Frank Kelly
University of Cambridge

PCAST Plenary Meeting
18 July 2013
Measuring the Economic Benefits of Mathematical Science Research in the UK

Final Report

November 2012
Deloitte Report

Funded by the Engineering and Physical Sciences Research Council (EPSRC)

Report looked at mathematical science occupations, defined as occupations which either entail mathematical science research or which use tools and techniques derived from mathematical science research.

Estimates the contribution of mathematical science to the UK economy in 2010 to be quite remarkable: 2.8 million in employment terms (around 10 per cent of all jobs in the UK) and £208 billion in terms of Gross Value Added (around 16 per cent of total UK GVA).
Figure 4.1.1: Top 20 sectors for direct employment in the UK, 2010

Source: Deloitte using ONS data
Figure 4.2.1: Top 20 sectors for direct mathematical science GVA in the UK, 2010, £m

Source: Deloitte using ONS data
Mathematical sciences graduates are in high demand

<table>
<thead>
<tr>
<th>Subject</th>
<th>First degree</th>
<th>Postgraduate (ex PGCE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological Sciences</td>
<td>£16,500</td>
<td>£22,500</td>
</tr>
<tr>
<td>Physical Sciences</td>
<td>£19,000</td>
<td>£24,000</td>
</tr>
<tr>
<td>Computer Science</td>
<td>£21,000</td>
<td>£24,000</td>
</tr>
<tr>
<td>Engineering &amp; technology</td>
<td>£23,000</td>
<td>£25,500</td>
</tr>
<tr>
<td>Mathematical Sciences</td>
<td>£22,500</td>
<td>£27,000</td>
</tr>
</tbody>
</table>

Table 2: average salary of undergraduates and postgraduates six months after graduation in 2007/08

Source: One Step Beyond: Making the most of postgraduate education (March 2010), (Smith Report)
Figure 1: number of first degree qualifications obtained by students at universities in mathematics, physics (including astronomy) and chemistry from 1985/86 to 2008/09. The data up to 1993/94 relates to universities only and does not contain any data for polytechnics (shown by the vertical dotted line)\textsuperscript{6}

Source:Higher Education Statistics Agency
Severe lack of qualified mathematics teachers

Figure 2: cumulative shortfall in meeting mathematics recruitment targets, 2000/01 to 2007/08

Message: beautiful and useful

“The flow of trained mathematical scientists into other disciplines and into the industries of the future is critical to the UK’s economic growth prospects, as whole sectors of the economy are transformed by new, essentially mathematical, technologies.

“Young people with an aptitude and interest in the subject will find University Mathematics and Statistics to be beautiful, challenging and extraordinarily stimulating.

“They should be reassured that, in addition, it is a subject which underpins our 21st century technology, economy and society, and that the demand for trained mathematical scientists is exceptionally high.”