Post 16 educational choices and institutional value added at Key Stage 5

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Research questions

• Who stays on in FTE? Who enrols in FE? Does pattern of provision influence staying on?
• Do FE colleges contribute more/less to the gain in pupil attainment at Key Stage 5 than school based provision?
  – How effective are different types of post 16 provision - accounting for sorting?
• Do post 16 institutions influence HE participation?
Question 1

• What factors determine staying on and choice of institution at age 16?
• Sequential model
  – Decision to stay on
  – Decision about which institution
Models I

\[ FTE_{ijl} = \alpha_0 + \beta_k \sum_k X_{ijl}^k + \gamma_k \sum_k S_{jil}^k + \lambda_k \sum_k L_{il}^k + \varepsilon_{ijl} \]

\[ FE_{ijl} = \alpha_0 + \beta_k \sum_k X_{ijl}^k + \gamma_k \sum_k S_{jil}^k + \lambda_k \sum_k L_{il}^k + \varepsilon_{ijl} \]
Question 2

• Does pupils’ value added at KS4 to KS5 vary by type of institution?
  – FE college, 6th form college, school

• Selection and common support issues
  – Focus on GCSE to A level
  – Value added regression allowing for observables
  – Matching model
Models II

\[ KS5_{ihi} = \alpha_0 + 9 KS4_{ihi} + \beta \text{ INSTTYPE}_{hi} + \delta_k \sum_k X_{ikl} + \gamma_k \sum_k S_{16j}^k + \lambda_i + \varepsilon_{ihi} \]
Question 3

• What are the longer run differences in outcomes for those who take the FE route as compared to those who take the school based route?
  – HE participation
  – High status HE participation (defined as Russell Group or institution of equivalent research quality)
Models III

\[ HE_{is} = \alpha + \beta_1 FE_i + \beta_2 X_i + \beta_3 PA_i + \varepsilon_{is} \]
Data

- Longitudinal Study of Young People in England
- 15,000 young people in England who were aged 13 and 14 in 2003/2004
- Last information available year 11
  - Pupils’ personal characteristics
  - Attitudes
  - Behaviours
  - Expectations and aspirations
  - Family background
  - Parents’ characteristics and aspirations.
Data matching

• LSYPE data matched to:
  – National Pupil Database (NPD) – gives us attainment data including KS5
  – Pupil Level Annual School Census (PLASC) – pupil characteristics
  – LEASIS - school level characteristics.
Measures

• Prior attainment
  – GCSE capped average point score (pupil's eight highest grades) – standardized
  – Dummy variable if achieved 5 A*-C GCSEs

• KS5 attainment
  – Average A level point score (restricted to those taking A levels)
Pupil characteristics

• SES
  – FSM
  – Parental occupation
  – Parental education
• Attitudes to school
• Parental aspirations
School characteristics (age 16 school)

• School has sixth form
• Single-sex school
• Type of school
• School level outcomes
  – % 5 A*-C GCSE
• Resource inputs
  – pupil-teacher ratio; school size
• Peer group effect
  – % FSM
LA characteristics

• Unemployment/ local deprivation
• Peer effects (e.g. % staying on)
• Pattern of provision
  – *based on data from the previous cohort*
  – proportion of those who are in full time education post 16 who are enrolled in FE
  – percentage of the total number of secondary schools that have a sixth form
HE analysis

• Linked administrative data NPD/PLASC/IIR/HESA
• Students in England who sat Key Stage 4 tests in 2001–02
• Not as rich as LSYPE
  – measure of SES based on entitlement to free school meals (recorded at age 16) and neighbourhood
• Complete measures of prior attainment from key stage 2 through to key stage 5
## Descriptive statistics

<table>
<thead>
<tr>
<th></th>
<th>Freq.</th>
<th>Percent</th>
<th>Cum.</th>
</tr>
</thead>
<tbody>
<tr>
<td>FT education</td>
<td>8087</td>
<td>71.87</td>
<td>71.87</td>
</tr>
<tr>
<td>full time paid work</td>
<td>968</td>
<td>8.6</td>
<td>80.47</td>
</tr>
<tr>
<td>part college part employer</td>
<td>207</td>
<td>1.84</td>
<td>82.31</td>
</tr>
<tr>
<td>Apprenticeship</td>
<td>641</td>
<td>5.7</td>
<td>88.01</td>
</tr>
<tr>
<td>something else</td>
<td>1350</td>
<td>11.99</td>
<td>100</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>11,252</td>
<td>100</td>
<td></td>
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</tbody>
</table>
## Descriptive statistics

<table>
<thead>
<tr>
<th></th>
<th>Freq.</th>
<th>Percent</th>
<th>Cum.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schools</td>
<td>4337</td>
<td>50.12</td>
<td>50.12</td>
</tr>
<tr>
<td>Sixth Form College</td>
<td>1156</td>
<td>13.36</td>
<td>63.48</td>
</tr>
<tr>
<td>General FE/Tertiary College</td>
<td>2589</td>
<td>29.92</td>
<td>93.41</td>
</tr>
<tr>
<td>Other</td>
<td>571</td>
<td>6.59</td>
<td>100</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>8,653</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>
Outcomes by institution
Question 1

• Who stays on?
  – Higher achieving, socially advantaged students
  – Pattern of provision (FE, 6th form, school) does not influence staying on
Question 1

- Who enrolls in school based provision?
  - More advantaged/high achieving pupils
  - Pupils in a school with a 6th form
  - Pupils in the most advantaged schools
  - Pupils in a single sex school
  - Pupils in a school with a lower pupil teacher ratio

- Comprehensive or community school pupils are significantly more likely to enrol in FE colleges
Question 1

- Pattern of provision and local area does influence choice of institution
- Once pupils in poorer areas have decided to stay in full time education, they are then more likely to choose FE
- This is a striking result given that the LSYPE data we are using is very rich
## Local area effects – choice of institution

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
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</thead>
<tbody>
<tr>
<td><strong>Inunemployment rate 16-19</strong></td>
<td>-0.002 (0.001)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-0.001 (0.001)</td>
</tr>
<tr>
<td><strong>DACI score</strong></td>
<td></td>
<td>0.112** (0.055)</td>
<td></td>
<td></td>
<td>0.147** (0.057)</td>
<td></td>
</tr>
<tr>
<td><strong>% schools with sixth forms</strong></td>
<td></td>
<td>-0.150*** (0.039)</td>
<td></td>
<td></td>
<td>0.151*** (0.055)</td>
<td></td>
</tr>
<tr>
<td><strong>% staying in FTE</strong></td>
<td></td>
<td></td>
<td>-0.004*** (0.001)</td>
<td></td>
<td></td>
<td>-0.008*** (0.001)</td>
</tr>
<tr>
<td><strong>% in FE post 16</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.003*** (0.001)</td>
</tr>
<tr>
<td><strong>All other controls</strong></td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Constant</strong></td>
<td>0.787*** (0.057)</td>
<td>0.755*** (0.051)</td>
<td>0.833*** (0.053)</td>
<td>0.901*** (0.053)</td>
<td>0.616*** (0.056)</td>
<td>1.045*** (0.089)</td>
</tr>
<tr>
<td><strong>Observations</strong></td>
<td>4744</td>
<td>5073</td>
<td>5069</td>
<td>5065</td>
<td>5073</td>
<td>4733</td>
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<tr>
<td><strong>R-squared</strong></td>
<td>0.242</td>
<td>0.234</td>
<td>0.240</td>
<td>0.251</td>
<td>0.245</td>
<td>0.262</td>
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</table>
Question 2

• Does value added vary by institution?
  – Once we allow for FE colleges admitting more disadvantaged pupils from disadvantage schools, the FE penalty remains negative but insignificant
  – **After controlling for LA, FE penalty becomes larger and significant**
  – FE colleges significantly less effective for high SES pupils, and borderline negative significant for high achieving students
Question 2

• Allowing for pupil prior attainment, pupil characteristics, school characteristics and LA fixed effects, 6th form colleges have significantly higher value added

• Holds only for high achieving pupils
## Question 2

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
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</thead>
<tbody>
<tr>
<td>Sixth form Colleges</td>
<td>0.083*</td>
<td>0.094**</td>
<td>0.127***</td>
<td>0.179***</td>
<td>0.168**</td>
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<tr>
<td></td>
<td>(0.050)</td>
<td>(0.043)</td>
<td>(0.042)</td>
<td>(0.060)</td>
<td>(0.068)</td>
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<tr>
<td>FE colleges</td>
<td>-0.223***</td>
<td>-0.111*</td>
<td>-0.069</td>
<td>-0.012</td>
<td>-0.153**</td>
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<tr>
<td></td>
<td>(0.068)</td>
<td>(0.058)</td>
<td>(0.058)</td>
<td>(0.067)</td>
<td>(0.075)</td>
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<tr>
<td>Other Inst</td>
<td>-0.027</td>
<td>0.068</td>
<td>0.106</td>
<td>0.164</td>
<td>0.114</td>
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<tr>
<td></td>
<td>(0.137)</td>
<td>(0.118)</td>
<td>(0.116)</td>
<td>(0.117)</td>
<td>(0.124)</td>
</tr>
<tr>
<td>Prior attainment</td>
<td>v</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>v</td>
</tr>
<tr>
<td>Pupil characteristics</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>v</td>
<td>v</td>
</tr>
<tr>
<td>School</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>v</td>
<td>v</td>
</tr>
<tr>
<td>characteristics (16)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LA dummies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>v</td>
</tr>
<tr>
<td>Observations</td>
<td>2804</td>
<td>2804</td>
<td>2804</td>
<td>2804</td>
<td>2804</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.006</td>
<td>0.263</td>
<td>0.304</td>
<td>0.344</td>
<td>0.415</td>
</tr>
</tbody>
</table>
Matching results
Distribution of Propensity scores

Before matching

After matching
## Matching results

Nearest Neighbour matching

<table>
<thead>
<tr>
<th></th>
<th>Match on all the X</th>
<th>Match on all the X plus LA dummies</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATT</td>
<td>-0.110</td>
<td>-0.239**</td>
</tr>
<tr>
<td>(standard error)</td>
<td>(0.099)</td>
<td>(0.134)</td>
</tr>
</tbody>
</table>
Question 3

• Fully controlling for prior attainment, those attending FE college are less likely to go to university

• Those who do go are less likely to attend a high status institution
## HE participation

<table>
<thead>
<tr>
<th></th>
<th>Overall Participation</th>
<th>Participation in a high status institution</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Females</td>
<td>Males</td>
</tr>
<tr>
<td>Obtained A-levels via FE</td>
<td>-0.041**</td>
<td>-0.047**</td>
</tr>
<tr>
<td>Observations</td>
<td>205669</td>
<td>166813</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.235</td>
<td>0.265</td>
</tr>
</tbody>
</table>
Implications

• Pattern of provision influences choice of institution but not staying on
• FE negative penalty at KS5 and HE participation is robust
• May be due to selection by unobservables or indeed resourcing
  – No explanation as to why