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1. **EXECUTIVE SUMMARY**

This report examines how private sector funding supported the development of a proposed qualification within the post-16 educational sector. In particular, it refers to the use of funding, from the Royal Bank of Scotland, which enabled a sixth form college to develop a financial qualification for A level students. It found widespread support for the qualification, the 'Finance Baccalaureate', among the students, schools and colleges, potential employers and universities. It argues that there are gains for students, the State and the private sector that would result from private sector funding of public sector educational changes.

The proposed qualification, the Finance Baccalaureate, was trialled with a group of A level students at King Edward VI College, Stourbridge. Funding by the Royal Bank of Scotland led to research into the wider application of the qualification, both within schools and colleges, and confirmed there was wide-spread support for the qualification.

The Finance Baccalaureate is an ‘umbrella qualification’ involving three distinct features:

- **A level subjects centered on Mathematics and finance-based subjects such as Economics, Business Studies and Accounts.**

- **Level four modules [first year undergraduate work] with a maths and finance-based focus.**

- **Enrichment activities, based around the world of finance, providing opportunities for a maths-based Extended Project Qualification.**

The pilot group of students, at King Edward VI College, who undertook all elements of the proposed Finance Baccalaureate, reported a greater insight into:

- **The world of finance.**

- **The application of mathematical concepts into financial and economic concepts.**

- **A greater commitment to seek employment in banking and finance which increased their career aspirations.**

There is a wider application of the Finance Baccalaureate:

- **With schools and colleges supporting development of the qualification.**

- **Through the use of ‘free standing’ maths qualifications as a component of the qualification.**

- **As an indicator of student commitment to finance-based degree courses.**

Therefore, the report proposes that private sector organisations, such as banks, investigate funding opportunities into public sector education. The use of such funds is likely to increase private sector access to highly qualified potential recruits, more effectively prepare students for the world of work and thereby enhance their employability, while supporting public sector organisations at a time of fiscal constraint.
2. BACKGROUND TO RESEARCH PROJECT

Within the financial sector of the United Kingdom, it has been identified by organisations such as the Royal Bank of Scotland that:

“We are struggling to recruit people with mathematical talent in this country to take the bank forward, for people at the top end of the bank we are having to go overseas and it’s a problem”.

This report relates to a collaborative project involving the Royal Bank of Scotland, and three public sector organisations within education to address this issue. It refers to the first year of a three year project that examines the feasibility of setting up a qualification to attract more able A level students into the financial sector. The project is being led by the sixth form college, King Edward VI College, Stourbridge, in consultation with Mathematics in Education and Industry [MEI], and the Institute of Financial Services [IFS].

The project is being supported and funded by the Royal Bank of Scotland.

2.1 The Research Partners

King Edward VI College Stourbridge is one of the top sixth form colleges in the country and has been consistently placed among the top ten colleges in the UK, both with regard to its A level point score and student success rates. Ofsted rated the college as ‘outstanding’ in its most recent inspection of January 2008. It is over-subscribed as an institution and has over 650 students studying Mathematics courses and large numbers in business and finance and business-related disciplines. These students achieve highly and many progress to some of the top universities in the country, studying both Maths and finance, or business-related, courses. The college has trialled the materials being developed for the Finance Baccalaureate.

Mathematics in Education and Industry [MEI] was founded in the early 1960s and is an independent UK curriculum development body. It provides a range of teaching resources for mathematics and has developed one of the country’s most popular A level mathematics qualifications, which is examined by the Oxford and Cambridge Examination board. MEI is an independent charity; any income generated through MEI’s work is used to support mathematics education. MEI has developed Level 4 teaching materials for the Finance Baccalaureate.

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1 RBS representative speaking at the Advisory Committee for Maths Education, ACME Conference 2011, sponsored by the Royal Society

2 A level performance tables, Department for Education, published 9th February 2012

3 Ofsted Inspection report, April 2008
The ifs School of Finance [IFS] is a registered charity, incorporated by Royal Charter and has a remit to provide the financial services industry with a skilled and competent workforce while also promoting a better understanding of finance amongst consumers. The ifs is the only specialist financial education body that is able to award its own taught degrees and it has adapted the teaching materials used on its degree course for the purposes of the Finance Baccalaureate.

Royal Bank of Scotland [RBS] is one of the world’s largest banks and has a major headquarters in London. In February 2009, RBS was nationalised by the United Kingdom government after the international financial crisis of 2008. As a result, RBS has undergone a significant change programme built around a five year strategic plan and by 2013, it is aiming to become financially independent of UK government support, while remaining among the top five global banks and able to recruit the most talented people across the globe. RBS is on track to achieve these goals with an announcement of an increase in the Royal Bank of Scotland’s Group operating profit, of 2011, to £1,892 million, which was an increase of 11%. RBS has supported and funded the development of the research project into the Finance Baccalaureate.

2.2 The Research Methodology

The research team constructed a financial qualification that provided additional preparation for A level students, who were considering a financial career. The purpose of the qualification was to; partly address the recruitment needs of organisations, such as the Royal Bank of Scotland. Secondly, it was intended to address difficulties experienced by some A level Mathematics students in gaining employment in finance-based firms, which had even affected high calibre students, both within King Edward VI College and the other schools and colleges within the sample group. Thirdly, in the experience of King Edward VI College, it appeared that some students who went to university in order to study Mathematics and business-related degree courses were unaware of, or not fully prepared for, studying finance-based programmes.

The research team examined the feasibility of setting up a new financial qualification, which would:

- Improve student understanding of the world of finance
- Attract more able students and extended their skills by introducing them into first year degree work

4 Royal Bank of Scotland Group, Annual Results for the year 31st December 2011, published 23rd February 2012

5 Emerging theme arising from interviews with senior managers at King Edward VI College, three Midlands colleges and two schools, January-February 2012

6 Emerging theme arising from interviews with students at King Edward VI College, three Midlands colleges and two schools, January-February 2012
Provided direct contacts with finance employers, such as the Royal Bank of Scotland

The research project involved:

- An action research project at King Edward VI College, where new teaching materials were trialled by a voluntary group of Year 13 A level students
- Research with schools and colleges to identify the level of interest among students, staff and managers for a financial qualification.

The schools and colleges included:

- Cadbury VI Form College, Birmingham
- Hereford Sixth Form College
- Joseph Chamberlain College, Birmingham
- King Edward VI Aston School, Birmingham
- Lawrence Sheriff School, Rugby

Informal discussions were, also, conducted with Worcester Sixth Form College, Rugby School and other Midlands grammar schools.

Research with a small number of universities to identify the suitability of the qualification as an entrance requirement for universities. The universities included:

- Birmingham City University
- Cambridge University
- Leeds University
- London School of Economics, LSE
3. THE ‘FINANCE BACCALAUREATE’

3.1 King Edward VI College has led the development of the new qualification, the ‘Finance Baccalaureate’, and teaching materials were piloted at the college from September 2011. In subsequent years, from September 2012, these materials will be trialled by a broader group of students in high achieving schools and colleges across the country. The teaching materials for the finance baccalaureate were developed by the national mathematics organisation, Mathematics in Education and Industry (MEI) and the Institute of Financial Services (IFS), the national financial training body. In addition during the course of the first year, the research team sought advice relating to the suitability of the financial baccalaureate as a university entrance requirement.

The intended outcome of the three year research project was to establish a finance baccalaureate qualification, which leads to more able students preparing themselves effectively for a career in finance.

3.2 Pilot Group at King Edward VI College, Stourbridge

A group of students were identified to trial new Level 4 teaching materials. They were:

- Year 13 students.

- Studying A level Mathematics plus at least one A level in a finance-related subject, such as Accounts, Business Studies and Economics.

- Recruited in July 2011.

- Required to complete two modules of level 4 (first year degree) work related to finance-related topics.

- Each module was developed by MEI and IFS.

The level 4 modules were delivered at King Edward VI College in a timetabled lesson by a member of staff from the college. An online version of the material was, also, provided for students who were unable to attend the lesson and they had access to support from the member of staff, via emails and a workshop.
The students involved in the pilot scheme were drawn from a cohort of students who were
taking a combination of A level Mathematics and a finance-related A level such as
Accounts, Business Studies and Economics. This group of students led to expressions of
interest by 29 students. Among this group, there were 16 students who were able to attend
the 1 hour weekly timetabled lesson and 13 students were sent the teaching materials
online, on a weekly basis, and received additional tutor support.

The maths-based curriculum profile of the 29 students was:

- 23 students studying A level Mathematics.
- 1 student studying A level Statistics.
- 4 students studying A level Mathematics and A level Further Mathematics.

In addition, the finance-related subjects taken by the students included:

- 14 students studying A level Economics.
- 6 students studying A level Business Studies.
- 2 students studying A level Accounts.
- 7 students studying TWO subjects taken from Economics, Business Studies and
  Accounts.

The gender profile of the 29 students in the pilot group was:

- 12 female students
- 17 male students
- The details of their curriculum profile are shown in Appendix 1.

Upon completion of the level 4 modules, the students were:

- Asked their views about the level 4 teaching materials.
- Involved in finance-related enrichment activities in finance/business, provided by the
college with input from RBS staff and also MEI/IFS.
- Involved in enrichment activities, centred on a graduate ‘immersion day’ at the Royal
  Bank of Scotland in February 2012.
- As a result of the feedback from students, the level 4 materials were reviewed and
  the timing of activities within the first year of the Finance Baccalaureate was
  amended. This informed planning of the second year of the research.
3.3 ‘The Mathematics behind Economics’ [MEI]

Mathematics in Education and Industry [MEI] is an independent UK curriculum development body, which provides a range of teaching resources for mathematics and has developed one of the country’s most popular A level mathematics qualifications, which is examined by the Oxford and Cambridge Examination board.

From September 2011 to December 2011, the students were required to undertake level 4 work, developed by Mathematics in Education and Industry. This work concentrated on developing student skills in applying mathematical concepts to economic and financial issues. The students were expected to make active use of computer packages during the module including:

- ‘Excel’,
- ‘Autograph’,
- ‘Geogebra’
- The UK government’s Department for Business, Innovation and Skills ‘Student Loan Repayment Ready Reckoner’.

The general focus of the module was the ‘Mathematics behind Economics’ and topics undertaken are shown in Table 1:

<table>
<thead>
<tr>
<th>MEI Level 4 module, Sept-Dec 2011, suggested teaching time and prerequisites</th>
<th>Economics Ideas</th>
<th>Mathematics Ideas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multipliers (1 hour)</td>
<td>• Marginal propensity to consume&lt;br&gt;• Marginal propensity to save&lt;br&gt;• The multiplier</td>
<td>• Infinite geometric series&lt;br&gt;• Reverse percentages</td>
</tr>
<tr>
<td>Statistical Modelling (2 hours)</td>
<td>• Using statistical modelling to inform business decisions&lt;br&gt;• Overbooking aircraft</td>
<td>• Modelling cycle&lt;br&gt;• Binomial probability model&lt;br&gt;• Expected value&lt;br&gt;• Use of spreadsheets in modelling</td>
</tr>
<tr>
<td>Elasticity (1 hour)</td>
<td>• Price elasticity of demand&lt;br&gt;• Maximising revenue&lt;br&gt;• Modelling demand curves as straight lines&lt;br&gt;• Modelling demand curves as curves of constant elasticity of demand</td>
<td>• Percentage change&lt;br&gt;• Maximising a quadratic function&lt;br&gt;• Differential equations&lt;br&gt;• Tangent fields</td>
</tr>
<tr>
<td>Unit, suggested teaching time and prerequisites</td>
<td>Economics ideas</td>
<td>Mathematics ideas</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>----------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Compound interest (1 hour)</td>
<td>• AER</td>
<td>• Use of different time intervals for compounding interest</td>
</tr>
<tr>
<td></td>
<td>• APR</td>
<td>• Multipliers for percentage change</td>
</tr>
<tr>
<td></td>
<td>• Gross interest</td>
<td>• Compound interest formula</td>
</tr>
<tr>
<td></td>
<td>• Net interest</td>
<td>• The exponential function as a limit of increasingly frequent compounding</td>
</tr>
<tr>
<td></td>
<td>• Use of different time intervals for compounding interest</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Continuous compounding</td>
<td></td>
</tr>
<tr>
<td>Inflation (1 hour)</td>
<td>• Inflation</td>
<td>• Index numbers</td>
</tr>
<tr>
<td></td>
<td>• RPI</td>
<td>• Weighted averages</td>
</tr>
<tr>
<td></td>
<td>• CPI</td>
<td>• Statistical sampling</td>
</tr>
<tr>
<td></td>
<td>• UK inflation target</td>
<td>• Percentage change</td>
</tr>
<tr>
<td></td>
<td>• Index linking of pensions and benefits</td>
<td></td>
</tr>
<tr>
<td>Student loans (1 hour)</td>
<td>• The new system of student loans</td>
<td>• Statistical modelling</td>
</tr>
<tr>
<td>Best done after compound interest and inflation</td>
<td>• Using modelling to inform national policy</td>
<td>• Percentage change</td>
</tr>
<tr>
<td></td>
<td>• Discounting and net present value</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Resource Accounting and Budgeting (RAB)</td>
<td></td>
</tr>
<tr>
<td>Measuring inequality (1 hour)</td>
<td>• Measuring inequality of income distribution</td>
<td>• Cumulative frequency</td>
</tr>
<tr>
<td></td>
<td>• Lorenz curves</td>
<td>• Quintiles</td>
</tr>
<tr>
<td></td>
<td>• The Gini coefficient</td>
<td>• Measuring spread</td>
</tr>
<tr>
<td>Modelling the Market part 1 (1 hour)</td>
<td>• Changes in value of shares and housing</td>
<td>• Time series</td>
</tr>
<tr>
<td>Best done after compound interest and inflation</td>
<td>• Adjusting for inflation</td>
<td>• Percentage change</td>
</tr>
<tr>
<td></td>
<td>• Modelling the stock market</td>
<td>• Random walks</td>
</tr>
<tr>
<td></td>
<td>• The work of Bachelier</td>
<td>• Geometric mean (optional)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Normal distribution and mean</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Relationship between standard deviation and variance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Stochastic modelling contrasted with deterministic modelling</td>
</tr>
<tr>
<td>Modelling the Market part 2 (1 hour)</td>
<td>• Comparing the Bachelier model with reality</td>
<td>• Comparing a model with reality</td>
</tr>
<tr>
<td>Needs to be done after part 1</td>
<td>• Introduction to derivatives</td>
<td>• Normal probability plot</td>
</tr>
<tr>
<td></td>
<td>• Introduction to pricing options</td>
<td>• Expected value</td>
</tr>
</tbody>
</table>
Exemplars from the ‘Mathematics behind Economics’ lessons one, and two, are shown in Appendix 3.

There was very positive feedback from the students involved in the Level 4 modules, both in terms of the quantitative research and qualitative comments, which were provided by a random sample of the students.

The students' views were gathered from an anonymous questionnaire conducted in January 2012 and the comments are shown in Table 2. The comments suggested:

- Students gained greater insight into A level economic concepts.
- Students gained greater awareness of the mathematical techniques used to calculate measures of income inequality.
- Students gained insights into the application of mathematical concepts into financial issues.
- Difficulty arose where students were unfamiliar with some of the software packages.
- Students were able to use online material, but it presented greater difficulties compared to students who attended the timetabled lessons.
- Students enjoyed the MEI material and would recommend the course to other students.

**TABLE 2:** Finance Baccalaureate, student feedback on ‘The Mathematics behind Economics’

<table>
<thead>
<tr>
<th>What did you find most helpful in this course (and why)?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Student 1</strong></td>
</tr>
<tr>
<td>The detail given to how concepts work such as the Lorenz curve and Gini coefficient was most helpful. The large amount of links to learn more information.</td>
</tr>
<tr>
<td><strong>Student 2</strong></td>
</tr>
<tr>
<td>The economic topics as they helped to contribute to the topics I was learning in my economics lessons.</td>
</tr>
<tr>
<td><strong>Student 3</strong></td>
</tr>
<tr>
<td>As I am intending to enter the finance industry, it was a good insight into the sort of operation I’ll be doing. The calculations were tough however, but I’m sure with more time studying the course the calculations wouldn’t seem too bad.</td>
</tr>
<tr>
<td><strong>Student 4</strong></td>
</tr>
<tr>
<td>The economic topics as they helped in the topics I was learning in my business studies lessons.</td>
</tr>
<tr>
<td><strong>Student 5</strong></td>
</tr>
<tr>
<td>I felt the additional information provided in email attachments was very helpful in allowing me to complete the assignments and learn about the topics being covered and how maths is used in finance.</td>
</tr>
</tbody>
</table>
Student 6
The interesting choice of topics relating to the world today.

Student 7
I found using the geometric series was the most useful it helped me in my maths lessons also.

Student 8
The history and application of theory/concepts used for example work on Lorenz curve and gini coefficient. Also discussions were helpful during lessons.

What did you find most difficult to understand in this course (and why)?

Student 1
How to use the student loan calculator, or excel programs, and the significance at each point.

Student 2
The algorithms in the main side as it you hadn't used certain software, you had to learn how to use the program first in order to be able to do the work.

Student 3
Understanding some of the complex calculations because they are slightly different from AS level maths.

Student 4
The algorithms were the most difficult to understand.

Student 5
Initially I found the pivot tables difficult as I did not understand what to do however after reading through again, I managed to understand them better.

Student 6
I studied the material online and was sometimes not which PowerPoint/documents to use at which time (I have lessons first thing on Wednesdays).

Student 7
I found the algorithms the most difficult since I found it the most challenging.

Student 8
How to use certain programmes on Autograph/Excel.
For example, not much instruction was on the ‘student loan calculator’.

How do you think the course could have been improved?

Student 1
More explanation on how to use Autograph diagram or Excel diagrams – perhaps a basic run through on screen by a teacher first before we try ourselves.

Student 2
Lesson time flexibility.
Student 3
To be set on a day where all students are able to go the lessons as the material is difficult to understand without being taught by the teacher. The lessons could also be spread over more days, if all students cannot come to one of the lessons.

Student 4
Lesson time flexibility.

Student 5
I think the course could be improved by reviewing work completed at home every 2 weeks in order to make sure everything is correct and understood.

Student 6
Hold it lunchtime so everyone can attend the lectures.

Student 7
I think it would have been better if it was available in a variety of timeslots, since I was not able to attend the allocated timeslot.

Student 8
More detail into work on computers such as programmes on Excel. A demonstration of the basics.

Any other comments?

Student 1
Overall a very good course and I would recommend to other Economists/Maths students.

Student 5
I found the course interesting and would recommend to future students.

Student 8
The topics covered were enjoyable with good links to present issues and would be good for other students.

Student 2, 3, 4, 6, 7
No comment provided
3.4 ‘THE UK FINANCIAL SERVICES INDUSTRY’ [ifs School of Finance]

From February 2012 to April 2012, the students were required to study aspects of the UK financial services industry using material drawn from the Institute of Financial Services’ Level 4 qualification, the ‘Certificate in Financial Administration and Planning’.

The topics relating to the UK financial services industry which were studied are shown in Table 3:

**TABLE 3:** Finance Baccalaureate, ifs Level 4 module, February-April 2012

<table>
<thead>
<tr>
<th>TOPIC</th>
<th>DESCRIPTION</th>
<th>Certificate in Financial Administration and Planning, Topic number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Key influences in the UK financial services industry</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Overview of financial services products</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>Economic factors affecting financial services</td>
<td>9</td>
</tr>
<tr>
<td>4</td>
<td>UK taxation and state benefits</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>Principles of financial protection: existing provision</td>
<td>11</td>
</tr>
</tbody>
</table>

The Certificate in Financial Administration and Planning is intended to meet the needs of individuals working, or aspiring to work, in financial administration and provides foundation knowledge of financial products, financial services, regulation and legislation in the area of financial advice. This information was used to provide introductory material to students considering the financial sector as a career option. Each unit in the Certificate of Financial Administration and Planning has a summative assessment and the students were required to:

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7 The Institute of Financial Services is a division of the ifs School of Finance

8 Information drawn from ifs School of Finance website, accessed 2nd April 2012, Certificate in Financial Administration and Planning (CeFAP®) - 600/1735/1
• Attend five 1 hour sessions.

• Complete five unit assessments, selected from the Certificate of Financial Administration and Planning.

• Discuss broader issues arising from a particular unit.

An exemplar from the ‘UK Financial Services Industry’ lesson one is shown in Appendix 4.

The students’ views were gathered from a questionnaire conducted in April 2012 and the comments are summarized in Table 4, where it is suggested that students:

• *Found little difficulty with the concepts in the units.*

• *Welcomed access to the end of unit assessments [and the ability to check answers].*

• *Had difficulty with some of the tax-based questions.*

• *Found difficulty with the timing of the sessions, as the late Spring term was a period where examination and coursework requirements became increasingly pressurised.*

**TABLE 4** Finance Baccalaureate, student feedback on Level 4 material relating to ‘The UK Financial Services’

<table>
<thead>
<tr>
<th>What did you find most helpful in this course (and why)?</th>
</tr>
</thead>
<tbody>
<tr>
<td>The layout of the course was helpful where the detail was given in depth and the review questions at the end forced you to search through all of the data before answering.</td>
</tr>
<tr>
<td>The course provided an opportunity to further my understanding in specific areas in finance. This has helped me in numerous ways, including help with interviews in Insurance industries, which has elements to its business that are difficult to understand. The overlap the material has with economics (Economic factors) is also a help to consolidate learning in that subject.</td>
</tr>
<tr>
<td>The course was interesting and provided more detail into taxes, benefits and financial products, which is an area that I would like to work in.</td>
</tr>
<tr>
<td>The course was well-organised and the review questions were useful to check understanding.</td>
</tr>
<tr>
<td>Economic factors affecting financial services was helpful as it allowed me to learn more about how the economy affects financial services and how they have to react to the economy which was very interesting.</td>
</tr>
</tbody>
</table>
What did you find most difficult to understand in this course (and why)?

The numerical examples were not easy to understand, such as the tax questions. I feel that these could have been explained more in the information given.

With some of the topics studied, there was a substantial amount of information to take into account. With only 1 hour per session, it could be beneficial to skim read the material prior to the lesson; if this wasn't to clash with exams.

Most of it was straight forward, but the textbook contained two small errors, which made it difficult for us, but the teacher spotted them!

I would have liked more numerical tax questions to practice.

The most difficult thing to understand was the UK taxation and state benefits section as I found it complex to get my head around initially however after rereading and discussion I feel I understand the topic better now.

How do you think the course could have been improved?

A few real life examples and applications would have helped my overall understanding such as in topic 11, a few examples of these policies in real life may have helped.

Sometimes, the solutions to the end of unit assessments were simply lifted from the text word for word. One improvement I could recommend is to develop these questions to improve understanding and even to create discussion points out of the material.

It would have been useful to have an end of topic test to check I knew the stuff!

Real life examples relating to finance and the benefit system would be useful.

Personally I would have liked to have learnt more about the London stock exchange and how shares are traded on them. Also I would have been interested in the different types of trades that go on.

Any other comments?

Overall, it was a well structured course that would be a good step towards degree level work.

As well as the workbook being provided by IFS, a possibility to develop the course could be to create activities and worksheets, similar to what MEI did for the first half of the year.

Yes, I would recommend it to other students.

Interesting course and a good insight into degree-level work.
A series of enrichment activities were planned for the students involved in the Finance Baccalaureate. These included careers advice, visits by managers and a visit to the Royal Bank of Scotland. The central focus of the visit to the Royal Bank of Scotland was an experience which directly linked the A level students, as students applying to universities, with the graduate employees at RBS, who had recently left university. This central focus led to an ‘immersion day’ at the Royal Bank of Scotland, where students gained a direct insight into the working lives of graduate recruits within the financial services industry.

The schedule of the ‘immersion day’ at the Royal Bank of Scotland is shown overleaf in Table 5:

**TABLE 5: Finance Baccalaureate, Immersion Day at RBS, 29th February 2012**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:30</td>
<td>Registration</td>
</tr>
<tr>
<td>10:30 – 10:45</td>
<td>Welcome to RBS, Global Banking and Markets</td>
</tr>
<tr>
<td>10:45 – 11:30</td>
<td>Current State of Global Economy – Given by a current RBS economist</td>
</tr>
<tr>
<td>11:30 – 11:40</td>
<td>Break</td>
</tr>
<tr>
<td>11:40 – 12:15</td>
<td><strong>Next Steps</strong> – What do the students need to do in order to be successful in securing graduate roles in finance in the future.</td>
</tr>
<tr>
<td>12:15 – 13:00</td>
<td><strong>Networking Lunch</strong> – Students will informally meet with graduates from different areas of the bank.</td>
</tr>
<tr>
<td>13:00 – 14:30</td>
<td>First Rotation</td>
</tr>
<tr>
<td>14:30 – 14:45</td>
<td>Break and transition to second rotation</td>
</tr>
<tr>
<td>14:45 – 16:15</td>
<td>Second Rotation</td>
</tr>
<tr>
<td>16:15 – 16:45</td>
<td>Mike Maddick, Head of RBS Global Recruitment. Feedback</td>
</tr>
</tbody>
</table>
There was a significantly positive response from the students, who attended the ‘immersion day’. The students provided their individual description of the events and their feelings during the course of the day. The response suggested that the ‘immersion day’ was:

- Relevant to their career aspirations.
- Linked to their learning from the School of Finance and MEI.
- Exciting, memorable and recommended to other students.
- A catalyst for over 50% of the students to apply to banks, such as the Royal Bank of Scotland, for employment

Set out overleaf are the views of two students and the responses of all students are shown in Appendix 2.
On Wednesday 29th February I embarked on a 3hr journey to the centre of London to visit Royal Bank of Scotland headquarters to gain a clearer insight of investment banking. Having left home at 6 am I and a group of college friends accompanied by our teacher we all ventured into what potential seemed like our future. I remembered as we approached our destination how all of the tall buildings engulfed our small mini coach, as we left the van an entered the hustle and bustle of a busy London street I immediately began to feel butterflies, it was as if I was living my dream.

As we all entered the large immaculate foyer of the headquarters I could see all of the professionals walking around in their suits, at this point I was thinking to myself ‘I wouldn’t mind being in their shoes right now’. Our first task of the day was to meet with one of the companies head recruiters who welcomed us to RBS by showing us a power point presentation and explaining briefly the company’s background. I found this helpful to relate with the company more, since before my knowledge about the company was quite shallow. After the recruiter had said her piece she invited a graduate economist to talk to us about the current state of the global economy. I remember distinctly our teacher asking him an awkward question and him answering it immaculately as if he had been doing this job for 10 years. This impressed me vastly as the graduate was only 4 years ahead of me. He then opened the floor to questions about his own personal background and journey into this job. I enjoyed the Q&A questions as it was extremely informative and helpful for my future. The recruiter then returned to tell us about their internship and graduate programs in detail, which was helpful to know as I was not aware of this information prior to the trip out here. At lunch more graduates came and talked to us expressing their tips and answering any of our questions given to them. This again was a good insight on the program since it was coming from primary sources making it highly useful information.

In the afternoon session we were sent with current RBS employees to shadow them to gain a first person experience of investment banking. I remember coming up on of the many escalators and seeing a room full of hard working employees trading on computers using 8 screens at once! This was astonishing seeing all of these graphs, numbers and words scrolling across all of these screens. One of my highlights of the trip was being able witness the employees absorb all of the information whilst speaking to clients on the phone then making high pressured decisions in a flash as if it was easy. I was blown away with the efficiency of all of these people. They explained their jobs to me, teaching me some of the basics of trading government issued bonds and how the markets worked, and also how the bank was making money from this. In the midst of people becoming ‘legged’ or having ‘fat fingers’ I found my time on the trading floor as being one of the most enjoyable and exciting things I have ever done.

Overall I found the day to be of great use as it helped me plan for the future and also hugely productive as I have learnt so much in one day. I have nothing but praise for the day and am extremely grateful for the opportunity presented to me. I would 100% recommend this course to anyone who is thinking of pursuing a career in finance.
STUDENT 2

Robert Dunn

On our arrival at RBS, we were greeted and issued with passes to have access to the various buildings we would require later in the day. Following this, the morning session consisted of 2 presentations. One of which was a presentation outlining the issues that the UK economy may face in the near future by an economist working for RBS as a graduate. The second presentation followed, which outlined the options of employment that RBS offer throughout your education; with additional hints and tips about applying for graduate roles and internships.

Following the morning session was a lunch where we could “network” with RBS graduates; this included asking them how they got to RBS and what they do from day to day.

In the first rotation of the afternoon session, I was delegated to one RBS graduate, who then showed me what he does on a day to day basis on the trading floor. His particular job was to oversee e-commerce which allows small and medium sized businesses to buy and sell currency (FX) without using a middleman salesperson. However, obviously they may be malfunctions which require expert intervention, hence why he has to ensure clients are happy with the use of the software. This method of trading is on the increase, but larger transactions (£1million+) are still carried out over the phone.

The trading floor is not as how it looks in movies, and whilst the job is obviously very frantic, I felt welcomed by all of the staff and they took time to answer any questions I had. It is obvious that workers on the trading floor were on the ball, with many arriving at around 6am, to ensure they knew what was going on in the world so that the best advice could be offered to clients.

The afternoon session involved shadowing 2 graduates, therefore after around an hour, I met Tim, another RBS graduate. His role entailed offering advice to firms who needed to hedge their risk. Therefore, his day to day job involved identifying the risk and methods to hedge the risk.

The best thing about the day was being allowed on the trading floor, which was very exclusive. RBS were also great by allowing so many staff the time to give us advice on their careers. I feel that it was a real benefit to have a one to one session with a graduate rather than a group session, as they could then tailor their demonstrations to my particular interests.

One improvement that could be made is to make better use of the time at the HQ. Whilst the careers advice and presentation on the economy worthwhile, I feel that they could also be carried out at college, which then could allow 4 rotations whilst at RBS.
4. RESEARCH WITH SCHOOLS AND COLLEGES IN THE MIDLANDS

The second feature of the research into the Finance Baccalaureate was to measure the level of interest within the educational sector, though visits and interviews with a sample of schools, colleges and a representative of the Department of Education.

During the visits to the schools and colleges, interviews were conducted with a range of stakeholders. Firstly, interviews were undertaken with a sample group of students, who were taking maths-based and finance related A levels. Secondly, interviews were conducted with subject managers and senior management within the organisations, all of which are located within the Midlands. The schools and colleges cater for a diversity of A level students with some organisations, based in inner city areas, compared to others in more rural settings. A common feature among all five organisations is the high proportion of their students, who take A level subjects. They are:

A. Cadbury VI Form College, Birmingham  
B. Hereford Sixth Form College  
C. Joseph Chamberlain Sixth Form College, Birmingham  
D. King Edward VI Aston School, Birmingham  
E. Lawrence Sheriff School, Rugby

In addition, informal discussions were conducted with:

- Worcester Sixth Form College
- Rugby School
- Other grammar schools within the Midlands
- A senior manager at Islington Sixth Form College, which is the largest Further Education College in London
- A representative of the Department for Education.

As a result of the visits to the five schools and colleges, a summary of the key points arising from the interviews have been summarised in Table 6. Secondly, the views of the senior management team, middle managers and the students themselves arising from student focus groups are shown in the following section. Selected quotations from the interviews have been indicated, in blue italics.
### TABLE 6: Summary of key points arising from interviews

<table>
<thead>
<tr>
<th></th>
<th>Cadbury Sixth Form College</th>
<th>Hereford Sixth Form College</th>
<th>Joseph Chamberlain College</th>
<th>King Edward VI Aston School</th>
<th>Lawrence Sheriff School</th>
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</thead>
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<td><strong>Sixth form student numbers</strong></td>
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<td>1800</td>
<td>2000</td>
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<tr>
<td>Estimated size of pilot group taking full qualification</td>
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<td>10-15</td>
<td>10-15</td>
<td>10-20</td>
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#### STUDENT TARGET GROUPS

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<th>Yr13</th>
<th>Yr13</th>
<th>Yr12/Yr13 [post-AS exams]</th>
<th>Yr12/Yr13 [post-As exams Further Maths]</th>
<th>Yr12/Yr13</th>
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<td>Year group in Economics</td>
<td>Yr13</td>
<td>Yr13</td>
<td>N/A</td>
<td>Yr12/Yr13 [post-AS exams]</td>
<td>Yr12/Yr13</td>
</tr>
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</table>

#### LINKS WITH EPQ

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<th>Yes</th>
<th>Yes</th>
<th>Yes</th>
<th>Yes</th>
<th>Yes</th>
</tr>
</thead>
</table>

#### MANAGERIAL ISSUES

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<tr>
<th>Work experience links to financial firms</th>
<th>Limited student-based links</th>
<th>Chartered accounting and Lloyds TSB</th>
<th>Limited student-based links</th>
<th>Student-based links</th>
<th>AXA, Barclays, HSBC and Santander</th>
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</thead>
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<tr>
<td>Possible Staffing</td>
<td>Economics</td>
<td>Economics/Maths</td>
<td>Maths</td>
<td>Maths</td>
<td>Economics/Maths</td>
</tr>
<tr>
<td>External Funding</td>
<td>Essential</td>
<td>Essential</td>
<td>Essential</td>
<td>Desirable</td>
<td>Essential</td>
</tr>
</tbody>
</table>
4.1 The Views of Senior Management

The views of the Head-teachers, Principals and senior management in the schools and colleges are:

- All five organisations considered there was a significant target market of students who would be interested in taking the qualification.

- The expected size of the pilot group of students would be approximately 10-20 students, and the number of students was likely to grow.

‘the students are quite savvy, they will only do the extra work if they think it will result in something and I suppose this is seen as a way to get into a city job and it gives you that chance to network very early on. That is the attraction I would suggest ... I think having the access, making that work experience, that is different. Having access then to proper careers advice and certainly by people who are there who are doing it. You wouldn’t be able to do get that otherwise and I think those two things in particular are attractive. So I would imagine you may start off with 20. We would almost certainly have to say you may have to cap numbers, you may have to have a selection process...’ [King Edward Vi Aston School]

- The qualification was of relevance to A level Maths students, especially Further Maths students, in the second year of their A level course.

- The qualification was also relevant to Economics students in the post-AS exam period and in the second year of their A level.

‘It would appeal to a distinct group of students who are leaning towards Mathematics and Economics. A great way to give these very talented students something more – a distinct area that is not catered for and the basic structure of Maths and one of Economics and Business is brilliant and would meet a lot of students needs.’[Lawrence Sheriff School]

- All of the schools and colleges were delivering the Extended Project Qualification and saw positive links that would result from combining the EPQ with the Finance Baccalaureate.

- Two of the five organisations had work experience links with financial organisations, which could be used as a feature of the Finance Baccalaureate, and all of the organisations felt this was an important feature of the qualification.

- All of the organisations suggested staff could teach the qualification, after appropriate training was provided, from the Maths and/or Economics departments.

- Four of the five organisations suggested that external funding for the costs of delivering the qualification was essential and one school suggested that funding was ‘desirable’.

‘Although we would do it if we thought it was useful and we would promote it as a really valuable thing so go with it from that, but it would be hard to justify it and subsidise it.’ [Hereford Sixth Form College]
4.2 The Views of Middle Management

Middle managers were interviewed at all of the schools and colleges including Economics subject leaders, Mathematics subject leaders and Work Experience Co-ordinators. Their views were:

- There were clear links between A level Maths and the Finance Baccalaureate.
- Further Maths students would be particularly interested.
- They expressed initial reservations about the level of difficulty of the mathematics.

‘I was going to ask you about was how difficult the mathematics would be and things like differential equations leapt out at me, but actually the mathematical content here would be fine for A level students...’ [King Edward VI Aston School]

In relation to Economics and finance-based subjects, such as Business Studies and Accounts:

- The course was most closely allied to Economics, but there were links to Business Studies as well.
- It was most appropriate for Economics students in the post-AS exam period in the summer term and in Year 13.

‘Although we don’t do Economics yet...I think that some of the students who go into Business Studies don’t shoot high enough. I think [the Finance Baccalaureate] would be good for Business Studies to link this to, as it’s quite an aspirational option.’ [Joseph Chamberlain College]

In relation to the Extended Project Qualification [EPQ], it was evident that:

- The Finance Baccalaureate was expected to add to the status of the EPQ.
- Finance-based EPQs may result from the Finance Baccalaureate, but Maths-based EPQs were not expected.
- EPQ teaching occurred at a similar time in the academic year as the teaching of the pilot group of students taking the Finance Baccalaureate.

‘The additional status of an RBS-funded qualification would encourage the students taking the EPQ’ [Cadbury Sixth Form College]

The work experience element of the Finance Baccalaureate was seen as most beneficial, but also problematic:

- Work experience with a finance firm would add status to the Finance Baccalaureate, especially if it was over two or more days.
- Work experience of any length of time was difficult to organise, as many firms were restricted in supervising students.
‘The two bits here that make it, the chance to get into RBS, to have a day in the city, that will attract students. It seems to me a day is not really long to do all this, is it? To make it sound, if it was two or three days it would be different, I think trying to do it in one day by the time you’ve got there. Even if you didn’t something like an afternoon, if you met in London at some point say 3 or 4 o’clock and then did something overnight and then did a full morning.’

[King Edward VI Aston School]

‘It would be challenging to provide it for all students and we would need to explore our ability to expand work experience to two day placements.’ [Lawrence Sheriff School]

4.3 The Views of Students

Student focus groups were conducted at four of the five schools and colleges [not at Joseph Chamberlain College]. There was an extremely enthusiastic response from the students, who wanted to start the course immediately, but [to their disappointment] were informed that it was an information gathering exercise The following views were expressed:

1) They welcomed the opportunity of work experience and links with financial organisations as a feature of the Finance Baccalaureate

2) They were very positive about the immersion day, as an alternative to work experience, if it was

‘a high powered day, shadowing senior staff, looking at issues and problems in the financial world. It is intended for students to understand aspects of the business that might spark ideas for potential research projects or work in the future.’ [King Edward VI College, Stourbridge]

3) The benefits of possibly taking the qualification as an alternative to an EPQ, or General Studies

Concerns were raised over the Finance Baccalaureate in relation to:

1) The possibility of being charged to undertake the course.

2) The level of difficulty of the Level 4 degree modules and how early the work would need to be taken.

3) How much time was involved in taking the course.

4) The acceptability of the qualification at universities.

‘How much would it cost to take the course’ [Cadbury Sixth Form College]

‘Do you get UCAS points for the course...and can we put it on our Personal Statement when applying for university?’ [Hereford Sixth Form College]
4.4 The Views of Universities

To assess the acceptability of the Finance Baccalaureate as an entrance qualification to universities, a number of admissions tutors were canvassed for their views. A limited number of universities, including some very prestigious institutions, responded to the requests for views and this is an area that requires further research to be confident of the validity of the findings. It was concluded that universities would view the Finance Baccalaureate positively because:

- It provided evidence of additional student motivation among equally able A level students.

‘With regard to admissions teams at universities, you have certain universities that are looking for motivation as much as anything else and the fact that students have gone down this sort of route would indicate they are keen to do it, they have done well in it therefore we should bring them on to our courses.’ [Birmingham City University]

- It provided contextualised information relating to finance to those students wanting to take a banking and finance-based degree.

‘I think the important point is that what you are teaching is contextualised.’ [Birmingham City University]

‘The Accounting and Finance courses, such as at Warwick University, are likely to be particularly interested in students taking this qualification’ [Cambridge University]

- The material being studies did not duplicate degree course material.

‘The outline proposal looks very promising. The Finance Baccalaureate provides a good mixture of stats, maths, economics and finance (theory and applied).’ [Leeds University]

It would not be an advantage to academic-based degree courses in Economics.

‘It would be no advantage to those students taking an academic degree with us, such as in Economics.’ [Cambridge University]

Visits to and work with the London School of Economics are also planned imminently. LSE has indicated interest in involvement in the initiative as a whole.

The overall impression of universities response was positive, but it would require additional research into the views of admissions tutors for finance-based degree courses.
5. RESEARCH WITH OTHER STAKEHOLDER GROUPS

5.1 The Banking Sector View

The UK banking sector has a significant strategic role in the UK economy and accounts for 10% of G.D.P. in the United Kingdom. The provision of retail banking services is highly concentrated and is dominated by the four big UK banking groups: RBS, Barclays, HSBC and Lloyds Banking Group (LBG). These banks, along with Nationwide and Santander, together account for almost 80% of the stock of UK customer lending and deposits.

The ‘City of London’ as a central hub for the banking sector is a world leader in international finance and business services. Within the UK Balance of Payments, financial services generated a trade surplus of more than £50bn in 2010. The long-term success of these financial organisations is important for their customers, employees and the financial well-being of the economy.

In order to maintain the long-term success of the UK banking sector, it needs to continue to employ talented individuals who have the aptitude to develop these businesses further. In the experience of the Royal Bank of Scotland, recruitment of such people across a range of backgrounds is becoming more difficult as:

“We are struggling to recruit people with mathematical talent in this country to take the bank forward, people at the top end of the bank having to go overseas and it’s a problem.”

Negative press associated with the banking sector and poor lending practices may exacerbate this problem of deterring high quality applicants into the financial sector. As a result, the financial sector is taking positive steps to become more involved in the educational sector to attract talented applicants and raise students’ awareness of financial matters. This is, first of all, seen in the support of the Chartered Institute of Financial Services of Bruncliffe School in its development of the CISI Certificate. And, secondly, the development of the Finance Baccalaureate, which may also address this issue by:

- Attracting more able, high calibre mathematical students.
- Providing introductory financial knowledge of the sector.
- Providing a more positive public image with private sector financial organizations supporting public sector curriculum development.
- Supporting government educational initiatives at a time of fiscal constraint.

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9 Extracts taken from the www.cityoflondon.gov.uk/Corporation, accessed on 7th December 2011

10 Advisory Committee for Maths Education, ACME Conference 2011, sponsored by the Royal Society

11 Morley Observer, 12th April 2012
5.2 The Government View

Government support for private sector involvement in the public sector is seen across a range of policies, including education. Government support for educational initiatives in the area of financial education and entrepreneurship is evident and the Finance Baccalaureate is increasingly recognized in this context. As stated in the House of Commons:

‘With regard to schools and colleges, I want as many schools as possible to encourage entrepreneurial opportunities. That can be done in a variety of ways. For example, there are a number of courses that schools could offer students. Those courses include the IFS School of Finance certificate and diploma in financial studies and the Finance Baccalaureate being piloted at King Edward VI College in Stourbridge, backed by the Royal Bank of Scotland. They are examples of where young people can do courses to encourage entrepreneurial flair. In some schools, that could be an appropriate way to encourage it.’

The Wolf Report

Professor Alison Wolf’s recent report into post 16 education recommended, amongst other things, a marked increase in the exposure to work-related learning, a move towards internship opportunities for advanced level students and an increased partnership between business and the education sector. A visit to senior civil servants in the Department for Education early in the New Year enabled the Wolf implementation team to be briefed fully on the Finance Baccalaureate project. They were suitably impressed and we were informed that Professor Wolf would be fully updated on the initiative. It is likely that the finance baccalaureate approach will gain some recognition in the roll-out of the Wolf report in the coming months and years.

Parliamentary Select Committee

Roger Porkess, former MEI Chief Executive was able to brief the parliamentary Education Select Committee on the Finance baccalaureate project in the autumn and gained an encouraging response from MPs who subsequently detailed Stourbridge MP Margot James to find out more and then report back. A successful meeting has led to further government encouragement for the project and a personal recommendation to the London School of Economics to work with the Finance Baccalaureate team to help develop it further. This is in now in hand.

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12 Hansard, House of Commons debate, Justin Tomlinson MP, Chairman of the All Party Parliamentary Group on Financial Education, 18th April 2012
6. CONCLUSIONS AND RECOMMENDATIONS

6.1 Financial organisations such as the Royal Bank of Scotland have stated:

“We are struggling to recruit people with mathematical talent in this country to take the bank forward, people at the top end of the bank having to go overseas and it’s a problem.”

The Finance Baccalaureate is intended to address this problem by combining elements of maths-based and finance-based A levels, so that they are directed towards the financial sector for those more able students who intend to go into a financial career. Research suggests that the Finance Baccalaureate:

- Meets a clear need in the market for post-16 students.
- With appropriate training, staff within Mathematics and Economics departments would be confident to deliver the qualification.
- It would be viewed positively by universities.
- It would be supported by financial organisations.
- It is the strong backing of government and fits well with current initiatives seeking to develop stronger links between education and businesses, increasing social mobility as well as increasing the financial literacy of the nation’s young people.

6.2 It is recommended to develop the Finance Baccalaureate further, that:

- It is disseminated to a larger number of schools and colleges, through professional bodies such as the Economics and Business Education Association.
- Research is undertaken into the development of Level 4 free-standing Maths qualifications in collaboration with MEI and the OCR examination board.
- The teaching materials are refined by MEI and the ifs School of Finance as a result of findings, drawn from the pilot scheme at King Edward VI College, Stourbridge.
- In collaboration with the Royal Bank of Scotland, support from the financial sector is encouraged to develop the qualification regionally and nationally.
- Research with the Department of Education and the UK government is undertaken into the efficacy of using private sector funding to support public sector educational developments.

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13 Advisory Committee for Maths Education, ACME Conference 2011, sponsored by the Royal Society
APPENDICES

Appendix 1  Curriculum profile of pilot group at King Edward VI College, Stourbridge

Appendix 2  Student responses to ‘immersion day’ at the Royal Bank of Scotland

Appendix 3  Exemplar lessons, ‘The Mathematics behind Economics’, MEI


Appendix 5  Extracts from interviews (available on request)
## APPENDIX 1

### Curriculum Profile of Pilot Group at King Edward VI College, Stourbridge

<table>
<thead>
<tr>
<th>Forename</th>
<th>Please if studying</th>
<th>List other finance-related subjects studied</th>
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</tr>
<tr>
<td>Alice</td>
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</table>
On Wednesday 29th February I embarked on a 3hr journey to the centre of London to visit Royal Bank of Scotland headquarters to gain a clearer insight of investment banking. Having left home at 6 am I and a group of college friends accompanied by our teacher we all ventured into what potential seemed like our future. I remembered as we approached our destination how all of the tall buildings engulfed our small mini coach, as we left the van an entered the hustle and bustle of a busy London street I immediately began to feel butterflies, it was as if I was living my dream.

As we all entered the large immaculate foyer of the headquarters I could see all of the professionals walking around in their suits, at this point I was thinking to myself ‘I wouldn’t mind being in their shoes right now’. Our first task of the day was to meet with one of the companies head recruiters who welcomed us to RBS by showing us a power point presentation and explaining briefly the company’s background. I found this helpful to relate with the company more, since before my knowledge about the company was quite shallow. After the recruiter had said her piece she invited a graduate economist to talk to us about the current state of the global economy. I remember distinctly our teacher asking him an awkward question and him answering it immaculately as if he had been doing this job for 10 years. This impressed me vastly as the graduate was only 4 years ahead of me. He then opened the floor to questions about his own personal background and journey into this job. I enjoyed the Q&A questions as it was extremely informative and helpful for my future. The recruiter then returned to tell us about their internship and graduate programs in detail, which was helpful to know as I was not aware of this information prior to the trip out here. At lunch more graduates came and talked to us expressing their tips and answering any of our questions given to them. This again was a good insight on the program since it was coming from primary sources making it highly useful information.

In the afternoon session we were sent with current RBS employees to shadow them to gain a first person experience of investment banking. I remember coming up on of the many escalators and seeing a room full of hard working employees trading on computers using 8 screens at once! This was astonishing seeing all of these graphs, numbers and words scrolling across all of these screens. One of my highlights of the trip was being able witness the employees absorb all of the information whilst speaking to clients on the phone then making high pressured decisions in a flash as if it was easy. I was blown away with the efficiently of all of these people. They explained their jobs to me, teaching me some of the basics of trading government issued bonds and how the markets worked, and also how the bank was making money from this. In the midst of people becoming ‘legged’ or having ‘fat fingers’ I found my time on the trading floor as being one of the most enjoyable and exciting things I have ever done.

Overall I found the day to be of great use as it helped me plan for the future and also hugely productive as I have learnt so much in one day. I have nothing but praise for the day and am extremely grateful for the opportunity presented to me. I would 100% recommend this course to anyone who is thinking of pursuing a career in finance.
STUDENT 2 James Bate

In the afternoon I spent my time with a couple of graduates working at RBS. The first graduate gave me a tour of the building he worked in. It was fascinating to see the change in working atmosphere between one office floor to another. The most tense office, I felt, was the trading floor, for obvious reasons. The two graduates worked on the Debt Capital Markets floor, which included Debt Capital Markets bankers, Syndicate Bankers, and Corporate Risk Solutions Sales People. The first graduate I was with was involved in raising finance for governments by selling government bonds (Gilts) to banks and other corporations. A Gilt is about the safest bond around, especially if with the UK government as they have never failed on a repayment before, and hence their A+++ credit rating. The graduate told me about a deal he did earlier in the week, where a government needed a large amount of money and he managed to sell a number of 20 year Gilts. I found it very interesting speaking to employees around him about what it was like to work at RBS back in the ‘dark days’ of 2008. They told me stories of how they just used to watch the share price drop constantly, without being able to do anything about it. Job security was low and so was morale. The second graduate I was with was a Syndicate Banker. This involves arranging large amounts of money for large corporations through what are called Syndicate loans. This is be done by bringing together a number of smaller loans from other banks and offering it to a company as one loan. In effect, the bank acts as a middle man, cutting out the running around for the company and only have one loan to worry about, instead of multiple loans. The advantage of this to RBS is that is allows them to spread risk over a number of other banks and it allows them to make a margin in terms of interest rates to make it worthwhile.

Three general things I established from the day was to not believe most things you hear in the press about RBS, how Germany really is a model economy, and how companies exploiting opportunities in emerging markets are worth consideration when investing money. I enjoyed the day very much and I would most definitely recommend this opportunity to students in the future, it opened my eyes and I feel much wiser for the experience.

STUDENT 3 Rahul Verma

The trip on a whole to RBS was fantastic. Even before we arrived to the headquarters, we were excited and full of enthusiasm. As soon as we arrived I was taken away by the sheer size of the building. The first meeting we had which was a overall broadcast on the economy as a whole and its current position was interesting - even though I knew what was the current situation of the economy. The second presentation with Candice was most insightful. It gave me an idea, what I need to do if I want a graduate scheme there. First of all we have to go to a spring week taster course in our first year of university. From there, we can apply for a summer internship and then do a graduate scheme. The talk was further beneficial as Candice gave us interview tips and CV tips that we can use to help us. I think the best part of the trip was the two sessions we did with two graduates. In the first session me and Harbinder, went with Stephane, a researcher who works in investment banking. Stephane gave us an overview of what he does and how he is still learning the trade of being a researcher. He also gave us valuable tips on how to apply and what key stages to go through if we want to end up at RBS. In the second session, we then spent the rest of the time with Sebastian. He also works in the same area as Stephane but is training as a sales person. Seb was great, he taught us how the various areas of sales, traders, researchers and the structural department work together. He also gave us an idea of how bonds and shares are sold between clients and the sales people and traders. Overall the whole experience was amazing, I
would definitely do this again and would definitely recommend this to someone. The only problem was that we didn’t have enough time to go around the other areas of banking like talking to the traders and the structural department. This experience has definitely made me want to go through the process of applying through a company like RBS.

STUDENT 4 Ranvir Ghag

We arrived at the RBS headquarters just before 10.30am after an early departure from college at 6.30am. We were all given passes and then entered a conference room where we received a talk about the current economic situation concerning the recent recession and Greece from a graduate. Then we had a short break before another talk about RBS internships which are about 10 weeks long and receive 90% of the pay of a graduate starting salary. Next we had a networking lunch with a few other graduates who explained what their roles were in the bank and how they'd got their various jobs. They explained how they dealt with trades involving millions and billions of pounds and how they made money for the bank. Then after lunch I shadowed a corporate bonds investor. He showed me his portfolio of trades and how he worked out which bonds to buy and sell. He also showed me a product called CDS' which are basically insurance against a bond if the company goes bust. He explained how these were most valuable when a bond was furthest from maturity and that they gradually lost their value as the bond matured. Next I shadowed another person who created financial products using complex maths to then sell to clients. He also showed me how to compare the yield of a product against the risk of it, by using standard deviation, to see if it was worth buying too. After this we all met the head of recruitment who asked us how the day had gone and if at all how it could have been improved. Then we all came home after the long day.

STUDENT 5 Robert Dunn

On our arrival at RBS, we were greeted and issued with passes to have access to the various buildings we would require later in the day. Following this, the morning session consisted of 2 presentations. One of which was a presentation outlining the issues that the UK economy may face in the near future by an economist working for RBS as a graduate. The second presentation followed, which outlined the options of employment that RBS offer throughout your education; with additional hints and tips about applying for graduate roles and internships.

Following the morning session was a lunch where we could “network” with RBS graduates; this included asking them how they got to RBS and what they do from day to day. In the first rotation of the afternoon session, I was delegated to one RBS graduate, who then showed me what he does on a day to day basis on the trading floor. His particular job was to oversee e-commerce which allows small and medium sized businesses to buy and sell currency (FX) without using a middleman salesperson. However, obviously they may be malfunctions which require expert intervention, hence why he has to ensure clients are happy with the use of the software. This method of trading is on the increase, but larger transactions (£1million+) are still carried out over the phone.

The trading floor is not as how it looks in movies, and whilst the job is obviously very frantic, I felt welcomed by all of the staff and they took time to answer any questions I had. It is obvious that workers on the trading floor were on the ball, with many arriving at around 6am, to ensure they knew what was going on in the world so that the best advice could be offered to clients.
The afternoon session involved shadowing 2 graduates, therefore after around an hour, I met Tim, another RBS graduate. His role entailed offering advice to firms who needed to hedge their risk. Therefore, his day to day job involved identifying the risk and methods to hedge the risk.

The best thing about the day was being allowed on the trading floor, which was very exclusive. RBS were also great by allowing so many staff the time to give us advice on their careers. I feel that it was a real benefit to have a one to one session with a graduate rather than a group session, as they could then tailor their demonstrations to my particular interests.

One improvement that could be made is to make better use of the time at the HQ. Whilst the careers advice and presentation on the economy worthwhile, I feel that they could also be carried out at college, which then could allow 4 rotations whilst at RBS.

STUDENT 6  Adam Coxshall (King Edwards VI College, previously at The Earls High School)

As part of trialling the material for the Financial Baccalaureate, a group of students, including myself, were able to go to the RBS headquarters in London to learn more about what happens in financial companies such as RBS. We began with an overview of how RBS works and the structure of its Global Markets division. We were then given a presentation by a graduate economist, Gareth Anderson, on the state of the economy at the moment post recession and the risks attached to the current economic position of the UK. Following on from that, we received insight into the how the Internship and Graduate program works for RBS and what we would need if we wanted to pursue a career in the financial sector. The advice including being able to network and get as many business cards from as many people as we could (because we never know when a chance encounter could equal a job).

In the afternoon we were given rotations in different areas of the bank. I was expecting to be just given a guided tour of the areas but we were instead at the desks of graduate at the bank as they worked, I was first on the desk in the bank area looking at the currency trading that goes on. To anyone looking in, it looks like a lot of numbers on screens but the people working their know what to look for. My second rotation was on the sales department in the currency area – looking at how RBS manages risks when deciding to accept buy and selling currency. I thought it was a thoroughly enriching day where I saw a lot of what happens in RBS behind closed doors and I would definitely recommend it for anyone with any interest in going into a career in finance, at least to see what goes on inside a company like RBS.

STUDENT 7  Jacob Gledhill

After arriving at RBS headquarters at around 10.30, we were taken to a meeting room in which we were introduced to a graduate, who gave us a presentation on the current (bleak) outlook for the UK economy. We then had a talk on what options were available for young people who were interested in a job at an organisation like RBS, including some valuable advice on how to make a solid application for an internship. After this we had a ‘networking’ lunch, which was basically just a chance for us to talk to some people who were currently on the graduate scheme run by RBS, who gave us some useful tips and interesting (and in some cases bizarre) anecdotes of their attempts to get into, and their experiences of, the banking industry.
My one worry for the trip was that we would be seen as unwanted guests, as a multi-billion pound corporation would surely have better things to do than host a bunch of A-level students. How wrong I was. In the afternoon we were each assigned two graduates to shadow, each for an hour and a half, meaning we got to see the workings of the inside of the company and ask any questions that we wanted to. For the first period I was in sales, learning about the sheer level of detail that must go into any one sale. My guide was heavily involved in the risk management process which must be considered in any transaction, so I discovered futures, options and all sorts of other strategies that are considered in every package offered to clients. We then went down to the trading floor (which was very hectic!) to get some recent updates on different markets. After retreating to the relative calm of the sales department, I was shown the organisational structure of RBS and then it was time for the second rotation.

The next department I visited was sales trading, which was similar to sales but with more involvement in the actual process of selling the product. This was a fascinating experience, as I was shown some examples of enquiries that my guide (Thomas) had received that day, and the level of complexity involved in these enquiries was again unbelievable. I was then allowed to have a go on a demo programme which modelled the stock market, and I was tasked with investing wisely to try and make a profit. Needless to say, being a complete novice I made an unrealised loss of over £100,000 (although I did make a realised profit of around £3000!) This was a brilliant indicator of just how difficult it is to play the markets, as there are so many different things to concentrate on, including the news channels and information on loads of different markets on about 6 different computer screens. After this period finished, we had a meeting with Mike Maddick, head of graduate recruitment and development at RBS, where he gave some final advice and we evaluated the day. It was then time to leave and make our way back home.

I really enjoyed the trip to RBS and I would thoroughly recommend it to anyone who has the opportunity to go on it. Seeing the inside of the bank was a real eye opener, as it was nothing like what I expected it to be, and the level of interaction between the different departments was astounding. The people who showed me around were incredibly friendly and I didn’t once feel as though I was unwelcome. I also found out that it is not necessary to have done a degree in economics or even a related subject to get a job at RBS, as my guides had done degrees in physics and geography! I fully intend to apply for a one week internship at RBS next Easter, and if I am successful in that then I hope to apply for the 10 week long summer internship the year after that.

STUDENT 8 Arun Bains

I thoroughly enjoyed the trip to RBS, and I felt that it was a very informative visit. At the start of the visit to the RBS headquarters, I was a little nervous, as we were in one of the biggest bank in England, and the size of the headquarters was quite daunting, however as we were spoken to by the graduates, I got a little more relaxed, as I realised that they were only 5 years older than us, as well as being warmly welcomed by Candice and the rest of the team. One of the main things that I learnt from the trip was that, as well as what you know, it is also about who you know. This was one of the key factors, as many of the graduates told us that networking helped them to secure a place as a graduate, as they used contacts that they had picked up through internship at RBS as well as contacts that they have met throughout life. The presentation was very informative regarding the process on how to become more desirable to the employee, as well as useful tips for CV’s and interviews. The shadowing of the graduates, was also one of the highlights of the day, as it put the theory into context, and it showed me what the graduates actually do and what their roles are. The trip/finance baccalaureate was very enjoyable and I would definitely recommend it to new students.
As well as a big thanks to the RBS team, I would also like to say thank you Mike, for giving us the opportunity to visit RBS as well as teaching us the finance course.

STUDENT 9 Daniel Carrington-Foster

On Wednesday 29\textsuperscript{th} of February I was fortunate enough to visit RBS which was a interesting experience.

On the coach I waited in anticipation not sure of what to expect from my experience of RBS one of the world’s largest banks. A long while later, after a small detour, we arrived at the bank. The building was massive and stylish with see-through glass elevators. I sat there taking it all in as we checked in and received our passes. Then we took one of the elevators into a meeting room and were welcomed by Candice, who worked in the bank. We were then delivered a presentation on the current state of the economy by a recent graduate followed by the opportunity to ask him questions for example: What he studied at university and what his job involved. This was intriguing and I learnt about the current GDP of the UK compared to France and Germany and the graduate’s opinion of the future economic climate.

We then received a presentation on Graduate recruitment at RBS which included helpful tips on Application and what we should and shouldn't include in a CV, alongside what should be contained in a cover letter. As well as the opportunity to ask questions again and find out more. This session was extremely useful and I left it feeling that my applications in the future would be better thanks to the information received.

We then had lunch and the opportunity to talk to more recent graduates and find out how they got to where they are today. I mainly talked to George who recently graduated from Manchester university and he provided a great insight into the university and also the internship. Whilst he was on internship he received an offer from RBS to join the graduate scheme which he is currently on.

In the afternoon I was paired with Paras who worked in trading and he talked about what he does, which is executing trading strategies to earn RBS cash which will hopefully lead to a profit for the bank. I then asked him various questions which helped me to understand some of the terminology they use such as FX being exchange rates and how the strategies they use work. I was really happy to have learnt something new and joined my new partner Sam looking forward to seeing what he did. Sam worked in sales which is very fast paced and within seconds of sitting down he was in action and managed to save the company 100k by managing to avoid a transaction after there was a mistake with the information provided to him. As time went on the pace was still relentless with desks around us jumping around in excitement or disappointment as transactions went through and I learnt a little more about what the screen was actually displaying and could see the pressure involved in the job.

We then met Mike Maddick who is head of recruitment for RBS and he gained feedback from us about the day and we got to ask him any questions that we hadn't yet found answers to, although I personally didn’t have anything to ask. After a few questions we then returned to the coach and after another long journey finally arrived back at college.

Overall I really enjoyed the day which provided a brilliant insight to RBS and I would definitely recommend it to anyone who has an interest in finance. The trip exceeded my expectations and has definitely left me considering applying to RBS’ Graduate recruitment programme.
EXEMPLAR LESSONS 1 & 2

Lesson 1

The Economic Multiplier  
and Geometric Series
A starter question
When you have left college or university, and have a job, write down what will you do with the money?

A model of a simple economy
Consider a simple economy where everyone spends half their income and saves the other half. This is not realistic but reality is complicated and we need to simplify it to help us understand it. We will make things gradually more complicated.

‘The Simple Economy’ PowerPoint.

<table>
<thead>
<tr>
<th>Mathematics in Economics</th>
<th>STUDENT NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Simple Economy</td>
<td></td>
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<tr>
<td>© MEI 2011</td>
<td></td>
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<tr>
<td>A simple example</td>
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<tr>
<td>The marginal propensity to consume</td>
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<tr>
<td>Visual representation of the marginal propensity to consume ['The square']</td>
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<tr>
<td>If the propensity to consume is 0.5</td>
<td></td>
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<tr>
<td>The idea in a nutshell</td>
<td></td>
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</tbody>
</table>

Key point: The total income is.....
‘Simple Economy’ Spreadsheet

This new spending is income for other people, how much will they spend?

There is a graph on the second page of the spreadsheet.

After only a few “rounds” the total income settles at a value which can be read off this graph.

**Key point:** The total income is .....

**Student exercise:**

Find the multiplier for three different values of marginal propensity to consume.

1]

2]

3]

**Key point:** Each multiplier should be the reciprocal of...
A geometric series

A geometric series is a sum where each number added on is the same multiple of the one before. The multiplier effect is an example of a geometric series.

Examples

3 + 6 + 12 + 24 (4 terms, common ratio 2)
1.2 + 12 + 120 + 1200 + 12 000 + 120 000 (6 terms, common ratio 10)
3 – 6 + 12 – 24 + 48 (5 terms, common ratio -2)

Write three more examples below and state the number of terms and the common ratio.

1.

2.

3.

Infinite series

If the common ratio is between -1 and 1, it is possible to find a sum for an infinite geometric series.

Sometimes, it is possible to show this visually.

\[
1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{16} + \frac{1}{32} + \ldots = 2
\]

What infinite sum does the following diagram illustrate?
**A formula for an infinite geometric series**

Suppose the first term is $a$ and the common ratio is $r$ with $0 < r < 1$.

<table>
<thead>
<tr>
<th>An algebraic approach</th>
<th>A visual approach</th>
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</thead>
<tbody>
<tr>
<td>[ S = a + ar + ar^2 + ar^3 + ar^4 + ar^5 + \ldots ]</td>
<td>[ \text{The area of the first circle is } a. ] [ \text{The area of each of the other circles is } r \text{ times the area of the circle to the left of it.} ]</td>
</tr>
<tr>
<td>Multiply both sides by $r$</td>
<td>[ S_r = ar + ar^2 + ar^3 + ar^4 + ar^5 + ar^6 + \ldots ]</td>
</tr>
<tr>
<td>Note that the sum goes on forever but the terms keep getting smaller and smaller.</td>
<td>What is $S - S_r$?</td>
</tr>
<tr>
<td>What is $S - S_r$?</td>
<td>How can you use this to get a formula for $S$?</td>
</tr>
<tr>
<td>How can you use this to get a formula for $S$?</td>
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</tbody>
</table>
‘Looking at things another way’

Refer to the spreadsheet.

Look at the tab labeled savings to show that.....

‘Looking at things another way’ PowerPoint.

<table>
<thead>
<tr>
<th>Mathematics in Economics Looking at things another way © MEI 2011</th>
<th>STUDENT NOTES</th>
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<tbody>
<tr>
<td>A formula for a simple economy</td>
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<tr>
<td>In a more complicated economy</td>
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<td>This square</td>
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<td>The multiplier</td>
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<td>The multiplier for a simple economy</td>
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<tr>
<td>Suppose the economy is more complicated</td>
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<tr>
<td>The multiplier</td>
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STUDENT EXERCISE:

How important is the multiplier effect to the economy?

What is the implications of an increase in the marginal propensity to save on the economy?
IT IS the biggest peacetime fiscal expansion in history. Across the globe countries have countered the recession by cutting taxes and by boosting government spending. The G20 group of economies, whose leaders meet this week in Pittsburgh, have introduced stimulus packages worth an average of 2% of GDP this year and 1.6% of GDP in 2010. Co-ordinated action on this scale might suggest a consensus about the effects of fiscal stimulus. But economists are in fact deeply divided about how well, or indeed whether, such stimulus works. The debate hinges on the scale of the “fiscal multiplier”. This measure, first formalised in 1931 by Richard Kahn, a student of John Maynard Keynes, captures how effectively tax cuts or increases in government spending stimulate output. A multiplier of one means that a $1 billion increase in government spending will increase a country’s GDP by $1 billion.

The size of the multiplier is bound to vary according to economic conditions. For an economy operating at full capacity, the fiscal multiplier should be zero. Since there are no spare resources, any increase in government demand would just replace spending elsewhere. But in a recession, when workers and factories lie idle, a fiscal boost can increase overall demand. And if the initial stimulus triggers a cascade of expenditure among consumers and businesses, the multiplier can be well above one.

The multiplier is also likely to vary according to the type of fiscal action. Government spending on building a bridge may have a bigger multiplier than a tax cut if consumers save a portion of their tax windfall. A tax cut targeted at poorer people may have a bigger impact on spending than one for the affluent, since poorer folk tend to spend a higher share of their income.

Crucially, the overall size of the fiscal multiplier also depends on how people react to higher government borrowing. If the government’s actions bolster confidence and revive animal spirits, the multiplier could rise as demand goes up and private investment is “crowded in”. But if interest rates climb in response to government borrowing then some private investment that would otherwise have occurred could get “crowded out”. And if consumers expect higher future taxes in order to finance new government borrowing, they could spend less today. All that would reduce the fiscal multiplier, potentially to below zero.

Different assumptions about the impact of higher government borrowing on interest rates and private spending explain wild variations in the estimates of multipliers from today’s stimulus spending. Economists in the Obama administration, who assume that the federal funds rate stays constant for a four-year period, expect a multiplier of 1.6 for government purchases and 1.0 for tax cuts from America’s fiscal stimulus. An alternative assessment by John Cogan, Tobias Cwik, John Taylor and Volker Wieland uses models in which interest rates and taxes rise more quickly in response to higher public borrowing. Their multipliers are much smaller. They think America’s stimulus will boost GDP by only one-sixth as much as the Obama team expects.

When forward-looking models disagree so dramatically, careful analysis of previous fiscal stimuli ought to help settle the debate. Unfortunately, it is extremely tricky to isolate the impact of changes in fiscal policy. One approach is to use microeconomic case studies to examine consumer behaviour in response to specific tax rebates and cuts. These studies, largely based on tax changes in America, find that permanent cuts have a bigger impact on consumer spending than temporary ones and that consumers who find it hard to borrow, such as those close to their credit-card
limit, tend to spend more of their tax windfall. But case studies do not measure the overall impact of tax cuts or spending increases on output.

An alternative approach is to try to tease out the statistical impact of changes in government spending or tax cuts on GDP. The difficulty here is to isolate the effects of fiscal-stimulus measures from the rises in social-security spending and falls in tax revenues that naturally accompany recessions. This empirical approach has narrowed the range of estimates in some areas. It has also yielded interesting cross-country comparisons. Multipliers are bigger in closed economies than open ones (because less of the stimulus leaks abroad via imports). They have traditionally been bigger in rich countries than emerging ones (where investors tend to take fright more quickly, pushing interest rates up). But overall economists find as big a range of multipliers from empirical estimates as they do from theoretical models.

These times are different

To add to the confusion, the post-war experiences from which statistical analyses are drawn differ in vital respects from the current situation. Most of the evidence on multipliers for government spending is based on military outlays, but today’s stimulus packages are heavily focused on infrastructure. Interest rates in many rich countries are now close to zero, which may increase the potency of, as well as the need for, fiscal stimulus. Because of the financial crisis relatively more people face borrowing constraints, which would increase the effectiveness of a tax cut. At the same time, highly indebted consumers may now be keen to cut their borrowing, leading to a lower multiplier. And investors today have more reason to be worried about rich countries’ fiscal positions than those of emerging markets.

Add all this together and the truth is that economists are flying blind. They can make relative judgments with some confidence. Temporary tax cuts pack less punch than permanent ones, for instance. Fiscal multipliers will probably be lower in heavily indebted economies than in prudent ones. But policymakers looking for precise estimates are deluding themselves.

Key points