

UK ENGINEERING STUDENTS' MATHS ENTRY QUALIFICATIONS: GRADES and NON-PROGRESSION

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How do the Maths (and Further Maths) A-level entry qualifications for Engineering students vary between sectors (Russell Group, other pre-92, and post-92), and to what extent does it affect students' Year 1 Engineering students' progression rates?

Nationally 88816 Maths A-level candidates, and 14028 Further Maths A-level candidates, in 2014.

About 11.3% of Maths A-level candidates, and 17.1% of Further Maths candidates, entered Yr1 Engineering degree programmes at UK Universities.

Maths A level (or equivalent Maths qualification) required by >90% of BEng and MEng Engineering programmes in UK.

About 90% of MEng Engineering programmes have a stated requirement for an A or B Maths A-level grade, whilst about 90% of BEng programmes ask for a B or C grade.

FULL HESA DATASET: All UK-domiciled Engineering students on Bachelor and integrated-Masters UG Engineering programmes in 2014/15.

- "Engineering programmes": >60% engineering content (JACS H1-H9) at ~100 Universities
- Number of UK Engineering students in all years of study: 62987 FT, and 10519 PT
- Number of UK Engineering students entering in Year 1: 19136 FT, and 1415 PT (+ ~1100 PT students at OU - did not have "Year of Study" recorded)
- Number of UK Engineering students entering in an Engineering Foundation Year (~50 HEIs): 3378 FT, and 139 PT

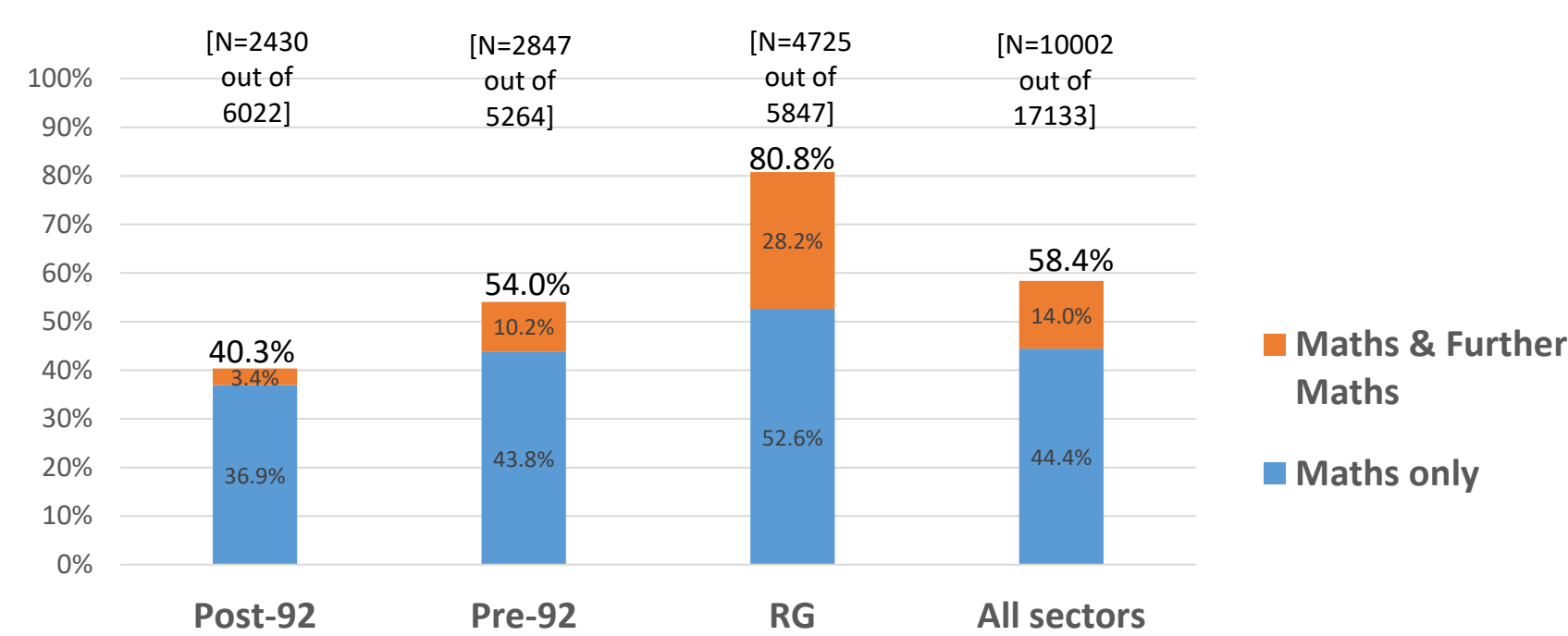
DATASET FOR THIS ANALYSIS: Year 1 full-time only; excludes Scottish University students; excludes students entering via a Foundation Year.

Hence 17133 students with any qualifications, of which 10002 have a Maths A-level qualification.

Acknowledgement to RAEng for funding this analysis.

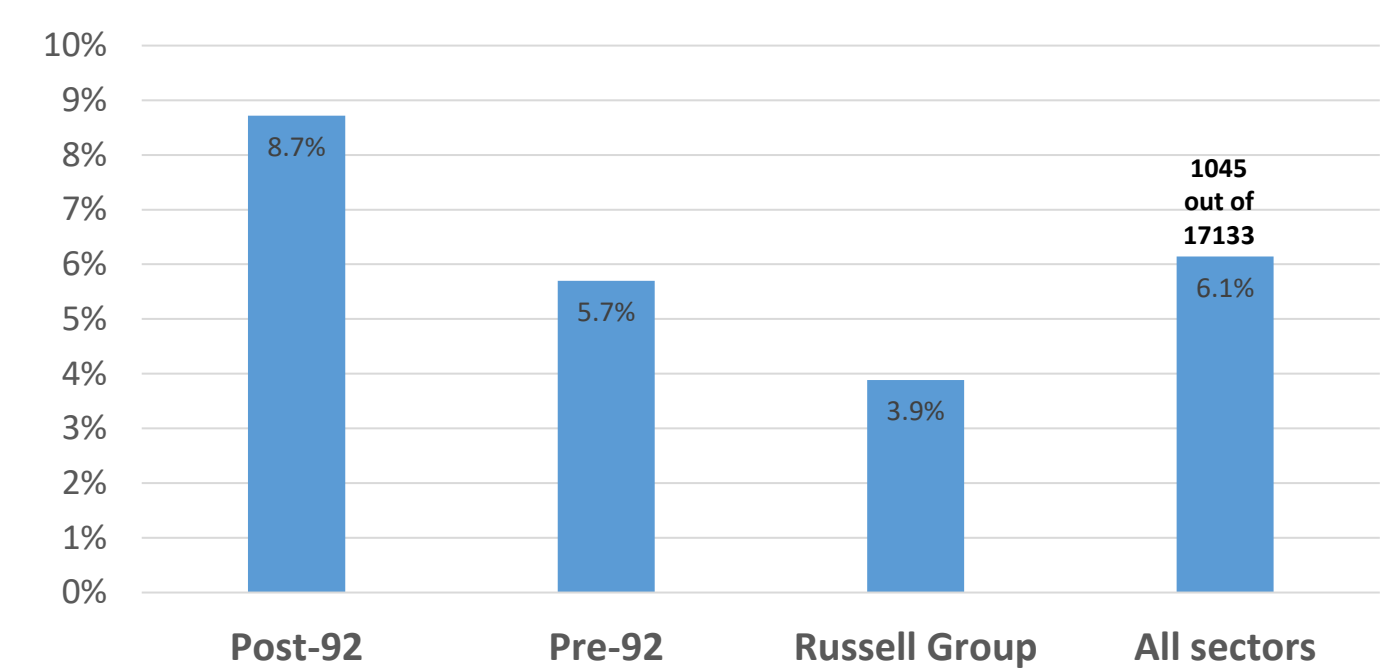
Engineering students with Maths A-level (with/without Further Maths) by SECTOR

Number and % in each sector with a Maths (& Further Maths) A-level entry qualification

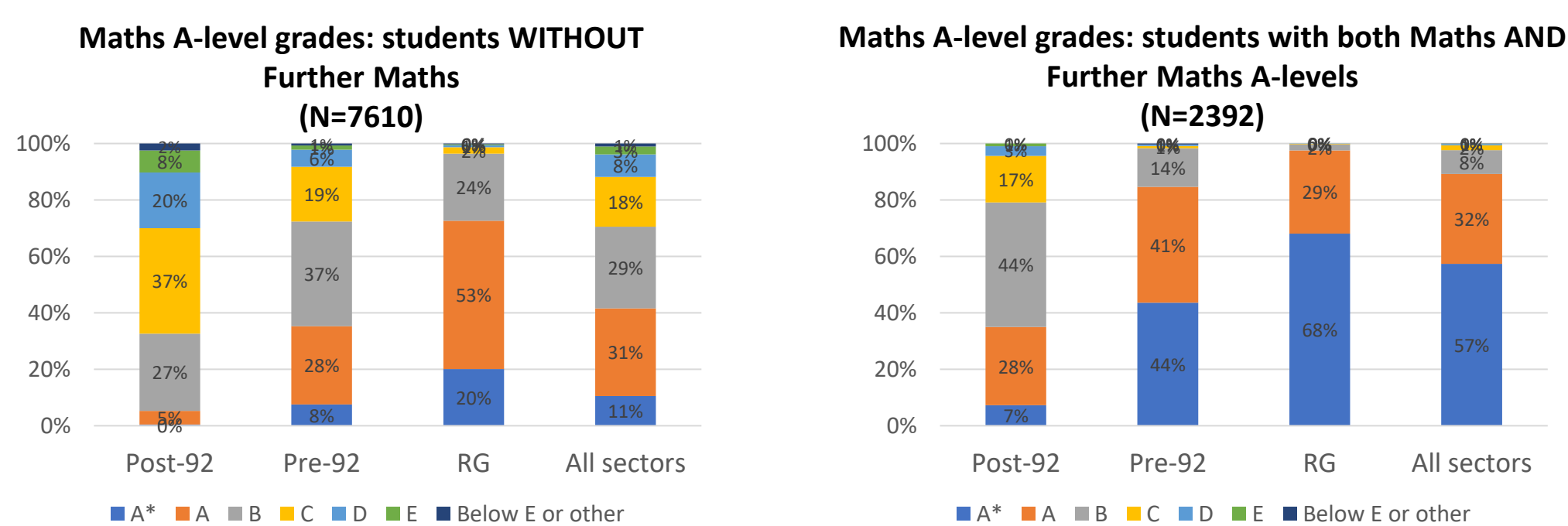


Year 1 NON-PROGRESSION rates by SECTOR

NON-PROGRESSION RATES: All Year 1 Engineering students (with any entry qualifications)

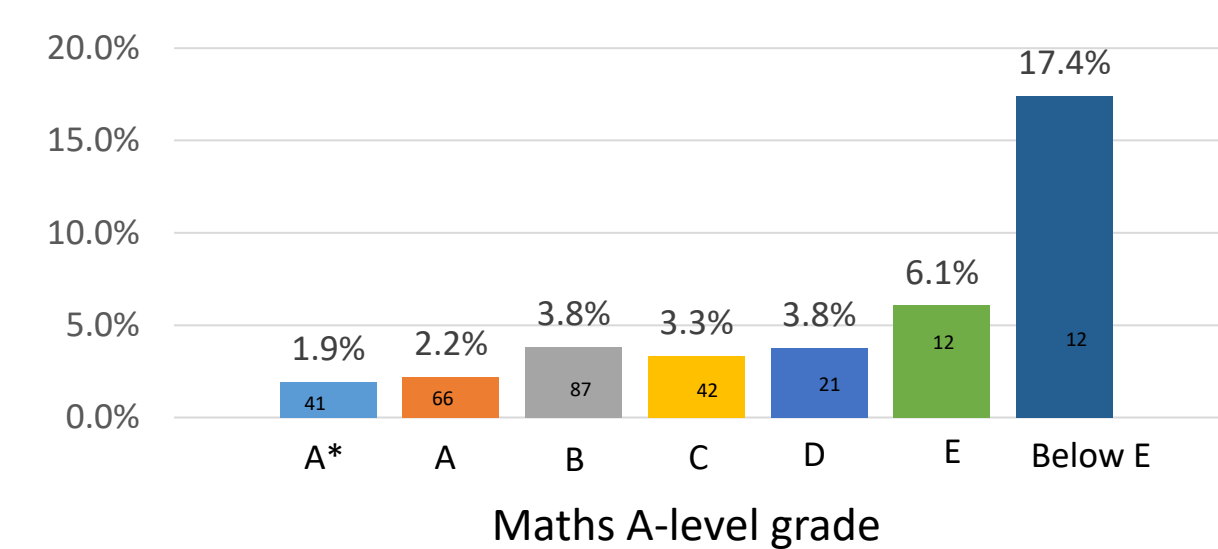


Maths A-level GRADES (with/without Further Maths), by sector

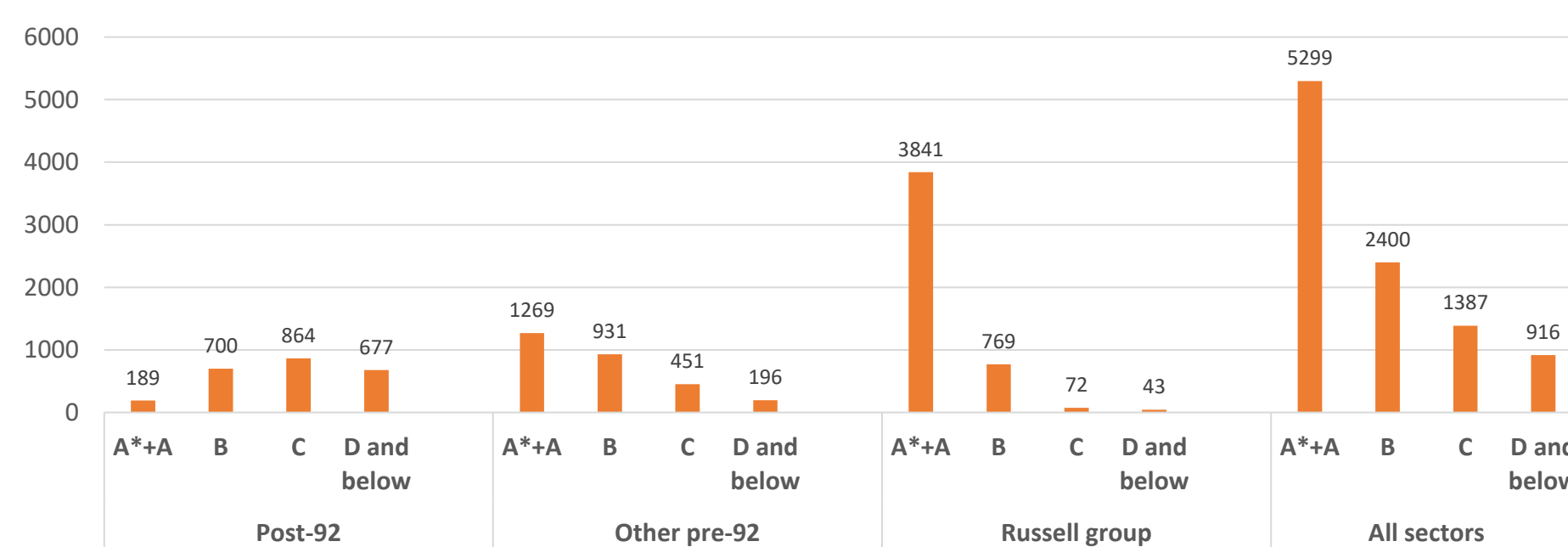


NON-PROGRESSION RATES: by Maths A-level grade, by sector

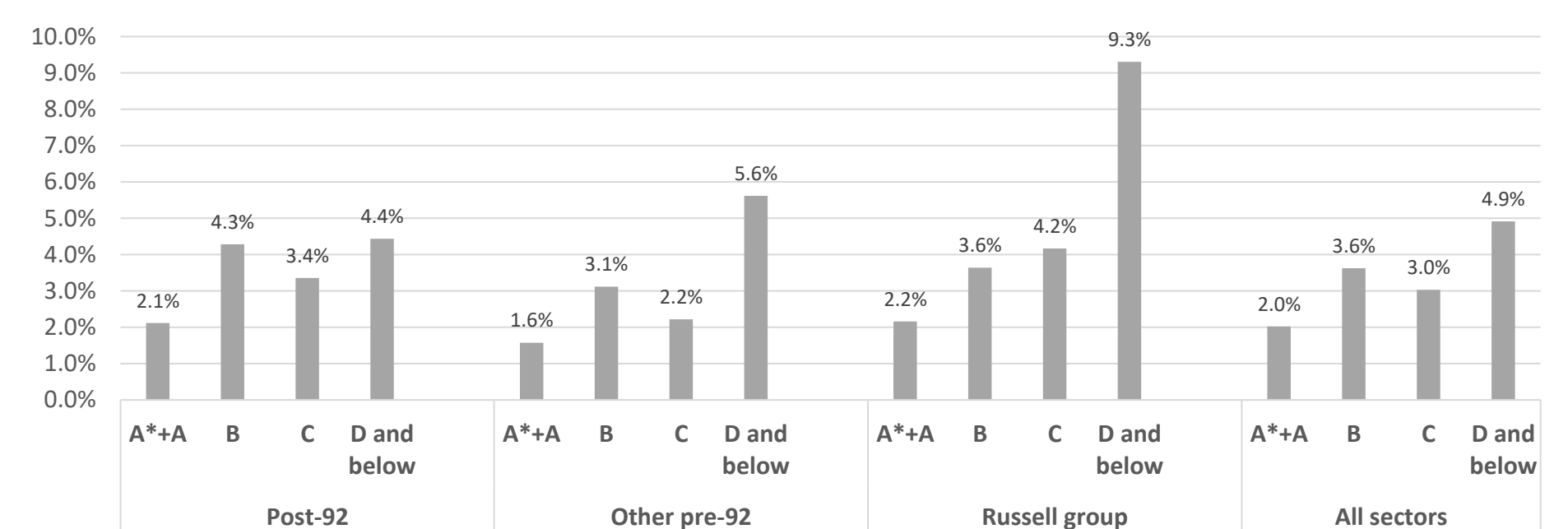
(Average 3.0% non-progression for all Yr1 Eng students with a Maths A-level (281 students))



Maths A-level grades: numbers of students with Maths A-level grades by sector

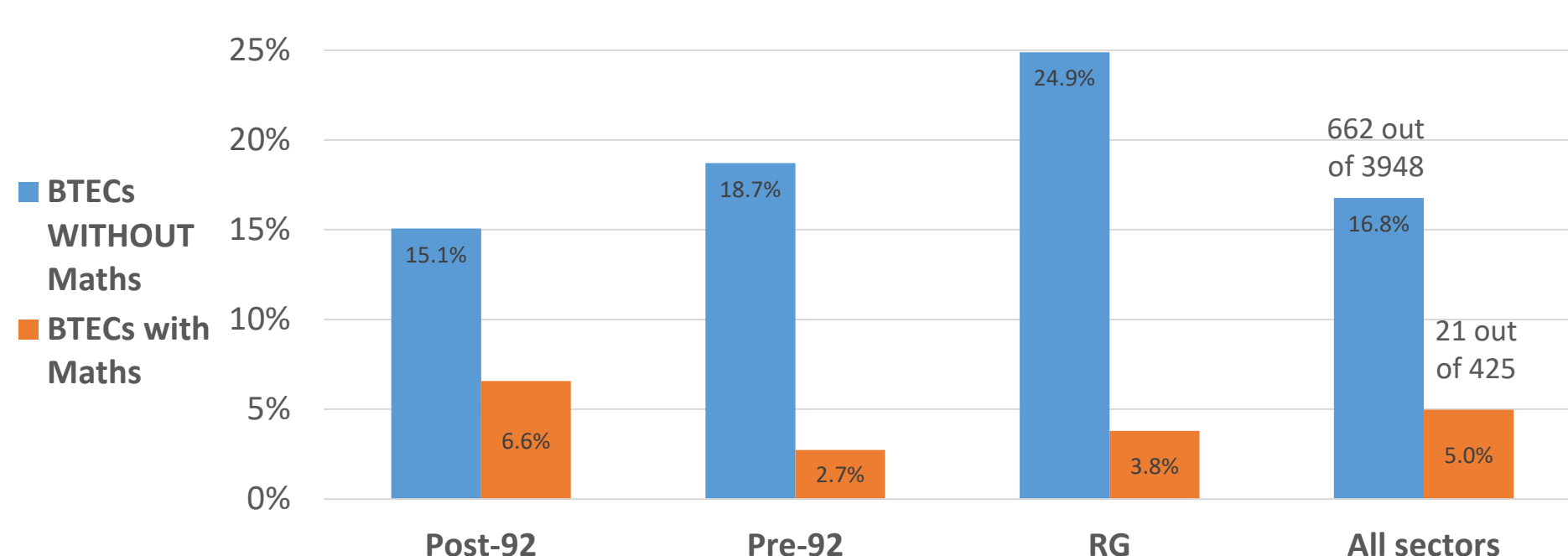


NON-PROGRESSION RATES of students with Maths A-level grades by sector



BTEC qualifications: what difference does it make if they also have a Maths A-level?

NON-PROGRESSION for Engineering students with BTEC qualifications: with and without a Maths A-level, by sector



CONCLUSIONS

Twice as many students in RG Universities (80.8%) have a Maths A level compared to in post-92s (40.3%), with 'other pre-92s' between these.

Just over 50% of students with an A-level Maths have an A or A* grade. In the RG just over 80% have an A or A*, whilst in the post-92 just under 8% do.

24% of students with Maths A-level also have a Further Maths A-level. (25% in RG, 8% in post-92)

Puts significant demand for innovative programme design and remedial Maths support especially in post-92s.

Makes it difficult for students without good Maths A-level to access RG programmes.

Progression rates improve with better A-level Maths grade in all sectors, as you might expect.

Non-progression consistently about 2% for A&A* grades in all sectors. No significant difference in progression rates for students with the same A-level grades in different sectors.

3% non-progression average for all Engineering students with Maths A-level, compared with 6.1% non-progression for all Engineering students.

Students with only BTEC entry qualifications have very high non-progression rates (about 25% in RG, decreasing to about 15% in post-92s). Having a Maths A-level (of any grade) alongside BTECs reduces non-progression to levels comparable to average for students with Maths A-level.

Most Engineering programmes designed for students who are confident and competent at Maths. BTEC qualifications by themselves are not preparing students well for the mathematical demands of most Engineering degree programmes in all sectors.