For Some, Luck Matters More

The impact of the Great Recession on Early Careers of Graduates from Different Socio-Economic Backgrounds

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Motivation

- *SES & Education*
  - Education is one of the channels through which parental background affects the life chances of their offspring → inter-generational transmission of (dis-)advantages.
  - Higher and better education leads to acquiring relatively better jobs.
- *Importance of early career and macroeconomic conditions at entry*
  - First steps in one's career are particularly important in determining one's long-term labour market outcomes (wages and occupation).
  - Young people are the most affected by downturns in the business cycle.

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Research questions

We want to understand whether the business cycle has a different effect on individuals from different socio-economic backgrounds (SES).

- If there is a gap in the labour market outcomes of graduates from different SES, does this worsen in periods of shrinking labour demand?
- Did the Great Recession have significant effects on social inequalities even within the population of most educated individuals?

Why graduates?

- We can observe them at the time of entry into the labour market.
- Nowadays important part of the population.
- Large amount of information on their education features (observed individual and observed and unobserved institutional characteristics).
- Graduates = high skilled "future" workers $\rightarrow$ Is higher education enough to guarantee that people of different SES will have the same opportunities?

Literature review I

Several papers on the effect of graduating in "bad times" on graduate careers:

- Altonji et al. (2014) USA: effects differ by field of study, but not for the latest recession.
- Oreopoulos et al. (2012) Canada: earnings for 10 years.
- Liu et al. (2012) Norway: job mismatch for 8 years or forever.
- Kahn (2010) USA: occupational attainment (measured with a prestige scale) and wages up to 15 years.
- Oyer (2006) USA: graduates in MBA less likely to work in Wall Street.
- Oyer (2008) USA: less productive PhD economists.

Literature review II

UK evidence is usually focused on the effect of leaving school in "bad times" or the effect of "bad times" on the probability of leaving school:

- Taylor (2013): higher unemployment on leaving school (age 16) permanently & negatively influences individual labour market outcomes.
- Meschi et al. (2013): mainly no effect of unemployment on decision to stay on (age 16), although some heterogeneity by gender.
- Tumino and Taylor (2014): unemployment on leaving school (age 16) on decision to stay on, for individuals from different SES (credit constrained or not).

Literature review III

Some papers look at SES-differences in graduate outcomes using a single cohort:

- Machin et al. (2009): 2002/03 cohort of graduates, some differences in outcomes when SES-marker is state vs. private school.
- Macmillan et al. (2014): 2006/07 cohort of graduates, linked to NPD (previous attainment), private school graduates are still 2.5 percentage points more likely to access top NS-SEC group.

Our contribution: graduates in the UK, various cohorts over time, Great Recession, SES & subject differences, several LM outcomes.

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DLHE

- Destination of Leavers from HE Survey
- Years of graduation: 2002/03 - 2011/12
- 6 months after graduation (questionnaire received in January)
- Demographic and socio-economic characteristics
- Measures of human capital (subject and degree class)
- Labour market outcomes

Sample

- Full-time first degree graduates;
- 21-24 years old when surveyed (non-mature students);
- UK nationals with a valid UK domicile;
- Students who went to English universities.

SES indicators I

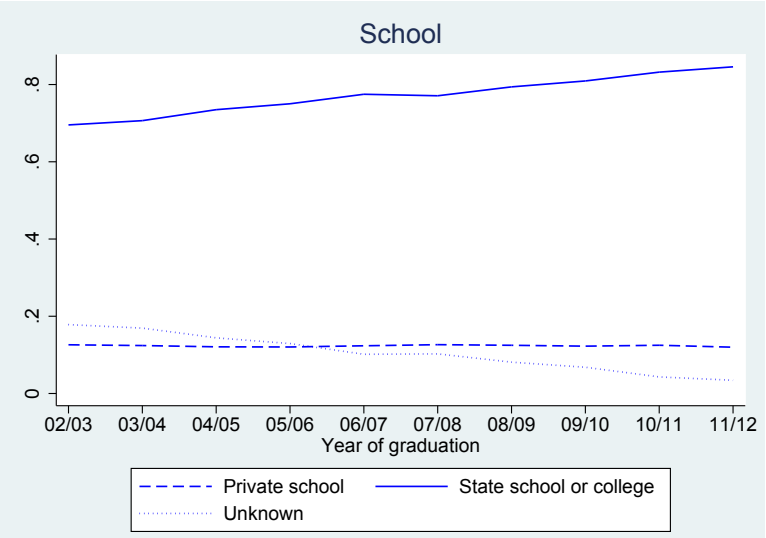
1. **School**: state school/college vs. private school.
2. **Low Participation Neighborhood (LPN)**: whether the neighborhood where graduates come from has a high participation of its residents in HE.
3. **Parents' Socio-Economic Classification (PSEC)**: NS-SEC 8 but only from year of graduation 2005/06.

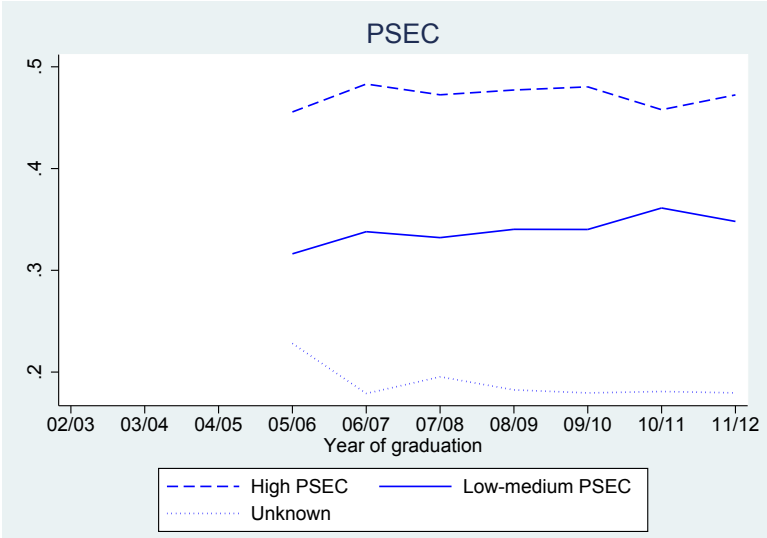
1. Higher managerial, administrative and professional occupations;
2. Lower managerial, administrative and professional occupations;
3. Intermediate occupations;
4. Small employers and own account workers;
5. Lower supervisory and technical occupations;
6. Semi-routine occupations;
7. Routine occupations;
8. Never worked and long-term unemployed.

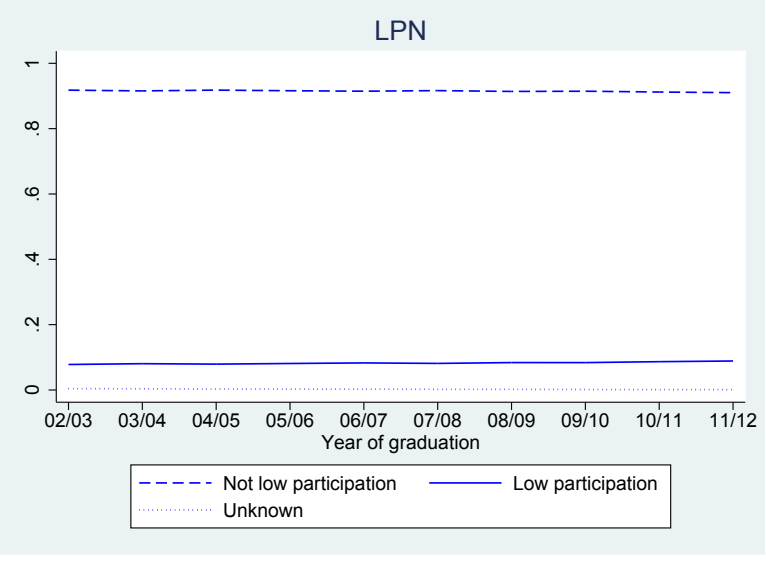
PSEC=0 if SEC$\geq$1 and SEC$\leq$2; PSEC=1 otherwise.

These indicators do not approximate SES in the same way...

SES indicators II







Outcomes

(a) *Labor market participation and activity status*:

- Post-graduate study vs. all other activity statuses;
- Paid work vs. all other activity statuses;
- Unemployed vs. all other activity statuses.

(b) *Type of job*:

- PT work vs. FT work;
- Annual gross (ln)salary - only for FT work;
- Professional/managerial occupation (PT and FT);
- Qualification required for job (PT and FT);
- Permanent contract (PT and FT);
- Large firm >50 (PT and FT);

(c) *Mechanisms*

- Social network
- Distance home/HEI-work

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Empirical model

$$Y_{iak,t+1} = \alpha + \beta UR_{at} * SES_i + \gamma SES_i + \delta UR_{at} + \chi UR_{at-3} +$$

$$+ \kappa UR_{at-3} * SES_i + \rho X_i + \nu fees_{t>2009} + \phi_k + \theta_a + \delta_t + \rho(\theta_a * t) + \epsilon_{iak,t}$$

- Socio-demographic characteristics: gender, ethnicity, disability
- Academic and institutional characteristics: first degree classification, subject studied
- Changes in composition: UR at time of enrollment and its interaction with SES (LADs)
- Propensity to move: Distance from domicile and HE institution (Km)
- FE: area/major, time, area/major specific trends, HE institution

Wild cluster bootstrap $\rightarrow$ regions/major

Note: most results in this presentation are preliminary - wild boostrap used only where specified in note.

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Which UR?

Our identification strategy requires variation in UR across time, but it is useful to exploit other dimensions:

- *across* **regions**:
  - England (N-E, N-W, Yorkshire and The Humber, E Midlands, W Midlands, E, London, S-E, S-W), Wales, Scotland, and Northern Ireland.
    - Region of family of residence = **Home**
    - Region of HE institution = **HEI** (England only) Region of job Jobs' characteristics
      - Claimant-count definition
      - Labour Force Survey definition UR regions
- *across* **subjects**:
  - Medicine, Medical related subjects, Biological Science, Physical Science, Maths & Computing, Engineering & Technology, Architecture and related subjects, Social Studies, Business and Financial studies, Communication, Languages, Arts, Humanities, Education.
    - Labour Force Survey $\rightarrow$ graduates $>$ 25 y.o. UR subjects

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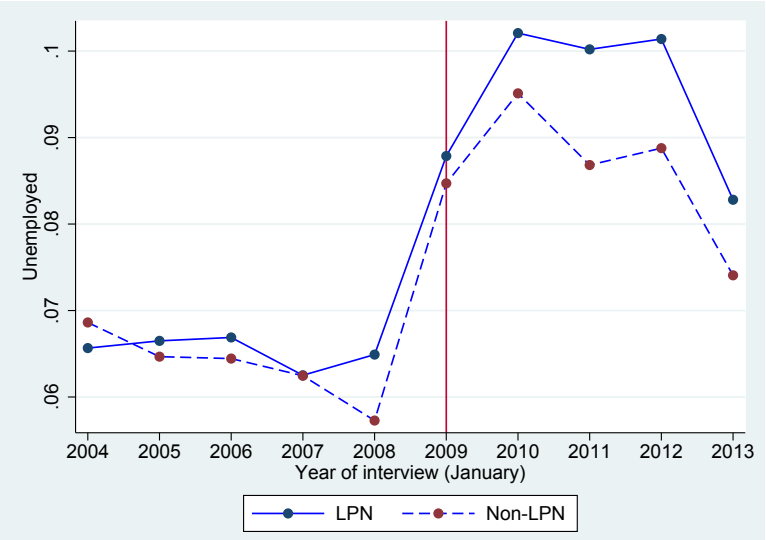
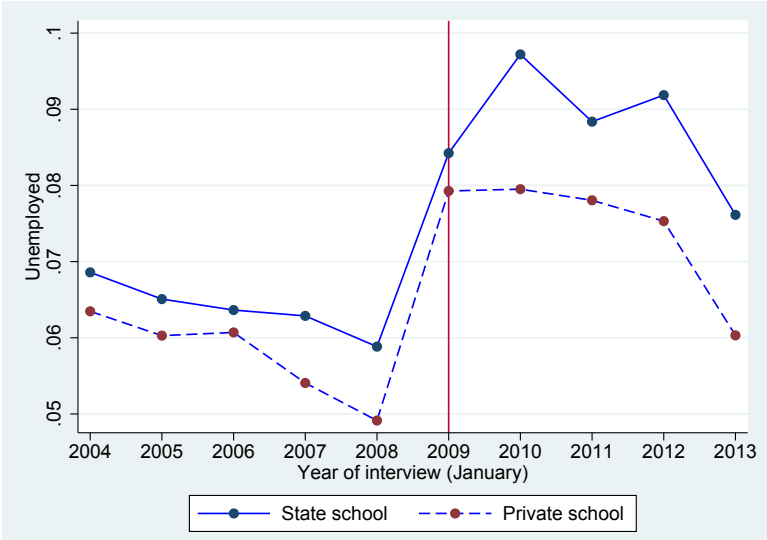
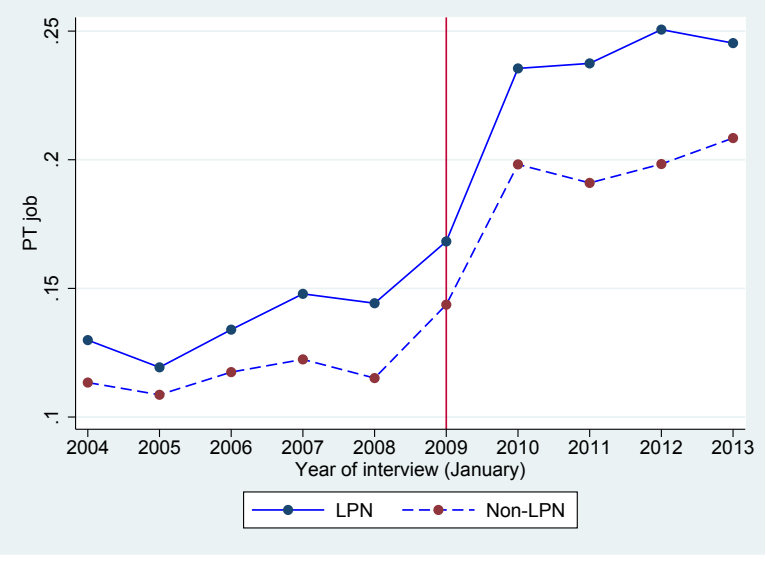
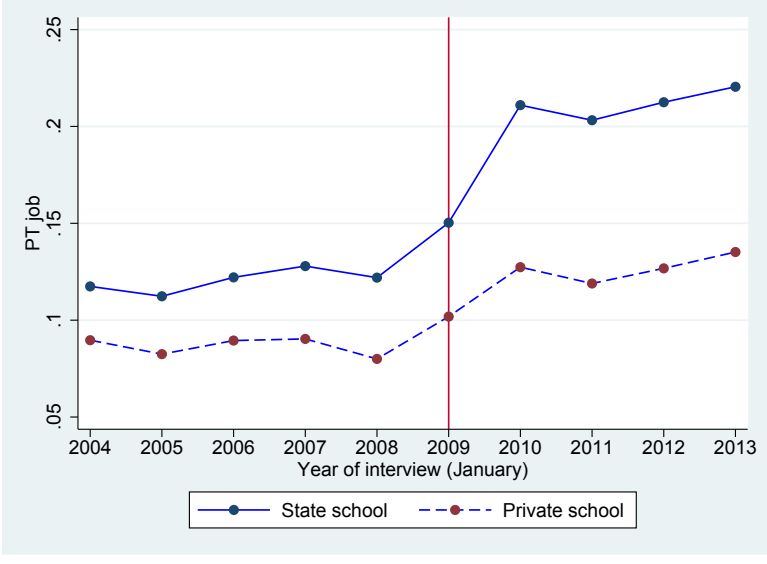
Unemployed and PT job at 6 months after graduation









How do graduates from different SESs differ?

Possible reasons explaining differences in LM outcomes between low/high SES graduates (all confirmed with Chi-squared test):

1. *Different academic ability/quality of education*: high SES better academic preparation at school and better performances in HE; differences in major chosen and in kind of HEI attended.
Academic differences

2. *Different quality of social networks*: higher proportion of high SES found job through family/friends. Social network

3. *Different geographical mobility ($\simeq$ financial constraints, aspirations, motivation)*: among those graduates who are employed, high SES moved farther away from home/HEI than low SES. Geographical mobility

We will see that even after controlling for individual academic characteristics and observed and unobserved institutional characteristics, the increase in the gap between high and low SES persists during the recession. Hence, we will investigate the last two points as possible mechanisms through which students adjust their entry in the labor market to the current macroeconomic condition at graduation.

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Postgraduate study - choice of specification

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
State school	-0.055**	-0.056**	0.001	-0.007	-0.007	-0.007	-0.008
	(0.007)	(0.007)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Regional UR (CC)	0.006**	0.000	0.001	0.002	0.002	0.002	0.005*
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
State School * regional UR	-0.004+	-0.004+	-0.004*	-0.006**	-0.006**	-0.006**	-0.006**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Demographics	x	x	x	x	x	x	x
Cohort & Region FE		x	x	x	x	x	x
HE institution FE			x	x	x	x	x
Degree class & Subject				x	x	x	x
Distance domicile-HEI					x	x	x
Fees						x	x
Region-specific trend							x
N	1,079,196	1,079,196	1,079,196	1,079,196	1,079,196	1,079,196	1,079,196
R-squared	0.006	0.007	0.046	0.095	0.095	0.095	0.095

Note: ** p-value<0.001; * p-value<0.05; + p-value<0.10. Regional unemployment rate derived from the Claimant Count and calculated in the region where individuals were living before going to university ("home").

with/out wild boost

Activity status at 6 months after graduation

	Unemployed	Paid work	Study
Public school * UR HEI	0.003**	-0.001	-0.003+
	(0.001)	(0.001)	(0.002)
Public school * UR home	0.005**	-0.000	-0.006**
	(0.000)	(0.002)	(0.002)
N	1,079,196	1,079,196	1,079,196
Public school * UR subject	0.004**	-0.000	-0.003
	(0.001)	(0.000)	(0.006)
N	960,625	960,625	960,625
LPN * UR HEI	0.005**	-0.002	-0.003+
	(0.000)	(0.002)	(0.002)
LPN * UR home	0.005**	-0.003	-0.004*
	(0.000)	(0.003)	(0.002)
N	1,196,412	1,196,412	1,196,412
LPN * UR subject	0.002	-0.002	-0.001
	(0.001)	(0.003)	(0.002)
N	1,066,050	1,066,050	1,066,050
Low PSEC * UR HEI	0.002**	-0.001	-0.003*
	(0.001)	(0.001)	(0.001)
Low PSEC * UR home	0.002**	-0.000	-0.003
	(0.000)	(0.000)	(0.002)
N	715,255	715,255	715,255
Low PSEC * UR subject	0.003**	-0.003	-0.000
	(0.000)	(0.002)	(0.003)
N	638,793	638,793	638,793

Note: ** p-value<0.001; * p-value<0.05; + p-value<0.10. S.e. corrected with wild bootstrap (499 reps for the school proxy, 100 reps for the LPN and PSEC proxies).

Quantifying the effects of the Great Recession - Unemployment

	2003/04	*2008/09*	Δ *SES-Gap*	β	Δ *UR*	*Contrib.*	*% Contrib.*
State school	.065	.097					
Private school	.060	.079					
SES-Gap	.005	.018	0.013				
				0.005	1.8	0.009	69%

Note: Regional unemployment rate derived from the Claimant Count and calculated in the region where individuals were living before going to university ("home").

Type of job at 6 months after graduation

	PT work	Salary	Qualification	Permanent contr.	Large firm
Public school * UR HEI	0.014**	-0.003	-0.004+	0.000	0.005*
	(0.004)	(0.004)	(0.002)	(0.003)	(0.002)
Public school * UR home	0.019**	-0.003	-0.004*	-0.003	0.005
	(0.000)	(0.003)	(0.002)	(0.002)	(0.003)
N	676,729	305,553	553,866	593,102	481,132
Public school * UR subject	0.014**	-0.028**	-0.013	0.008	0.012**
	(0.000)	(0.010)	(0.009)	(0.009)	(0.005)
N	604,328	273,152	495,627	530,234	431,471
LPN * UR HEI	0.003*	-0.002	-0.000	0.002	0.004
	(0.001)	(0.003)	(0.000)	(0.002)	(0.003)
LPN * UR home	0.005**	0.002	0.001	0.001	0.005
	(0.000)	(0.004)	(0.006)	(0.003)	(0.004)
N	752,487	337,786	615,942	659,109	535,292
LPN * UR subject	0.007**	-0.012	-0.006	0.007	0.007**
	(0.000)	(0.007)	(0.006)	(0.006)	(0.000)
N	672,461	302,109	551,476	589,636	480,296
Low PSEC * UR HEI	0.005**	-0.004*	-0.003	0.002	-0.002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Low PSEC * UR home	0.008**	-0.002+	-0.002	0.001	-0.001
	(0.000)	(0.001)	(0.002)	(0.001)	(0.001)
N	447,797	205,831	374,044	398,927	324,731
Low PSEC * UR subject	0.008**	-0.007	-0.007	0.005**	0.006+
	(0.000)	(0.005)	(0.007)	(0.000)	(0.003)
N	401,540	184,897	335,827	358,039	292,131

Note: ** p-value<0.001; * p-value<0.05; + p-value<0.10. S.e. corrected with wild bootstrap (499 reps for the school proxy, 100 reps for the LPN and PSEC proxies).

Mechanism I: Job found through family/friends

	Network
Public school * UR HEI	-0.009+
	(0.005)
Public school * UR home	-0.007*
	(0.003)
N	470,275
Public school * UR subject	-0.013**
	(0.005)
N	419,598
LPN * UR HEI	-0.006*
	(0.002)
LPN * UR home	-0.006+
	(0.003)
N	529,114
LPN * UR subject	-0.003
	(0.005)
N	472,421
Low PSEC * UR HEI	-0.004
	(0.003)
Low PSEC * UR home	-0.003
	(0.003)
N	303,571
Low PSEC * UR subject	-0.004
	(0.004)
N	272,004

Note: ** p-value$<$0.001; * p-value$<$0.05; + p-value$<$0.10. S.e. corrected with wild bootstrap (499 reps for the school proxy, 100 reps for the LPN and PSEC proxies).

Mechanism II: Distance HEI-work

Distance HEI-Work (FT+PT)					
Public school * UR HEI	-0.053	LPN * UR HEI	-0.013	Low PSEC * UR HEI	-0.009
	(0.041)		(0.008)		(0.007)
Public school * UR home	-0.031*	LPN * UR home	-0.001	Low PSEC * UR home	-0.011*
	(0.014)		(0.026)		(0.005)
N	635,315	*N*	706,045	*N*	422,347
Public school * UR subject	-0.034+	LPN * UR subject	-0.001	Low PSEC * UR subject	-0.011
	(0.018)		(0.000)		(0.009)
N	567,858	*N*	631,450	*N*	379,119

Note: ** p-value<0.001; * p-value<0.05; + p-value<0.10. S.e. corrected with wild bootstrap (100 reps).

When we split the sample according to the type of job:

Distance HEI-Work	FT only	PT only
Public school * UR home	-0.031*	-0.014+
	(0.013)	(0.008)
N	533,047	102,268
LPN * UR home	-0.002	0.007
	(0.007)	(0.010)
N	593,201	112,844
Low PSEC * UR home	-0.011+	-0.006
	(0.006)	(0.004)
N	349,211	73,136

Note: ** p-value<0.001; * p-value<0.05; + p-value<0.10. S.e. corrected with wild bootstrap (100 reps).

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Heterogeneity

We then run the regressions for several subgroups based on gender, ethnicity, university "quality", STEM/non-STEM subjects, lowest/highest net financial rates of return subjects (Walker & Zhu 2010). Some interesting findings (v. preliminary results):

- outcomes on activity status: SES gap found in males, non-white, lowest and highest return subjects.
- outcomes on quality of job: SES gap found especially among men, white, non-STEM subjects and humanities and arts subjects.
- in the Golden Triangle group we don't find any increase in the SES gap during the Recession except for PT employment.
- use of network: significant in the groups of white, males, and law and business subjects but not in the counterpart groups ($\sim$ quality of job)
- distance HEI-work: SES gap not found only in the ex-polytechnics group.

Table groups $\Rightarrow$ need to investigate this better with fully interacted

Robustness checks

- Including distance home-HEI * SES

  Distance*SES

- Including tariff score (from year of graduation 2005/06)

  Tariff score

- Restricting to 3-year courses

  3-year courses only

Summary

- Higher unemployment at the time of graduation pushes young people to stay in education
- Less so for low-SES students, who end up being in unemployment
- Among those who find a job, low-SES students are more likely to get a PT job
- Evidence that there might also be SES-differences in the quality of the job found
- Evidence that social network and geographical mobility might explain why the gap between high and low SES graduates increases during downturns
- The Great Recession has significantly increased the SES-gap in graduate outcomes!

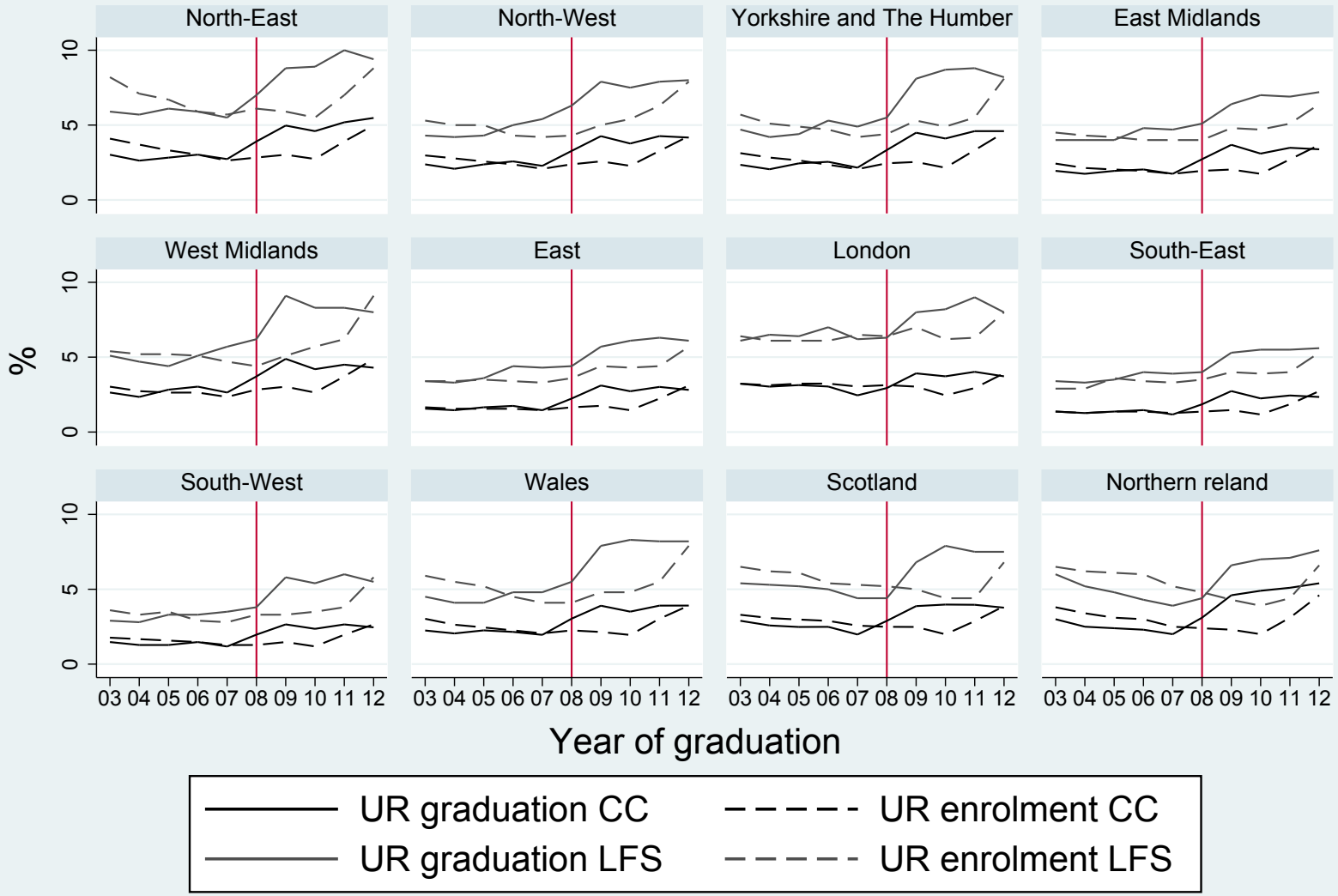
Summary

- Higher unemployment at the time of graduation pushes young people to stay in education
- Less so for low-SES students, who end up being in unemployment
- Among those who find a job, low-SES students are more likely to get a PT job
- Evidence that there might also be SES-differences in the quality of the job found
- Evidence that social network and geographical mobility might explain why the gap between high and low SES graduates increases during downturns
- The Great Recession has significantly increased the SES-gap in graduate outcomes!

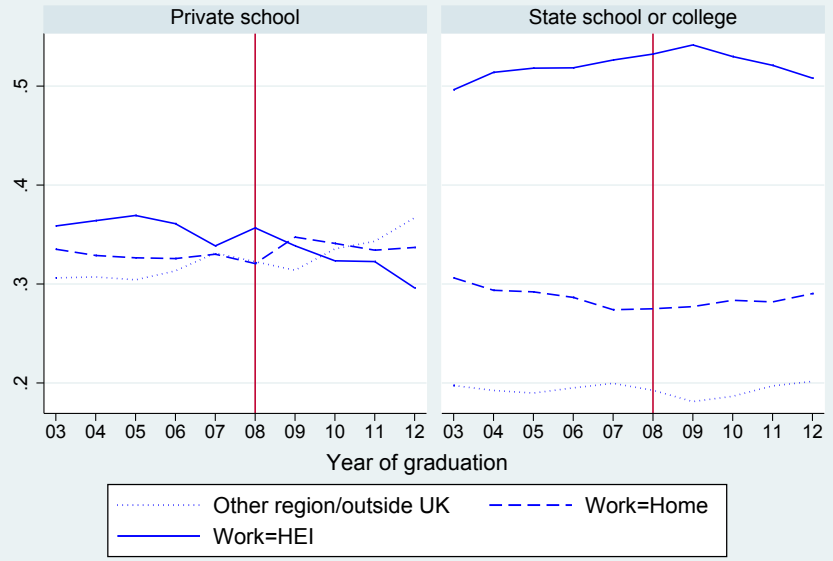
Directions for future research

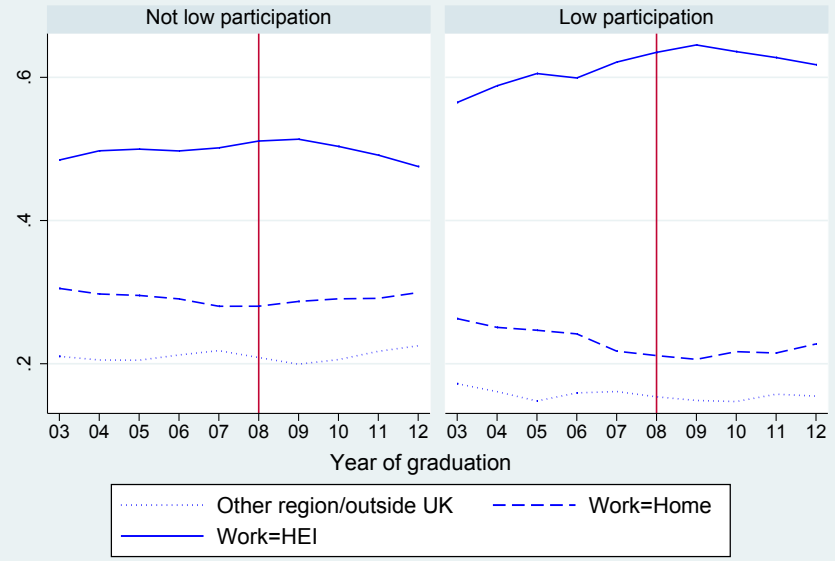
- Different measure of SES (Index of Multiple Deprivation)
- Check possible changes in "academic" behavior of cohorts studying/enrolling during recession
- Use LFS-imputed wages
- Consider what happens 3 and 1/2 years after graduation

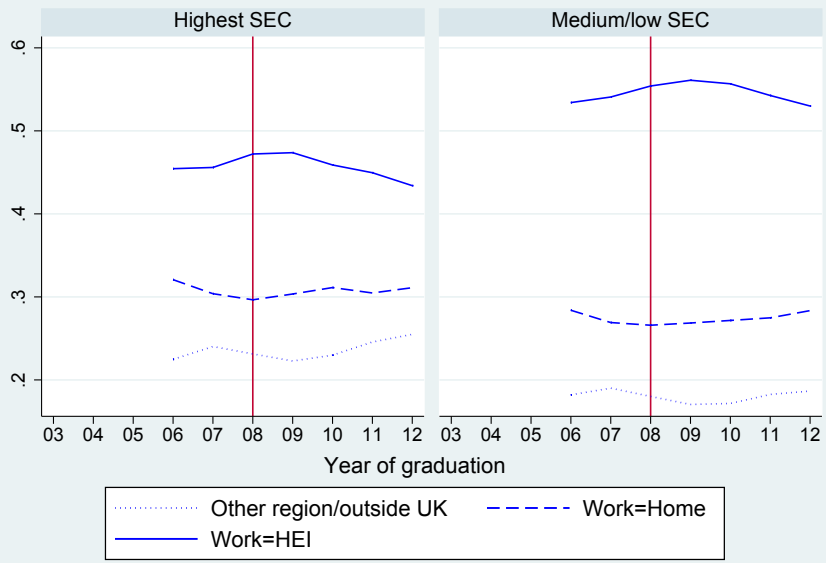
UR by region and source



Region where graduates are observed to work







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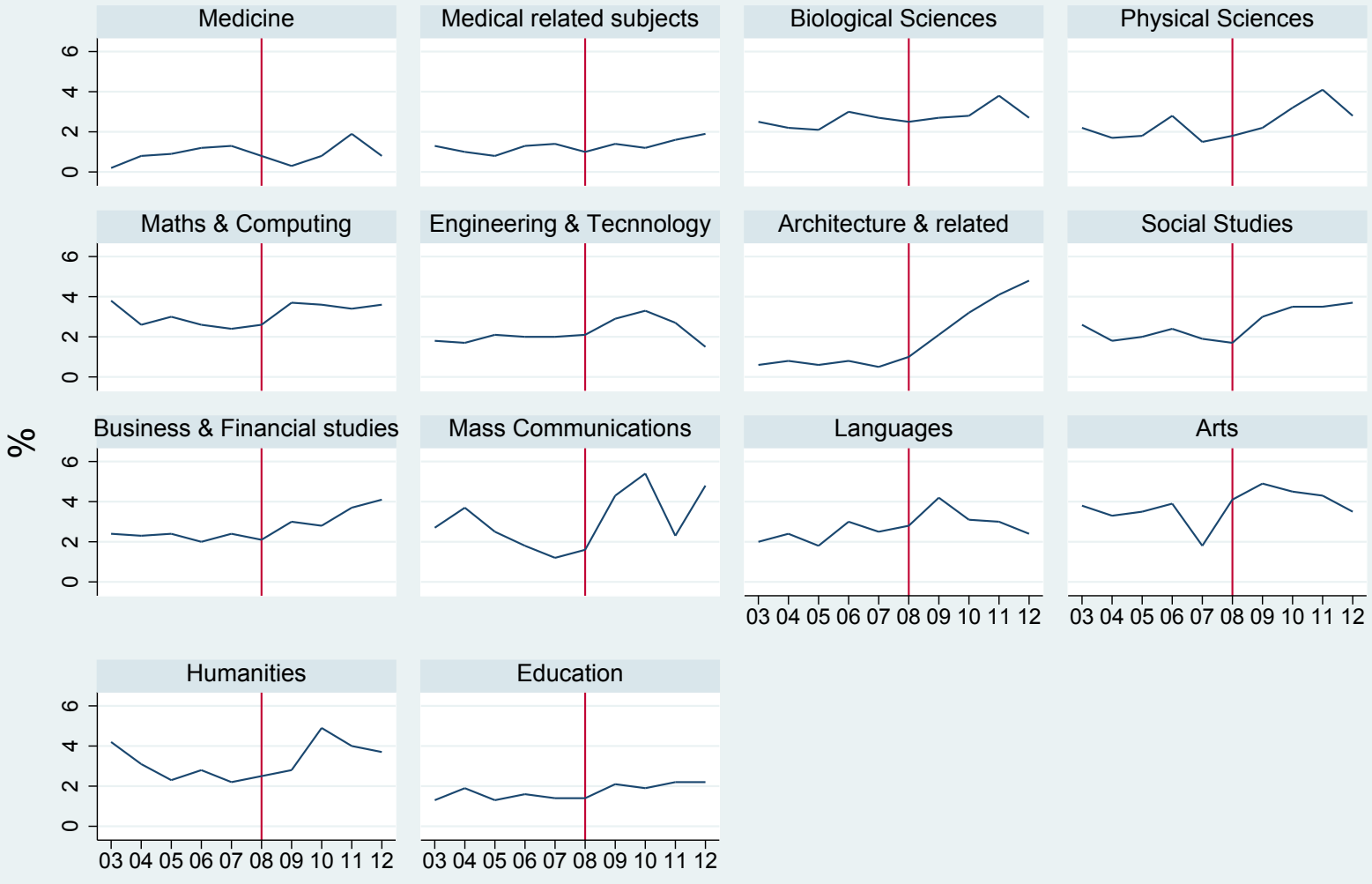
UR by field of study



Academic differences

	1. LPN		2. School		3. PSEC	
	LPN	**Non-LPN**	**State school**	**Private school**	**Low PSEC**	**High PSEC**
Tariff score (quintile)	2.57	2.96	2.85	3.57	2.75	3.18
	(1.40)	(1.43)	(1.43)	(1.25)	(1.41)	(1.41)
First	.14	.14	.14	.14	.14	.16
	(.32)	(.34)	(.34)	(.35)	(.34)	(.37)
2:1	.49	.52	.52	.55	.52	.55
	(.50)	(.50)	(.50)	(.50)	(.50)	(.50)
2:2	.32	.27	.28	.21	.28	.23
	(.47)	(.44)	(.45)	(.40)	(.45)	(.42)
Pass	.05	.04	.04	.03	.04	.03
	(.23)	(.20)	(.20)	(.17)	(.20)	(.17)
Unclassified	.03	.03	.03	.07	.02	.03
	(.14)	(.18)	(.16)	(.25)	(.15)	(.18)
STEM subject	.37	.37	.38	.38	.37	.37
	(.48)	(.48)	(.48)	(.48)	(.48)	(.48)
Golden Triangle	.02	.07	.05	.20	.04	.08
	(.15)	(.25)	(.22)	(.40)	(.20)	(.27)
Russell Group	.14	.22	.19	.46	.18	.29
	(.37)	(.45)	(.42)	(.50)	(.40)	(.47)
Ex-polytechnics	.44	.34	.37	.13	.40	.29
	(.50)	(.47)	(.48)	(.34)	(.49)	(.45)

back

Academic differences

	1. LPN		2. School		3. PSEC	
	LPN	Non-LPN	State school	Private school	Low PSEC	High PSEC
Tariff score (quintile)	2.57	2.96	2.85	3.57	2.75	3.18
	(1.40)	(1.43)	(1.43)	(1.25)	(1.41)	(1.41)
First	.14	.14	.14	.14	.14	.16
	(.32)	(.34)	(.34)	(.35)	(.34)	(.37)
2:1	.49	.52	.52	.55	.52	.55
	(.50)	(.50)	(.50)	(.50)	(.50)	(.50)
2:2	.32	.27	.28	.21	.28	.23
	(.47)	(.44)	(.45)	(.40)	(.45)	(.42)
Pass	.05	.04	.04	.03	.04	.03
	(.23)	(.20)	(.20)	(.17)	(.20)	(.17)
Unclassified	.03	.03	.03	.07	.02	.03
	(.14)	(.18)	(.16)	(.25)	(.15)	(.18)
STEM subject	.37	.37	.38	.38	.37	.37
	(.48)	(.48)	(.48)	(.48)	(.48)	(.48)
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	(.15)	(.25)	(.22)	(.40)	(.20)	(.27)
Russell Group	.14	.22	.19	.46	.18	.29
	(.37)	(.45)	(.42)	(.50)	(.40)	(.47)
Ex-polytechnics	.44	.34	.37	.13	.40	.29
	(.50)	(.47)	(.48)	(.34)	(.49)	(.45)

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Work found through friends/family

	1. LPN		2. School		3. PSEC	
	LPN	Non-LPN	State school	Private school	Low PSEC	High PSEC
Social network	.21	.23	.22	.26	.21	.22
	(.40)	(.42)	(.41)	(.43)	(.41)	(.42)

back

Differences in propensity to move

	1. LPN		2. School		3. PSEC	
	LPN	Non-LPN	State school	Private school	Low PSEC	High PSEC
Distance home-work	57.10	64.95	61.54	86.44	56.67	70.43
	(84.49)	(92.46)	(89.27)	(105.20)	(87.04)	(95.50)
Distance HEI-work	71.89	90.50	85.05	124.80	81.43	100.29
	(85.73)	(96.96)	(92.66)	(112.21)	(92.24)	(100.85)

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	State school * regional UR			
	Unemployed	Paid work	Post. Study	PT work
Without wild bootstrap	0.005**	-0.000	-0.006**	0.019**
	(0.001)	(0.003)	(0.002)	(0.001)
With wild bootstrap (100 reps)	0.005**	-0.000	-0.006*	0.019**
	(0.000)	(1.304e+19)	(0.003)	(0.000)
With wild bootstrap (499 reps)	0.005**	-0.000	-0.006**	0.019**
	(0.000)	(0.002)	(0.002)	(0.000)
N	1,079,196	1,079,196	1,079,196	676,729

	State school * regional UR				
	Salary	Matched job	Permanent contr.	Large firm	Network
Without wild bootstrap	-0.003	-0.004*	-0.003	0.005+	-0.007*
	(0.003)	(0.002)	(0.002)	(0.002)	(0.003)
With wild bootstrap (100 reps)	-0.003	-0.004+	-0.003	0.005	-0.007+
	(0.002)	(0.003)	(0.002)	(0.003)	(0.004)
With wild bootstrap (499 reps)	-0.003	-0.004*	-0.003	0.005	-0.007*
	(0.003)	(0.002)	(0.002)	(0.003)	(0.003)
N	305,553	553,866	593,102	481,132	470,275

Note: ** p-value<0.001; * p-value<0.05; + p-value<0.10. Regional unemployment rate derived from the Claimant Count and calculated in the region where individuals were living before going to university ("home").

back

Robustness checks - Distance * SES

	Unemployed	Paid work	Post. Study	PT work	Salary	Matched job	Permanent contr.	Large firm	Network
State school * UR major	0.004**	-0.000	-0.003	0.014**	-0.028**	-0.013	0.008	0.012*	-0.013**
	(0.001)	(0.005)	(0.005)	(0.003)	(0.007)	(0.008)	(0.008)	(0.004)	(0.004)
Distance	-0.000	0.010**	-0.013**	-0.051**	0.016*	0.017*	-0.039**	-0.010**	-0.002
	(0.001)	(0.003)	(0.003)	(0.005)	(0.006)	(0.006)	(0.003)	(0.003)	(0.002)
Distance2	0.000	-0.000**	0.000**	0.000**	-0.000+	-0.000*	0.000**	0.000	0.000+
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
N	960,625	960,625	960,625	604,328	273,152	495,627	530,234	431,471	419,598
R-squared	0.027	0.068	0.082	0.066	0.246	0.199	0.059	0.062	0.025
	Unemployed	Paid work	Post. Study	PT work	Salary	Matched job	Permanent contr.	Large firm	Network
State school * UR major	0.004**	0.000	-0.004	0.015**	-0.027**	-0.013	0.008	0.013*	-0.013**
	(0.001)	(0.005)	(0.005)	(0.003)	(0.007)	(0.008)	(0.008)	(0.004)	(0.004)
Distance	0.002	0.011+	-0.016*	-0.012*	0.025**	0.012*	-0.011*	0.001	0.005
	(0.002)	(0.006)	(0.007)	(0.005)	(0.005)	(0.005)	(0.005)	(0.009)	(0.007)
Distance2	-0.000	-0.000+	0.000*	0.000+	-0.000*	-0.000	0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
State school * distance	-0.003	-0.000	0.003	-0.044**	-0.010	0.006	-0.031**	-0.012	-0.007
	(0.002)	(0.007)	(0.008)	(0.004)	(0.006)	(0.006)	(0.005)	(0.009)	(0.008)
State school * distance2	0.000	-0.000	0.000	0.000**	0.000	-0.000+	0.000**	0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
N	960,625	960,625	960,625	604,328	273,152	495,627	530,234	431,471	419,598
R-squared	0.027	0.068	0.082	0.066	0.246	0.199	0.060	0.062	0.025

Note: ** p-value<0.001; * p-value<0.05; + p-value<0.10. Regional unemployment rate derived from the Claimant Count and calculated in the region where individuals were living before going to university ("home").

back

Robustness checks - 3-year courses only

	Unemployed	Paid work	Post. Study	PT work	Salary	3-year courses
State school * regional UR (home)	0.005**	0	-0.006**	0.019**	-0.003	no
	-0.001	-0.003	-0.002	-0.001	-0.003	
N	1,079,196	1,079,196	1,079,196	676,729	305,553	
State school * regional UR (home)	0.005**	0.000	-0.006**	0.023**	-0.009**	yes
	(0.001)	(0.003)	(0.002)	(0.001)	(0.002)	
N	853,011	853,011	853,011	524,693	230,061	
State school * UR major	0.002+	-0.002	-0.001	0.007**	-0.012*	no
	(0.001)	(0.003)	(0.002)	(0.002)	(0.005)	
N	1,066,050	1,066,050	1,066,050	672,461	302,109	
State school * UR major	0.006**	0.001	-0.009**	0.015**	-0.011	yes
	(0.001)	(0.004)	(0.002)	(0.003)	(0.006)	
N	734,440	734,440	734,440	452,292	197,660	

	Matched job	Permanent contr.	Large firm	Network	3-year courses
State school * regional UR (home)	-0.004*	-0.003	0.005+	-0.007*	no
	-0.002	-0.002	-0.002	-0.003	
N	553,866	593,102	481,132	470,275	
State school * regional UR (home)	-0.006**	-0.003	0.005	-0.006	yes
	(0.002)	(0.002)	(0.003)	(0.003)	
N	428,710	460,301	371,103	366,297	
State school * UR major	-0.006	0.007	0.007**	-0.003	no
	(0.004)	(0.005)	(0.002)	(0.004)	
N	551,476	589,636	480,296	472,421	
State school * UR major	-0.003	0.013	0.006	-0.008+	yes
	(0.009)	(0.007)	(0.005)	(0.004)	
N	370,471	397,433	321,442	315,620	

Note: ** p-value<0.001; * p-value<0.05; + p-value<0.10. Regional unemployment rate derived from the Claimant Count and calculated in the region where individuals were living before going to university ("home").

back

Robustness checks - Tariff score

	Unemployed	Paid work	Post. Study	PT work	Salary	Tariff score
State school * regional UR (home)	0.005**	0	-0.006**	0.019**	-0.003	no
	-0.001	-0.003	-0.002	-0.001	-0.003	
N	1,079,196	1,079,196	1,079,196	676,729	305,553	
State school * regional UR (home)	0.004**	-0.002	-0.004	0.017**	-0.005*	yes
	(0.001)	(0.003)	(0.002)	(0.001)	(0.002)	
N	702,082	702,082	702,082	428,800	197,989	
State school * UR major	0.002+	-0.002	-0.001	0.007**	-0.012*	no
	(0.001)	(0.003)	(0.002)	(0.002)	(0.005)	
N	1,066,050	1,066,050	1,066,050	672,461	302,109	
State school * UR major	0.004**	-0.002	-0.003	0.014**	-0.026**	yes
	(0.001)	(0.006)	(0.005)	(0.003)	(0.008)	
N	622,454	622,454	622,454	381,359	176,777	

	Matched job	Permanent contr.	Large firm	Network	Tariff score
State school * regional UR (home)	-0.004*	-0.003	0.005+	-0.007*	no
	-0.002	-0.002	-0.002	-0.003	
N	553,866	593,102	481,132	470,275	
State school * regional UR (home)	-0.002	-0.001	0.003	-0.006*	yes
	(0.003)	(0.002)	(0.002)	(0.002)	
N	356,350	381,076	308,145	289,278	
State school * UR major	-0.006	0.007	0.007**	-0.003	no
	(0.004)	(0.005)	(0.002)	(0.004)	
N	551,476	589,636	480,296	472,421	
State school * UR major	-0.015+	0.006	0.010*	-0.013**	yes
	(0.008)	(0.008)	(0.004)	(0.004)	
N	317,461	339,194	275,105	257,168	

Note: ** p-value<0.001; * p-value<0.05; + p-value<0.10. Regional unemployment rate derived from the Claimant Count and calculated in the region where individuals were living before going to university ("home").

back

Heterogeneity

	Public school * UR home									
	Unemployed	Paid work	Study	PT work	Salary	Qualification	Permanent contr.	Large Firm	Network	Distance HEI-work
Females	0.003**	0.005	-0.007**	0.017**	-0.001	0.000	-0.005	0.004	-0.005+	-3.797**
	(0.001)	(0.003)	(0.002)	(0.001)	(0.004)	(0.002)	(0.003)	(0.004)	(0.003)	(0.487)
Males	0.007**	-0.006+	-0.004*	0.021**	-0.005+	-0.009*	0.001	0.006*	-0.011*	-2.373**
	(0.001)	(0.003)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.004)	(0.464)
White	0.003**	0.003	-0.006*	0.017**	-0.005+	-0.004*	-0.002	0.007*	-0.007*	-3.290**
	(0.001)	(0.003)	(0.002)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.526)
Non-white	0.010**	-0.014**	-0.005**	0.028**	0.004	-0.006	-0.005	-0.005	-0.007	-2.820**
	(0.002)	(0.003)	(0.002)	(0.006)	(0.006)	(0.004)	(0.005)	(0.006)	(0.006)	(0.822)
STEM	0.004**	-0.002	-0.005**	0.016**	0.003	0.002	-0.004	-0.003	-0.005+	-3.404**
	(0.001)	(0.002)	(0.001)	(0.002)	(0.004)	(0.003)	(0.003)	(0.002)	(0.002)	(0.533)
Non-STEM	0.005**	0.000	-0.007**	0.021**	-0.008*	-0.008**	-0.002	0.010**	-0.009*	-2.860**
	(0.001)	(0.003)	(0.002)	(0.001)	(0.003)	(0.001)	(0.002)	(0.003)	(0.003)	(0.705)
Law/business	0.006*	-0.001	-0.005	0.026**	-0.004	-0.015**	-0.002	0.006	-0.011*	-2.994*
	(0.003)	(0.005)	(0.005)	(0.003)	(0.003)	(0.005)	(0.005)	(0.005)	(0.005)	(1.113)
Humanities/arts	0.005	0.003	-0.008*	0.021**	-0.013*	-0.012*	0.000	0.012*	-0.006	-2.155+
	(0.003)	(0.005)	(0.003)	(0.004)	(0.005)	(0.005)	(0.004)	(0.004)	(0.007)	(1.106)
Golden triangle	0.003	-0.005	0.004	0.009*	0.003	-0.006	-0.002	-0.004	-0.003	-2.368+
	(0.002)	(0.003)	(0.004)	(0.003)	(0.007)	(0.004)	(0.004)	(0.003)	(0.004)	(1.097)
Russell group	0.004**	-0.001	-0.002	0.012**	0.001	0.001	-0.003	0.000	-0.007+	-2.907**
	(0.001)	(0.003)	(0.002)	(0.002)	(0.004)	(0.002)	(0.004)	(0.001)	(0.003)	(0.694)
Ex-polytechnics	0.005	-0.003	-0.003	0.023**	0.000	-0.007*	0.004	0.009+	-0.008	-1.830
	(0.003)	(0.003)	(0.002)	(0.003)	(0.004)	(0.003)	(0.003)	(0.005)	(0.005)	(1.098)

Note: ** p-value<0.001; * p-value<0.05; + p-value<0.10.

back

Characteristics of job

%	Region Work=Home	Region Work=HEI	Region Work≠Home/HEI
PT jobs	17	19	7
Matched job	33	38	56
Permanent contr.	58	63	66
Large firm	70	73	77
Network	24	22	20

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