk/heqe/herd99.htm (Accessed 24th
15
16 May, 2006).
17
18

19
20 Dolton, P. and Vignoles, A. (2000), The incidence and effects of
21
22 overeducation in the UK graduate labour market, *Economics of Education*
23
24 *Review*, 19, 179-198.
25
26

27
28 East Midlands Development Agency (2000a), *Executive Strategy : Learning*
29
30 *and Skills*, www.emda.org.uk/strategy-new/learning_skills.htm (Accessed 5th
31
32 February, 2001)
33
34

35
36 East Midlands Development Agency (2000b), *Getonwithgraduates : better*
37
38 *people, better business*, www.getonwithgraduates.org.uk (Accessed 5th
39
40 February 2001).
41
42

43
44 Fairweather, M. (1980), *University enrolment patterns in England and the*
45
46 *United States*, Dept of Geography, University of New York, Plattsburgh, New
47
48 York (mimeo)
49
50

1
2 Fazackerley, A. (2005a), £14m bid to attract new blood to region, *The Higher*,
3
4 29th July.
5
6

7
8 Fazackerley, A. (2005b), North flaunts strengths, *The Higher*, 5th August.
9
10

11
12 Forrant, R. (2001), Pulling together in Lowell : the university and the regional
13
14 development process, *European Planning Studies*, 9, 613-628.
15
16

17
18 Goddard, J.B. and Chatterton P. (1999), Regional Development Agencies and
19
20 the knowledge economy : harnessing the potential of universities,
21
22 *Environment and Planning C*, 17, 685-699.
23
24

25
26 Groen, J.A. (2004), The effect of college location on migration of college-
27
28 educated labor, *Journal of Econometrics*, 121, 125-142.
29
30

31
32 Guimaraes, R. (2002), The diaspora : an exploratory study on the geographic
33
34 displacement of Brazilian researchers in the 1990s, *Dados-Revista de*
35
36 *Ciencias Sociais*, 45, 705-750. Hansen, S.B., Ban, C. and Huggins, L. (2003),
37
38 Explaining the 'brain drain' from older industrial cities : the Pittsburgh region,
39
40 *Economic Development Quarterly*, 17, 132-147.
41
42

43
44 Hartshorn, C. and Sear, L. (2005), Employability and enterprise : evidence
45
46 from the North East, *Urban Studies*, 42, 271-283.
47
48
49
50

1
2 HEFCE [Higher Education Funding Council of England] (1999), Performance
3 Indicators in Higher Education in the UK, HEFCE 1999/66, Higher Education
4 Funding Council for England, Bristol.
5
6
7

8
9
10 HEFCE (2003), Schooling effects on higher education achievement, HEFCE
11 2003/32, Higher Education Funding Council for England, Bristol.
12
13

14
15
16 HEFCE (2005a), POLAR – young participation maps, Higher Education
17 Funding Council for England, url: <http://www.hefce.ac.uk/widen/polar>
18 (Accessed 20th May 2006).
19
20
21

22
23
24 HEFCE (2005b), Young participation in higher education, HEFCE 2005/03,
25 Higher Education Funding Council for England, Bristol.
26
27

28
29
30 HESA [Higher Education Statistics Agency] (2003), First Destinations of
31 Students Leaving Higher Education Institutions 2001/02, Higher Education
32 Statistics Agency, Chrlctnham.
33
34
35

36
37
38 HESA (2004), Destinations of Leavers from Higher Education 2002/03, Higher
39 Education Statistics Agency, Cheltenham.
40
41
42

43
44 Hills, G and Lingard, R. (2004), *UHI : the making of a university*, Dunedin
45 Academic Press, Edinburgh.
46
47
48
49
50

1
2 H.M.Treasury (2006), Prosperity for all in the Global Economy – world class
3 skills (Leitch Report of Skills – final report), The Stationery Office, Norwich.
4
5

6
7
8 Hoare, A.G.(1991), University competition, student migration and regional
9 economic differentials in the United Kingdom, *Higher Education*, 22, 351-370.
10
11

12
13
14 Hoare,A.G. (1991), Bias in university enrolments : a regional analysis,
15 *Regional Studies*, 25, 459-470.
16
17

18
19
20 Hoare,A.G. (1994a), School type as a discriminant in the geography of
21 university applications in Great Britain, *Geoforum*, 25, 87-104.
22
23

24
25
26 Hoare, A.G. (1994b), Transferred skills and university excellence : an
27 exploratory analysis of the geography of mobility of UK academic staff,
28 *Geografiska Annaler*, 76B, 143-160.
29
30
31

32
33
34 Hoare, A.G. (1995), UK public policy and the emergent geography of Higher
35 Education, Being Ch 14 (pp 292-316, in Cliff, A.D., Gould, P.R., Hoare, A.G.
36 and Thrift, N.J. (Eds), *Diffusing Geography : essays for Peter Haggett*,
37 Blackwell, Oxford.
38
39
40
41
42
43

44
45
46 Howells, J. (1986), Industry-academic links in research and innovation : a
47 national and regional development perspective, *Regional Studies*, 20, 472-
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3
4 Howells, J., Nedeva, M and Georghiou, L, (1998), *Industry-academic Links in*
5 *the UK*, Report 98/70, Higher Education Funding Council for England, Bristol.
6
7

8
9
10 Johnston, R.J. (1989), The southwards drift : preliminary analyses of the
11 career patterns of 1980 graduates in Great Britain, *Geography*, 74, 239-244.
12
13

14
15
16 Johnes, J. and Taylor, J. (1989), The first destination of new graduates :
17 comparisons between universities, *Applied Economics*, 21, 357-373.
18
19

20
21
22 Jones, G.W., Nagib, L, Sumono Handayani, T. (1998), the expansion of high
23 school education in poor regions : the case of East Nusa Tenggara,
24 Indonesia, *Bulletin of Indonesian Economic Studies*, 34, 59-84.
25
26
27

28
29
30 Justman, M. and Thisse, J.F. (1997), implications of the mobility of skilled
31 labor for local funding of higher education, *Economic Letters*, 55, 409-412.
32
33
34

35
36
37
38 Keeble, D.E. (1989), High-technology industry and regional development in
39 Britain ; the case of the Cambridge phenomenon, *Environment and Planning*
40 C, 7, 153-172.
41
42
43

44
45
46 Kitagawa, F.(2004), Universities and regional advantage, higher education
47 and innovation policies in English regions, *European Planning Studies*, 835-
48 852.
49
50
51

1
2
3
4 Kodrzycki, Y.K. (2000), New England's educational advantage : past
5
6 successes and future prospects, *New England Economic Review*, Jan-Feb,
7
8 25-40.
9

10
11
12 Kodrzycki, Y.K.(2001), Migration of recent college graduates : evidence from
13
14 the National Longitudinal Survey of Youth, *New England Economic Review*,
15
16 Jan/Feb, 13-34.
17

18
19
20 Kronfol, N.M., Sibai, A.M. and Rafeh, N.(1992), the impact of civil
21
22 disturbances on the migration of physicians – the case of Lebanon, *Medical*
23
24 *Care*, 30, 208-215.
25
26

27
28
29 Leppel, K. (1993), Logit estimation of a gravity model of the college enrolment
30
31 decision, *Research in Higher Education*, 34, 387-398.
32

33
34
35 McAvinue, M.B., Boulet, J.R., Kelly, W.C. Seeling, S.S. and Opalek, A.
36
37 (2005), US citizens who graduated from medical schools outside the United
38
39 States and Canada and received certification from the Educational
40
41 Commission for Foreign Medical Graduates, 1983-2002, *Applied Medicine*,
42
43 80, 473-478.
44

45
46
47 Marquez-Serrano, M, Vazquez-Martinez, D., Garcia- Molina, C. (1996),
48
49 Migration patterns of medical students in Mexico, *Salud Publica de Mexico*,
50
51 38, 20-28.
52

1
2 Massey, D. (2007), *World City*, Polity Press, Cambridge

3
4
5
6 McNicholl, I.H. (1993), *The impact of Strathclyde University on the Economy*
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
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41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
of Scotland, Glasgow, Department of Economics, University of Strathclyde.

Mick, S.S. and Lee, S.Y.D. (1999), Are there need-based geographical differences between international medical graduates and US medical graduates in rural US counties, *Journal of Rural Health*, 15, 26-43.

Nor, F. and Plusa, S.M. (2004), career intentions and prospects of basis surgical trainees in the Northern Region of England, *Annals of the Royal College of Surgeons of England*, 86, 125-127.

Northwest Development Agency (2000), *A Learning and Skills Strategy*,
www.nwrda.co.uk/Skills/Documents/skills.pdf (Accessed 2nd February 2001)

ODPM [Office of the Deputy Prime Minister] (2005), Regional development agencies:overview, www.odpm.gov.uk/stellent/groups/odpm_urbanpolicy/documents/page/odpm_urbpol_608000.hcsp (Accessed 23rd September, 2005)

Oh, J. (2002), Technology-based regional development policy : case study of Taedok Science Town, Taejon Metropolitan City, Korea, *Habitat International*, 26, 213-228.

1
2 Okada, A. and Iwamoto, T. (1995), An asymmetric cluster-analysis study on
3 university enrolment flow among Japanese prefectures, *Sociological Theory*
4 *and Methods*, 10, 1-13.
5
6
7
8
9

10 One NorthEast (2000), *Regional Development Strategy*,
11 www.onenortheast.co.uk/reg_es (Accessed 2nd February 2001)
12
13
14

15
16 Ono, H. and Piper, N. (2004), Japanese women studying abroad, the case of
17 the United States, *Womens Studies International Forum*, 27, 101-118.
18
19
20

21
22 Osborne, R.D., Cormack, R.J., Miller, R.L. and Williamson, A.P. (1987),
23 Graduates : geographical mobility and incomes, Being Ch 16 (pp 231-244) in
24 Osborne, R.D., Cormack, R.J. and Miller, R.L. (Eds) *Education and Policy in*
25 *Northern Ireland*, Policy Research Institute, Queen's University of Belfast and
26 The University of Ulster.
27
28
29
30
31
32

33
34 Owen, G. (2003), Graduates with 2:2s fail to pass with employers, *The Times*,
35 7th July.
36
37
38
39

40
41 Passos, C.A.D., Terra, B.R.C., Furtado, A.T., Vedovello, C., and Plonski, G.A.
42 (2004), Improving university-industry partnership – the Brazilian experience
43 through the scientific and technological development support program
44 (PADCT III), *International Journal of Technology Management*, 27, 475-487.
45
46
47
48
49
50

1
2 Peach, H.G., Trembath, M and Fensling, B. (2004), A case for more year-long
3
4 internships outside metropolitan areas ? *Medical Journal of Australia*, 180,
5
6 106-108.
7

8
9
10 Robson, B., Drake, K. and Deas, I. (1997), *Higher Education and the Regions*,
11
12 Report 9, The National Committee of Inquiry into Higher Education, The
13
14 Stationery Office, London.
15

16
17
18 Ruspini, E. (2002), *Introduction to Longitudinal Research*, Routledge, London.
19
20

21
22 Sa, C., Florax, R.J.G.M. and Rietveld, P. (2004), Determinants of the regional
23
24 demand of higher education in the Netherlands : a gravity model approach,
25
26 *Regional Studies*, 38, 375-392.
27

28
29
30 Salsberg, E.S., Wing, P., Dionne, M.G. and Jemiolo, D.J. (1996), graduate
31
32 medical education and physician supply in New York state, *JAMA – Journal of*
33
34 *the American Medical Association*, 276, 683-688.
35

36
37
38 Sanders, C. (2002), Goldmines right under the noses of locals, *The Higher*,
39
40 11th October.
41

42
43
44 Thexton, A.J. and McCarrick, J.D. (1983), The geographical distribution of
45
46 recently qualified dental graduates (1975-1980) in England, Scotland and
47
48 Wales, *British Dental Journal*, 154, 71-75.
49
50

1
2 Thomas, E. (2002), Speech at university of Bristol Enterprise Dinner, 1st July,
3
4 2002, www.bris.ac.uk/Depts/Info-Office/news/vcspeeches (Accessed 14th
5
6 August 2002)
7

8
9
10 Utley, A (2003a), Graduate jobs data deemed flawed, *The Higher*, 7th
11
12 February.
13

14
15
16 Utley, A. (2003b) Cumbrian university in need of roadmap, *The Higher*, 16th
17
18 May.
19

20
21
22 Westhead, P. and Storey, D.J. (1995), Links between higher-education
23
24 institutions and high-technology firms, *Omega-International Journal of*
25
26 *Management Science*, 23, 345-360.
27

28
29
30 Wiltshire,R. (1980), Research on reverse migration in Japan : (III) return
31
32 migration of university graduates, *Science Reports Tokohu University*,
33
34 Seventh Series, Geography 30, 65-75.
35

36
37
38 Wojtas, O. (2005), Physicists build up critical mass, *The Higher*, 6th May.
39

40
41
42 Wolf, A. (2002), *Does Education Matter ? myths about education and*
43
44 *economic growth*, Penguin, London.
45
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Table 1 Previous investigations of HULT components

Scale	HULT element	Author(s)	Date	Geographical context
National	H-U	Desbarats	1977	UK HE applications
		Fairweather	1980	US and English HE enrolments
		Desbarats	1983	UK HE applications
		McHugh and Morgan	1984	US college enrolments
		Hoare	1991a	UK HE enrolments
		Hoare	1991b	UK HE enrolments
		Leppel	1993	US college enrolments
		Hoare	1994a	UK HE applications
		Okada and Iwamoto	1995	Japanese HE enrolments
		Marquez-Serrano <i>et al</i>	1996	Mexican medical students
		Jones <i>et al</i>	1998	West Timor(Indonesia) migrants to HE
		Croot and Chalkley	1999	UK HE enrolments for geography
		Alston	2004	Australian rural migrants
		Sa <i>et al</i>	2004	Netherlands HE entrants
Abbott and Leslie	2004	UK HE applications and acceptances		
	U-L	Thexton and McCarrick	1983	British dentists
		Johnston	1989	UK graduates
		Johnes and Taylor	1989	UK graduates
		Kronfol <i>et al</i>	1992	Lebanese medics
		Barnett	1992	New Zealand medics
		Campbell	1994	US defense scientists
		Salsberg <i>et al</i>	1996	Medics in New York State
		Baer <i>et al</i>	1998	Medics in rural US
		Mick and Lee	1999	Medics in rural US
		Davis and Patterson	2000	Migrant economists
		Guimaraes	2002	Brazilian researchers
		Hansen <i>et al</i>	2003	Pittsburgh graduates
		Danell and Persson	2003	
Peach <i>et al</i>	2004	Swedish PhDs		

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		Nor and Plusa Groen	2004 2004	Victoria (Australia) medics Medics trained in N.England US graduates
	H-U-L	Osborne et al Kodrzycki Kodrzycki Belfield and Morris	1987 2000 2001 1999	N.Ireland graduates New England graduates US college graduates UK HE graduates
International	H-U	Harman Brandi Ono and Piper McAvinue <i>et al</i>	1994 2001 2004 2005	Asian HE admissions Migrants to Rome Japanese women to HE abroad 'Outside' trained doctors in US
	U-L	Kronfol <i>et al</i> Barnett Baer <i>et al</i> Mick and Lee Davis and Patterson Guimaraes Nor and Plusa	1986 1992 1992 1998 1999 2000 2002 2004	Lebanese medics New Zealand medics Medics in rural US Medics in rural US Migrant economists Brazilian researchers Medics trained in N.England
	H-U-L	Wiltshire Chang Lianos <i>et al</i>	1980 1992 2004	Returning Japanese at HE abroad Taiwan's Brain Drain Returning Greeks at HE abroad

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Table 2 Graduate labour recruitment : regional winners and losers

Status	Region	Gain rates			
		<i>(100 = balance of in- and out-flows)</i>			
		1998/99	1999/2000	2000/01	2001/02
<i>Deficit</i>	North East	75.4	79.8	85.2	90.2
	North West	86.6	88.6	92.1	94.2
	East Midlands	82.2	80.9	83.8	90.7
	West Midlands	86.4	81.8	83.8	87.3
	East of England	75.5	71.0	86.3	73.8
	South East	94.1	91.4	91.1	86.5
	South West	81.2	81.4	84.3	88.6
	Wales	79.8	75.8	81.2	88.7
	Northern Ireland	76.5	73.8	75.5	77.7
<i>Surplus</i>	London	217.6	237.3	215.1	194.3
<i>Balanced</i>	Yorks and Humber	100.8	97.9	101.8	110.3
	Scotland	101.3	98.5	103.8	105.6

Table 3 Typology of regions based on student flows to university

Region	Internal	Outflow	Inflow	Cohort conformity
West Midlands	3rd	1st	2nd	All conform
East of England	3rd	1st	2nd	All conform
London	3rd	1st	2nd	All conform
South East	3rd	1st	2nd	All conform
South West	3rd	1st	2nd	All conform
Yorkshire and Humber	3rd	2nd	1 st	All conform
East Midlands	3rd	2nd	1 st	All conform
Wales	3rd	2nd	1 st	All conform
North East	3rd	2nd	1 st	2 nd and 3 rd reversed 2001/2
North West	3rd	1st	2 nd	1 st and 2 nd reversed 1999/00 and 2000/01
Scotland	1 st	3rd	2 nd	All conform
Northern Ireland	1 st	2nd	3rd	All conform

Notes :

1st – largest absolute flow

3rd – smallest absolute flow

Internal : undergraduate enrolments from same home region

Outflow : undergraduates leave home region to enrol elsewhere

Inflow ; undergraduates from external home regions enrol at university in region

Table 4 Graduate labour recruitment: regional conversion rates and pathways

Status	Region	2001/02 Conversion rates by pathways (100 = all potential graduates convert to actual recruits)			
		Locals	Returners	Stayers	Outsiders
<i>Deficit</i>	North East	85.2	44.3	17.2	0.3
	North West	89.5	54.8	26.6	1.5
	East Midlands	77.1	46.2	19.7	1.4
	West Midlands	86.8	51.5	19.5	1.4
	East of England	76.1	45.7	19.3	2.1
	South East	74.6	49.3	27.2	3.7
	South West	80.1	46.5	25.1	1.6
	Wales	90.0	41.8	22.4	0.4
	Northern Ireland	94.1	35.9	60.0	0.04
<i>Surplus</i>	London	88.4	71.2	52.3	9.7
<i>Balanced</i>	Yorks and Humber	84.5	51.2	25.5	1.1
	Scotland	92.1	35.9	43.2	0.4

Table 5 Rank ordering of regional recruitment pathways

Status	Region	Average regional rank of pathways (highest = 1) 1998/99-2001/02			
		<i>Locals</i>	<i>Returners</i>	<i>Stayers</i>	<i>Outsiders</i>
<i>Deficit</i>	North East	6.9	9.3	12.0	10.5
	North West	4.0	2.0	5.0	5.6
	East Midlands	11.5	8.0	10.0	6.9
	West Midlands	5.8	3.5	9.8	5.5
	East of England	10.3	7.0	8.3	3.0
	South East	11.3	3.8	4.0	2.0
	South West	9.0	6.5	7.0	4.0
	Wales	5.0	10.8	9.3	10.4
	Northern Ireland	1.0	10.3	1.3	12.0
<i>Surplus</i>	London	3.5	1.0	1.8	1.0
<i>Balanced</i>	Yorks and Humber	7.9	4.8	6.8	8.0
	Scotland	2.0	11.3	3.0	9.2

Table 6 Absolute levels of regional recruitment by pathway

Status	Region	Largest pathway (and % graduates recruited thereby)			
		1998/99	1999/2000	2000/01	2001/02
<i>Deficit</i>	North East	Locals (39)	Locals (44)	Locals (45)	Locals (47)
	North West	Returns (38)	Locals (40)	Locals (42)	Locals (43)
	East Midlands	Returns (35)	Returns (34)	Returns (36)	Returns (36)
	West Midlands	Returns (41)	Returns (41)	Returns (39)	Returns (41)
	East of England	Returns (47)	Returns (46)	Returns (49)	Returns (52)
	South East	Returns (36)	Returns (37)	Returns (36)	Returns (39)
	South West	Returns (36)	Returns (38)	Returns (38)	Returns (36)
	Wales	Locals (49)	Locals (48)	Locals (49)	Locals (49)
	Northern Ireland	Locals (79)	Locals (82)	Locals (82)	Locals (85)
<i>Surplus</i>	London	Outsiders (49)	Outsiders (55)	Outsiders (49)	Outsiders (45)
<i>Balanced</i>	Yorks and Humber	Stayers (33)	Stayers (31)	Locals (33)	Locals (34)
	Scotland	Locals (88)	Locals (83)	Locals (80)	Locals (80)

Table 7 Regional conversion rates, pathways and degree class

Status	Region	Conversion rates by pathway and degree class 2001/02							
		Locals		Returners		Stayers		Outsiders	
		High	Low	High	Low	High	Low	High	Low
<i>Deficit</i>	North East	82.3	88.8	44.2	44.5	16.6	18.4	<i>0.3</i>	<i>0.3</i>
	North West	87.7	91.3	51.2	60.7	25.5	28.1	1.6	1.4
	East Midlands	73.8	82.2	42.1	53.1	19.5	20.1	1.5	1.3
	West Midlands	85.4	88.9	50.4	53.4	19.0	20.5	1.5	1.2
	East of England	72.2	82.9	43.6	49.6	18.6	20.6	2.3	1.6
	South East	70.7	80.0	46.5	54.6	25.4	30.1	4.4	2.8
	South West	76.6	84.9	44.2	51.3	23.1	28.1	1.6	1.4
	Wales	90.3	89.7	37.8	46.9	22.3	22.5	0.3	0.4
	Northern Ireland	93.6	94.7	33.0	39.4	60.0	n.c	0.04	0.03
<i>Surplus</i>	London	87.9	89.1	72.4	69.2	55.0	47.7	11.9	6.2
<i>Balanced</i>	Yorks and Humber	80.4	89.5	47.6	56.5	24.5	27.2	1.3	0.9
	Scotland	89.7	95.1	41.3	34.2	41.7	46.8	0.4	0.3

Notes : n.c – not calculated due to zero observations
larger conversion rate of 'high-low' pair in **bold**
italics where conversion rate of high-low' is equal

Table 8 Dominant pathways and Quality of Graduates, 2001/2 cohort

Region	Pathway(% of all graduates recruited)	% with Low degree	Pathway(% of all graduates recruited)	% with Low degree	Pathway(% of all graduates recruited)	% with Low degree
North East	Locals (47)	47				
North West	Locals (43)	52	Returners (32)	43		
Yorks and Humber'e	Locals (34)	48	Stayers (30)	39	Returners (26)	42
Wales	Locals (49)	49				
Scotland	Locals (80)	46				
Northern Ireland	Locals (85)	39				
East Midlands	Returners (36)	43	Locals (25)	43		
West Midlands	Returners (41)	40	Locals (31)	40		
East of England	Returners (52)	38				
South East	Returners (39)	38	Locals (27)	45		
South West	Returners (36)	36	Locals (28)	45		
London	Outsiders (45)	26				

NBs : Pathways shown providing at least 25% region's graduate recruitment
 % Low graduates below the national 2001/2 mean in **bold**

Overall % Low graduates for cohort : 39%

Table 9 Summary of diagnosis

Status	Region	Dominant present factor <i>Col 1</i>	Most to gain from... <i>Col 2</i>	Max % change (a) <i>Col 3</i>	Additional gain from... <i>Col 4</i>
<i>Deficit</i>	North East	HE	CR	94	PR, UC
	North West	HE	PR	6	
	East Midlands	HE	CR	25	PR
	West Midlands	HE	CR	17	UC,PR
	East of England	<i>None</i>	HE	27	UC,PR.CR
	South East	CR	HE	13	<i>None</i>
	South West	PR	CR	17	UC,HE
	Wales	HE	CR	77	UC
	Northern Ireland	PR	UC	197	CR,HE
<i>Surplus</i>	London	CR	HE	9	UC
<i>Balanced</i>	Yorks and Humber	HE	CR	25	PR
	Scotland	HE	SR	23	PR

Notes : CR :Conversion rates
 PR : Participation rates
 UC : University catchments
 HE : Higher Education capacity
 (a) : maximum growth in resultant graduate recruitment in any of four cohorts

Table10 Prescriptive outcomes for deficit regions : % changes necessary for 10% growth in total graduate recruitment

Region	PR(a)	HE(b)	PR/HE	UC
	Col 1	Col 2	Col 3	Col 4
North East	13.9	14.9	0.93	75.2
North West	13.3	17.5	0.76	277.7
East Midlands	16.4	21.4	0.77	163.9
West Midlands	14.0	22.7	0.62	163.9
East of England	14.7	42.7	0.34	370.3
South East	15.1	24.2	0.62	1428.0
South West	15.5	21.3	0.73	277.8
Wales	13.6	14.6	0.73	69.4
Northern Ireland	10.2	11.8	0.86	<i>Negative effect</i>

Key (a) equivalent to a conversion rate i) change
 (b) equivalent to a conversion rate ii) change
 PR : participation rate
 HE : Higher Education capacity
 UC : university catchment

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3 **Figure captions:**
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7 **Figure 1 : The HULT model : a 2-regional system**
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9 (a) Transition streams from home to university to labour market
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11 (b) Graduate labour market recruitment pathways
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14 **Figure 2 : The United Kingdom regional system**
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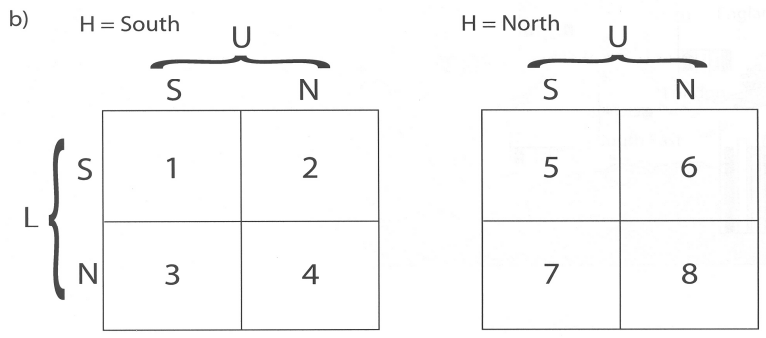
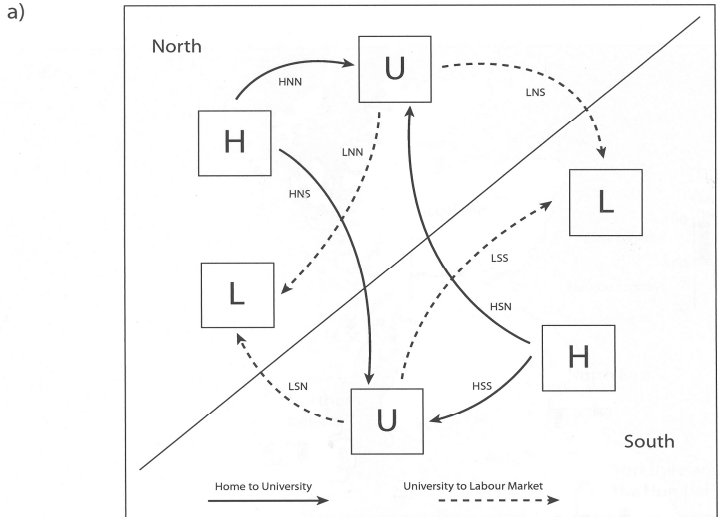


Figure 1

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Figure 2

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