Acknowledgements

1. Excellent co-operation from the Cambridge Admissions office, research assistance from former post-doc Renata Rabovic and undergrad Emily Song

2. Research funded by ERC Consolidator grant “Empirical Demand and Welfare Analysis” to DB 2016-21

3. Reflects our views and not of Cambridge, Christs College and Trinity College
Commonly claimed that elite-college admissions are ‘biased’
- “Just eight schools send as many pupils to Oxbridge as 3,000 others" Sutton Trust, 2018
- “Harvard rated Asian-American applicants lower on personality traits, Suit says", NYTimes, 2018

Univs claim to admit academically most promising students
- “Oxford is committed to recruiting the best candidates from all backgrounds and all identities"
- “Admissions Tutors are looking for the students they believe have the most academic potential"

Qn. Can the data tell whether admissions are solely merit-based?
Economics of “Fair” Admissions

- Equal Success vs Equal Outcomes across groups
- Observed vs unobserved variables
Merit-Based Admissions

Equal Bars BUT Unequal Success-Rates

Unequal Bars BUT Equal Success-Rates
Our Approach
2013-2017 Entrants

- **ESTEM:** Economics, NatSci (Physical), Engineering, Math
- **Non-ESTEM:** NatSci (Bio), Law, Medicine
- 3 years’ standardized (by subject) Tripos score
- Whether Pooled, Gender, School-type (State/Non-state)
<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
<th>State-Schools</th>
<th>Pvt+Intl</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESTEM</td>
<td>17</td>
<td>17.5</td>
<td>18.2</td>
<td>27+11</td>
</tr>
<tr>
<td>Non-ESTEM</td>
<td>21</td>
<td>18</td>
<td>25</td>
<td>31+10</td>
</tr>
</tbody>
</table>
Mean Comparison

Blue

Admitted from pool Blue

Red

Directly admitted Red
### Mean-Difference: Gender

**Pooled Male – Direct Admit Female**

<table>
<thead>
<tr>
<th></th>
<th>1st Yr</th>
<th>2nd Yr</th>
<th>3rd Yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESTEM</td>
<td>0.24***</td>
<td>0.16***</td>
<td>0.15***</td>
</tr>
<tr>
<td>Non-ESTEM</td>
<td>0.02</td>
<td>0.08</td>
<td>0.05</td>
</tr>
</tbody>
</table>

Controlling for Subject-Fixed Effects and College-Fixed Effects
### Pre-entry Scores: Home Students

#### Pooled Male – Direct Admit Female

<table>
<thead>
<tr>
<th>Subject</th>
<th>Mean-difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>GCSE A*s</td>
<td>-0.372***</td>
</tr>
<tr>
<td>AS Social &amp; Nat. Sciences</td>
<td>-0.022***</td>
</tr>
<tr>
<td>AS Maths</td>
<td>0.196***</td>
</tr>
</tbody>
</table>
Mean-Difference: School-type

<table>
<thead>
<tr>
<th></th>
<th>1st Yr</th>
<th>2nd Yr</th>
<th>3rd Yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>All subjects</td>
<td>0.014</td>
<td>-0.071</td>
<td>-0.065</td>
</tr>
</tbody>
</table>

Controlling for Subject-Fixed Effects and College-Fixed Effects
1st Yr Tripos Distbn by Gender

![Graph showing the distribution of 1st year tripos by gender for ESTEM and Non-ESTEM students. The graphs display the cumulative distribution functions (c.d.f.) for pooled females, non-pooled males, non-pooled females, and pooled males.]
School-type

CDF

Standardized percentage score

-4 -3 -2 -1 0 1 2 3

C.D.F.

- c.d.f. of Non-pooled maintained
- c.d.f. of Non-pooled others
- c.d.f. of Pooled maintained
- c.d.f. of Pooled others
Summary

- In ESTEM, Non-pooled females score significantly lower in 1st year exams than pooled males.
- The gender gap falls slightly but persists in subsequent years.
- Does not happen for non-ESTEM but competitive subjects.
- Weak evidence for maintained school candidates.
Future Research

- Why are female students performing poorly in ESTEM?
  - **Implicit** bias in marking
  - Gender differences in big stake exams
- How to design admissions/assessments optimally?
- Huge interest among students – great for teaching and recruiting RAs!
- **Broader Research Agenda**: How to target policies to maximize aggregate outcome and utilities?


Thank you for listening!