



Career Portfolios and the Labour Market for Graduates and Postgraduates in the UK

A Report to the Higher Education Funding Council of England

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Executive Summary

- 1.** The knowledge, skills and capabilities embedded in graduates and postgraduates are recognised to be key contributors to the competitiveness and success of nations. If they can maximise the development and use of these attributes, governments have the potential to boost economic growth and prosperity.
- 2.** There is a recurring debate in the UK about how well the supply of graduates and postgraduates fares relative to current and future demand from the labour market, with a particular focus on STEM (science, technology, engineering and maths) subjects. This report is the first of a series of new contributions NCUB will make to this debate, reviewing existing evidence and gathering NCUB members' views on how best to meet labour market demand. In doing so, it is intended to complement HEFCE's work on the supply of graduates and postgraduates in different subject areas, as well as skills surveys published by UKCES and others.
- 3.** Whereas the supply of graduates and postgraduates from different subjects is well understood and accounted for in official statistics, it is harder to define which jobs require skills and attributes at this level. Demand assessments tend to count and forecast jobs in selected employment sectors and or occupations, neither of which map readily onto subjects or levels in higher education. Furthermore, projections of current employment into the future may not capture unforeseen demand changes that happen in the dynamic labour markets prevalent in innovative economies. The traditional view of the demand for labour does not offer enough scope for unplanned demand shifts.
- 4.** NCUB members identified a degree of separation between professional sectors with an identifiable link between subject and job requirements, and sectors with a looser alignment to any given subject, which as a result face a wider pool of candidates. In both cases, however, there can remain a gap between the attributes and specialism developed in higher education and what is required for work. As the number of graduates increases, employers are becoming more focused on how to fill this knowledge gap, seeking practical skills and flexibility above and beyond graduate and subject knowledge. Filling the knowledge gap is seen as a joint responsibility for universities and employers. Better feedback, shared infrastructure, staff and student mobility, and co-development of provision are the key ingredients for this.
- 5.** NCUB members depict a fluid labour market characteristic of innovation-led economies. Graduate and subject knowledge provide the platform for success, but adaptability, speed, mobility and shared expectations are needed for career progression as future needs are difficult to predict. Rather than matching counts of subject qualifiers with jobs, it may be more productive to identify areas of knowledge and skills mismatch, and to explore how these can be addressed through dialogue, mobility and learning by doing.
- 6.** A view of the labour market based on diverse career progression can complement the established evidence on the flow of graduates and postgraduates. It can offer a fuller understanding of the health of a subject from the supply side, while also determining whether it is fit for labour market demand purposes. It should, therefore, serve to bridge the two spheres, and thereby provide a better basis for informing policy and practice.

Introduction

Specialised skills, talent and abilities are intangible but vital assets in driving innovation, competitiveness, and sustainable economic growth¹. Successful innovation systems also need state-of-the-art physical infrastructure, good labour market relations, a healthy capital market, and a well-designed regulatory environment. But it is highly qualified people who facilitate the circulation and advancement of new ideas² and ways of doing things, as well as nurturing the timely absorption of developments elsewhere³.

Graduates and postgraduates who have invested time and money in acquiring specialist knowledge through higher education are key drivers of innovation. In this report we revisit the employment choices of university-educated employees in the UK and how well these choices match onto the needs of employers. We uncover some inconsistency in the approaches for matching skills supply to skills demand in that graduate skills are often identified with subjects of study while businesses are increasingly using attributes other than degrees to identify the desired talent in the growing pool of graduates. Agility and dynamism are reported most often as valued attributes by employers and do not correspond to any particular subject of degree.

Investment in higher education is directly worthwhile for employers, employees and the wider community. Graduates enjoy lower levels of unemployment and higher wages than non-graduates⁴. Firms that innovate employ proportionally more graduates than those which do not⁵. There is also evidence that increasing the average years of schooling in the population leads to improved long-term growth: the most recent estimate is a 0.2% increase in the long-term growth rate for one additional year of schooling⁶.

To understand the positive effects of higher education on economic performance we must consider where the skills and knowledge carried by graduates are being put to use rather than just accounting for the number of students or graduates per subject. Where higher-level skills are present but not put to their best economic use, the full impact of these skills may be subtle and not appear clearly in the evidence. Ignoring usage may give a misleading view that *all* higher skills have low or no impact when this is true only for those that are underused. Underutilisation on the other hand may just indicate the time it takes to adjust in a dynamic economy rather than a malfunctioning market⁷.

We provide evidence that the inconsistent approaches to accounting for skills from supply and demand perspectives drives a mismatch in the market for skills. To mitigate these inconsistencies we offer a more visible way of identifying graduate skills, other than degree subject, and the uses of these skills in jobs and roles in the labour market. Traditionally, discipline and level of degree identify the specialist skills acquired by graduates and postgraduates. While such specialism is important for accessing many jobs, particularly professional roles and those requiring a license to practise, many employers do not manage their workforces on the basis of academic disciplines. When prompted about their specific hiring requirements, employers speak about generic skills and attributes that indicate a readiness to work rather than a specific discipline. With this information gap between what is offered with a degree and what is needed from graduates, the discipline and level of degree are losing importance when determining a good person-job match, in favour of other attributes. Some employers use prior work experience as a proxy for these attributes.

¹ BIS Research Paper 74 (2012) The Impact of Investment in Intangible Assets on Productivity Spillovers. A report by London Economics. London: Department for Business Innovation and Skills.

² Nelson, R and E. Phelps (1966) Investment in Humans, Technological Diffusion and Economic Growth. American Economic Review Vol 56, No1/2.

³ Cohen and Levinthal (1990) Absorptive Capacity: A New Perspective on Learning and Innovation, Administrative Science Quarterly, Vol 35.

⁴ BIS Research Paper 45 (2011) The Returns to Higher Education Qualifications. A report by London Economics. London: Department for Business Innovation and Skills.

⁵ BIS 2013 (May) First findings from the UK Innovation Survey (Revised) Science and Innovation Analysis. London: Department for Business Innovation and Skills.

⁶ Holmes, C, (2013), 'Has the expansion of higher education led to greater economic growth?', National Institute Economic Review, 224(1)

⁷ Pissarides, C.A. (2011) "Equilibrium in the Labor Market with Search Frictions." American Economic Review, 101(4): 1092-1105.

To bridge the gap we consider the role of early career sector mobility in a market for graduate and postgraduate labour where career progression happens through job mobility. This is a market where employees accumulate generic skills by performing different jobs and employers reward these generic skills with promotions for internal candidates and with career progression for external candidates. Occupational and sectoral mobility are not intended to substitute the information carried by the degree subject but it can complement the specialist knowledge of the degree with generic knowledge about agility and adaptability. After explaining why mobility matters, we tackle the question of which subjects prepare their graduates better for internal or external occupational mobility.

To answer this question we first revise the recent evidence published in the UK accounting the supply of and demand for graduate and postgraduate skills. This is followed by a summary of employer demand views from some of the NCUB's business members. We then consider the role of job mobility in the labour market, enabling employees to progress in their career and employers to fill their vacancies with candidates who hold experience in other sectors as well as the own. We then link early career choices to degree subject in an effort to inform a less rigid relationship between supply and demand dynamics. Finally, we review those areas of the economy where this analytical framework is insufficient and on which we will report in future.

The Demand for and Supply of Graduates and Postgraduates in the UK

Researchers traditionally count jobs as a proxy for demand and degree qualifier for supply. Whereas what counts as a 'degree qualifier' is taken directly from official higher education statistics, defining a graduate or post-graduate 'job' is not as universally agreeable. As a result, accounting for the demand for skills is as good as the definition of graduate job used. In the ideal, a direct and relatively simple route is to ask employers⁸ and employees⁹ to assess the skills levels of jobs. Realistically, however, large companies cannot review tens of thousands of positions in their business, and there are well documented problems with self-reporting bias.

Historically analysts have assessed the demand for labour by counting the number of employees in narrowly defined sectors or occupations, or a combination of both¹⁰. The UK Commission for Employment and Skills' (UKCES) *Working Futures* periodical (2012) is one of the most comprehensive descriptions available of the current state and future trends of the labour market in the UK, covering all levels of education and job detail in every regions of the UK over a ten year period. Although these projections have been tried and tested over the years, the UKCES acknowledges that the future of the labour market cannot just be a linear projection of the present. Thus, official forecasts of consumption and productivity are factored in when estimating where skills demand is projected to grow or decline in the near future.

These corrections for productivity are important because while consumption gains often produce higher employment, increased productivity can result in lower employment as fewer jobs are needed to produce the same output. For example, the UKCES report forecasts a 17% reduction of employment opportunities in engineering (Table 3.5 op. cit.) between 2010 and 2020 caused by an increase in productive efficiency (and wages) in the sector. However, this finding is in contrast to what employers report regarding shortages of engineers. So even with realistic corrections, forecasts of employer demand based on statistical projections from the present are subject to error.

⁸ The CBI Education and Skills survey. www.cbi.org.uk/business-issues/education-and-skills/in-focus/education-and-skills-survey.

⁹ Felstead, A. Gallie, D. Green, F. and Hande Inanc (2012) *Skills at Work in Britain: First Findings from the Skills and Employment Survey 2012*. Cardiff School of Social Sciences.

Despite the caveats, the method of approximating demand for graduate skills by counting jobs in the so called higher level occupations is widely used. Selecting certain occupations within each sector, for example, professionals employed in the construction sector, gives a better fit to high skills demand in the construction sector than total employment in that sector. Such a method is popular in assessments of demand for specific subjects, like Science Technology Engineering and Maths (STEM). In their dedicated report *Supply and Demand for High Level STEM Skills* (2013), the UKCES define the demand for STEM to be the number of employees found in certain occupations in each of a limited number of sectors. The criteria for choosing what occupations and sectors to count as higher skill STEM were those that scored high in the following two dimensions:

1. Density - The proportion of STEM degree holders within that sector or occupation;

And

2. Proportion - How large employment of STEM in that occupation or sector is as a percentage of the total employment of STEM graduates.

Using this method, STEM includes sectors or occupations with either a very high representation of STEM graduates – such as ‘engineering activities’ - but also those with a smaller number of graduates but who are numerous enough to account for a large amount of overall STEM employment, such as ‘teaching professionals’. Less than 20% teaching professionals have a STEM graduate qualification, but because education is a large sector they make up for around 7% of overall STEM employment.

By contrast, 60% of employees in R&D manager occupations hold a STEM degree, but together only make up 1% of STEM employment (all data from Table 2 in UKCES, 2013). Both ‘teaching professionals’ and ‘R&D managers’ are classified as STEM occupations, even though neither of them are comprised of 100% STEM degree holders.

Indeed, no sector or occupation is entirely populated by STEM graduates. According to the UKCES report, around 80% of ‘health professionals’ have medical STEM degrees, so we assume the rest could be health managers or similar without a degree in these subjects. Even in professions where there is a license to practice - such as architecture - roles are performed by employees from multiple disciplines.

The same practice of matching a discipline-based graduate labour supply with a demand for labour based on occupation job counts is used in multiple other studies, as indicated in the report commissioned by the NCUB to CFE (2013)¹¹. To complement the picture portrayed by these quantitative studies, the CFE report also summarises findings from studies asking employers for a direct assessments of skills demand, including the CBI’s *Education and Skills Survey*⁸ and sector wide organisations such as Sector Skills Councils (COGENT, SEMTA) and the Association of British Pharmaceutical Industry.

Rapid evidence assessment of graduate and post-graduate skills needs

The intelligence gathered by CFE demonstrates that employers can identify highly specific sector skills that they find in short or inadequate supply at the time of the survey. Examples include “zoological physiology” in biosciences or “modern methods of construction.” However, the cumulative effect of this evidence means that it is possible to identify broad patterns of needs and concerns that extend beyond a specific industry and apply to the whole labour market:

- The demand for graduates and postgraduates will remain strong in the foreseeable future, in particular because of:
 - » Replacement demand
 - » Increased diversity of destinations per subject (typically but not exclusively STEM graduates recruited to non-STEM jobs)

¹⁰ Tables A1 and A2 in the appendix illustrate the official statistics content of sectors and skill requirements of occupations.

¹¹ CFE (2014) Industry graduate skills needs: summary report for the National Centre for Universities and Business.

- Despite increasing levels of qualification of employees in all occupations, employers continue to report inadequate preparation of recruits. This finding indicates that qualifications demonstrate levels of ability in some areas but miss out in others. Employers would welcome a more holistic approach to demonstrating the work-readiness of graduate and post-graduate recruits.
- Generic skills that are not exclusive to a specific discipline are reported to be in short supply among graduates and postgraduates in many industries. They include fluency in general ICT and digital technologies and general numeracy.
- Management skills, like project and people management or understanding business models, are widely reported to be lacking among graduates and post-graduates.
- Employers acknowledge that changes in technology or regulation sometimes shift demand for highly specific skills in directions that are difficult to predict. Regulation in the construction sector for example is continuously evolving and merging with sustainable policies, thus becoming more complex and widening the skills requirements in the sector.
- An ageing workforce is widely reported as a cause for concern as experienced employees retire. Diversity is less widespread a concern than ageing.

The traditional analysis of the market for graduate and post-graduate skills described in the previous section rests on a static view of the labour market, where current levels of qualification and employment are used to forecast future need. The views from employers gathered in CFE's evidence assessment tell a more dynamic story with employers valuing the ability of recruits to adapt to changing conditions and to develop seniority beyond the subject knowledge upon graduation.

NCUB members views

To complement the evidence gathered in publications by CFE and validate the dynamic views of employer demand, the NCUB held semi-structured conversations with four large employers among the NCUB membership, spanning the industries of pharmaceuticals, defence and engineering, utilities and professional services. This model has been successfully implemented in earlier multi-company studies on global graduates¹², the talent requirements for postgraduates¹³, and support for NCUB activities alongside Taskforces.

The conversations were loosely structured around three areas flowing from the CFE report: 1) specific areas of skill shortage in their sector, 2) the value of the degree in recruitment and retention and 3) suggestions for improving the situation.

All employers interviewed are active recruiters of graduate and postgraduate talent. Despite covering different industries there were multiple areas of agreement among these employers, some of which reinforce similar findings elsewhere:

- Graduate and postgraduate recruitment are important resources for all of these sectors. When prompted on the difference between them, the general view was that unless actively recruiting post-graduates for specific jobs, employers would not always be able or willing to make a distinction between the two. Employers acknowledge that some subjects are better aligned to specific jobs than others, citing for example law or medicine, whereas other subjects offer broader employment opportunities.

¹² CIHE/AGR/CFE (2011) "Global Graduates into Global Leaders".

¹³ CIHE (2010) "Talent Fishing: What business want from Post-graduates".

- External recruitment remains a challenge across industries. Employers find it more difficult to identify the top recruits among an increasing number of graduate and post-graduate candidates. Because of specialisation, profession-based sectors can more easily identify the best talent and retain it in the sector. Sectors with looser alignment to any subject face a more diverse pool of candidates - increasing the choice but also the cost of identifying the best.
- In the task of identifying the best, degrees are informative of specialist knowledge but are becoming less informative as a signal of candidate quality. Employers find it increasingly valuable that new recruits understand the ethos of the private sector: geared to delivery from day one, agile in thinking and acting, and focussed on returns on the recruitment investment. A knowledge gap exists between 'graduate knowledge' and 'job knowledge' and employers increasingly seek recruits with the latter.
- There is widespread consensus that mobility across jobs and countries is a must for career progression but also a perception that the expectations of recruits and employers do not match, particularly for recent graduates.
- Mindful that improving supply is a joint responsibility between business and universities, suggestions for improvement from employers often involve joint provision. Some employers also perceive the academic sector alone would be too sluggish in their response to change. Suggested ways forward were:
 - » Industry champions for subject areas
 - » Using lecturers from industry in HE provision
 - » Bringing academics onto business sites to work in multidisciplinary teams (such as the Welsh Crucible, which is a leadership development programme for future research leaders in Wales)
 - » Dedicated labs in industry to use state-of-the-art technology
 - » Joint industry-academia labs to foster bonding of different cultures
 - » University apprenticeship schemes
- Many initiatives are already in place and working; others, such as joint labs, are bound by the location of the lab, and initiatives funded locally are only available in certain regions or countries.

The NCUB's business members affirm the notion of a fluid labour market for graduates and post-graduates. Much of the discourse focused on change, on speed of response, on mobility and on expectations. The traditional view of counting qualifiers and jobs in the present seems unsuited for this more dynamic viewpoint of employers. What flexible features do graduates have that can be matched to employer demand?

A Dynamic Framework for Understanding a Changing Labour Market

To reconcile the static model with the needs of modern demand we review the recent evidence of change in the market for graduate and postgraduate skills in the UK, and how the job and sector mobility of recent graduates can give a fluid view of supply to match demand.

Spot and sustained changes in the labour market for graduates and post-graduates

Employment and graduation levels fluctuate separately over time: the former moves according to economic conditions and the latter in response to student choice. Spot changes over one year reflect predominantly short-term variations, but unless they are sustained or exceptionally large, one-year changes do not translate into shifts in demand.

Figure 1 depicts spot and sustained (five-year) growth in jobs – measured from employer not employee surveys- by sector in the UK, with sectors arranged by size from smallest at the bottom¹⁴. Spot changes, shown in blue, are generally larger than sustained changes, shown in green. Spot changes can appear disproportionate for the smaller sectors since a small number of jobs gained or lost in a small sector can represent a large part of the total. Despite this, it is evident that the distribution of employment opportunities is uneven across sectors and this applies to both spot and sustained changes.

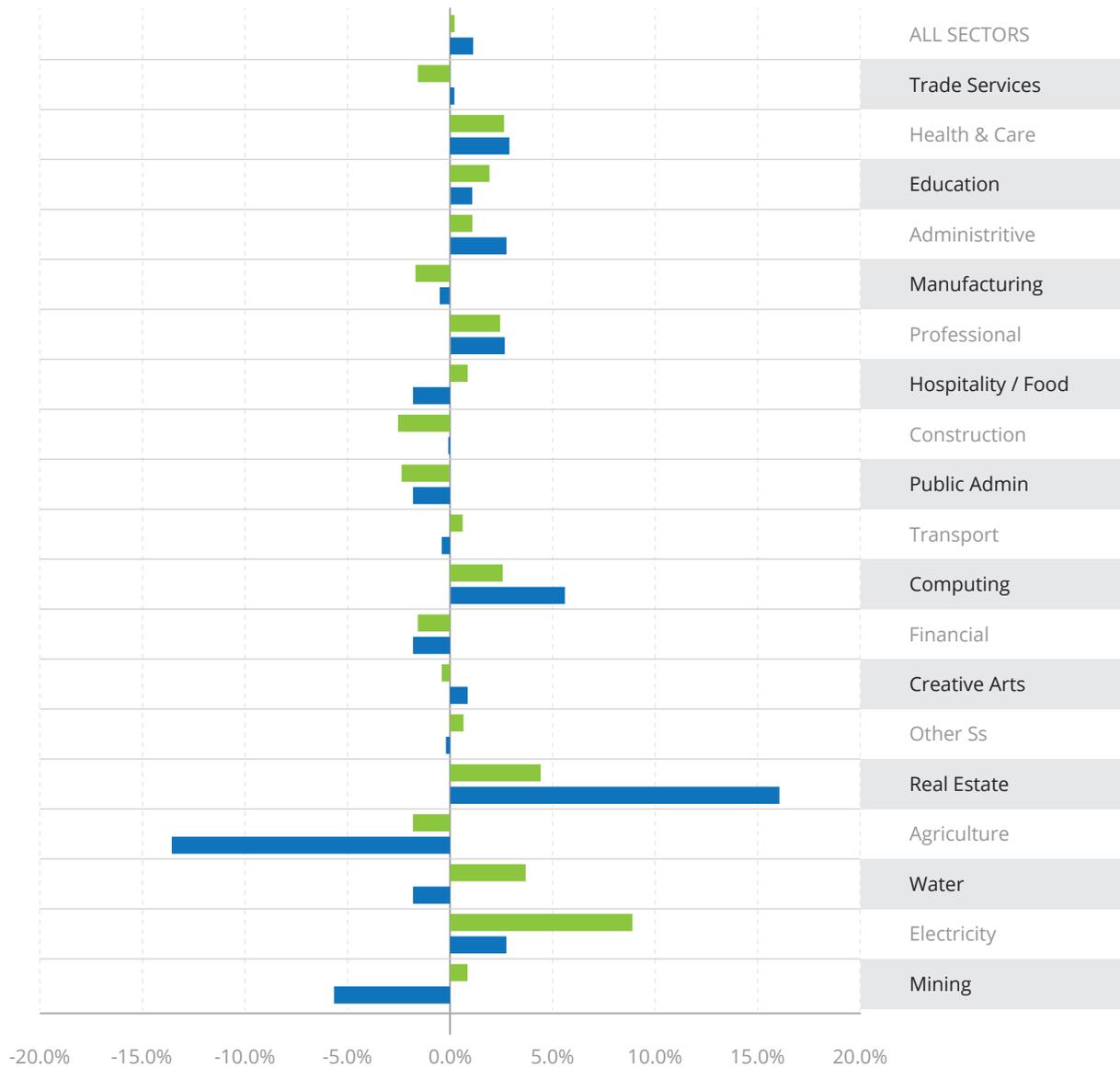


Figure 1: Workforce jobs at June 2013 (ONS). Sectors arranged by size from largest (Trade services). One (blue) and five (green) year growth rates. Data in Table A3.1.

¹⁴ The Mining, Electricity and Water sectors accounted each for less than 1% of employment in 2013; whereas Trade (Wholesale and Retail) and Health and Care account each for more than 10%. See Table A3 in Appendix.

Figure 2 shows corresponding one and five-year growth rates for broad occupational groups. This time the data is based on employee not employer job counts and depicts a more consistent picture of employment opportunities.

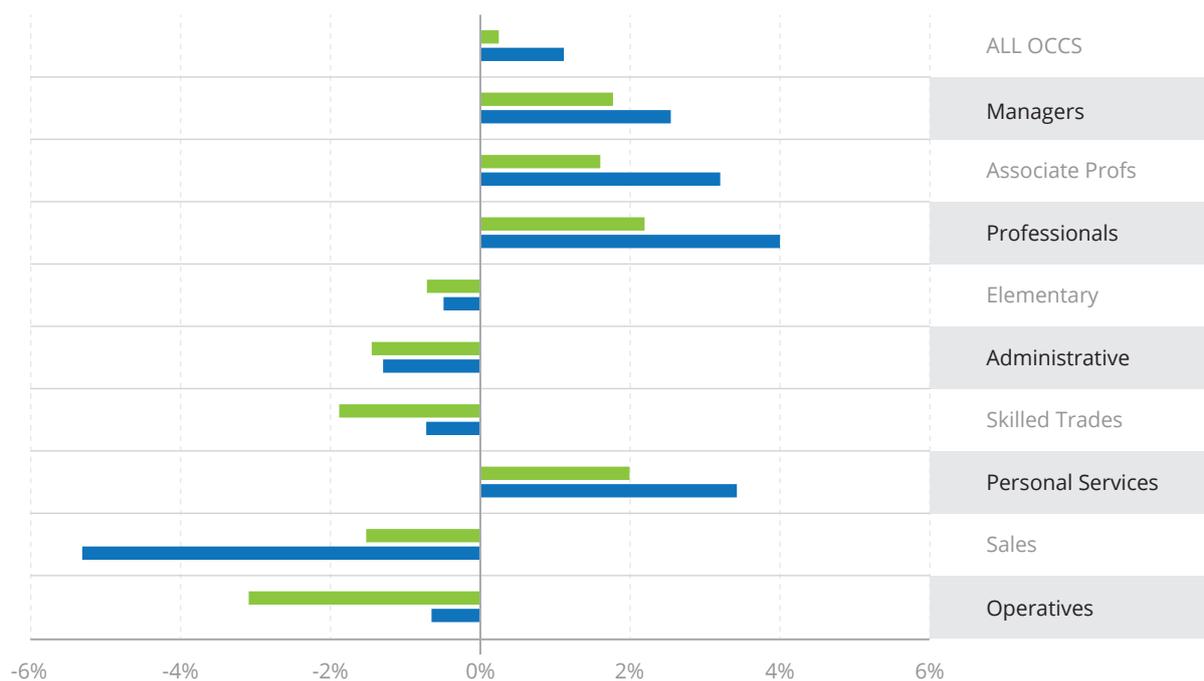


Figure 2: Administration and Personal Services. One (blue) and five (green) year growth rates. Data in Table A3.2.

There is sustained growth both in the long run and current year particularly among the so called higher level occupations (managers, professionals and associate professionals) who also comprise the largest occupational groups. And of course graduates and postgraduates dominate these categories¹⁵.

Table 1 shows the educational attainment of the economically- active population. This includes employees but also those without a job who are ready to work, and thus captures the potential pool of candidates from which employers recruit. Not only are graduates and postgraduates (equivalent to Level 4+ in Table 1) the most numerous group among potential job-holders, but because of zero growth in the headcount, they are also an increasing proportion of a relatively stable pool of candidates. Potential employees with at least Level 4 qualifications grew 5% year-on-year since 2008 whilst most other groups fell.

Table 1: Annual Population Survey - Qualifications held by Active Population (ONS)

	Jan-Dec 2008	Jan-Dec 2012	Head GAGR
Level 4 +	29%	34%	5%
Level 3	15%	17%	-1%
Trade Apprenticeships	4%	4%	-4%
Level 2	16%	17%	2%
Level 1	14%	12%	-3%
Other Qualifications	9%	6%	-8%
No Qualifications	14%	10%	-8%
Headcount (thousands)	40,565	40,060	0%

¹⁵ See Table A3.2 in the Appendix for more detail.

The evidence provided in this section depicts a dispersed but overall increasing demand for highly-qualified labour and increasing opportunities among more skilled occupations.

Moving on to the supply of graduates and postgraduates, Figure 3 depicts the size of subjects as shares of the total of qualifiers (all levels) in 2007/8 and 2011/12. The proportions of each subject qualifiers in the total have remained broadly constant, but those for which the green bar exceeds the blue bar have increased their share of the total and vice versa. Even though for some subjects like Education the share has fallen from 11% in 2007/8 to 10% in 2011/12, this is not to say that the actual number of qualifiers in Education is lower because the totals over which these proportions are calculated are higher. As the total number of qualifiers has increased, even for those subjects with falling shares, the headcounts have grown. In Figure 3, the triangles show year-on-year growth rates (right axis) in the actual number of qualifiers per subject, which is positive for all subjects.

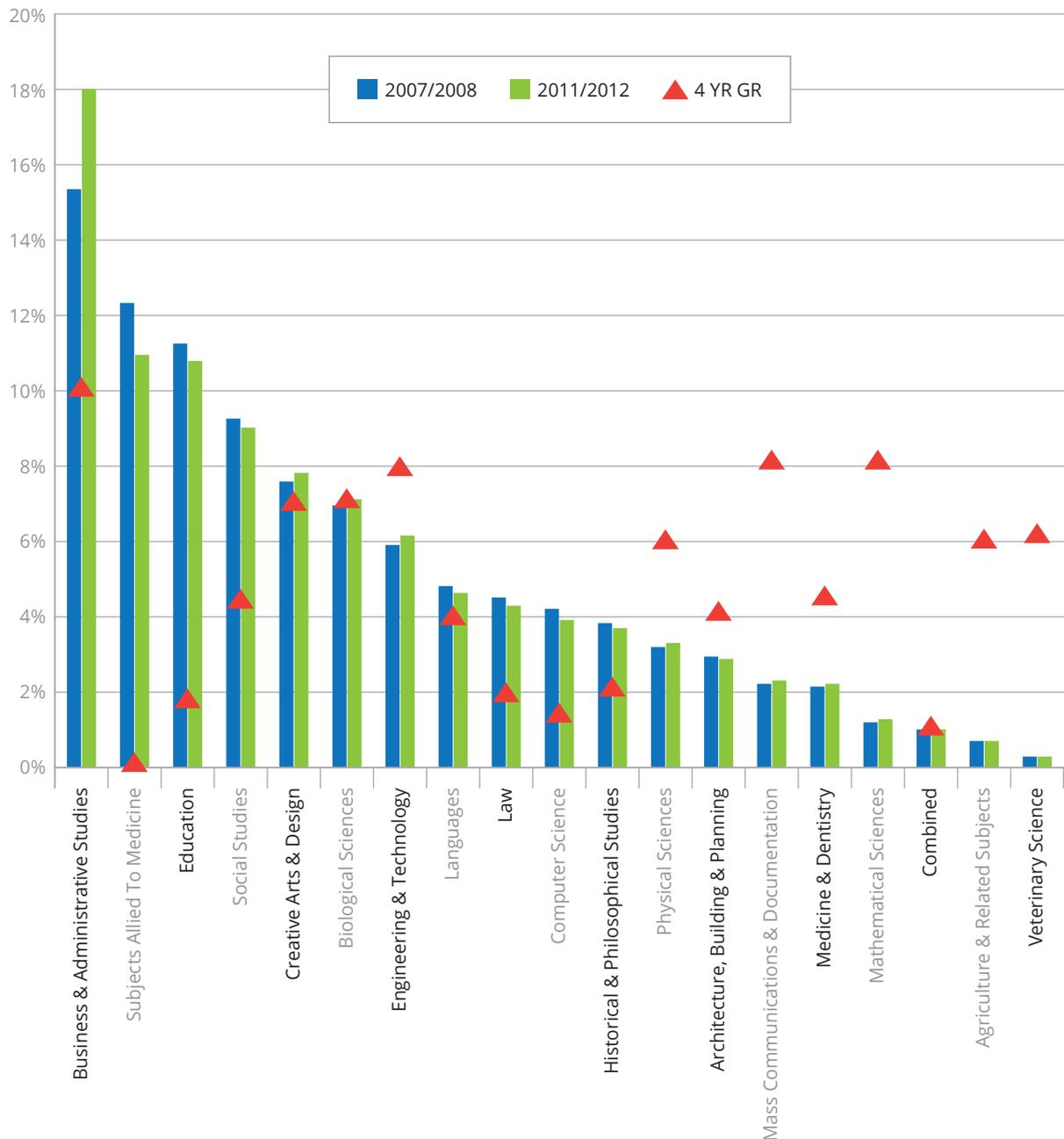


Figure 3: Proportional size of each subject in the totals in 2007/8 (blue) and 2011/12 (green). Gross annualised growth rates of headcounts per subject in red triangles. Data in Table A4.

Not only are there more qualifiers for all subjects, the proportion of 1st degree qualifiers who enter UK employment six months after graduation increased at a gross annualised rate of 5.4% in the four years to 2012-delivering, according to Table 2, almost 190,000 new employees with graduate level skills for the labour market in 2012.

Table 2: Destinations of Leavers of Higher Education 6 months after graduation (HESA)

	2007/2008	2011/2012	Head GAGR
UK Employment Only	59%	63%	5.40%
Overseas Employment Only	3%	3%	3.70%
Employment & Study	8%	6%	-3.20%
1st Degree Qualifiers	262,440	301,370	3.50%

In summary, on the supply side there are increasing numbers of graduates and postgraduates, albeit dispersed across subjects, but with increasing achievement in qualifications and labour market outcomes.

Competing for careers and jobs

Despite all of this evidence, the perception from employers is that there are skill mismatches. These persistent reports of shortages at a time of increasing achievement in qualifications point towards a shift in demand needs. Employers are seeking to separate the best talent among an increasing pool of qualifiers by using personal attributes over and above qualifications. This is consistent with a shift in higher skills demand that takes for granted the subject knowledge indicated by the qualification and seeks to further identify practical skills and flexibility. Many employers refer to this attribute as 'agility'. In addition, employers report shortages of skills that are traditionally expected in job holders of more experienced and senior roles - namely project and people management, a working understanding of business models and leadership skills.

Employers compete for graduates and post-graduates to fill many roles within the organisation, meaning that not all recruitment efforts and demand needs are at 'entry level' roles. Perhaps the best evidence of such a shift in the demand for skills is the increasing concern over replacing retiring employees, the so called 'replacement demand', and the loss of skill as a consequence of an ageing and retiring workforce. This demand is unlikely to be met by recent graduates because it refers to experience and seniority, not to specific subject knowledge obtained within higher education.

Adding to the impact of ageing and loss of experienced staff is the scale of supply compared to demand. We have seen sustained growth in high-skilled job opportunities, and in the number of qualifiers available to fill in those posts, but job opportunities for higher occupations per sector count in the hundreds of thousands whilst qualifiers per subject count in the tens of thousands. Despite the improving picture, there remains an order of need ten-fold larger than the level of supply. Employers still have to exert significant recruitment effort if they are to capture and retain the best recruits in a highly competitive market for graduate and post-graduate skills.

A situation of shifting demand for skills at all levels of seniority in the organisation coupled with fierce competition to fill these roles is consistent with the presence of internal and external labour markets¹⁶. The internal labour market is the occupational ladder within the organisation, where each step represents a role or set of roles. Moving up signifies higher levels of responsibility and/or complexity. Typically if an organisation operates an internal labour market, they recruit new entrants to 'entry level' jobs and provide promotion and development opportunities for those who want to advance in the organisation. The onus in an internal labour market is to recruit talent early and retain it in-house.

¹⁶ Lazear, Edward P. & Oyer, Paul, 2004. "Internal and external labor markets: a personnel economics approach," *Labour Economics*, Elsevier, vol. 11(5).

Organisations experience job openings at all levels of seniority, not just entry level. Where an organisation operates an internal labour market, positions higher up in the occupational ladder would normally be filled from within through promotion. Where the organisation does not operate an internal labour market, or where the talent required cannot be promoted from within, then organisations recruit talent by competing with others in the external labour market.

Figure 4 illustrates how competition for careers and jobs works alongside an occupational ladder. At each step in the ladder different types of skills are required that can be acquired through different channels. Entry level positions, at the bottom of the ladder, are akin to recent qualifiers, with adequate subject knowledge from their degree but limited experience in the generic job-related skills that employers call 'practical skills', 'work-readiness' or 'agility'. These generic skills are predominantly learned 'by doing' and can be transferred across different roles inside or outside the organisation.

The generic nature of work-readiness is captured in Figure 4 by charting 'Qualifiers with experience' equally in the internal or the external labour markets. Generic experience skills can be acquired by doing a job, meaning that qualifiers with experience can move into the organisation from a different employer in any other industry, provided they have the relevant subject knowledge, and still be as suitable for more experienced jobs as internal candidates. As noted by employers in discussions with the NCUB, job mobility and flexibility are necessary conditions for advancement within the organisation.

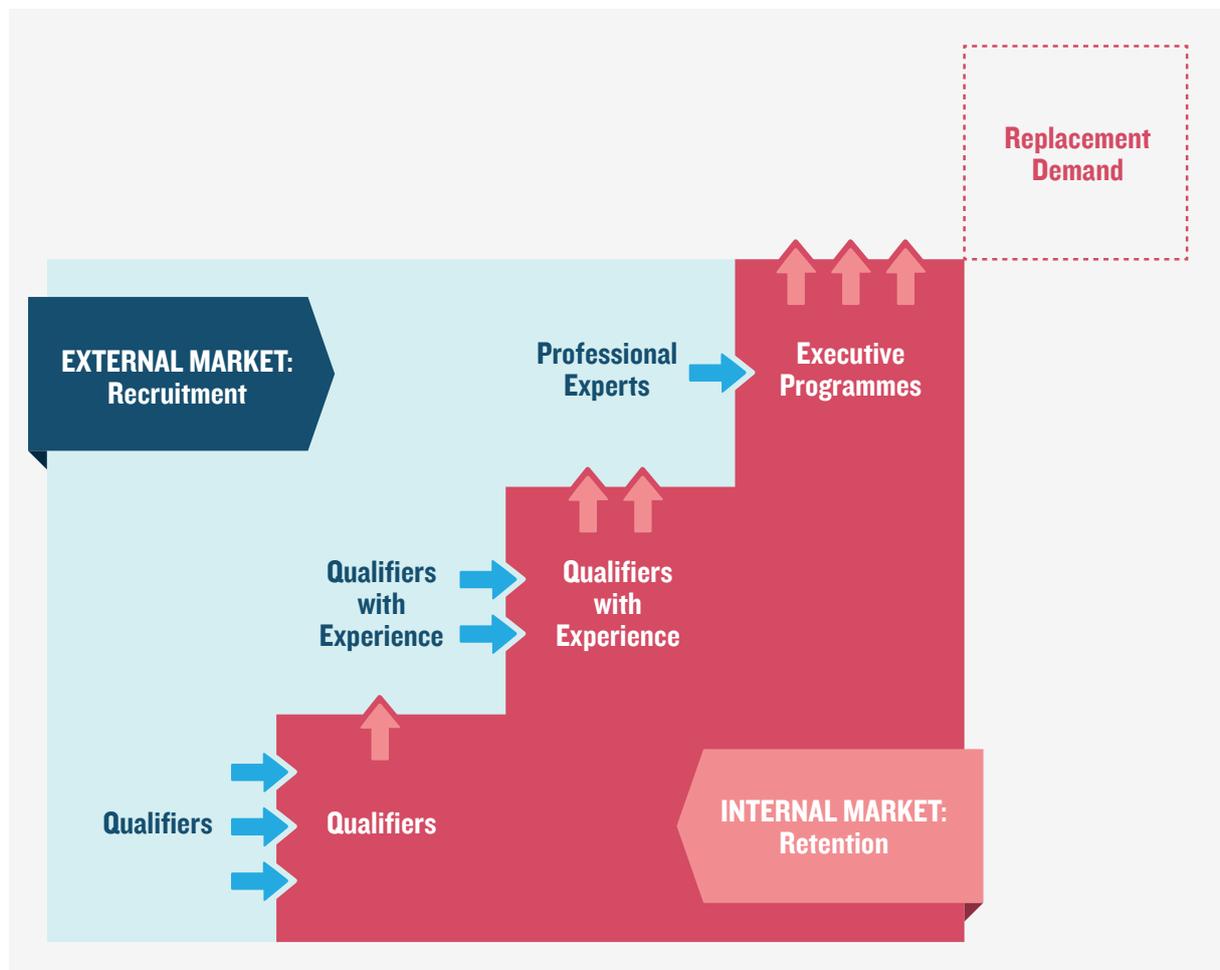


Figure 4: Career progression and career portfolios along internal and external labour markets.

Advancement beyond the middle level of graduate and post-graduate occupations to positions of higher responsibility requires project and people management and leadership skills and often entails additional dedicated training. This training can be provided in-house but it is often sourced externally using accredited programmes, such as Executive Education Programmes.

This notion of occupational hierarchies and progression in responsibility and complexity of roles can also be used to understand personal development along a lifetime career. A graduate or post-graduate enters the labour market at entry level or, if they have work experience, they can enter as a 'qualifier with experience' and move along a career path either within or outside the same organisation where they started. Nowadays many personal careers comprise a portfolio of jobs that cut across different employers and sectors. In building a career portfolio many employees accumulate generic skills by moving across jobs with increasing levels of responsibility and complexity, and can also invest in additional subject specific skill and even pay for their own leadership courses. These portfolio employees enable a functional external labour market, which would not otherwise be fluid if everyone always stayed with their initial employer.

Before moving onto the evidence supporting internal and external labour markets for graduates and postgraduates in the UK, it is worth noting that Figure 4 also illustrates how difficult it is for the external labour market to cope with replacing the top of the occupational hierarchy, since this entails substantial levels of generic but also firm specific knowledge.

Job and occupational mobility in early career

The incidence and scale of job mobility indicates the presence and effectiveness of the external labour market. Particularly in the early years while advancing from entry level, job and occupational mobility can help employees move their career portfolios along.

To find evidence of job mobility one has to follow workers over their working lives. Using the UK's British Household Panel Study, Dustman and Pereira¹⁷ found that on average British workers held four jobs in the first ten years of their careers and five in the first 20 years. This higher incidence of mobility earlier in the working life is a feature reflected in most countries for which cohort data is available.

Additionally, mobility is increasing - indicating more fluid external markets now than in the past. Bukodi and Dex¹⁸ harmonise data from two UK cohort studies that have followed individuals for at least 34 years, to study changes in mobility in the early career. Table 3 shows mobility patterns for the 1958 cohort (National Child Development Study) and for the 1970 cohort (British Cohort Study) for job moves only, excluding unemployment and out-of-work spells. Overall the incidence of job immobility halved between the two cohorts for both males and females while job mobility and particularly occupational mobility upward have nearly doubled between cohorts for both genders.

¹⁷ Dustman and Pereira (2008) Wage Growth and Job Mobility in the UK and in Germany; *Industrial and Labor Relations Review*, Vol. 61, No. 3.

¹⁸ Bukodi, E. and Dex, S. (2010) 'Bad start: is there a way up? Gender differences in the effect of initial occupation on early career mobility in Britain', *European Sociological Review*, Vol 26.

Table 3: Job Mobility up to age 34 in UK cohort studies (Bukodi & Dex 2010)

PERCENTAGE	MEN 1958	MEN 1970	WOMEN 1958	WOMEN 1970
Immobile	22.2	13.6	21.4	10.8
Job Mobility Only	7.4	12.3	6.4	11.7
Lateral Occupational Mobility Only	3.6	3.7	4.3	4.7
Upward Occupational Mobility Only	12.6	20.4	9.6	18.0
Downward Occupational Mobility Only	7.3	8.5	7.1	8.0
Both Upward and Downward	46.9	41.5	51.2	46.8
N	6,447	5,915	6,174	5,386

'Job Mobility Only' counts moves within an occupation, more likely across employers. This type of mobility indicates the presence of external labour markets and has nearly doubled between the two cohorts. 'Lateral Occupational Mobility Only' captures moves that entail a change in job and occupation but where the new role is at the same level of complexity as before. This could be graduates moving within an organisation, say from finance to marketing, but each time at associate professional level. This type of mobility indicates internal labour markets are at work and the take up has not changed significantly across cohorts. The other categories show job and occupational mobility where the destination is at a different level of skill than the original role¹⁹, which could be internal or external labour markets at work.

The same study also shows that the incidence of mobility increases with educational attainment in both cohorts. Graduates and post-graduates are not only more mobile than non-graduates, they have also become proportionally more mobile in the recent cohort.

The increasing incidence of mobility in recent cohorts, and proportionally more for the higher skilled, supports the presence of an external labour market that graduates and post-graduates use to advance in their careers. Furthermore, this external labour market has more of an impact in the early career where mobility is highest. Early career choices determine the future progression for the person and the quality of recruits for the employer. As far as the accumulations of generic skills is concerned, the sectoral choices of recent graduates provide a good indication of generic skills supply.

¹⁹ Table A2 in the Appendix provides skills levels for broad major group occupations.

Sectoral Choice in the Early Career of Graduates and Post-graduates

In this section we propose to link the degree subject with the likelihood of entering an internal or an external labour market using the sectoral destinations in the early career of graduates and post-graduates in the UK. We believe this provides a connection between supply and demand that is less rigid than, and can provide a complement to, the existing norm of using discipline of degree alone.

The data refers to the employment of UK qualifiers three and a half years after graduation²⁰. We classify the degree subject according to its fit for internal or external labour markets and more or less varied career portfolios. The wider the variety of sectors a subject enables the candidate to enter, the better the prospect of this degree to fit with an external labour market and portfolio career. This is not to say that degrees associated to professions such as law or medicine do not enable career progression, but it implies that progression for these subjects is more likely within an internal labour market. We have no evidence to suggest that one type of career progression is superior to the other.

To classify subjects we look at graduate employment in each degree subject and compare how many different sectors graduates enter. As an illustration of diversity in employment, Figures 5 and 6 depict the subject with the least and the most variety in employment destinations for the cohort who graduated in 2008/9, whose data was published in 2013. The data includes destinations for all higher degree qualifiers: first degree, postgraduate degree and other degree.

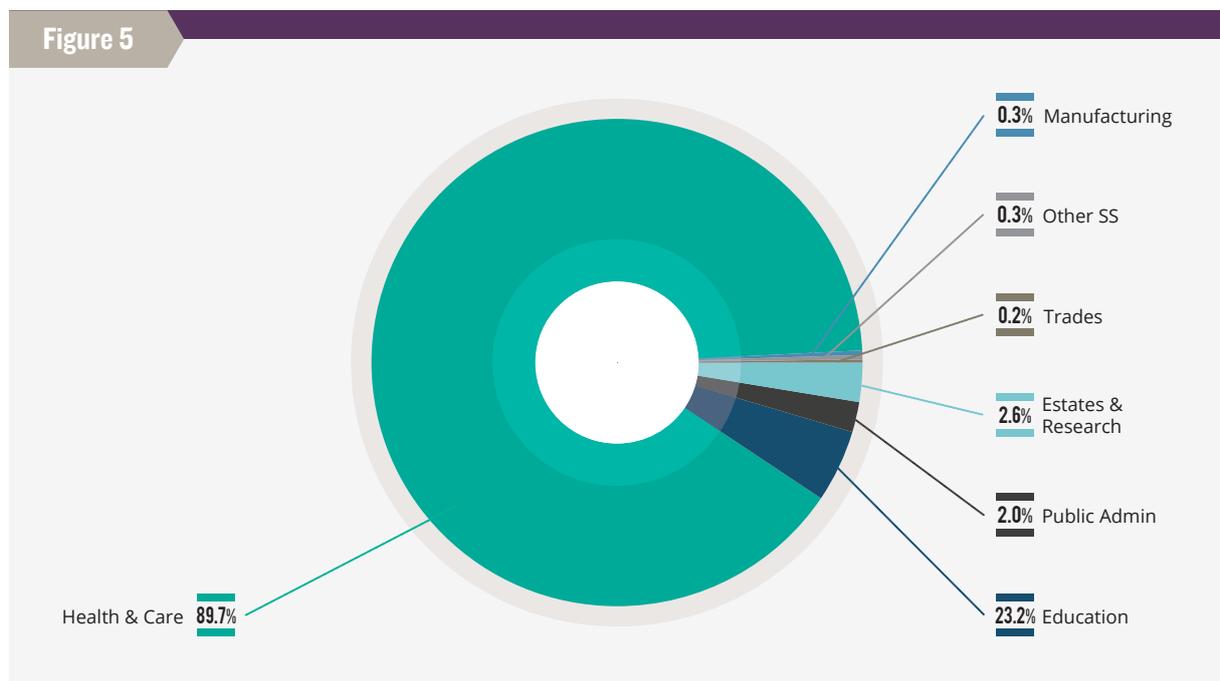


Figure 5: Destinations of Medicine and Dentistry graduates and postgraduates from 2008/9 cohort in 2013. HESA classification Estates and Research includes sections L and M of SIC07 as per Table A1. Only destinations larger than 0.1% shown.

²⁰ Higher Education Statistical Agency (HESA) longitudinal survey of Destinations of Leavers of Higher Education (DLHE).

Figure 6

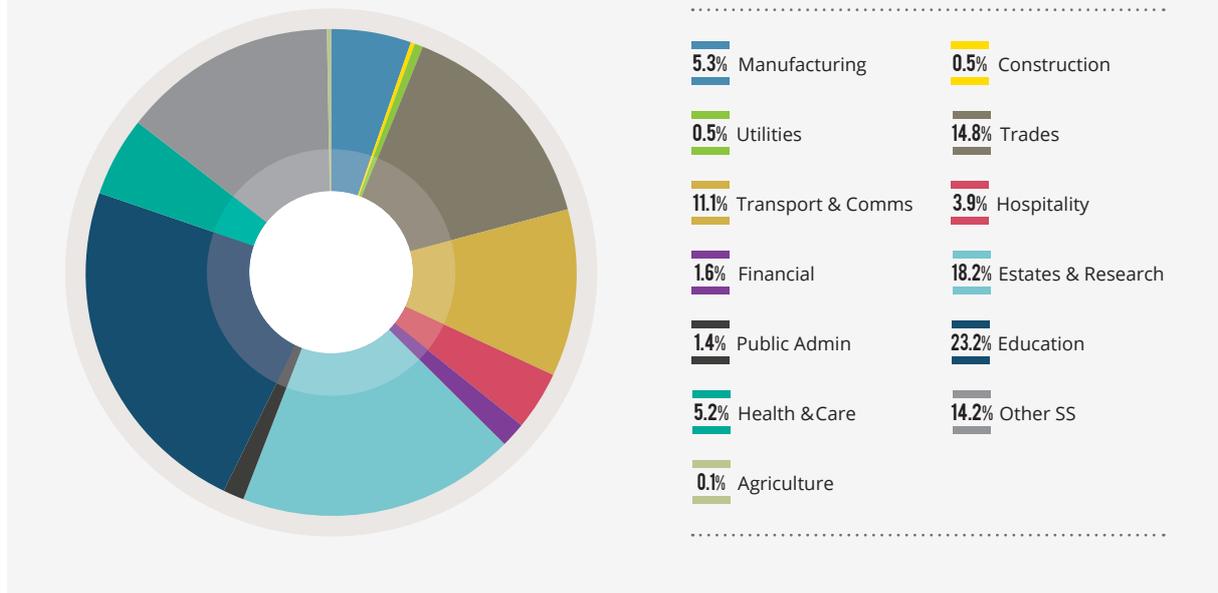


Figure 6: Destinations of Creative Arts and Design graduates and postgraduates from the 2008/9 cohort in 2013. HESA classification Estates and Research includes sections L and M of SIC07 as per Table A1.

The degree subject with the least sectoral dispersion in the employment destinations is medicine and dentistry: 90% of graduates find employment in the health and care sector. In contrast, graduates in creative arts and design are employed in many sectors. Following our earlier argument, medicine and dentistry graduates are more likely to experience an internal labour market type of career progression while those from creative arts and design are more prone to build a career portfolio and experience external labour markets progression.

There are 17 other subjects of degree reported under the UK longitudinal survey DLHE whose destinations are reported in Table 4A in the appendix. Subject qualifiers with dispersed employment across sectors, which are more amenable to external labour markets and career portfolios, include: agriculture and related, business and administrative studies, physical sciences, engineering and technology, mass communications and historical studies. By contrast, subjects with less dispersed employment, which are therefore more amenable to internal labour markets and career progression within sector, are: medicine and dentistry, education, veterinary science and law.

Although dispersed employment opportunities provide a good, simple way to link degree subjects to early careers in external labour markets, subjects with lower dispersion do carry a demand-side risk that any sudden reduction in the supply of say, medicine and dentistry graduates, will be felt immediately in the health and care sector. Table 5 displays evidence of this risk for each of the 19 subjects. The risk display is the combination of how big the subject is in numbers and the size of the sector's dependency on this subject. The size of the subject indicates that small changes in take-up rates have a disproportionate effect on the total supply of this subject. The dependency indicates how important a given subject is for the sector of employment it fits the best. Dependency is the proportion of a given subject qualifier that ends up employed in the single largest sector e.g. 90% in medicine and dentistry and 23% for creative arts and design. The table also displays which are these dependent sectors.

Table 5: Size of cohort subject and dependency of largest employing sector

	Size	Dependency	Dependent Sector
Combined	0.2%	36%	Education
Veterinary Science	0.2%	81%	Professional Activities
Agriculture & Related Subjects	1.0%	18%	Professional Activities
Mathematical Sciences	1.6%	25%	Education
Architecture, Building & Planning	2.2%	52%	Professional Activities
Mass Communications & Documentation	3.0%	26%	Transport and Communications
Medicine & Dentistry	3.0%	90%	Health and Care
Physical Sciences	3.7%	25%	Professional Activities
Computer Science	3.7%	39%	Transport and Communications
Law	4.5%	59%	Professional Activities
Historical & Philosophical Studies	4.8%	26%	Education
Engineering & Technology	4.9%	25%	Professional Activities
Languages	6.3%	33%	Education
Biological Sciences	8.7%	30%	Education
Social Studies	9.2%	28%	Health and Care
Creative Arts & Design	9.8%	23%	Education
Subjects Allied to Medicine	10.1%	79%	Health and Care
Business & Administrative Studies	10.1%	28%	Professional Activities
Education	13.0%	88%	Education
ALL SUBJECTS	100.0%	26%	Education

For example, 81% of veterinary science graduates in 2008/9 were employed in veterinary activities. This means that if there were a sudden reduction in the take-up of this degree that this one sector would be seriously affected. A similar argument can be made for other 'smaller' qualifications with high dependency: architecture, medicine and dentistry, and law, all of which are smaller than 5% in size but have a concentration of twice the average for all subjects.

In summary, rather than attaching all graduates in a single subject to a particular sector of employment, as is customary, there is merit in looking at the dispersion of destinations as an enabler of external labour markets. In sectors where internal labour markets appear to be the norm, it is equally important to track the take-up of subjects that meet most of that sector's demand.

Challenges for the Future

The traditional empirical view of the labour market is unsuited to capture the continuous changes in skills demand that are characteristic of innovation-driven economies and sectors. Employers repeatedly refer to flexibility, agility and work-readiness as skills required to succeed within the current ethos of work “geared to delivery from day one”. Supply analysis based only on qualifiers per degree subject are insufficient for demand requirements that go beyond specialist knowledge.

In response to this mismatch we proposed a fluid view of the market for high-level skills driven by early-career occupational mobility. Job-to-job mobility serves as a channel for gaining the readiness skills reported in short supply by employers. In so far as this occurs beyond the boundary of a classroom, the higher education sector is going to have to face up to the possibility that there will always be some degree of knowledge mismatch between the ‘graduate knowledge’ and ‘job knowledge’ of young recruits. In order to tackle this discrepancy one needs to understand the size of this gap and the extent to which it can be minimised.

In as far as the labour market for graduates and postgraduates is fluid, it will be difficult to predict changes in the demand for skills with accuracy. Given these uncertainties, businesses and universities must collaborate more effectively in developing talented graduates for a complex labour market. In future reports we will look at best practice in doing so, as well as explore different types of labour markets – in particular entrepreneurship, small businesses and the public sector.

The exchange of knowledge between universities and business continues to be one of the most important intangible assets in the innovation system. Actions that lead to a better functioning of the transitions between the two sectors have the potential for significantly improving economic growth and prosperity.

Appendices

Table A1: Standard Industrial Classification 2007

SECTION	DIVISION
A	AGRICULTURE, FORESTRY AND FISHING
	01 Crop and animal production, hunting and related service activities
	02 Forestry and logging
	03 Fishing and aquaculture
B	MINING AND QUARRYING
	05 Mining of coal and lignite
	06 Extraction of crude petroleum and natural gas
	07 Mining of metal ores
	08 Other mining and quarrying
	09 Mining support service activities
C	MANUFACTURING
	10 Manufacture of food products
	11 Manufacture of beverages
	12 Manufacture of tobacco products
	13 Manufacture of textiles
	14 Manufacture of wearing apparel
	15 Manufacture of leather and related products
	16 Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
	17 Manufacture of paper and paper products
	18 Printing and reproduction of recorded media
	19 Manufacture of coke and refined petroleum products
	20 Manufacture of chemicals and chemical products
	21 Manufacture of basic pharmaceutical products and pharmaceutical preparations
	22 Manufacture of rubber and plastic products
	23 Manufacture of other non-metallic mineral products
	24 Manufacture of basic metals
	25 Manufacture of fabricated metal products, except machinery and equipment
	26 Manufacture of computer, electronic and optical products
	27 Manufacture of electrical equipment
	28 Manufacture of machinery and equipment n.e.c.
	29 Manufacture of motor vehicles, trailers and semi-trailers
	30 Manufacture of other transport equipment
	31 Manufacture of furniture
	32 Other manufacturing
	33 Repair and installation of machinery and equipment
D	ELECTRICITY, GAS, STEAM AND AIR CONDITIONING SUPPLY
	35 Electricity, gas, steam and air conditioning supply

E WATER SUPPLY; SEWERAGE, WASTE MANAGEMENT AND REMEDIATION ACTIVITIES

36	Water collection, treatment and supply
37	Sewerage
38	Waste collection, treatment and disposal activities; materials recovery
39	Remediation activities and other waste management services

F CONSTRUCTION

41	Construction of buildings
42	Civil engineering
43	Specialised construction activities

G WHOLESALE AND RETAIL TRADE; REPAIR OF MOTOR VEHICLES AND MOTORCYCLES

45	Wholesale and retail trade and repair of motor vehicles and motorcycles
46	Wholesale trade, except of motor vehicles and motorcycles
47	Retail trade, except of motor vehicles and motorcycles

H TRANSPORTATION AND STORAGE

49	Land transport and transport via pipelines
50	Water transport
51	Air transport
52	Warehousing and support activities for transportation
53	Postal and courier activities

I ACCOMMODATION AND FOOD SERVICE ACTIVITIES

55	Accommodation
56	Food and beverage service activities

J INFORMATION AND COMMUNICATION

58	Publishing activities
59	Motion picture, video and television programme production, sound recording and music publishing activities
60	Programming and broadcasting activities
61	Telecommunications
62	Computer programming, consultancy and related activities
63	Information service activities

K FINANCIAL AND INSURANCE ACTIVITIES

64	Financial service activities, except insurance and pension funding
65	Insurance, reinsurance and pension funding, except compulsory social security
66	Activities auxiliary to financial services and insurance activities

L REAL ESTATE ACTIVITIES

68	Real estate activities
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M PROFESSIONAL, SCIENTIFIC AND TECHNICAL ACTIVITIES

69	Legal and accounting activities
70	Activities of head offices; management consultancy activities

71	Architectural and engineering activities; technical testing and analysis
72	Scientific research and development
73	Advertising and market research
74	Other professional, scientific and technical activities
75	Veterinary activities

N ADMINISTRATIVE AND SUPPORT SERVICE ACTIVITIES

77	Rental and leasing activities
78	Employment activities
79	Travel agency, tour operator and other reservation service and related activities
80	Security and investigation activities
81	Services to buildings and landscape activities
82	Office administrative, office support and other business support activities

O PUBLIC ADMINISTRATION AND DEFENCE; COMPULSORY SOCIAL SECURITY

84	Public administration and defence; compulsory social security
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P EDUCATION

85	Education
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Q HUMAN HEALTH AND SOCIAL WORK ACTIVITIES

86	Human health activities
87	Residential care activities
88	Social work activities without accommodation

R ARTS, ENTERTAINMENT AND RECREATION

90	Creative, arts and entertainment activities
91	Libraries, archives, museums and other cultural activities
92	Gambling and betting activities
93	Sports activities and amusement and recreation activities

S OTHER SERVICE ACTIVITIES

94	Activities of membership organisations
95	Repair of computers and personal and household goods
96	Other personal service activities

T ACTIVITIES OF HOUSEHOLDS AS EMPLOYERS; UNDIFFERENTIATED GOODS-AND SERVICES PRODUCING ACTIVITIES OF HOUSEHOLDS FOR OWN USE

97	Activities of households as employers of domestic personnel
98	Undifferentiated goods- and services-producing activities of private households for own use

U ACTIVITIES OF EXTRATERRITORIAL ORGANISATIONS AND BODIES

99	Activities of extraterritorial organisations and bodies
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Table A2: General nature of qualifications, training and experience for occupations in SOC2010 major groups

MAJOR GROUP	GENERAL NATURE OF QUALIFICATIONS, TRAINING AND EXPERIENCE FOR OCCUPATIONS IN THE MAJOR GROUP
Managers, Directors and Senior Officials	A significant amount of knowledge and experience of the production processes and service requirements associated with the efficient functioning of organisations and businesses.
Professional Occupations	A degree or equivalent qualification, with some occupations requiring postgraduate qualifications and/or a formal period of experience-related training.
Associate Professional and Technical Occupations	An associated high-level vocational qualification, often involving a substantial period of full-time training or further study. Some additional task-related training is usually provided through a formal period of induction.
Administrative and Secretarial Occupations	A good standard of general education. Certain occupations will require further additional vocational training to a well-defined standard (e.g. office skills).
Skilled Trades Occupations	A substantial period of training, often provided by means of a work based training programme.
Caring, Leisure and Other Service Occupations	A good standard of general education. Certain occupations will require further additional vocational training, often provided by means of a work-based training programme.
Sales and Customer Service Occupations	A general education and a programme of work-based training related to Sales procedures. Some occupations require additional specific technical knowledge but are included in this major group because the primary task involves selling.
Process, Plant and Machine Operatives	The knowledge and experience necessary to operate vehicles and other mobile and stationary machinery, to operate and monitor industrial plant and equipment, to assemble products from component parts according to strict rules and procedures and subject assembled parts to routine tests. Most occupations in this major group will specify a minimum standard of competence for associated tasks and will have a related period of formal training.
Elementary Occupations	Occupations classified at this level will usually require a minimum general level of education (that is, that which is acquired by the end of the period of compulsory education). Some occupations at this level will also have short periods of work-related training in areas such as health and safety, food hygiene, and customer service requirements.

TABLE A3.1 (FIG 1)	SIZE	1 YR GR	5 YR GR
Mining	0.2%	-5.5%	0.7%
Electricity	0.4%	2.6%	8.2%
Water	0.6%	-1.5%	4.0%
Agriculture	1.1%	-13.1%	-1.6%
Real Estate	1.7%	15.9%	4.5%
Other Services	2.5%	-0.1%	0.5%
Creative Arts	2.7%	0.9%	-0.2%
Financial	3.5%	-1.9%	-1.5%
Computing	4.1%	5.4%	2.0%
Transport	4.8%	-0.4%	0.6%
Public Admin	4.8%	-1.7%	-2.7%
Construction	6.2%	0.0%	-3.1%
Hospitality/Food	6.4%	-1.8%	0.8%
Professional	8.0%	3.5%	3.0%
Manufacturing	8.1%	-0.5%	-2.2%
Administrative	8.2%	3.9%	0.9%
Education	8.6%	1.0%	1.9%
Health & Care	12.8%	2.9%	2.7%
Trade Services	15.1%	0.3%	-0.8%
ALL SECTORS	100.0%	1.0%	0.3%

ONS Workforce Jobs (June 2013)

TABLE A3.2 (FIG 2)	SIZE	1 YR GR	5 YR GR
Operatives	0.2%	-5.5%	0.7%
Sales	0.4%	2.6%	8.2%
Personal Services	0.6%	-1.5%	4.0%
Skilled Trades	1.1%	-13.1%	-1.6%
Admin	1.7%	15.9%	4.5%
Elementary	2.5%	-0.1%	0.5%
Professionals	2.7%	0.9%	-0.2%
Associate Profs	3.5%	-1.9%	-1.5%
Managers	4.1%	5.4%	2.0%
ALL OCCS	4.8%	-0.4%	0.6%

ONS Labour Force Survey (2nd Quarter to June 2013)

TABLE A4 (FIG 3)	2007/2008	2011/2012	4 YR GAGR
Business & Administrative Studies	15.5%	17.8%	10.1%
Subjects Allied to Medicine	12.5%	10.9%	0.4%
Education	11.2%	10.2%	2.1%
Social Studies	9.4%	9.4%	4.9%
Creative Arts & Design	7.4%	7.8%	6.8%
Biological Sciences	6.7%	7.0%	7.1%
Engineering & Technology	5.9%	6.4%	8.2%
Languages	4.8%	4.7%	4.0%
Law	4.6%	4.2%	2.1%
Computer Science	4.3%	3.9%	1.4%
Historical & Philosophical Studies	3.9%	3.6%	2.6%
Physical Sciences	3.3%	3.3%	5.9%
Architecture, Building & Planning	2.8%	2.8%	4.5%
Mass Communications & Documentation	2.3%	2.5%	8.4%
Medicine & Dentistry	2.2%	2.3%	5.3%
Mathematical Sciences	1.3%	1.5%	8.3%
Combined	1.0%	0.9%	1.5%
Agriculture & Related Subjects	0.7%	0.7%	6.6%
Veterinary Science	0.1%	0.1%	6.7%
ALL SUBJECTS	100.0%	100.0%	5.2%

HESA Statistical First Release Jan 2013

Table A5: Destination of leavers of all subjects in all levels of graduate and post graduate education. Destinations of the 2008/9 cohort as per December 2013 HESA LDLHE release.

	Agriculture	Mining	Manufact.	Utilities	Construct	Trades	Transport & Comms	Hospitality
Combined	0.0%	0.0%	3.6%	1.9%	0.0%	5.1%	9.7%	0.0%
Veterinary Science	0.5%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%
Agriculture & Related Subjects	16.4%	0.1%	5.0%	2.8%	2.4%	13.0%	2.1%	2.7%
Mathematical Sciences	0.1%	0.5%	2.6%	1.9%	1.0%	5.3%	8.6%	1.0%
Architecture, Building & Planning	0.5%	0.2%	2.0%	1.1%	12.1%	5.7%	2.3%	3.3%
Mass Communications & Documentation	0.1%	0.1%	4.2%	1.4%	0.6%	12.0%	26.1%	3.0%
Medicine & Dentistry	0.0%	0.0%	0.3%	0.0%	0.0%	0.2%	0.0%	0.0%
Physical Sciences	0.3%	3.1%	8.0%	3.8%	1.8%	7.6%	5.7%	1.8%
Computer Science	0.1%	0.3%	5.7%	1.0%	0.9%	8.8%	38.6%	1.4%
Law	0.0%	0.4%	1.5%	0.2%	0.6%	4.1%	3.4%	1.1%
Historical & Philosophical Studies	0.0%	0.3%	3.0%	0.4%	0.5%	9.5%	8.6%	2.7%
Engineering & Technology	0.3%	3.6%	22.1%	3.8%	7.1%	6.0%	12.5%	1.1%
Languages	0.0%	0.2%	3.1%	0.6%	0.3%	7.2%	12.2%	1.6%
Biological Sciences	0.4%	0.3%	3.4%	0.6%	0.8%	6.4%	3.3%	2.3%
Social Studies	0.1%	0.3%	2.0%	0.9%	0.9%	5.1%	4.6%	1.6%
Creative Arts & Design	0.1%	0.0%	5.3%	0.5%	0.5%	14.8%	11.1%	3.9%
Subjects Allied to Medicine	0.1%	0.1%	1.7%	0.2%	0.2%	7.2%	0.8%	0.2%
Business & Administrative Studies	0.1%	0.8%	7.2%	1.7%	1.4%	12.5%	9.6%	4.6%
Education	0.0%	0.0%	0.4%	0.1%	0.2%	1.3%	0.5%	0.2%
TOTAL ALL LEVELS	0.3%	0.5%	4.2%	0.9%	1.2%	7.3%	7.5%	1.9%

Financial	Estates & Research	Public Admin	Education	Health & Care	Other Services	Household Employers	Extra-territorial	Base (Weighted)
4.5%	23.3%	2.6%	35.9%	12.1%	1.4%	0.0%	0.0%	70
1.5%	80.5%	1.2%	7.2%	7.2%	1.5%	0.0%	0.0%	95
3.5%	18.4%	4.7%	14.6%	5.2%	9.1%	0.0%	0.0%	405
22.5%	23.4%	3.2%	25.2%	2.6%	2.2%	0.0%	0.0%	640
3.5%	51.7%	8.2%	5.1%	1.5%	2.4%	0.0%	0.0%	865
5.0%	18.8%	4.1%	12.9%	5.3%	6.4%	0.0%	0.0%	1180
0.1%	2.6%	2.0%	4.8%	89.7%	0.3%	0.0%	0.0%	1200
4.7%	25.2%	8.7%	19.9%	5.6%	3.2%	0.0%	0.4%	1475
7.8%	13.6%	4.6%	11.3%	4.0%	2.0%	0.0%	0.0%	1490
6.7%	58.8%	8.9%	6.2%	5.7%	2.3%	0.0%	0.2%	1775
5.2%	19.7%	7.0%	25.6%	7.4%	9.9%	0.0%	0.2%	1915
3.0%	24.6%	5.8%	6.7%	1.2%	2.0%	0.0%	0.0%	1935
4.5%	19.1%	3.8%	33.1%	8.1%	5.8%	0.0%	0.2%	2505
2.4%	13.8%	5.4%	29.8%	24.5%	6.5%	0.0%	0.0%	3470
7.6%	18.3%	12.2%	15.0%	27.5%	3.3%	0.1%	0.5%	3655
1.6%	18.2%	1.4%	23.2%	5.2%	14.2%	0.0%	0.0%	3890
0.4%	2.8%	2.4%	4.5%	78.9%	0.8%	0.0%	0.0%	4040
11.8%	28.3%	4.6%	8.9%	4.6%	3.7%	0.0%	0.1%	4045
0.3%	1.2%	1.3%	88.4%	4.8%	1.0%	0.0%	0.0%	5195
4.4%	17.9%	4.8%	25.5%	18.8%	4.5%	0.0%	0.1%	39855



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