

How might recent UK education policy changes affect the supply of skills to the labour market? Are these changes desirable?

Second Prize – 3rd Year Undergraduate Category

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1. Introduction:

In this essay we discuss how changes in higher education policy may have affected the supply of skills to the labour market. Higher education participation has been increasing across OECD countries in recent decades, and participation in the UK has been increasing at a faster rate (OECD, 2011).

We track changes in graduate participation between 1993 and 2011 using UK Labour Force Survey (LFS) data and set this against the backdrop of increasing student numbers. We assert that the increase in graduates has increased the supply of skills to the labour market in this period. To answer whether this is desirable we focus on graduates' labour market outcomes, by comparing them to individuals with A Level education, with respect to employment, wages and types of job. We find that desirability is mixed. We use Ordinary Least Squares (OLS) regression to estimate the graduate earnings premium in the years 2001-11 and find that this is declining.

2. What are the recent policies changes in Higher Education?

Over the past two decades the direction of higher education policy has been towards higher participation in university level education. In 1991 the number of universities in the UK was 46, in 1992 38 new universities emerged out of former polytechnics. Since then growth in the higher education sector has seen the number of universities in the UK reach 115 in 2012 (Burke, 2012). During that period annual degree attainment increased from 77,163 students in 1990, to 330,720 in 2010 (HOCES, 2012). As we will argue later we equate this increase in student numbers to an increase in the supply of skills in the UK.

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There was no single policy responsible for this expansion of higher education, which is why we describe the direction of policy. On the simplest level, for participation to have increased more places were made available by government, and students were willing to fill them. We now look at how policy was used to encourage and enable people to attend university.

The Dearing Report (1997) claimed in the 20 years leading up to 1997, the unit funding per student had fallen by 40% (Dearing, 1997), and the most striking recent higher education reforms relate to funding. While the 'sticker price' of a degree has risen in the last two decades, the introduction of student loans has meant that up-front costs have remained low. As such, funding reforms (including fee increases) can be seen as policy to facilitate greatly expanded numbers by shifting costs away from the state and towards the student.

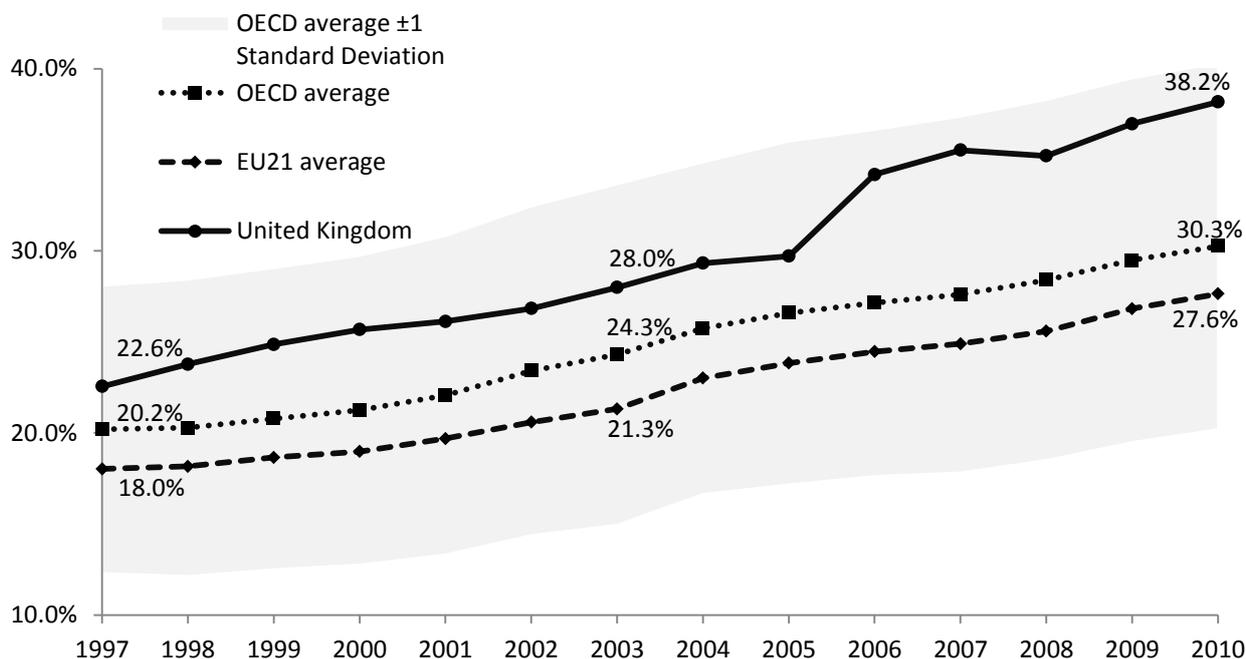
The Dearing Report (1997) also stated that "national need and demand for higher education will drive a resumed expansion of student numbers", expressing the view that policy at this time was in reaction to a changing economy and a changing society (Dearing, 1997). This view is echoed in the 2011 Browne Review, which stated that a record number of people are enrolling at university and "add to the nation's strength in the global knowledge based economy" (Browne, 2010). It can be said that policy has been to encourage the already changing attitudes to university education and to enable students to be able to get the degree they want, while funding changes ensure that this will be sustainable in the long run.

3. Has this increased the supply of skills to the labour market?

Drawing on human capital theory we assert that every additional year spent in education will increase an individual's stock of human capital by improving their skills (Hatch and Dyer, 2004). At an intuitive level we can say that in order to gain a degree an individual must know more at the end of their course than at the beginning. Similarly, if one has a high skill level before studying for a degree, these skills will be enhanced through practice or refinement. Arum and Roska (2011) present evidence that a student moves up the skill distribution over the course of their degree; for example, a student who entered university in the 50th percentile of skill level in his or her cohort would have moved up to the 68th percentile of skill level by graduation (Arum and Roska, 2011).

Graduates have more skills, and using data from the OECD we can see that the UK graduate concentration increased between 1997 and 2011 (Figure 1). It follows that the supply of skills has increased owing to the increase in graduates. We now turn to the LFS to examine this increase in supply.

Figure 1: Number of Graduates (25-64) (by degree attainment)



Data Source: OECD, Education at a Glance (2011)

4. Increased graduate skills in the labour market: data from the LFS

To examine the supply of skills to the labour market we pool LFS Quarter 4 data from Q4-1992 to Q4-2011. We use data on respondents’ age, economic activity, employment and hourly pay.

We need to make a link between increased participation as a social trend, and labour market performance of individuals within each cohort, so that we can associate policies with outcomes. Since we are examining recent policies we will focus on recent cohorts, and do this by restricting the sample to 21-30 year olds. This age group is narrow enough to be cohort specific and wide enough to recognise the accumulative effect of labour market experience.

We use the LFS variable HIQUAL to separate graduates from non-graduates. The relevant sub-category is “Degree or equivalent”, and we pool two other sub-categories, “Higher Education” (HE) and “GCE, A-Level or equivalent”. We pool these two together because the number of observations reporting HE is a small fraction of either Degree or A-Level, and because both HE and A-Level can be used to enter university, and are equivalents in that sense. Note, for brevity we will refer to this pooled group simply as ‘A-levels’.

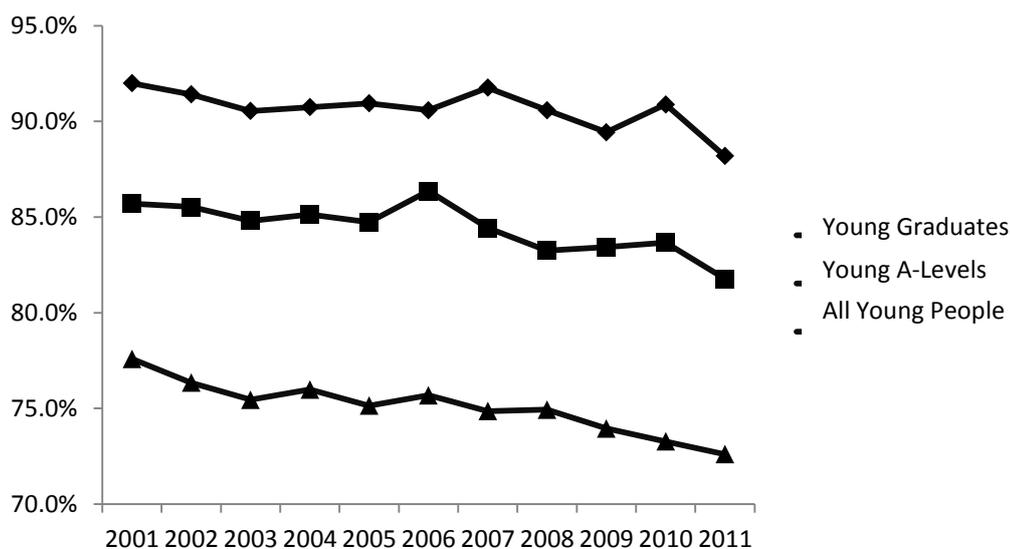
Throughout the rest of this essay we refer to the sample group as either ‘young graduates’, or ‘young people with A-levels’.

In deciding how to present the data, we follow the steps by which an individual would supply skills to the labour market. We examine, in order: economic activity, the employment rate of the economically active, the skill-level and the wages of the employed.

4.1 Economic Activity

Taking data from the LFS (2001 -2011), which reports economic activity according to International Labour Organisation (ILO) criteria (those who are employed or unemployed and looking for work), we construct Figure 2. This illustrates that in our reference period, young graduates have consistently had a higher rate of economic activity than young people with A-levels.

Figure 2: LF participation



Data Source: LFS (2001-11)

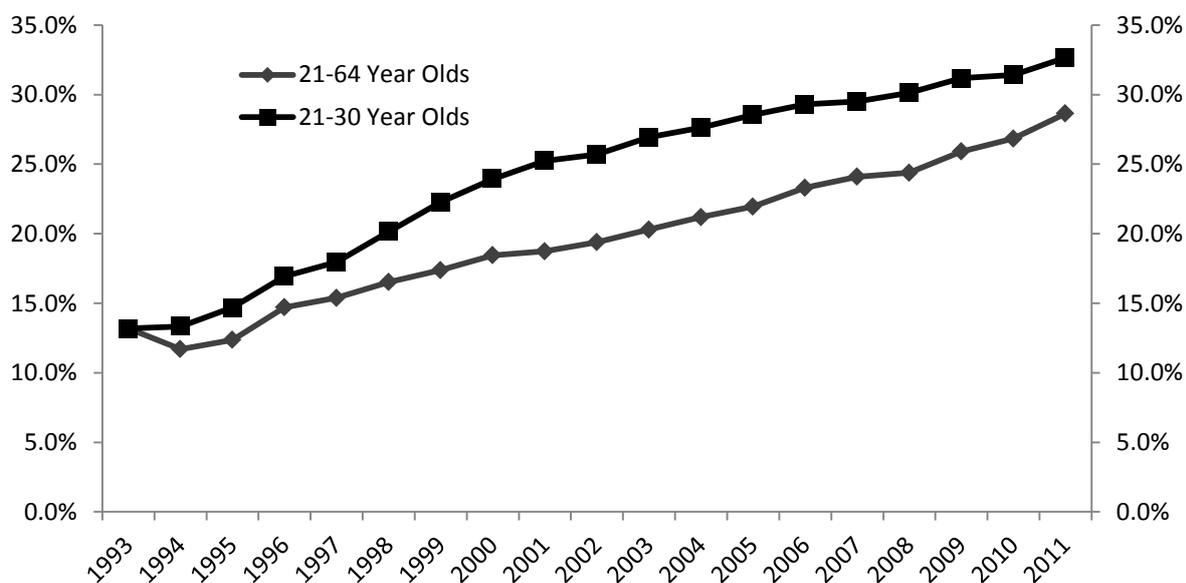
4.2 Employment rates for the economically active

We now look at the proportion of employed people with degrees. This has been increasing for all prime-age workers and for young graduates (Figure 3). We should note that the UK labour force has grown by 8.7% between 2001 and 2011. Graduates represent an increased proportion of a

labour force which has also expanded, which means that in absolute terms the number of graduates is higher than it first may appear.

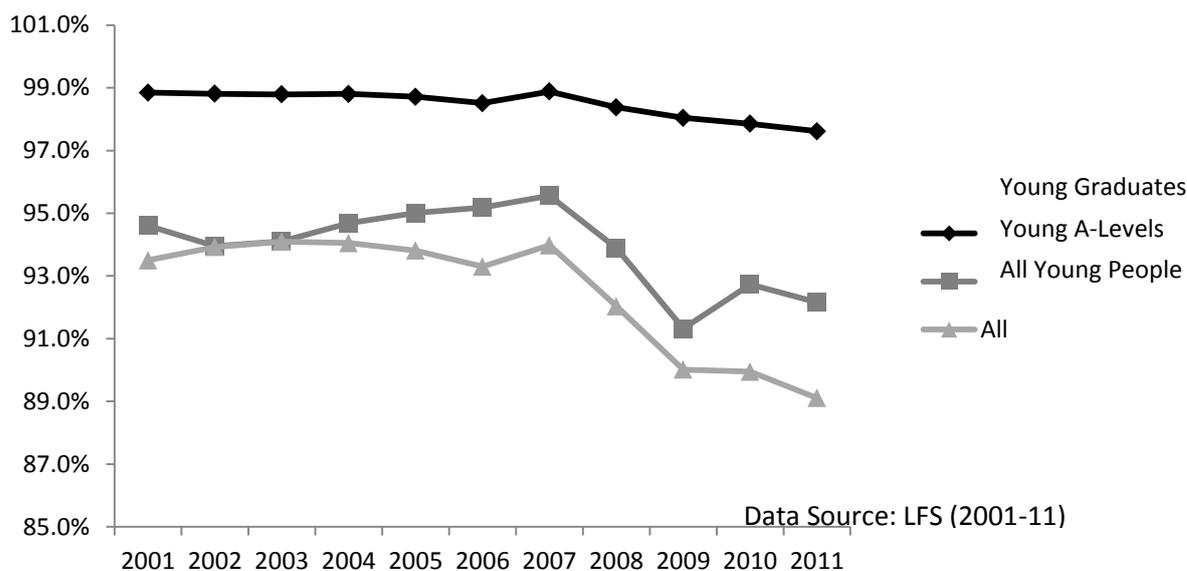
Looking at employment rates, Figure 4 shows young graduate employment falling slightly, but not to the same extent as young people with A-levels. These figures indicate that young graduates fare better than young people with A-levels, and all young people taken together.

Figure 3: Proportion of individuals who have degrees and are Economically Active



Data Source: LFS (1993-2011)

Figure 4: Graduate Employment Rates



4.3 Skill level in jobs

Continuing with the steps by which an individual would supply skills to the labour market we now turn to an analysis of the type of work young people are employed in. We make a link between class of job and skill level. To do this we make use LFS data from 2001 -2011, which classifies respondents’ jobs according to the National Statistics Socio-economic Classification (NS-SEC), as defined by the Office for National Statistics (ONS). These analytic classes are listed in Table 1.

Table 1: National Statistics Socio-economic Classification (NS-SEC)

Class	NS-SEC Analytic Description
1	Higher managerial, administrative and professional occupations
	1.1 Large employers and higher managerial and administrative occupations
	1.2 Higher professional occupations
2	Lower managerial, administrative and professional occupations
3	Intermediate occupations
4	Small employers and own account workers
5	Lower supervisory and technical occupations
6	Semi-routine occupations
7	Routine occupations
8	Never worked and long-term unemployed

We observe that more than 90% of jobs obtained by young graduates are in Classes 1, 2 and 3. We also observe that an increasing proportion of Class 1 and 2 jobs are being held graduates while the number held by young people with A-levels has fallen by approximately the same amount. This is shown below in Figure 5.

Narrowing our focus to young graduates only (Figure 6), we observe that the percentage of all young graduates getting Class 1 and 2 jobs has fallen.

Figure 5: Class 1 and 2 Jobs held by 21-30 year olds

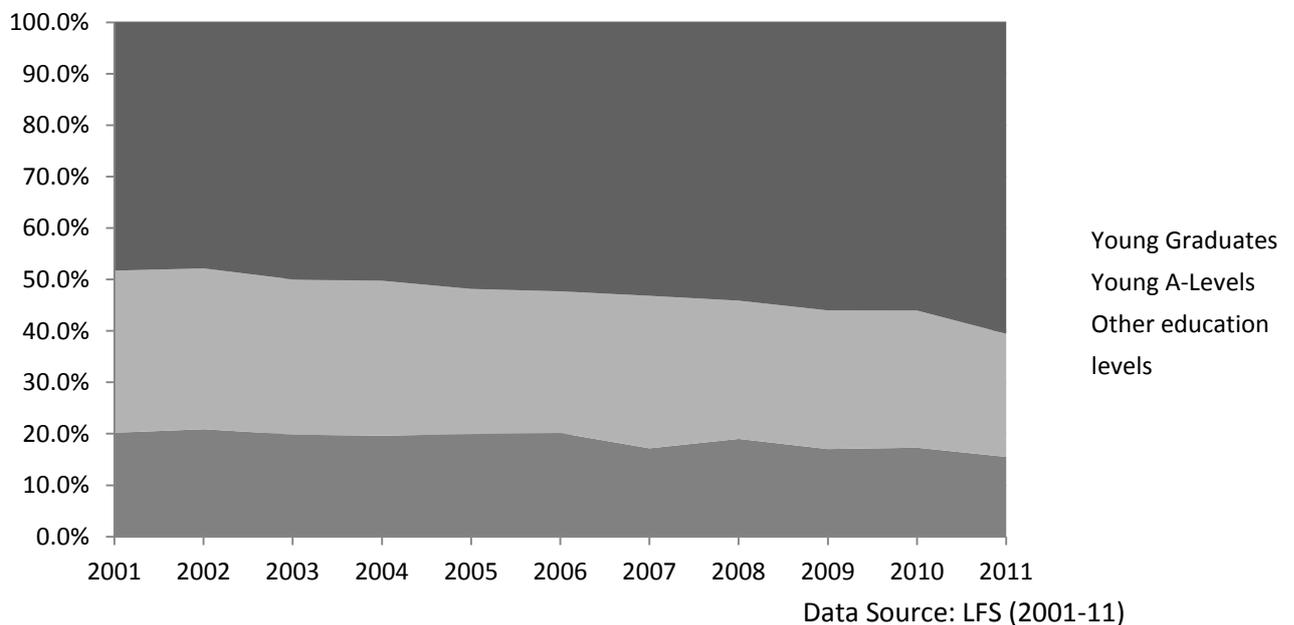
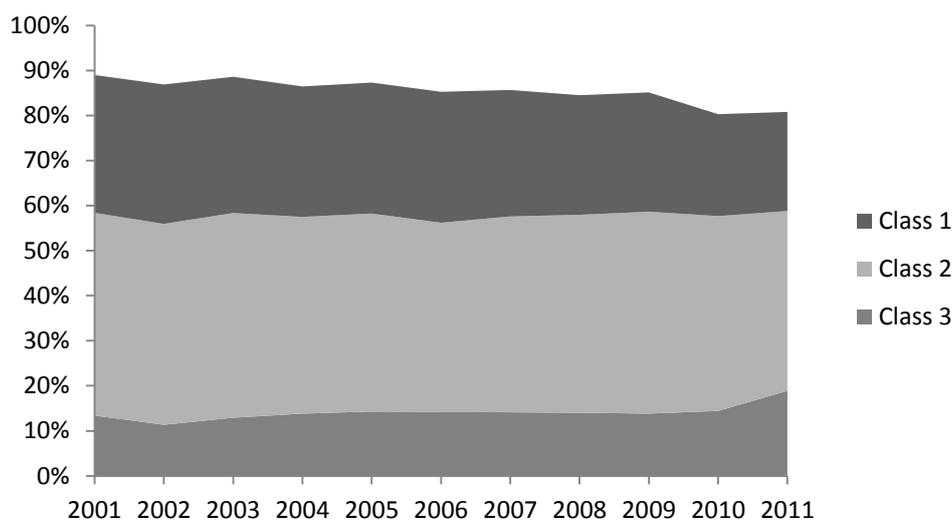


Figure 6: Young Graduate Employment by Class of Job

Data Source: LFS (2001-11)

4.4 Using regression analysis to examine wages

4.4.1 Estimating the earnings model

Finally, we examine young graduate wage premiums. We do this by estimating an earnings regression for 21-30 year olds between 2001 and 2011. We control for age, gender, ethnicity and degree status, as well as whether the respondent works in London. We estimate the following model for hourly wages:

$$\ln(\text{Hourly wage}) = \beta_0 + \beta_1 \text{AGE} + \beta_2 D_1 \text{DEGREE} + \beta_3 D_2 \text{GENDER} + \beta_4 D_3 \text{LONDON} \\ + \beta_5 D_4 \text{NON-WHITE} + e$$

Descriptions of the variables used to estimate the model are given in Table 2.

Table 2: Variables Used

Regression Variables	Description	LFS Variable	LFS Coding
AGE	Age of respondent	AGE	
DEGREE	Dummy Variable; whether the respondent has a degree	HIQUAL	1 = Degree or equivalent, 2 = Higher education, 3 = GCE, A-level or equivalent
GENDER	Dummy Variable; gender of respondent	SEX	1 = Male, 2 = Female
LONDON	Dummy Variable; whether the respondent works in London	GORWK	13 = Central London, 14 = Inner London, 15 = Outer London
NON-WHITE	Dummy Variable; respondent's ethnic group	ETH01	1 = White, 2 = Mixed, 3 = Asian or Asian British, 4 = Black or Black British, 5 = Chinese, 6 = Other ethnic group

4.4.2 Regression results

We performed eleven regressions, one for each year between 2001 and 2011; the results of these regressions are shown in full in the Appendix. To comment on them generally, the R^2 ranges between 0.197 and 0.287. We observe high levels of significance across years and for all variables. We now present the results for the degree co-efficient in Table 3, which represents the predicted average young graduates' wage premium in each year 2001-2011.

Table 3: Graduate Wage Premiums

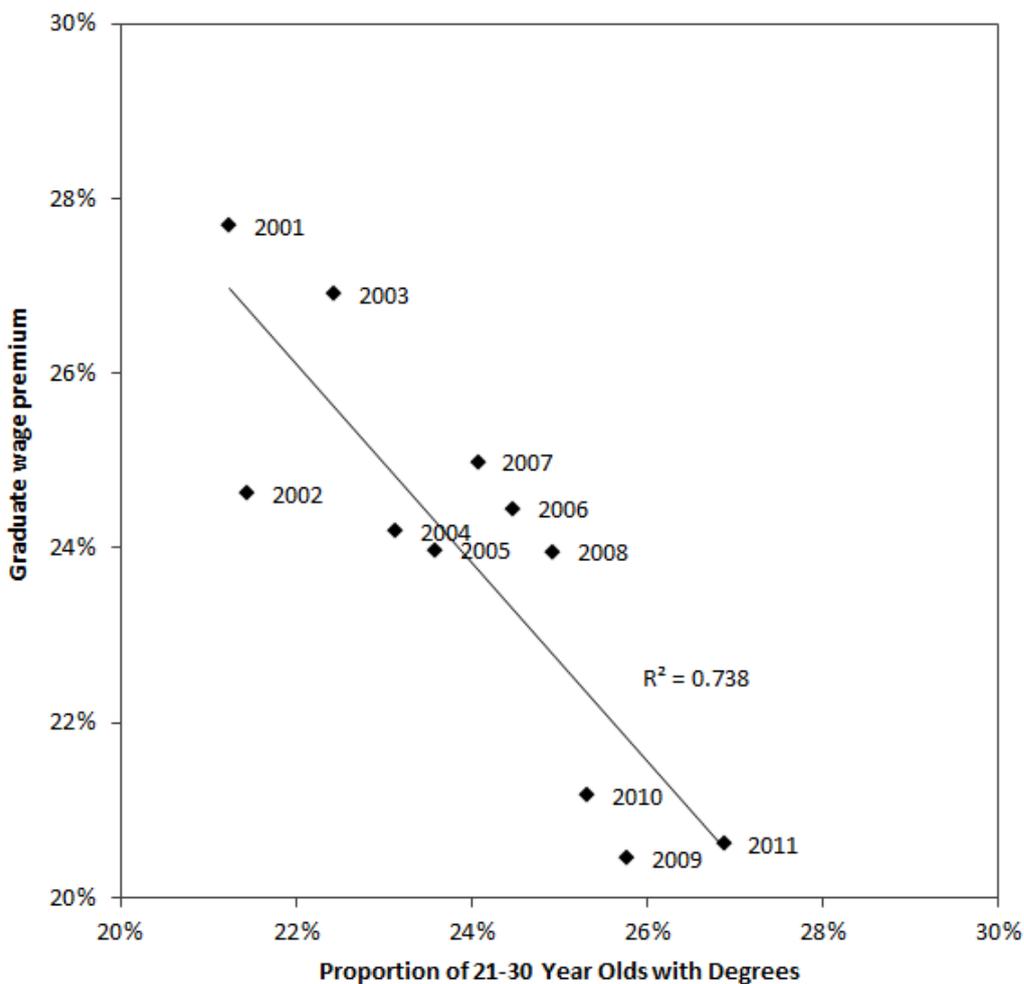
Year	DEGREE coefficient	Standard error
2001	0.277	(0.018) ***
2002	0.246	(0.019) ***
2003	0.269	(0.02) ***
2004	0.223	(0.02) ***
2005	0.240	(0.019) ***
2006	0.244	(0.02) ***

2007	0.250	(0.021) ***
2008	0.240	(0.02) ***
2009	0.204	(0.022) ***
2010	0.212	(0.023) ***
2011	0.206	(0.022) ***

Asterisks denote level of significance:
*** 0.001, **0.01. *0.05

From this we observe a 7.1 percentage point fall in young graduates’ predicted wage premiums, from 27.7% in 2001 to 20.6% in 2011. In Figure 7 we plot predicted young graduate wage premiums against the proportion of young graduates, and observe a clear linear relationship, with an R^2 for the trend line of 0.738.

Figure 7: Wage Premiums against Degree Holders (21-30)



4.5

Summarising the data

We showed that economic activity is higher for young graduates than for young people with A-levels. This, together with the increase in university attendance has increased the proportion of young graduates in the labour force. Of those graduates who are economically active, employment rates remain higher and more stable than for those with A-levels. Looking at Class 1 and 2 jobs held by young people (and equating those with high skill levels) the proportion of those with degrees has increased. However, when looking purely at young graduates, the proportion of those with Class 1 jobs has fallen relative to other classes of job.

Finally, we examined wage premiums using regression analysis and found evidence of declining graduate wage premiums between 2001 and 2011. We now discuss the desirability of these data.

5. Desirability:

We should acknowledge that there are many ways to interpret desirability, and education influences many aspect of people lives, including health (Ross and Wu, 1995) and happiness (Hartog and Oosterbeek, 1998). Additionally, there is evidence for society-wide benefits (Psacharopoulos and Patrinos, 2004). However, these would have indirect or ambiguous effects on the labour market, which is the focus of our question.

We asses the desirability of the outcomes we have described against the policy backdrop of increasing degree attainment. Young graduates have a consistently high participation rate, in the order of 90%; some of this must be attributable to young graduates perceiving there to be demand for their labour. If a policymaker is targeting higher labour force participation, increased young graduate numbers is desirable on this count.

Young graduate employment is higher and more stable than those with A-levels; this is desirable for young graduates themselves but the story is unlikely to be that straightforward. From our data we cannot ascertain whether this is due to graduates maintaining a high employment rate by displacing those with lower skill levels, or because there is high demand for graduate skills.

The proportion of Class 1 and 2 jobs held by young graduates has increased. Necessarily, the proportion held by non-graduates must have fallen, but within that, the proportion held by young people with A-levels has also fallen. We can assume that there is a given level of ability necessary to perform a Class 1 or 2 job. If that is the case then the data does not allow us to identify whether graduates are displacing young people with A-levels and 'Class 1/2 ability', or whether more people with 'Class 1/2 ability' now choose to study for a degree.

Looking at the similar measure of the class of jobs that young graduates obtain, the proportion of young graduates getting Class 1 and 2 jobs has fallen. At a graduate level this would appear as undesirable, but to simply say that this undesirable is to potentially ignore how the graduate cohort has expanded. It seems logical that the range of abilities is now wider in current cohorts.

Our regression results suggest that young graduate wage premiums have fallen. When we plotted this against young graduate concentration we observe evidence of a negative relationship; this would appear to be an undesirable outcome. However, as the highest concentration of degrees has coincided with the recession then this could be a spurious correlation, or at least not offer a causal relationship. Even if we exclude the years 2008-2011 there evidence of a negative relationship in the years 2001-2007, albeit with a less steep trend line which has a lower R^2 . On balance it is not obvious to us that these years need to be excluded; our measurement is a differential between wages, so if all wages were to fall (as in a recession) there is nothing to say that the percentage difference between wages has to fall also. In which case the relationship we identified might be as valid as it appears.

6. Conclusion:

We made the link between changes in recent higher education policy and increased degree concentration. Accepting a straightforward link between education and skills we asserted that these policies have facilitated an increase in the supply of skills. Through the LFS data we saw that the individuals with these skills are supplying them to the labour market. To directly answer our essay question: increasing graduate concentration increases the supply of skills.

On the question of whether this change is desirable, we conclude that the evidence is mixed. Where we have found evidence of worsening outcomes, the results are based on examining averages for whole graduate cohorts. To bring clarity to these issues we would need to find ways to distinguish students within those cohorts. It may be that a subset of high-ability graduates has maintained, for example, high wage premiums, but that the appearance of a declining average wage premium is attributable to lower-skilled graduates lowering the average.

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Appendix:

1. Regression Results:

VARIABLES	LABOUR FORCE SURVEY										
	Q4-2001	Q4-2002	Q4-2003	Q4-2004	Q4-2005	Q4-2006	Q4-2007	Q4-2008	Q4-2009	Q4-2010	Q4-2011
AGE	0.054 (0.003) ***	0.055 (0.003) ***	0.055 (0.003) ***	0.051 (0.003) ***	0.059 (0.003) ***	0.058 (0.004) ***	0.052 (0.004) ***	0.057 (0.004) ***	0.061 (0.004) ***	0.052 (0.004) ***	0.056 (0.004) ***
DEGREE	0.277 (0.018) ***	0.246 (0.019) ***	0.269 (0.02) ***	0.223 (0.02) ***	0.240 (0.019) ***	0.244 (0.02) ***	0.250 (0.021) ***	0.240 (0.02) ***	0.204 (0.022) ***	0.212 (0.023) ***	0.206 (0.022) ***
GENDER	-0.099 (0.018) ***	-0.127 (0.018) ***	-0.125 (0.019) ***	-0.110 (0.019) ***	-0.078 (0.019) ***	-0.111 (0.02) ***	-0.075 (0.02) ***	-0.089 (0.02) ***	-0.092 (0.021) ***	-0.078 (0.022) **	-0.066 (0.022) *
LONDON	0.259 (0.025) ***	0.283 (0.028) ***	0.189 (0.031) ***	0.242 (0.031) ***	0.199 (0.031) ***	0.191 (0.03) ***	0.260 (0.032) ***	0.177 (0.029) ***	0.252 (0.031) ***	0.197 (0.035) ***	0.226 (0.034) ***
NON-WHITE	-0.125 (0.039) *	-0.147 (0.036) ***	-0.066 (0.04)	-0.128 (0.036) ***	-0.162 (0.032) ***	-0.111 (0.037) *	-0.138 (0.036) ***	-0.116 (0.034) *	-0.111 (0.034) **	-0.099 (0.041)	0.105 (0.037) *
CONSTANT	0.614 (0.082) ***	0.612 (0.084) ***	0.645 (0.09) ***	0.784 (0.091) ***	0.593 (0.092) ***	0.647 (0.095) ***	0.802 (0.098) ***	0.825 (0.099) ***	0.645 (0.097) ***	0.913 (0.11) ***	0.629 (0.107) ***
R ²	0.281	0.287	0.263	0.242	0.258	0.263	0.239	0.258	0.260	0.197	0.227
N	2014	1877	1715	1618	1713	1636	1673	1582	1529	1453	1418

Notes: - The dependent variable is log of Hourly Wage.

- The base groups are: No Degree, for DEGREE; Male, for GENDER; Outside London, for LONDON; White, for ETHNICITY.

- Standard errors are in parentheses.

- Asterisks denote level of significance: *** 0.001, **0.01, *0.05