

# The Economics of Higher Education

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# Overview

## **Government intervention in higher education**

- Rationale for government intervention
- What happens in the UK?

## **Financial returns to higher education**

- Methodological challenges and some potential solutions
- UK results

# Government intervention in higher education

# Higher Education: why should government intervene?

## Why does government regulate and subsidise higher education?

Why not rely on market forces?

## The market may produce inefficient outcomes due to:

1. Financial market imperfections
2. Externalities
3. Incomplete Information

# 1. Financial market imperfections

Imagine a world where there was a **completely private market in higher education**.

- Universities would charge unconstrained tuition fees upfront.

**Problem 1:** Students from poorer families may be **credit-constrained**.

- Solved if students **can borrow** (at the risk-free interest rate)

**Problem 2:** Higher education is **financially risky**.

- Solved if students **can insure** against poor outcomes

**If financial markets were perfect, credit constraints and financial risk would not call for government intervention.**

# 1. Financial market imperfections

- However:
  - **No collateral:** Students may not pay in the future.
  - **Adverse Selection:** Students with the highest earnings expectations are likely to opt out.
  - **Moral Hazard:** Insurance may lead students to make less lucrative career choices.
- Consequences:
  - **High interest rates** on private student loans (e.g. US)
  - **No private insurance** available against financial risk
  - Without intervention, **suboptimal level of investment** in higher education

## 2. Externalities

### Substantial non-private returns to (higher) education

- Higher tax revenues (Walker and Zhu, 2013)
- Higher productivity of other workers (Moretti, 2004)
- *Improved health (Heckman et al., 2018)*
- *Lower crime (Lochner and Moretti, 2004; Machin et al., 2011)*
- *Higher civic engagement (Dee, 2004)*
- ...

**Individuals won't take non-private returns into account when deciding on education investment.**

### 3. Incomplete Information

**In order to make optimal decisions, prospective students need complete information.**

Incomplete information on:

- Quality of teaching
- University experience
- Prices (living costs and fees)
- Repayment terms of loans
- Future benefits (earnings, health, happiness...)

**Information e.g. on financial returns and teaching quality is limited.**



# How does the UK government intervene?

## Income contingent student loans

- Government student loan to cover tuition fees and (some) maintenance costs
  - Alleviates credit constraints
- Structure: Repay 9% of income above £25,725 after graduation
  - High repayment threshold provides partial insurance
  - Implicit subsidy is large (nearly half of the loan value)
    - ~90% take out loan → limited adverse selection
  - Moral hazard also appears low (Britton and Gruber, 2019)

# How does the UK government intervene?

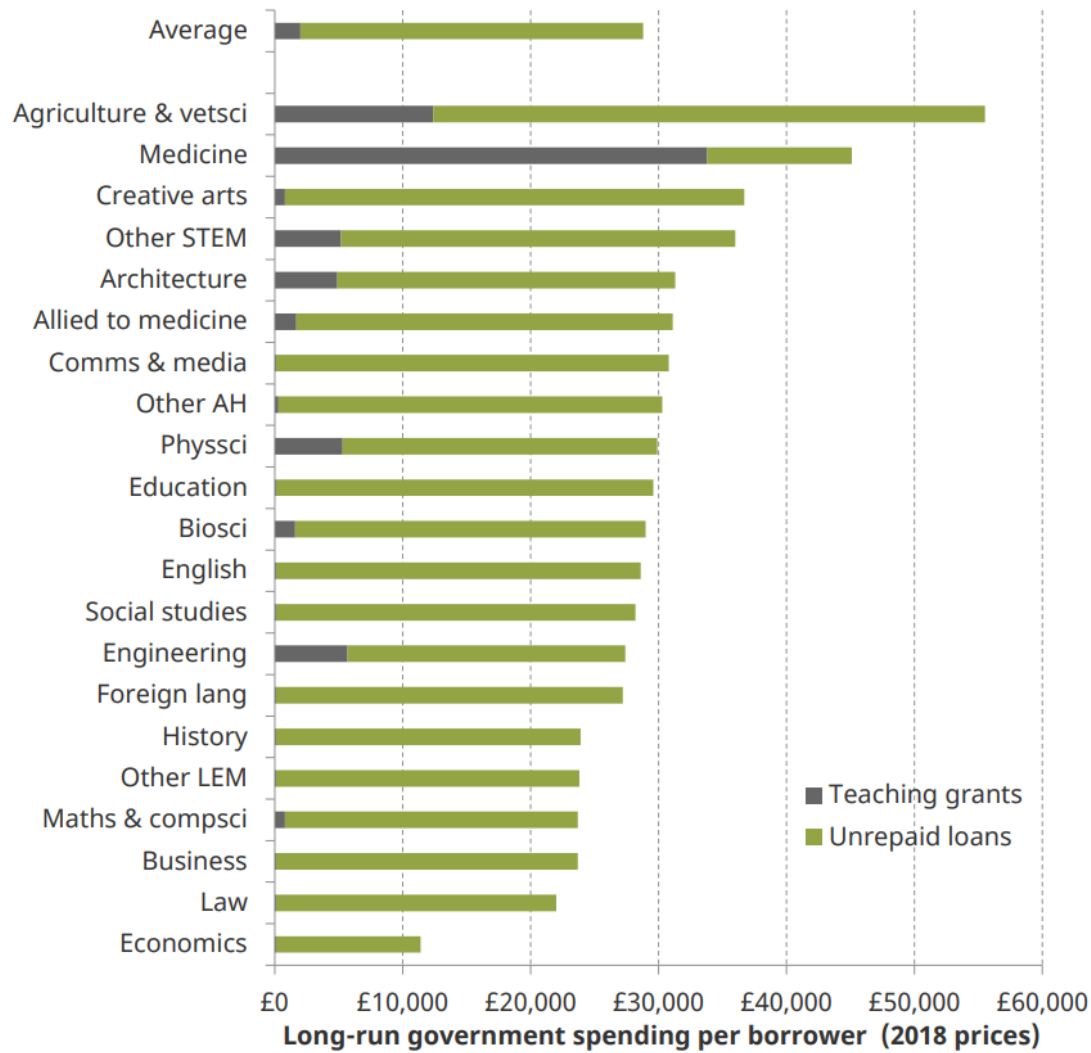
## Additional subsidies to HE

- E.g. teaching grants for medicine/STEM, bursaries for teachers
  - Target subjects with high social returns

## Information provision

- Discover Uni government website
  - Employment and earnings outcomes
  - Student Satisfaction from Surveys
- Teaching Excellence Framework (TEF) assessments

# Efficiency restored?



Source: Belfield et al. (2019)

# Financial returns to higher education

# Measuring course returns is important...

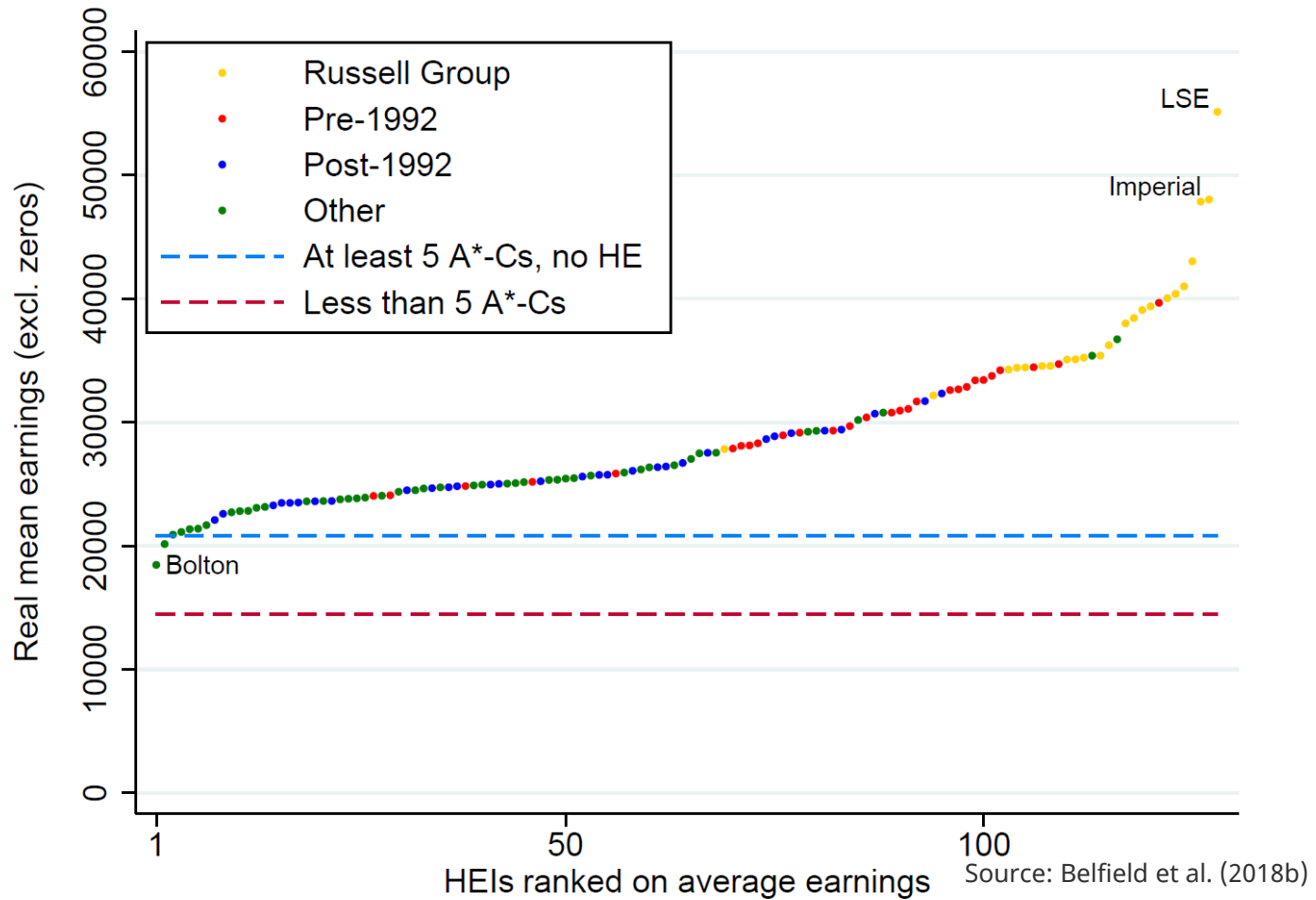
## ... for students

- Attend university or not? Which subject/university?

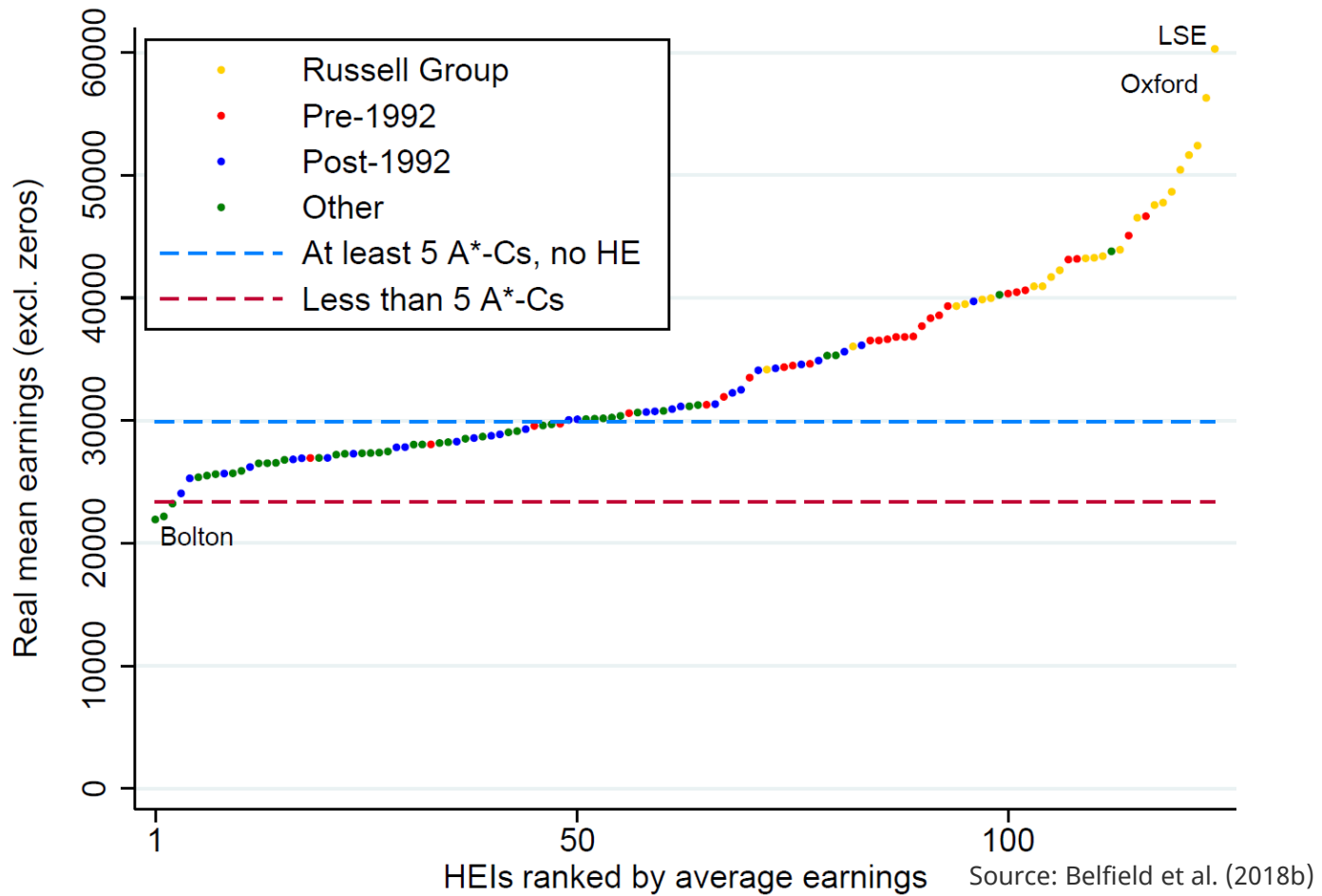
## ... for the government

- University education is expensive: £17bn to get cohort of students through university, £8bn of which paid by government
- The government wants to design the higher education funding system to achieve value-for-money
- higher financial returns to a degree affect both sides of this calculation:
  - *higher* value for students
  - *lower* cost to government

# Earnings at age 29 by institution for women...



# ... and men



## Is this due to the degrees, or due to differences between the students?

- Large differences in family background and prior attainment between universities

|  | Oxford | Kent |
|--|--------|------|
| % from low participation neighbourhood | 3.5%   | 9.3% |
| % private school                       | 42.3%  | 6.6% |
| Mean UCAS tariff                       | 582    | 377  |



# How can we identify returns?

- Need to separate earnings impact of degree from selection bias e.g. due to prior attainment and family background
- Not possible to do a Randomized Controlled Trial (RCT)

## Most common methods

### 1. Regression discontinuity

- make use of thresholds that determine university enrolment

### 2. Standard linear regression with rich controls

- Account for dependence of earnings on prior attainment, socio-economic background, and demographic characteristics

# Standard Linear Regression: Theory

**difference in earnings = causal impact of degree + selection bias**

**Selection bias** arises because students on different programmes differ in characteristics that have an independent effect on earnings. Examples include family background and prior attainment.

**Idea: *control* for these other differences between students**

**Intuition:** by accounting for the earnings impact of other differences between students, we can compare similar individuals who did different degrees (or none).

**Simplest Regression model:**

$$Y_i = \beta_0 + \beta_1 D_i + X_i' \gamma + \epsilon_i$$

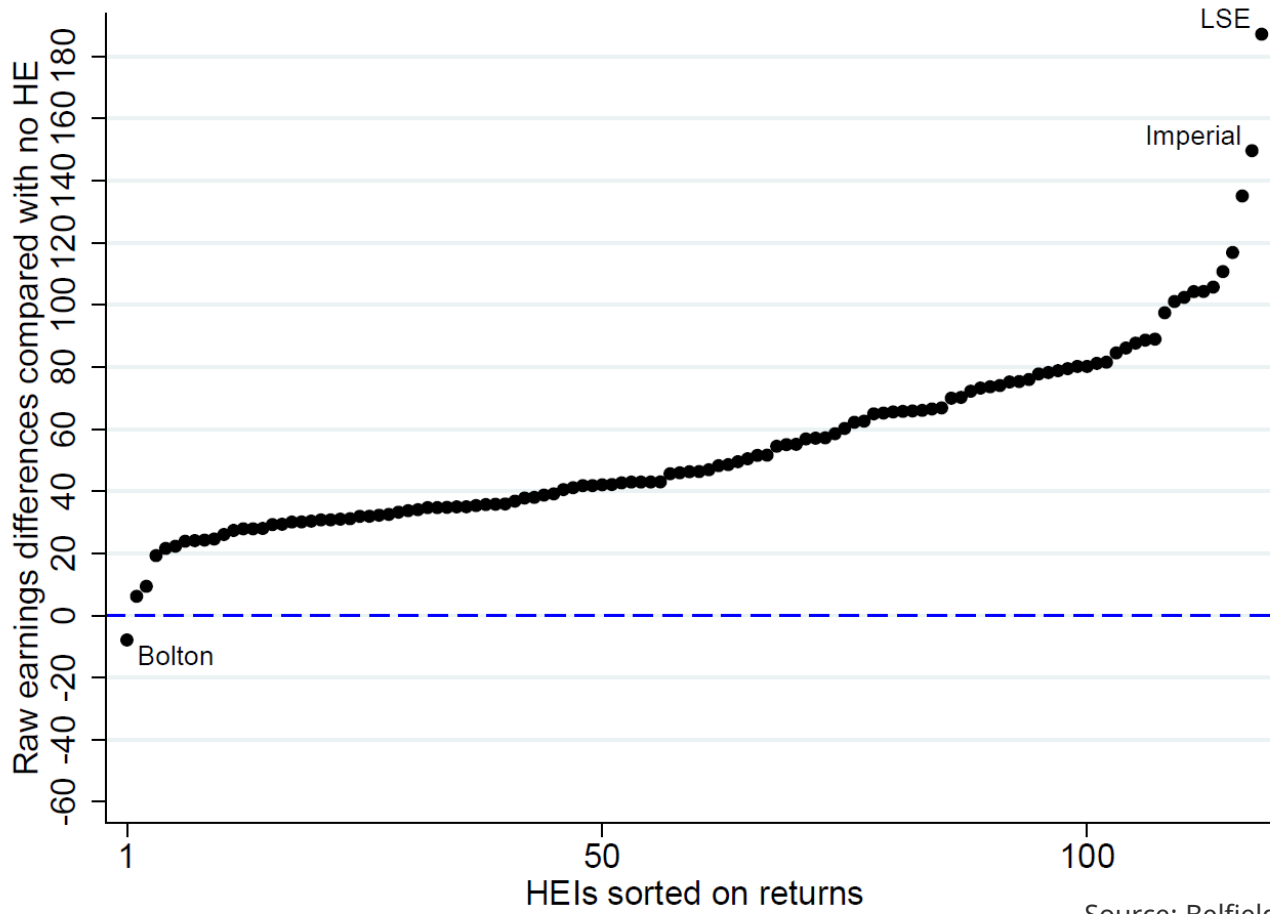
# Standard Linear Regression: Some results

- Results from **Belfield et al. (2018b)**
- Analysis uses the **LEO dataset**, which contains linked school records, university records, and tax records
- LEO data **covers everyone** who took GCSEs in England since 2002
- All results relate to **earnings at age 29**

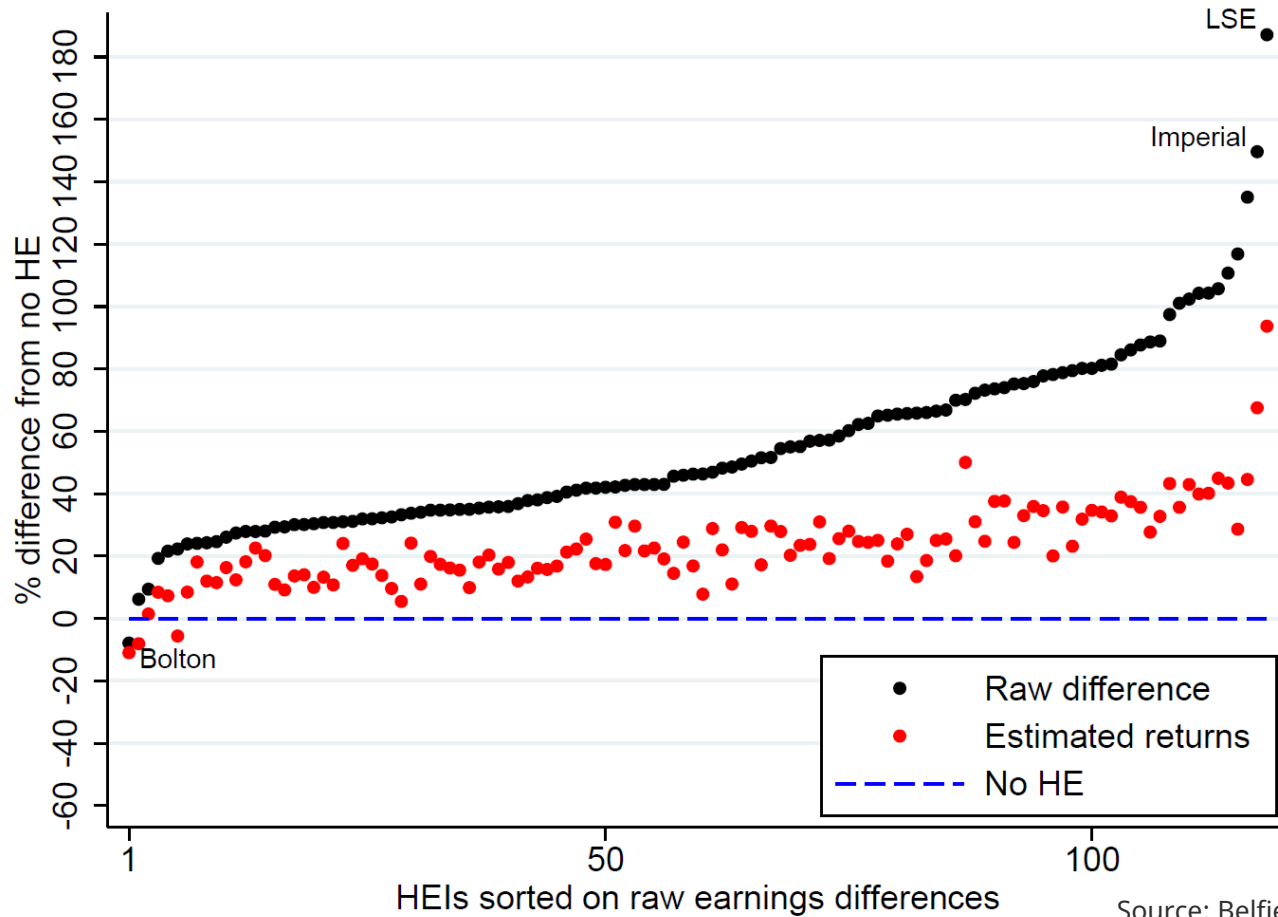
## Control variables

- **prior attainment:** GSCE and A-level choices and results
- **socio-economic background:** Free-school meals, neighbourhood deprivation, independent school
- **demographic characteristics:** ethnicity, region, gender, EAL

# Linear Regression: raw earnings differences for women

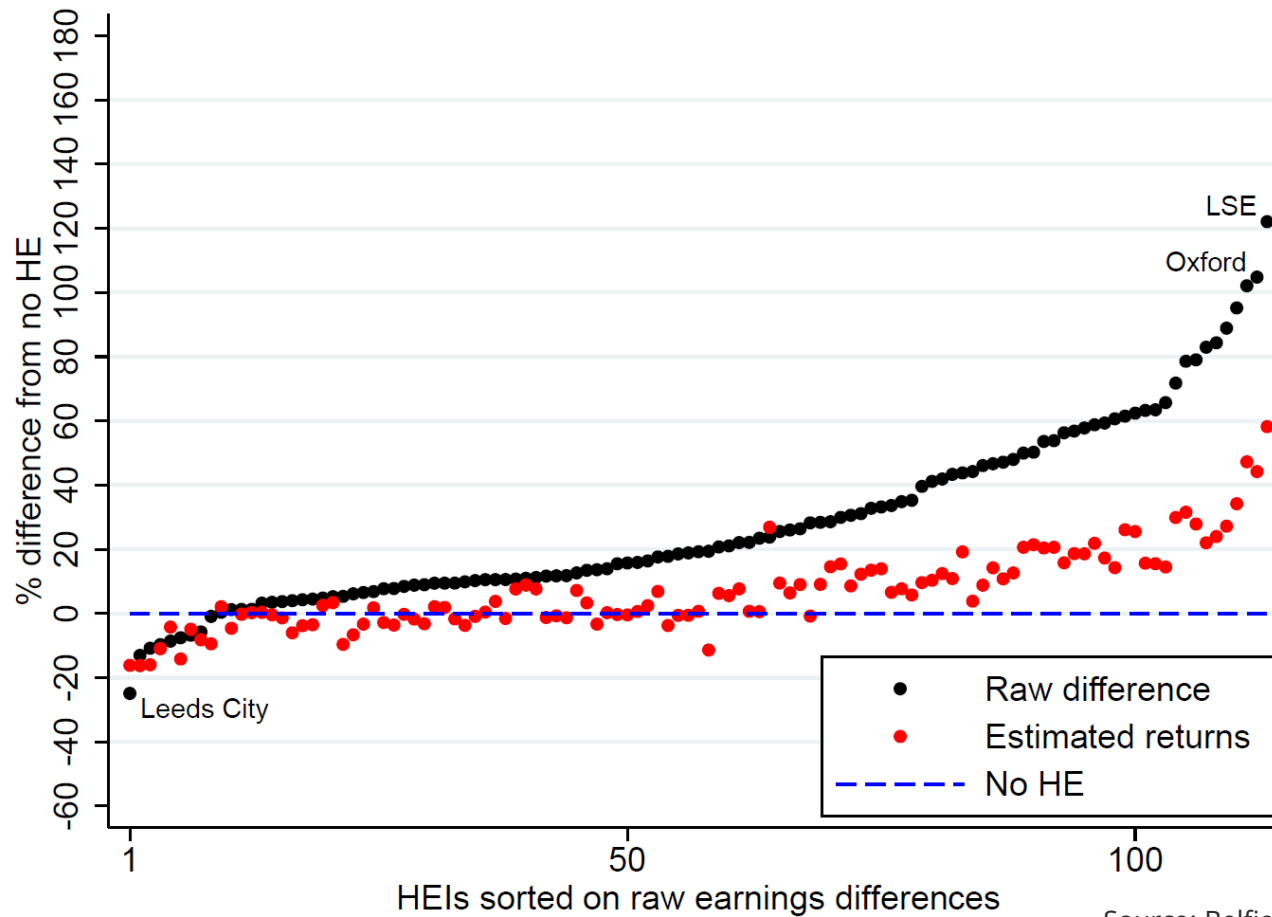


# Linear Regression: returns for women



Source: Belfield et al. (2018b)

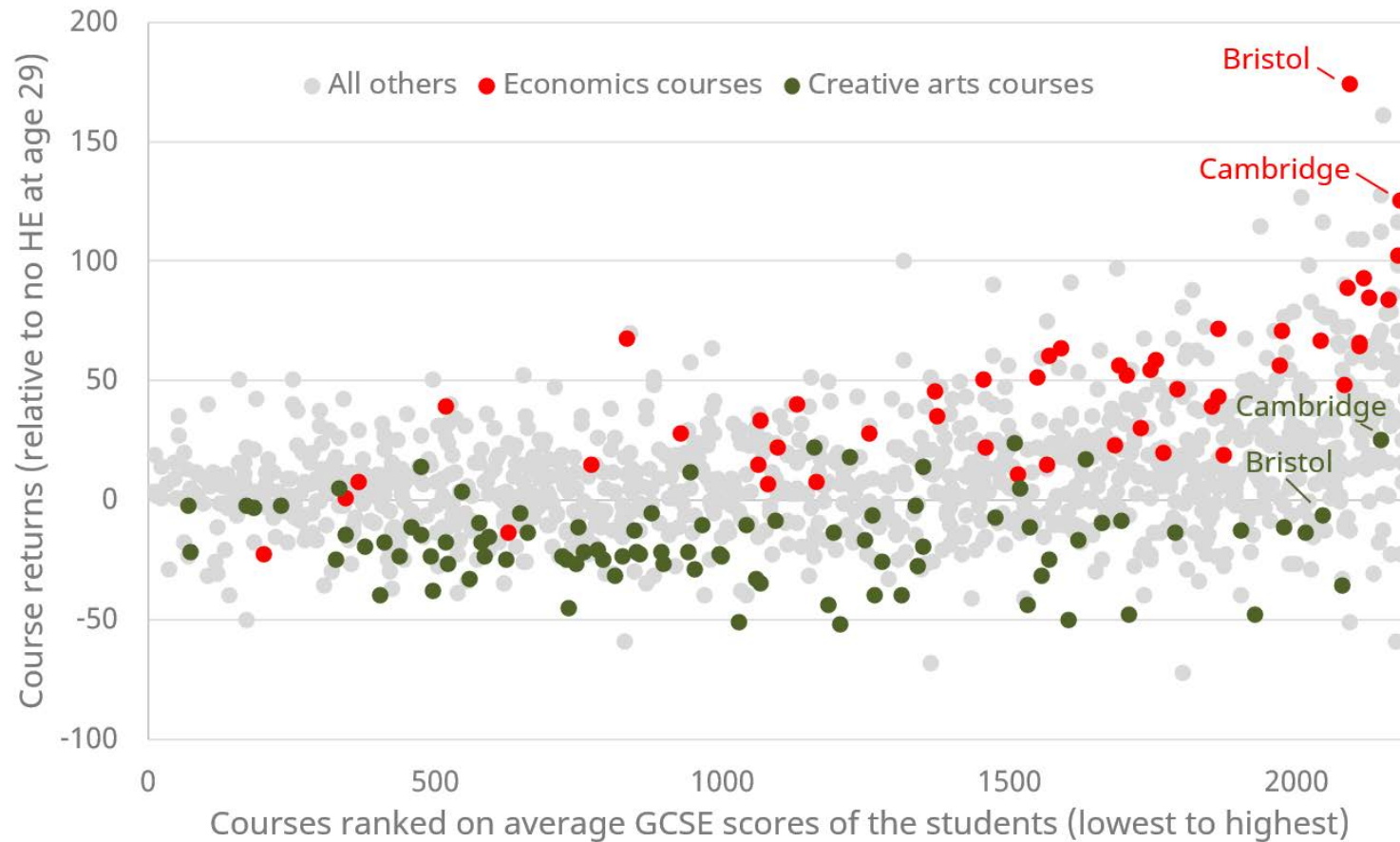
## ... and for men



Source: Belfield et al. (2018b)

# Large differences between subjects

**Figure 9: Course returns for men by average GCSE scores**



Source: Britton et al. (2019)

# Assumption for these results: No selection on unobservables that affect earnings

**If unobserved factors influence both earnings and degree enrolment, our estimates will be biased (*omitted variable bias*).**

## Examples

- *Among people with the same observable characteristics, UCL economics students are more motivated, and more motivated people earn more whether or not they go to university.*
  - We would **overestimate returns**.
- *Among people with the same observable characteristics, UCL economics students are worse at non-academic work, and would therefore have earned less without a degree than others.*
  - We would **underestimate returns**.

**Rich background information in the LEO dataset allows us to control for most relevant factors. Remaining bias could go either way.**



# Conclusion

## **Good economic reasons for government to intervene in higher education**

- Financial market imperfections
- Externalities
- Incomplete Information

## **Raw earnings differences overstate the private returns to a degree**

- Universities with higher earnings usually take in brighter students from wealthier backgrounds than average
- Among other methods, can use regression discontinuity or standard linear regression with rich controls to get at returns
- There is large variation in returns between different courses