

# Mismatch in higher education: prevalence, drivers and outcomes

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# Motivation

- Considerable interest in widening participation in higher education
- Until recently there has been less interest in the courses that students attend
- Belfield et al. (2018) highlight large differences in returns to different courses in the labour market
- We ask: How well matched are students to courses? Are there inequalities in mismatch? What is driving these inequalities?
- Two forms of mismatch:
  - Undermatch: students in courses that are lower 'quality' than expected
  - Overmatch: students in courses that are higher 'quality' than expected

# Why does this matter?

- Undermatch: students in courses that are lower ‘quality’ than expected
  - They may enjoy other dimensions and characteristics of a university
  - They may gain from being a ‘big fish in a small pond’
  - But attending a lower quality institution has implications; lower attaining peers, lower spending per student, lower returns
- Overmatch: students in courses that are higher ‘quality’ than expected
  - They benefit from attending a high quality institution: more prestigious, higher return
  - But less selective courses may be better at graduating less well prepared students

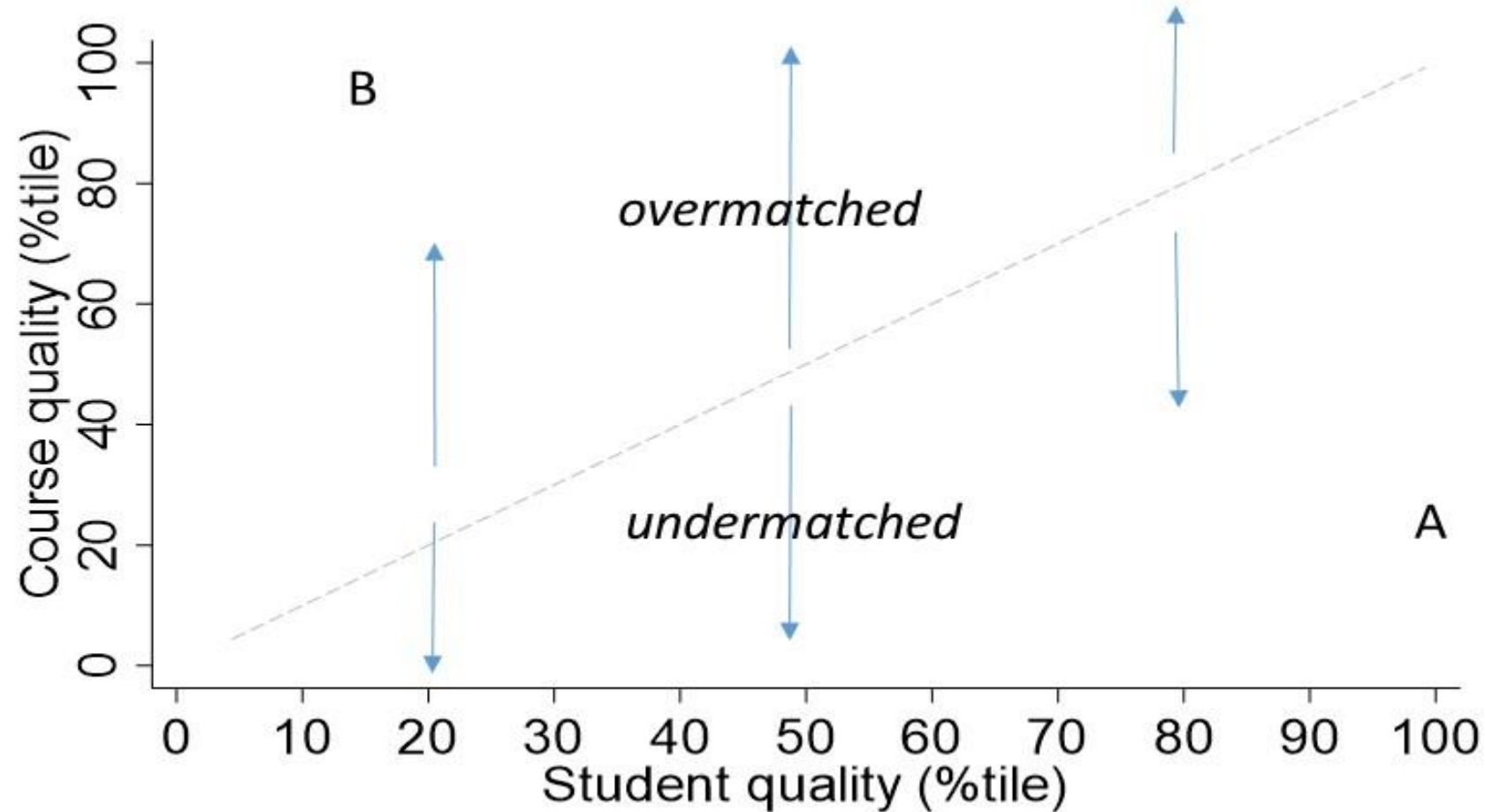
# Some caveats

- ‘Quality’ is an emotive word – there are multiple dimensions of university course ‘quality’ – we focus here on two: the achievement of peers on the course, and the median labour market earnings of previous graduates
- Higher education is about much more than just what people earn afterwards – people go to university to learn new topics, broaden their experiences, meet new people, live somewhere else in some cases etc.
- **But this still matters!** We know that the course attended is associated with later outcomes – inequalities across groups, such as deprived pupils or women, conditional on their prior attainment, have likely **important consequences for social mobility and the gender pay gap**
- We estimate average effects for broad groups of the population (with very large amounts of data) – there are always exceptions to the rule!

# Overview

1. Defining mismatch in higher education
2. Extent of mismatch in England
3. Inequalities in mismatch by SES and gender
4. Drivers of mismatch
5. Policy implications

# 1. Defining mismatch



# 1. Defining mismatch

*Mismatch = Course Percentile - Student Percentile*

## Two definitions of mismatch

1) **Academic Mismatch:** Difference between a student's national academic percentile rank and the course's national academic percentile rank

- *Matched: Higher attaining students enrol in courses with higher attaining peers*

2) **Earnings Mismatch:** Difference between a student's national academic percentile rank and the course's national graduate earnings percentile rank

- *Matched: Higher attaining students enrol in courses with higher future earnings*

# 1. Data

- **NPD**: individual-level administrative data on state-school students in England
- Student demographics, test scores/exam results at 11, 16 and 18, and school attended.
- Quintiles of Socio Economic Status (SES): Index of Free School Meals, & neighbourhood characteristics at 16 (as in Chowdry et al., 2013, JRSSA)
- **HESA**: individual-level administrative data on every course in every university in UK (1,722 different university courses) – median student's achievement on course
- **LEO**: aggregated earnings data for 23 subject categories at each university compiled from tax records by the Department for Education – median earnings 5 years after graduation
- Our cohort: age 16 exams in 2006, age 18 exams in 2008, uni entry at 18 or 19 in 2008 or 2009 (N=138,535)

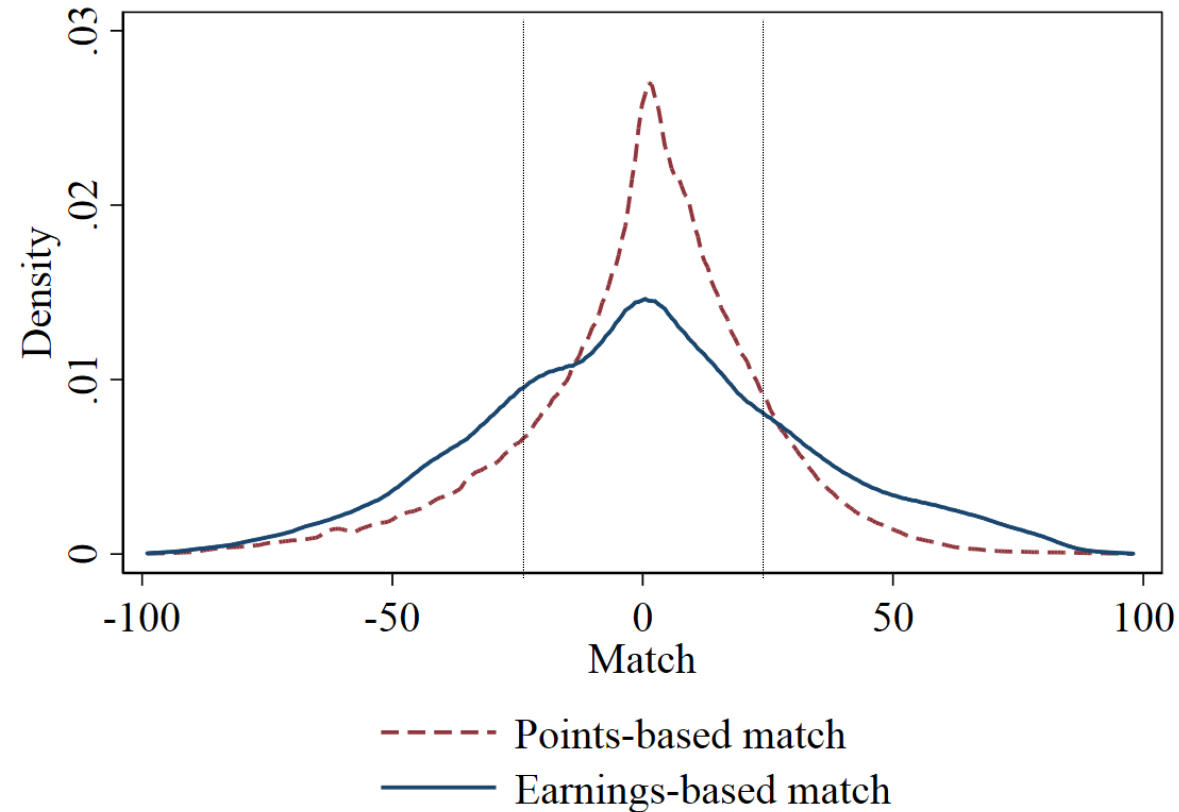


# 1. Data

## **Contributions from using this detailed linked-administrative data**

- We can look across the distribution of attainment
- We can look across the distribution of mismatch
- We can measure mismatch at the course (inst\*subject) level
- We can explore key drivers, including school measures

## 2. Extent of mismatch

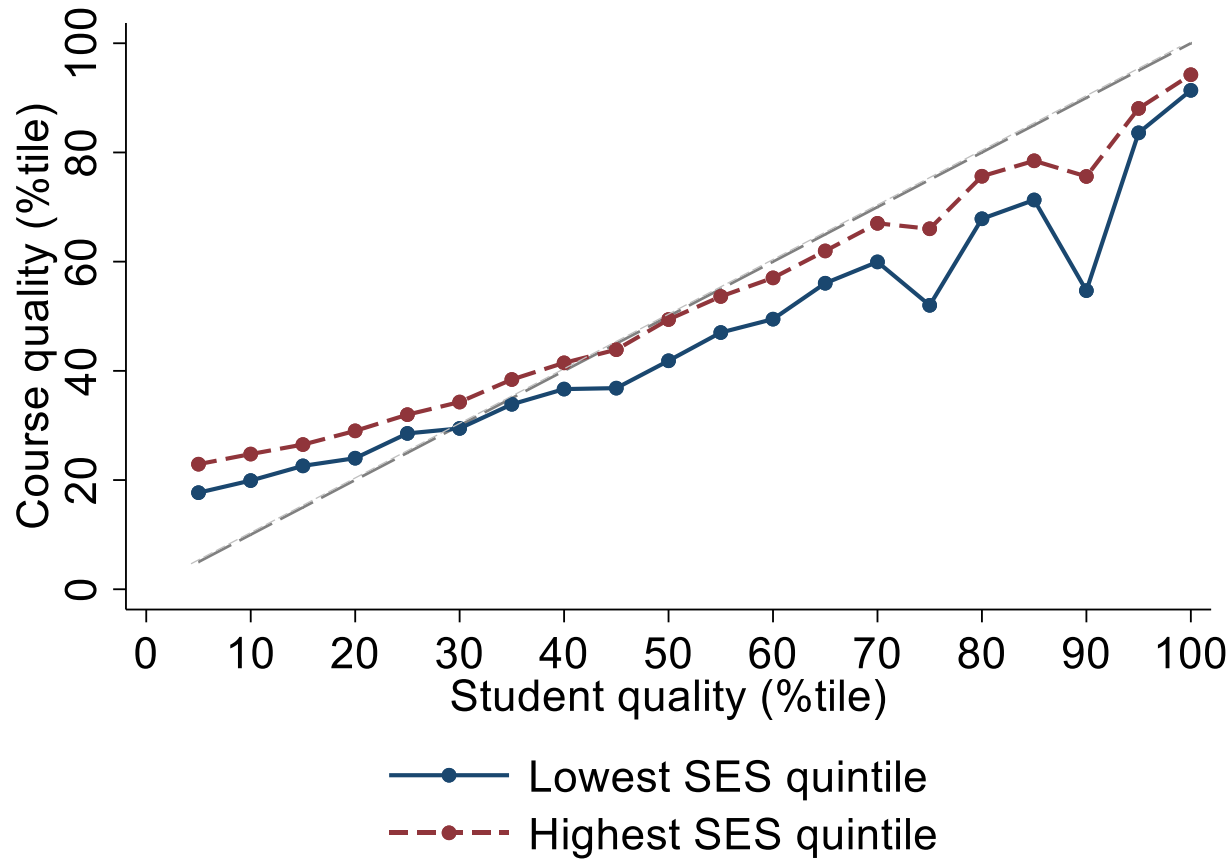


15% over/under matched points-based match

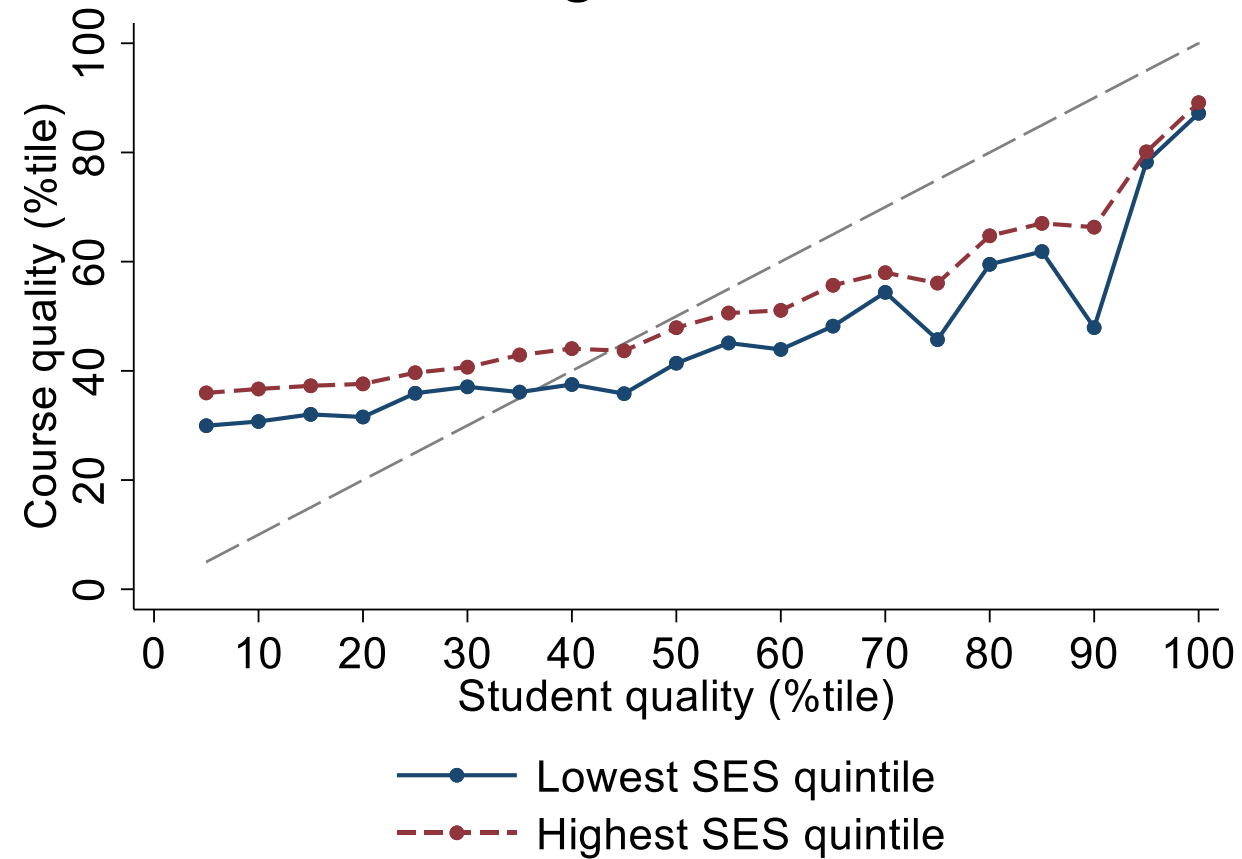
23% over/under matched earnings-based match

# 3. Inequalities in mismatch - SES

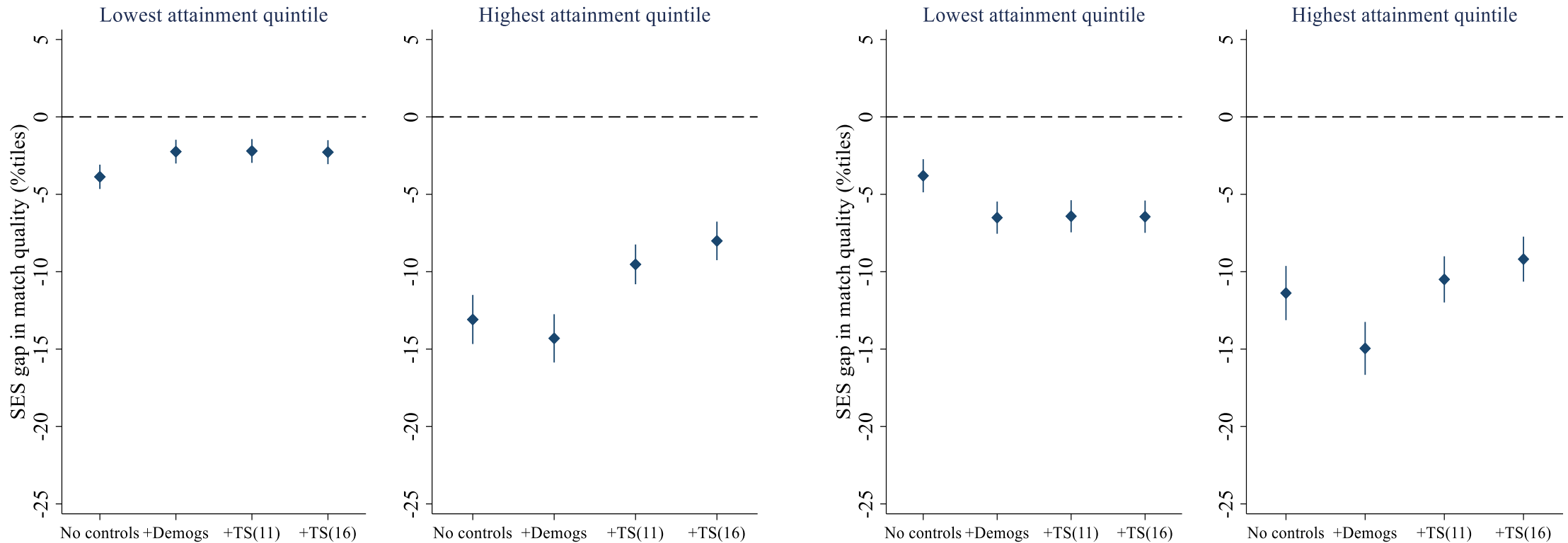
## Academic Mismatch



## Earnings Mismatch



# 3. Inequalities in mismatch - SES



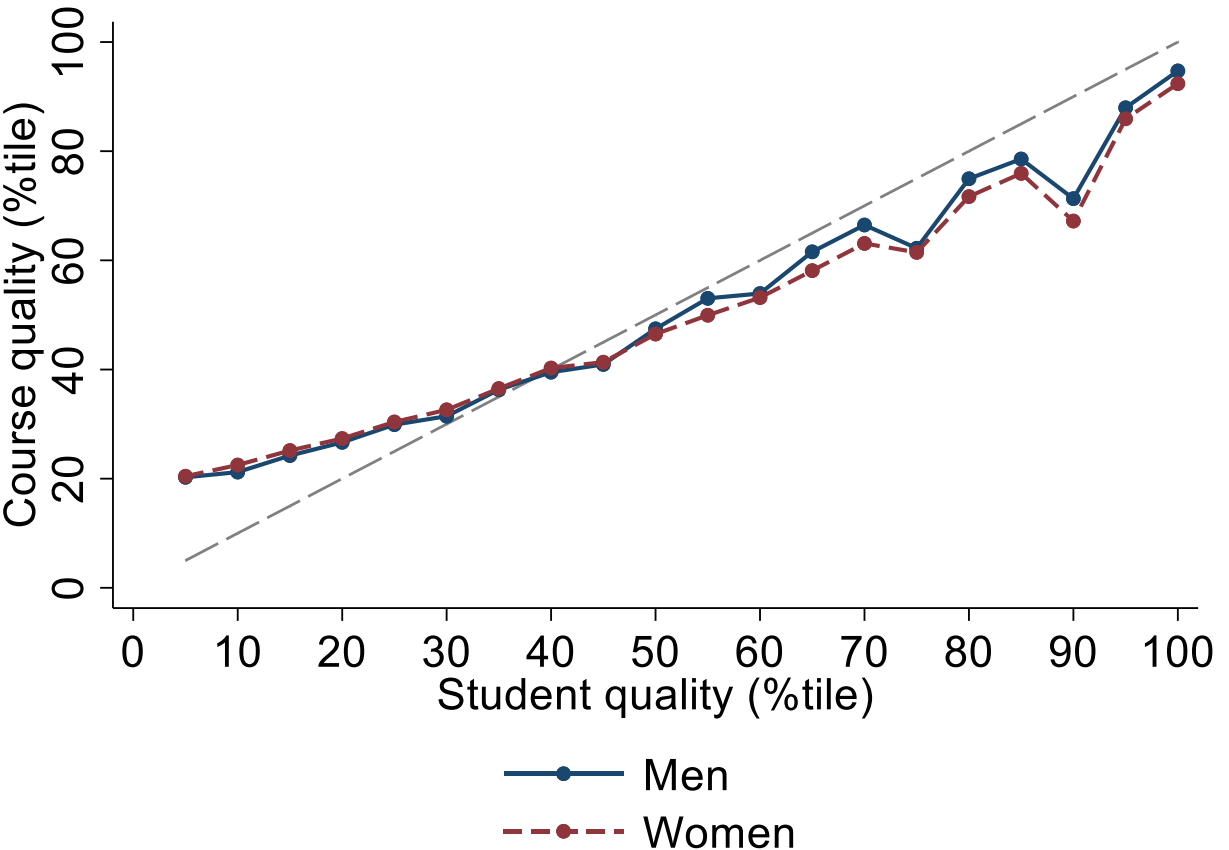
Academic Mismatch

Earnings Mismatch

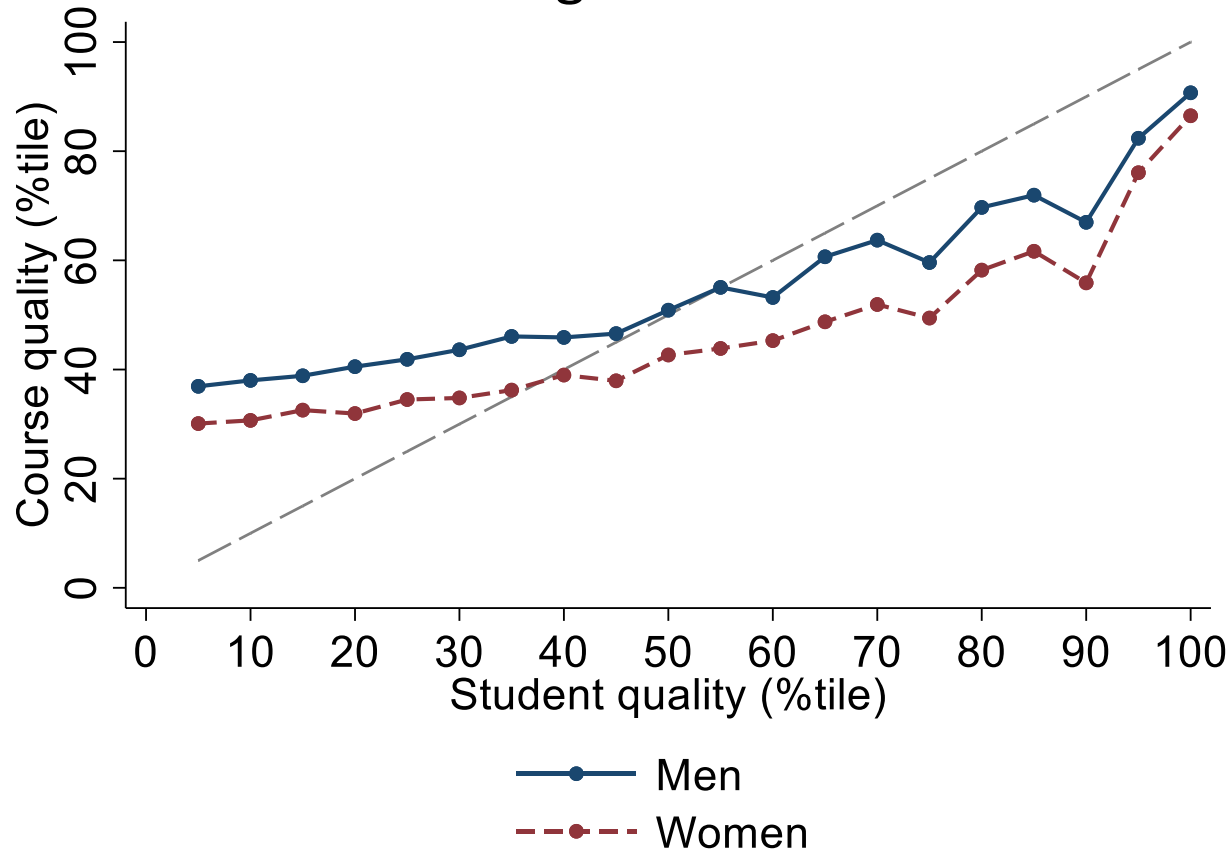
Column 1) Raw association; 2) Cond. on ethnicity, EAL, region; 3) + KS2; 4) + KS4

# 3. Inequalities in mismatch - gender

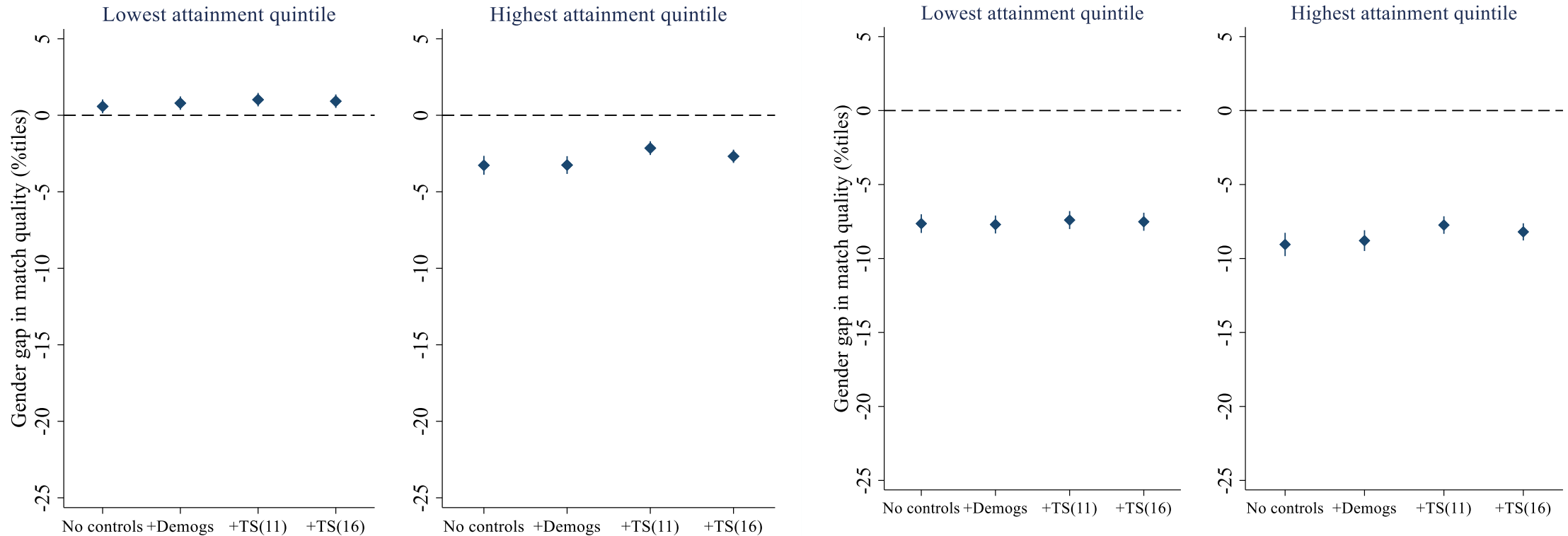
Academic Mismatch



Earnings Mismatch



# 3. Inequalities in mismatch - gender



Academic Mismatch

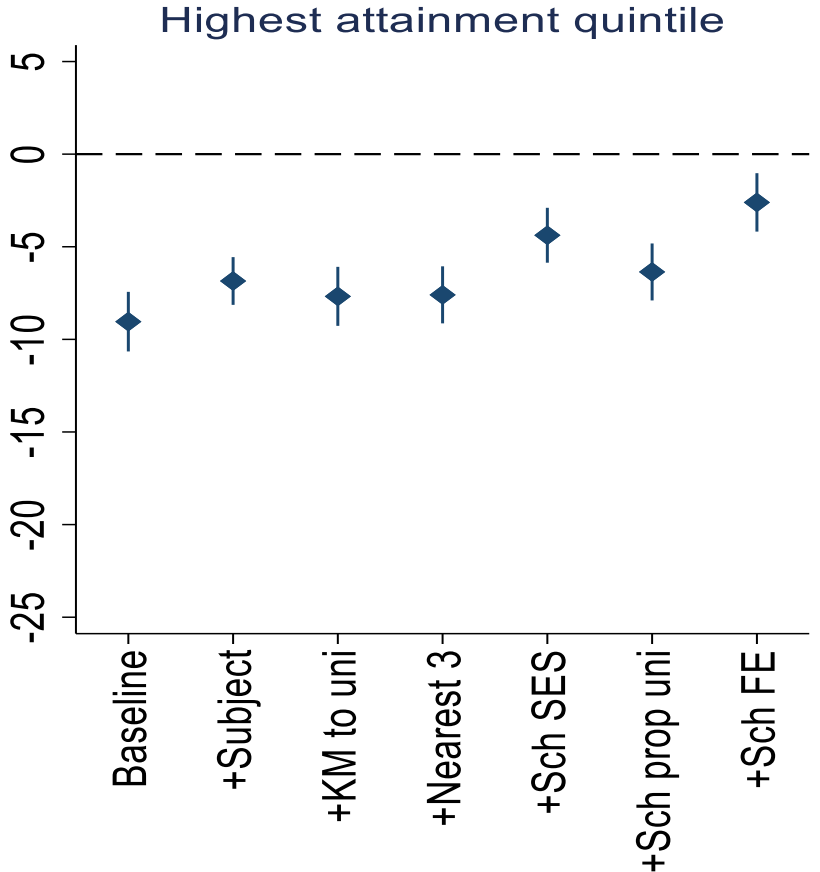
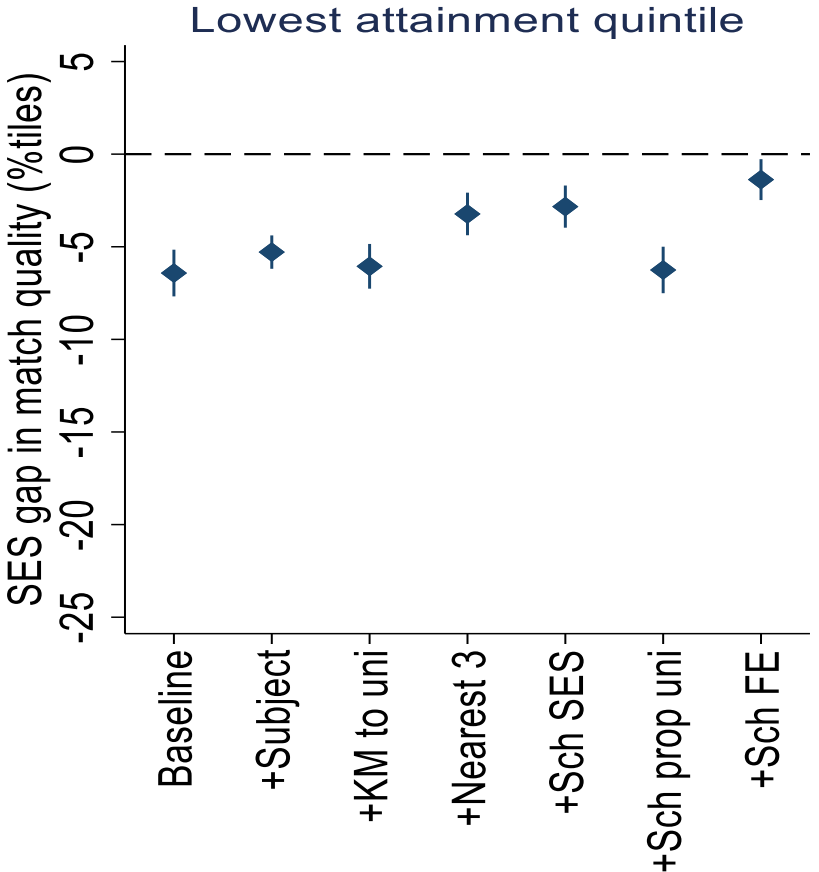
Earnings Mismatch

Column 1) Raw association; 2) Cond. on ethnicity, EAL, region; 3) + KS2; 4) + KS4

## 4. Drivers of mismatch

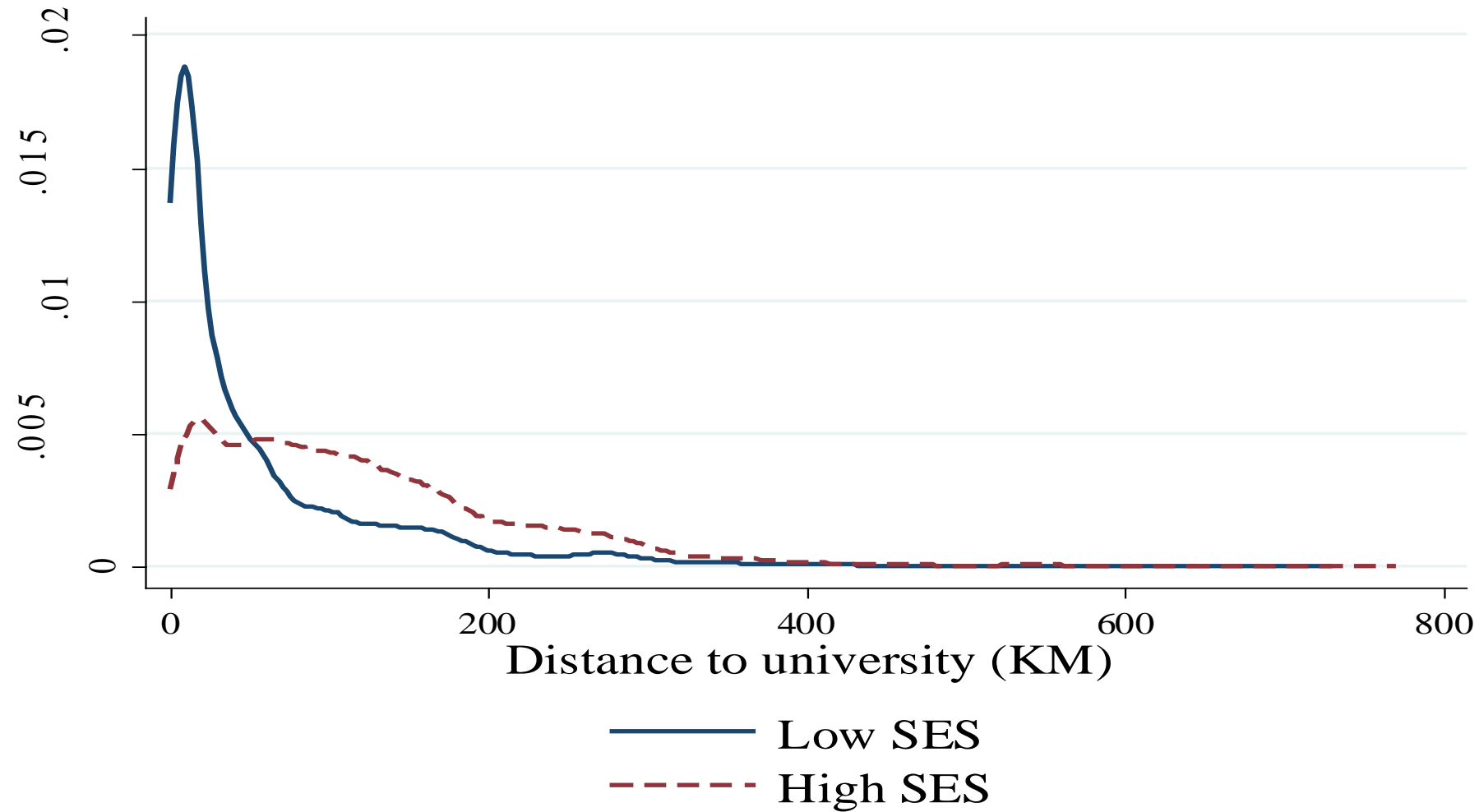
- Subject choice
  - Subject studied at university
- Geography
  - Distance to university attended
  - Distance to nearest 3 universities
- School Factors
  - School average SES
  - Proportion from school going to university
  - Any school factor – school fixed effects

# 4. Drivers of SES Gap

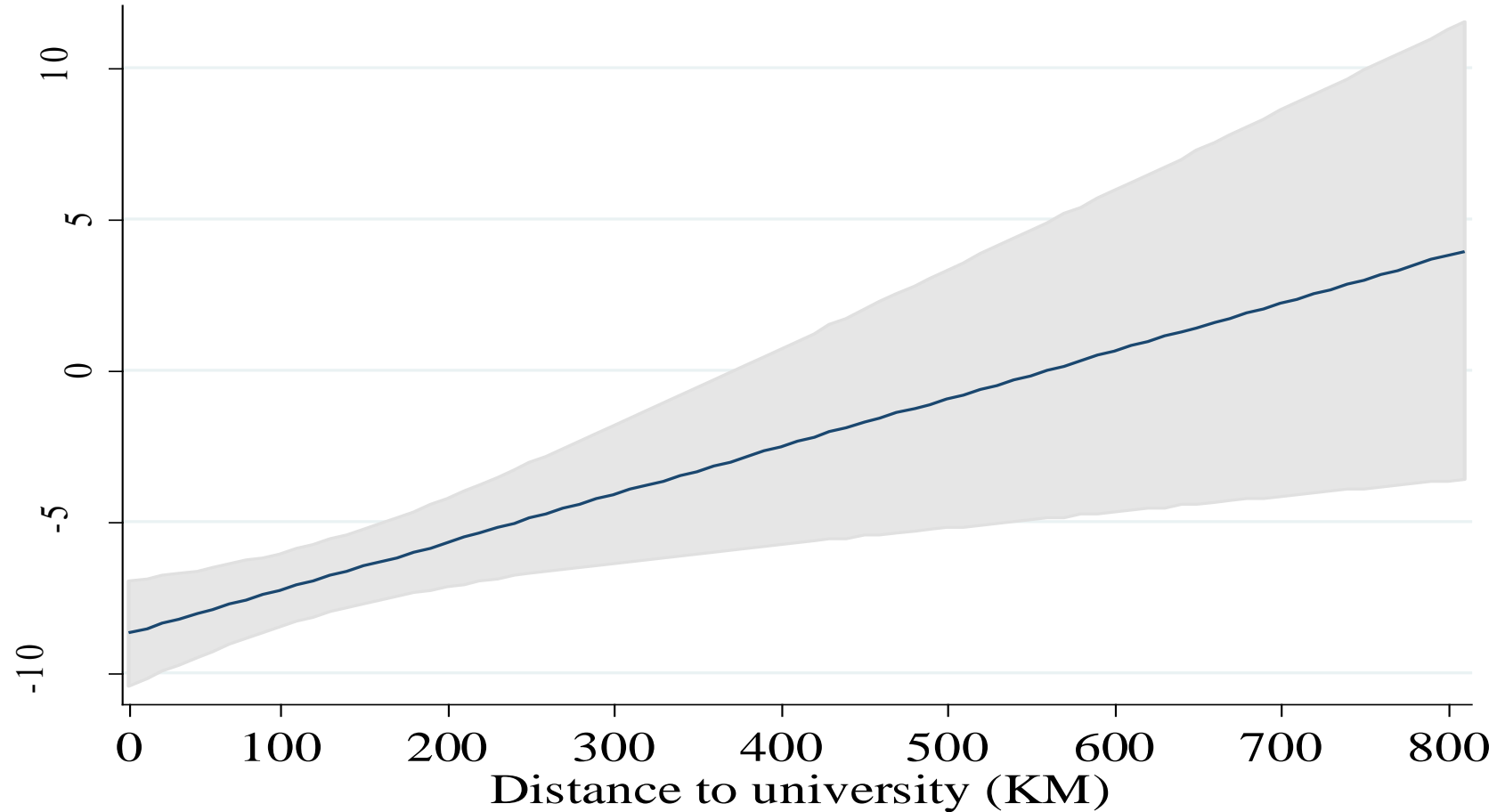




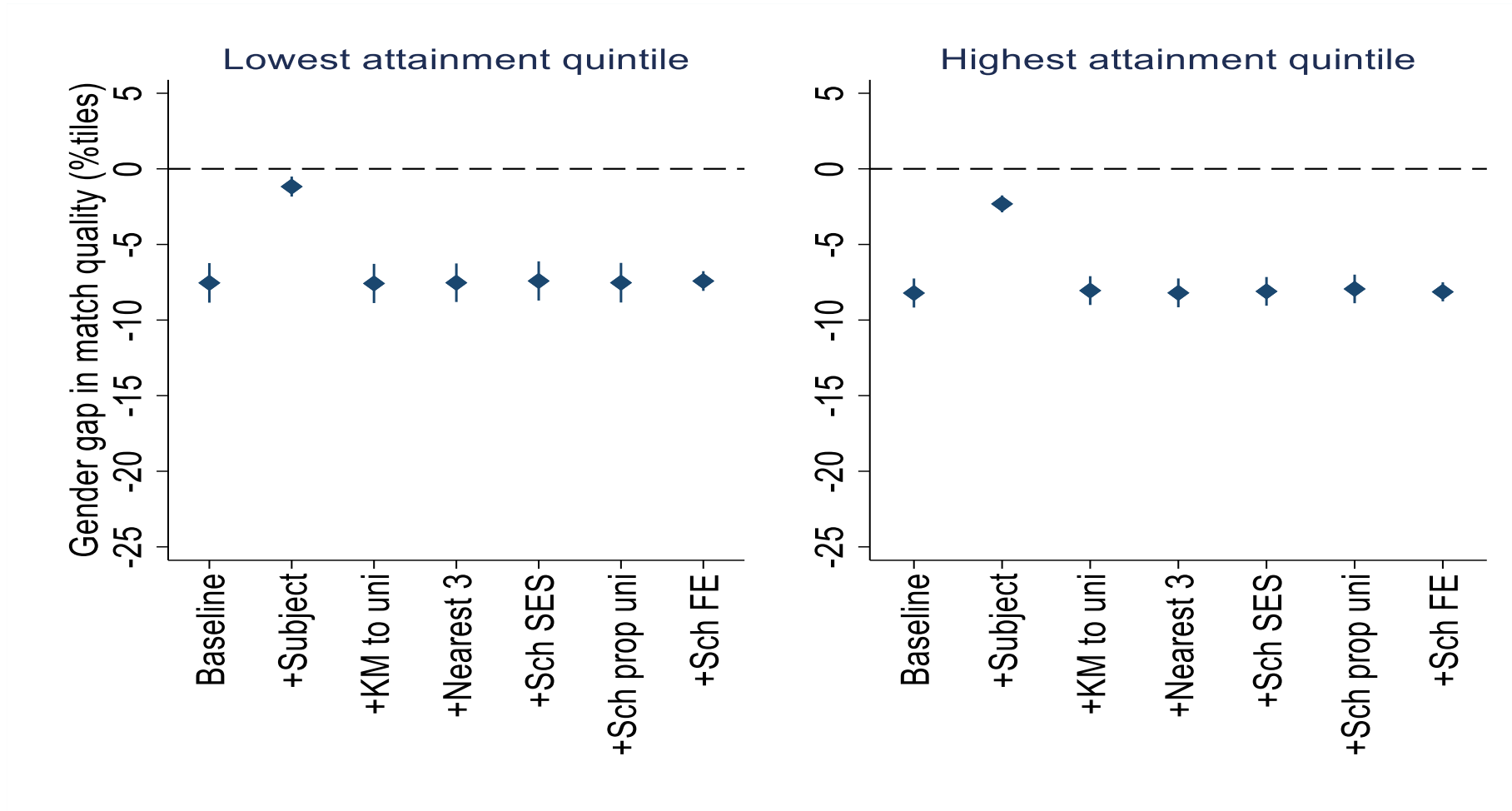
## 4. Distance to university



## 4. Distance to university



# 4. Drivers of Gender Gap



# Summary of findings

- SES gap: high attaining, low SES students undermatching to lower 'quality' courses - implications for their future earnings and social mobility
- Largely driven by school factors. Varies by distance travelled to university
- Gender gap: high attaining women undermatching to courses with lower average future earnings - implications for equity and the gender pay gap
- Largely driven by subject choice at university.

## 5. Policy implications

- US research (Hoxby and Avery, 2012) shows that undermatch stems from student application behaviour rather than universities rejecting them (we cannot verify this without access to UCAS data)
- Our results suggest secondary schools are a key driver of SES gaps and subject choice is a key driver of gender gaps
- Supplementary analysis in report from Next Steps shows better prepared students are more likely to be matched
- Improving the information, advice and guidance on the potential outcomes from different courses could influence decisions
- Evidence suggests that specific targeting is key here

## 5. Policy implications

- Our results also have possible implications for the university applications process:
- Research (Dynarski, 2018; Oreopoulos and Ford, 2016) shows that reducing uncertainty in the applications process can reduce undermatch
- Admissions based on predicted grades create uncertainty – evidence shows low SES students are systematically underpredicted

## 5. Policy implications

- Our results also suggest that SES gradients in mismatch are particularly pronounced for students who attend a local university
- Low SES students are more likely to attend lower ‘quality’ courses nearby, conditional on attainment at 18. They could attend a higher ‘quality’ course, but do not. Why not? Driven by perceptions?
- This suggests that there could be a role for university outreach programmes here to challenge perceptions of local students about the intakes of particular institutions / courses

# Summary of implications

1. Targeted Information, Advice and Guidance on grade requirements, course composition, previous graduates' earnings
2. Reduce uncertainty in the applications system
3. University outreach programmes to challenge perceptions



# Appendix

# Measuring Mismatch: Academic

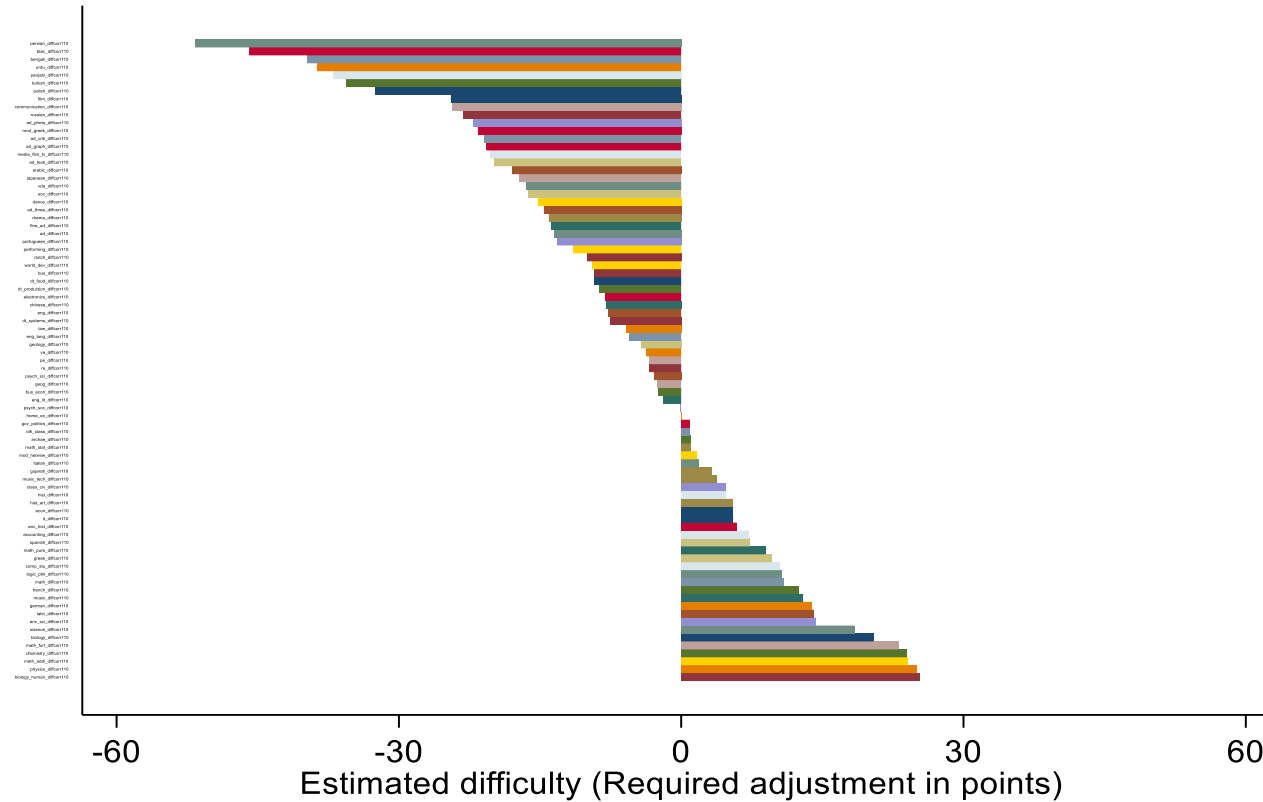
- Student Ability
  - Student's percentile in the achievement distribution of age 18 exam scores
  - A-level grades A/B/C/D/E which are worth 270/240/210/180/150pts
- Course Quality:
  - Course's percentile in the course 'quality' distribution
  - Course 'quality' based on achievement of median student
- Adjust for subject difficulty (Coe et al. 2008)
- Subject 'difficulty rating' based within student relative performance
- Iterated over all students and subject until the difficultly adjusted scores are equalized

$$\textit{Mismatch} = \textit{Course Percentile} - \textit{Student Percentile}$$

# Adjusting for subject 'difficulty'

**'Easy subjects'**  
 Photography  
 Communication  
 Film

Total A-level and equivalent difficulty correction



**'Hard subjects'**  
 Maths  
 Physics  
 Chemistry  
 Biology