Keeping up with the Germans?: A comparison of student funding, internationalisation and research in UK and German universities

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- *A guide to the removal of student number controls* (September 2014);
- *A comparison of student loans in England and Australia* (April 2014); and
- *Unfinished Business?: Higher education legislation* (February 2014).

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Drawing a direct comparison between two different countries is challenging but the author alone is responsible for any errors or opinions herein.

Indicative figures about universities in Germany and the UK

	Germany	UK
Population	81 million	65 million
Universities	121 universities, 215 universities of applied science and 56 art and music colleges	140 (151 institutions with degree-awarding powers)
Students (men:women)	2.5m (1.3m:1.2m)	2.3m (1.0m:1.3m)
First-year enrolments	493,000	670,000
People aged 25-34 with a tertiary qualification	27%	48%
International students (Berlin / London)	11% (13%)	18% (26%)
PhDs awarded	27,000	22,000
Staff (academic staff)	619,000 (337,000)	275,000 (126,000)
Completion rate Tertiary A (Tertiary B)	75% (75%)	79% (50%)
Spending per student	€13,665	€16,500
HE spending as % of GDP (public:private) (2011)	1.3% (1.1%:0.2%)	1.2% (0.9%:0.3%)
Institutional income:expenditure	€41.0bn:€41.2bn	£29.1bn:£27.9bn
Total R&D as % of GDP (public spending)	3% (0.9%)	1.7% (0.5%)
Total spending on research in universities	€12.7bn	£7.2bn
Top 10 universities (THE / Shanghai)	0 (0)	3 (2)
Fees	£0	Up to £9,000 (for home / EU undergraduates in England and students from Scotland and Northern Ireland studying elsewhere in the UK)

The table is based partly on figures from: the German Rectors' Conference, *Higher Education Institutions in Figures*, 2013; Universities UK, *Higher Education in Facts and Figures*, 2014; and OECD, *Education at a* Glance, 2014. Some UK data is taken from the Higher Education Statistics Agency (www.hesa.ac.uk). The figures are indicative rather than precise and the comparison should be treated with caution, given the different higher education systems in the two countries.

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Introduction

1. HEPI strives to take an international perspective, not least to inform policy debates in the UK. Our past programme has featured international speakers from the World Bank and the European University Institute, consultancy work in the Middle East and a year-long study during 2014 of the Australian higher education system.[1] Despite some work on the Bologna process, we have not generally kept a close watch on the higher education systems of our European neighbours.[2] That explains why we are now looking at the higher education system of the richest and most populous European country: Germany.

2. There are two more specific reasons for this publication. First, in response to recent higher education reforms in the UK, particularly England, there has been greater interest in university systems that look less 'neo-liberal'. Aside from a small number of pieces on league tables and the Research Excellence Framework, the most-read *Times Higher Education* article of 2014 was on the abolition of tuition fees in Germany.[3] One response to HEPI's work on Australia was to question the focus on a country that is both far away and comparatively similar in terms of higher education.[4] Countries that are closer geographically but further apart in their approach to higher education may hold lessons too.

3. Secondly, there is a common fear that the UK underperforms when compared to one of our closest neighbours. As Alison Wolf has written, Britain has been

obsessed since at least Victorian times with the apparent superiority of some elements of the German education system:

> *British policy-makers are preoccupied with German competition, German education and German training. This has been the case ever since the 1867 Paris International Competition, where British manufacturers won almost none of the prizes they had confidently expected.*[5]

4. These two concerns have come together in recent critiques. For example, the historian Professor Howard Hotson has fused long-standing and current concerns:

> *For decades, Germany was treated with disdain by the Anglo-American axis, which boasted that it had found a new high road to growth. The bursting of the US housing bubble in 2007, the meltdown of the international financial system and the revelation of deep-seated corruption in the financial sector has silenced those boasts, and set the UK scrambling to 'rebalance the economy', that is, to reindustrialise more along the lines of the German model. Germans, having resisted that neoliberal fantasy, can still afford public higher education, and are entitled to a bit of* Schadenfreude.[6]

5. While German initiatives have influenced the UK in recent years, it has been in a rather episodic and unstructured way. For example, Catapult centres, which seek to provide a bridge between industry and research, are based upon the German Fraunhofer Institutes for research into applied

science and there is now even a Fraunhofer Centre in the UK (specialising in Applied Photonics in Glasgow). Britain has also looked enviously at the mature employer-focused German apprenticeship system (known as the *Duales Ausbildungssystem*), which has influenced the development of longer and more prestigious vocational pathways.

6. Learning is a two-way process and Germany has also been influenced by recent British experience. For example, the success with which the English-speaking world has attracted international students has been one factor in the shift towards teaching in English at German universities. Around 1,000 postgraduate degree courses in Germany are now taught in English, although this remains less common at undergraduate level.

7. Despite the awe in which some parts of the German education system have been held, Germany's federal system of administration, in which 16 powerful *Länder* have responsibility for education, has hampered direct comparisons with the UK in the past. Devolution for Scotland, Wales and Northern Ireland and an increasing appetite for strong city regions has modified this in recent years. Even if the German higher education system has not always had clear lessons for the traditionally centralising forces of Whitehall and Westminster, it may have some for today's more diffused power structures. This could be especially so in Scotland, for Germany and Scotland share some demographic concerns, boast degrees that can take longer to complete and have abolished tuition fees in recent years.

8. So it is timely to take a deeper look at German higher education. This paper focuses on three issues, with a particular focus on the first: funding; internationalisation; and research. For all three, the differences between the two countries are sharp.

- **Funding:** Germany is taking a notably different approach to most of the UK, and particularly England. For example, while fees were being tripled in England, those German *Länder* that had adopted them were abolishing them.
- **Internationalisation:** Societal and political concerns about net inward migration are thought to be limiting the global ambition of the UK's university sector, whereas Germany has increasingly looked outward as an explicit way of strengthening the higher education system, the research base and the economy. For instance, while the UK has tightened up the post-study work rules for international students, Germany has been liberalising them.
- **Research:** The UK has tended to root research in universities whereas Germany has based much of it within separate non-teaching institutions. This has had a profound effect on the relative standing of UK and German universities in the global league tables. However, initiatives in both countries are making the differences less profound.

9. The UK is entering a period of deep reflection on its relationship with the rest of the world, which will culminate in a referendum by 2017 on whether to leave the European Union (EU). Between now and then, the UK's place in the

world could be the single biggest policy issue facing universities in all four parts of the UK.

10. It is hoped the pages that follow will inform people in the UK of the strengths of Germany's higher education system. It is also hoped that the perspective of a UK-based policy organisation might serve as a small contribution to higher education debates in Germany.

1: Student fees and funding

'I feel that Germany still has the remnants of a Utopian approach to education,' says 23-year-old Annie Rutherford, from Dumfries, who is studying for a two-year postgraduate degree in comparative literature at the University of Göttingen. 'There is an idea that everyone should be able to study, from whatever background they come from,' she says. 'There is a sense of education for the sake of education, rather than just a tick in a box which enables you to get a better paid job at the end of it.'[7]

The number of students

11. The total number of students in the UK and German higher education systems is similar at around 2.5 million. However, Germany is a more populous country and degrees have historically taken longer there. This explains why, despite a similar number of students overall, first-year enrolments are higher in the UK than in Germany: around half a million students newly enrol in Germany each year, similar to the number of new full-time students in the UK, but the UK also has 175,000 new part-time students each year.

12. In the UK and the overwhelming majority of other countries in the Organisation for Economic Co-operation and Development (OECD), more women obtain tertiary qualifications than men. In Germany, however, there are still slightly more male students than female ones.[8] But Germany has an above-average proportion of female science students

– 44 per cent of tertiary qualifications in science were awarded to women in 2012, compared to 38 per cent in the UK (and 41 per cent across OECD countries as a whole).[9]

13. Germany has a lower proportion of its younger population educated to university level than the OECD average, in contrast to the UK which is above the OECD average. In the UK, 48 per cent of people aged between 25 and 34 have a tertiary qualification but in Germany only 27 per cent do so. The disparity is smaller for those aged 55 to 64: in the UK, 34 per cent of the age group have a tertiary qualification compared to 25 per cent in Germany. The different relative performance of these two age groups reflects recent changes, which have seen a bigger expansion of higher-level skills in the UK than in Germany. Between 2000 and 2013, the proportion of 25 to 34 year olds in Germany with a tertiary qualification grew from 22 per cent to 30 per cent, or 2.3 per cent a year on average. In the UK, the total rose from 29 per cent to 48 per cent, or an average of 4.0 per cent a year.[10]

14. Given the time lag in international comparisons and recent increases in the proportion of people going to higher education, Germany could rise further up the OECD rankings for higher education participation. On some measures, more people in Germany now take the academic route than the vocational one. Some Germans are questioning whether the balance between academic and vocational routes has shifted too far in favour of the former. According to Holger Burckhart, Rector of the University of Siegen:

For the first time this year [2014] more students are opting for higher education than vocational education … This vocational sector forms the backbone of the German economy and many are asking do we need so many graduates – this debate has only started very recently.[11]

15. The focus is a little different in England, where politicians have been keen to commit to raising the number of vocational places to match the number of student places. For example, in his 2014 party conference speech, Ed Miliband, then the Leader of the Labour Party, promised a 'national goal' under which 'as many young people leaving school should be able to do apprenticeships as currently go to university.'[12] The 2015 Conservative Party manifesto promised three million new apprenticeships.[13] Nonetheless, all the main political parties are also committed to further higher education expansion. The Conservative and Liberal Democrat Coalition in office between 2010 and 2015 even announced the removal of the student number controls that limit institutional recruitment, with effect from the 2015/16 academic year.

16. The UK takes pride in having a relatively low non-completion rate compared to many other countries in the EU and beyond. But for traditional academic forms of higher education, the figures for Germany and the UK are not very far apart: OECD data show completion for Tertiary type-A courses is 75 per cent in Germany and 79 per cent in the UK. For Tertiary type-B courses, which include more vocational routes, Germany significantly outperforms the UK, with a completion rate of 75 per cent compared to just 50 per cent.[14]

Tertiary-type A programmes 'are largely theory-based and are designed to provide sufficient qualifications for entry to advanced research programmes and professions with high skill requirements, such as medicine, dentistry or architecture. Tertiary-type A programmes have a minimum cumulative theoretical duration (at tertiary level) of three years' full-time equivalent, although they typically last four or more years.'

Tertiary-type B programmes 'are typically shorter than those of tertiary-type A and focus on practical, technical or occupational skills for direct entry into the labour market, although some theoretical foundations may be covered in the respective programmes. They have a minimum duration of two years full-time equivalent at the tertiary level.'

Source: OECD, *Education at a Glance*, 2002, Glossary

Tuition fees

17. Tuition fees were banned in West Germany in 1976, but some *Länder* successfully challenged this in the Constitutional Court in 2005 on the grounds that education is their responsibility. Fees of up to €500 a semester (typically, €1,000 a year) were then introduced from 2006/07 in seven states (none in the former East Germany). The precise arrangements differed but there were exemptions for students with certain characteristics, such as those with a disability, which benefited a maximum of around one-third of students in the areas with fees. Loans from state banks were available to cover the cost, though only one-in-ten students took these out while seven-in-ten apparently relied on financial support from their parents.[15]

18. The experiment was notably short-lived. Hesse abolished fees after just a year, in 2008/09, and the last state to get rid of them was Lower Saxony in 2014/15. There are now no undergraduate tuition fees for public universities anywhere in Germany.[16] Fees are charged at the 100 or so private higher education institutions, but they are typically small and educate only around 5 per cent of all students.

Tuition fees in German Länder, 2006/07-2014/15

State	Introduced Fees in…	Repealed Fees in…	Fee level
Schleswig-Holstein	-	-	-
Hamburg	Summer 2007	Winter 2012-2013	€500 (€375 from Winter 2008/09)
Lower Saxony	Winter 2006-2007 (Freshers) Summer 2007 (Everyone)	Winter 2014-2015	€500
Bremen	-	-	-
North Rhine-Westphalia	Winter 2006-2007	Winter 2011-2012	€500
Hesse	Winter 2007-2008	Winter 2008-2009	€500
Rhineland-Palatinate	-	-	-
Baden-Württemberg	Summer 2007	Summer 2012	€500
Bavaria	Summer 2007	Winter 2013/2014	Universities of Applied Sciences: €100 – €500 Universities/ Art Colleges: €300 – €500
Saarland	Winter 2007-2008	Summer 2010	€500 (€300 for the first 2 semesters)
Berlin	-	-	-
Brandenburg	-	-	-
Mecklenburg-Western Pomerania	-	-	-
Saxony	-	-	-
Saxony-Anhalt	-	-	-
Thuringia	-	-	-

Source: Jens Schulz, 'Tuition Fees in Germany: Much Ado about Nothing?', American Institute for Contemporary German Studies, 11 November 2014 (http://www.aicgs.org/issue/tuition-fees-in-germany/)

19. The centre-right Christian Democratic Union (CDU) and the liberal Free Democratic Party (FDP) were behind the introduction of fees, while the centre-left Social Democrats (SPD) and the Greens opposed them. However, local administrations from both sides of the political spectrum moved to abolish them.

- **For the left, it was important to protect the right to a universal free higher education:** for example, Dorothee Stapelfeldt, SPD Senator for Science and Research in Hamburg, claimed, 'It is a core task of politics to ensure that young women and men can study with a high quality standard free of charge in Germany.'[17]
- **For the right, there were clear electoral motivations, as well-organised protests raised the salience of the issue:** in Bavaria, 1.4 million people signed a petition against fees in 2013, shortly before the state government led by the Christian Social Union (linked to the CDU) abandoned them in the face of upcoming state and national elections.

20. Despite the abolition of fees, higher education in Germany is not actually free as there are service charges. These can be in the region of €200 to €500 per semester so, over the course of a year, a student can pay up to €1,000 in those areas where free local travel is included. For example, in 2014/15 the University of Cologne fee totals €234.42 and is comprised of:

- travel ticket (€162.80);
- student union (€59.00);
- student administration (€8.77);
- faculty allocation (€2.10); and
- sports activities (€1.75).

21. In some *Länder*, fees are additionally levied on students who take longer than the standard time to complete their course. The pressure for shorter degrees stems partly from the Bologna process aimed at ensuring comparability of higher education qualifications. This has been more controversial in Germany than England because it has necessitated the redesign of courses.[18] In the past a degree (known as a *Diplom* for natural sciences, business and engineering and a *Magister* for the humanities, arts and languages) could typically take four-and-a-half years. But courses have now been split in to three-to-four year Bachelor degrees and one-to-two year Master degrees. While this more closely resembles the English model, changes in Germany have echoes in the Scottish debate on whether three-year degrees might displace the traditional four-year model.[19]

22. The German position on fees is very different to that in England, which increased the undergraduate tuition fee for home and EU students from a little over £1,000 to a maximum of £3,000 in 2006 before tripling it once again to £9,000 from 2012. There is no upfront cost for undergraduate tuition in England because a tuition-fee loan, backed by taxpayers, is available to all first-time full-time students domiciled in

the EU for the previous three years. However, the National Union of Students have highlighted the issue of 'hidden course costs', such as laboratory equipment or course texts.[20] Moreover, upfront fees are faced by some undergraduates – for example, non-EU international students, those already holding a degree and part-time students studying at a lower intensity (below 25 per cent of a full-time course).

The impact of fees on participation

23. Because the sixteen German states did not all introduce tuition fees and the seven which did so introduced them at different times, there is a rich dataset on the impact of fees. Initially, it was thought that the introduction of tuition fees had discouraged higher education attendance. Evidence seemed to suggest that enrolment in non-fee states grew while it declined in those states with fees (though from a higher starting point).

High-school graduates enrolling in higher education

	2002-2006	2007-2008
Fee states	42.10%	40.70%
Non-fee states	37.40%	38.60%

Source: Statistisches Bundesamt as used in http://blogs.lse.ac.uk/europpblog/2013/02/11/petition-bavaria-university-tuition-fees-germany-referendum/

24. However, more recent analysis that controls for variables such as the different characteristics of fee-free states comes to the opposite conclusion. It also suggests the recent abolition of tuition fees may have been based on incorrect assumptions:

> *there is no evidence that a general negative effect on enrolment occurred during the recent introduction of tuition fees in Germany. Yet, the supposition of such a negative effect was the main argument for abolishing tuition fees. Our results suggest that this argument had little empirical basis.*[21]

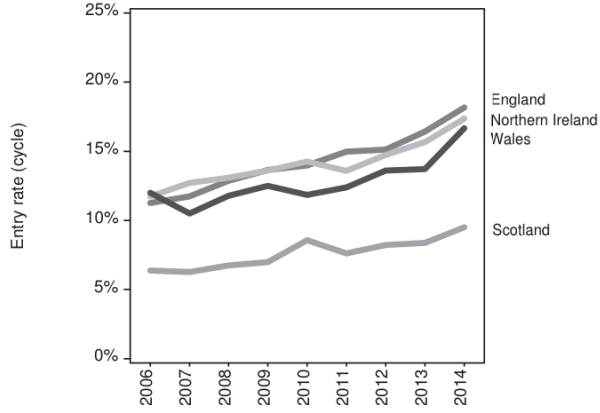
This research drew contrasts with the UK and the US and concluded:

> *The German experiment suggests that deterrence does not occur if, first, tuition fees are rather low, second, tuition fees are combined with an appropriate public student loans programme, and third, tuition fees are not imposed if certain social criteria such as a low-income-family background apply.*[22]

25. Recent experience in England suggests it may not be necessary for all three of these factors to apply to ensure there is no substantial deterrent: fees in England are typically ten times the level they were in Germany when they existed, yet the latest admissions data show unprecedented demand from young people for full-time higher education and a disproportionate growth in enrolments from those with the most disadvantaged backgrounds (although these remain far below the rates for those from advantaged backgrounds). The 2014 entry round was the first time ever that the Universities and Colleges Admissions Service (UCAS) managed to place over half a million people on to full-time undergraduate courses for the first time, which they claim:

provides a stunning account of social change, with the most disadvantaged young people over 10 per cent more likely to enter higher education than last year and a third more likely than just five years ago ... [23]

18 year old entry rates for disadvantaged areas (POLAR2 Q1) by country of domicile



Source: UCAS, *End of Cycle*, 2014, p.74

26. This confirms the assessment of the OECD, which has found:

absolutely no cross-country relationship between the level of tuition countries charge and the participation of disadvantaged youth in tertiary education. In fact, social mobility is worse in Germany which pays for all university education through the public purse than it is in the UK.[24]

Funding per student

27. According to the OECD, the annual amount spent on educating each undergraduate in Germany and the UK was very similar in 2011 – a little over $10,000 (USD).[25] However, courses in Germany have typically been longer than the three years that have been standard in the UK. Moreover, the moving picture is more revealing than this snapshot. The OECD have noted a big increase in spending per student in the UK (at constant prices) as tuition fees took effect:

> *At the tertiary level, expenditure grew by 98% between 2000 and 2011 while the number of tertiary students increased by 18%. Thus, spending per tertiary student in 2011 was 67% higher than it was in 2000 ...* [26]

28. In Germany over the same period, expenditure on tertiary education grew by around 40 per cent, while the number of students grew by around 30 per cent, meaning spending per student grew by much less.[27]

29. The 2011 data used by the OECD predates the further increase in tuition fees in England to a maximum of £9,000 in 2012, which protected and in some cases enhanced the amount of funding available. The data also predate the abolition of tuition fees in Germany. While extra funding has been found to make up the shortfall, many policymakers suspect this will be temporary.[28] Moreover, more recent comparative analysis by Delft University of Technology shows a bigger gap in the amount of funding for each student in the UK (€16,500) and Germany (€13,665).[29]

30. In Germany, part of the pressure on the funding available to educate each student arises from the cost of recent expansion. The first *Hochschulpakt* (Higher Education Pact), which lasted from 2007 to 2010, saw the federal government and the *Länder* agree to fund 91,000 additional student places on top of the number of places that had been available in 2005. But, according to the German Rectors' Conference (which fulfils a comparable role to Universities UK), the average annual cost of each student was €7,300 while the extra funding provided amounted to only €5,500. In *Hochschulpakt II*, covering the period 2011 to 2015, annual funding of €6,500 per student was provided for the extra places but the actual cost has been estimated to be €7,200. A third phase, set to take place between 2016 and 2020, is also set to award €6,500 per student place.[30]

31. In England, the Coalition claimed that the increase in the maximum tuition fee cap to £9,000 a year allowed the ending of restrictions on student numbers.[31] The Treasury's costings on the removal of student number controls assumed the additional places were full-cost ones, although there remains a lack of clarity over the source of the extra funding as well as over what will happen to student numbers and per-student funding over the medium term.[32] The £9,000 tuition fee cap has been fixed since 2012, although the cap for universities that can demonstrate high-quality teaching is to increase in line with inflation from 2017/18.[33]

32. It is commonly believed that some institutional income designed to pay for tuition is used to cross-subsidise research in many English institutions. Indeed, according

to data collected from higher education institutions as part of the Transparent Approach to Costing (TRAC) exercise, universities made a surplus of over £800 million on teaching (including fees from international students) but had a deficit of over £2 billion on research in 2012/13.[34]

33. Cross-subsidies from teaching to research appear less common in Germany because of the lower spending per student, the concentration of research in non-teaching research institutions and the ring-fencing of budgets. When tuition fees existed, they were limited to teaching costs:

> *By law, tuition fees had to be spent only on improving teaching, not for constructing buildings, not for large-scale efforts or machinery for research, but only for teaching: teaching assistants, offering more classes, offering more tutorials and so forth.*[35]

34. The short-lived experiment with tuition fees in Germany helped discourage the co-funding of higher education by the federal government and the states at a time when responsibility for higher education was already flowing back to the states. This produced a financial bonus that helped the federal government undertake new initiatives on research, notably the Excellence Initiative discussed in chapter 3. However, the ending of tuition fees has inevitably increased demand for federal spending once more. According to Malte Huebner, an economist at the German Council of Economic Experts:

If annual expenditure per student is to be kept constant, Germany's universities will need an additional source of funding. As Germany's recent tuition fee experiment has shown, increasing private contributions does not seem to be an option. This leaves the federal government as the only 'spender of last resort'.[36]

35. Germany's 'debt brake', which constrains state expenditure, is an additional factor that is expected to encourage universities to lobby for more federal funding. Moreover, recent changes to Germany's Basic Law governing the constitution enable the federal government to provide direct funding to universities.

36. The autonomy of academic institutions is prized in both Germany and the UK. But the greater dependence of German universities on their states for funding is in stark contrast to the position in England, where universities now often receive more than half of their income from tuition fees and where student number caps are being removed in 2015/16. Although English institutions have their fees capped and must commit to spend money on outreach activities (if they charge more than £6,000 a year), as monitored by the Office for Fair Access, it seems clear that they enjoy a greater level of financial independence than their Germany counterparts. Barbara Kehm, former Secretary of the Consortium of Higher Education Researchers, has explained:

The present situation [in Germany] is that all higher education institutions receive a budget from the responsible

ministry of the state in which they are located, based on annual or biennial negotiations. This basic budget is complemented by additional agreements between higher education institutions and the state concerning the intake of additional numbers of students and the money to compensate the loss of income from tuition fees.[37]

37. Once more, the parallels between Germany and Scotland, where more direct funding survives and autonomy is weaker (and currently being weakened further), appear stronger than the parallels between Germany and England.[38]

The future of tuition fees

38. There are different views as to whether tuition fees are now off the agenda in Germany for the foreseeable future, but it seems rash to assume they have definitely disappeared for good. Influential groups are lobbying for the option to be reconsidered. On this, Barbara Kehm has said:

The debate about tuition fees – though dead for the moment – can easily be revived in the future. It has not been dropped from the agenda once and for all. Government policies continue to be in favour of tuition fees, most representatives of institutional leadership are as well, though for different reasons. But there is currently a lack of general public support. Once this has changed – and influential advisory bodies and think tanks are working towards such a change – the idea of tuition fees will be introduced again.[39]

Gudrun Paulsdottir, former President of the European Association of International Education, takes a similar view:

> *the real questions* [sic] *is how long can any state in Germany keep this up … The cost for German tax payers is huge … The question is which of the German states will be the first to reintroduce the fees.*[40]

39. The German Rectors' Conference (HRK) continues to argue that fees would help address funding gaps, which notably assumes that any extra income from fees would be additional rather than a way of reducing public support:

> *the HRK has made it clear that it considers the abolition of tuition fees to be erroneous and that the future financing of universities in the present circumstances without tuition fees is hardly conceivable.*[41]

40. Political geography is thought by some to be relevant. Howard Hotson says Germany and Scotland were able to abolish tuition fees while England travelled in the opposite direction because of their different make-up. But they nonetheless set out a path that England could follow:

> *For those who yearn for a Germanic change of course, the idea that this case of English exceptionalism is rooted in 800 years of political and intellectual geography is not encouraging. But the German example does indicate the strategy that must be adopted if this course is to be altered: the campaign against fees must be fought out in the localities.*[42]

41. It has also been argued that the abolition of fees in Germany was achievable because of the modest sums involved. Malte Huebner has written, 'it might have been the relatively low level of the fee that made it easy for newly elected state governments to give in to public opposition against tuition fees.'[43] Like Germany, Scotland was able to abolish fees of around £1,000 (initially replaced by a £2,000 Graduate Endowment scheme from 2001/02 but this too was abolished in 2006/07). No part of the UK has abolished fees set at higher rates.

42. The novel nature of the English funding system with its high fees, high debt and relatively high non-repayment rates has led some people to claim it is unsustainable. The Higher Education Commission's report *Too Good to Fail* concluded: 'We have created a system where everybody feels like they are getting a bad deal. This is not sustainable.'[44] However, all three of the main political parties have supported loan-backed tuition fees in office over the past fifteen years. While Labour made a manifesto commitment to reduce the costs of higher education at the 2015 general election, this did not envisage any change other than a reduction in the fee cap and was criticised by some for its timidity.[45] After the election, the most left-wing of the four candidates to become Leader of the Labour Party, Jeremy Corbyn, promised to abolish tuition fees altogether.[46]

43. Andreas Schleicher, Director for Education and Skills at the OECD, has drawn a sharp contrast between the current English and German student finance models:

European countries like France, Germany or Spain, too, say higher education is important, but their governments are neither willing to put in the required funds nor allowing universities to charge tuition. They end up compromising quality and restricting access, with the effect that all workers end up paying for the university education of the rich parents' children.[47]

Support for living costs

44. The rules on financial support for living costs are more similar for England and Germany than they are for tuition costs. In both countries, there is a mix of means-tested grants and loans to help students pay for food, rent and other living expenses. Given that only around half of all EU countries offer maintenance support, Germany and the four parts of the UK have more in common with each other than they do with many other European countries.[48]

45. In Germany, the *Bundesausbildungsförderungsgesetz* (or *BAföG*) system has a maximum award of €670 a month, depending on variables such as household income, family situation and housing need. The payment is provided half as a grant and half as an interest-free loan, with a 20-year write-off period. In 2013, the average amount received was €5,352. Repayments on the loan element do not begin until five years after graduation and are then capped at €10,000. In addition, parents of German students under the age of 25 receive financial support in the form of family allowances or tax relief.[49]

46. In England, students from households on less than £25,000 a year receive a full (non-repayable) grant worth £3,387 (2014/15), which is tapered away for those from better-off households. There is also a maintenance loan, which is a maximum of £5,555 for those living away from home and not studying in London (where both costs and available support are higher). Maintenance loans are provided on the same terms as tuition loans, with: a graduated interest rate that is 3 per cent above inflation for graduates on higher incomes (and for everyone while studying); a repayment rate of 9 per cent of salary above £21,000; and full write-off after 30 years. In the summer Budget of 2015, the Chancellor of the Exchequer, George Osborne, announced that maintenance grants were to be abolished in favour of higher maintenance loans for new students from 2016/17.[50] This is a significant change as, except for a brief hiatus between 1998 and 2004, generous maintenance grants have existed since at least 1962, when they were first put on a national footing.[51]

47. Living costs are higher in the UK than in Germany. Straight comparisons are inherently difficult, and the table below – which uses data from the German Academic Exchange Service (DAAD) and the UK's National Union of Students (NUS) – is further complicated by showing monthly data for Germany and data for a 38-week academic year for the UK. It is nonetheless clear that some major items, such as rent and travel, as well as overall total living costs are significantly higher in the UK than in Germany. Moreover, the difference between the two countries is almost certainly much larger

for their capital cities, to which international students are especially drawn. The NUS have put the annual cost for a student in London (excluding tuition fees) at £14,762.[52] Rent in Berlin is lower than in London and indeed lower than in some other parts of Germany.[53]

Living costs for international students in Germany and the UK[54]

Germany (per month)		UK (per year), outside London	
Rent and utilities	€298	Rent	£4,989
Food and drink	€165	Food	£1,954
Clothing	€52	Personal Items	£1,917
Learning materials	€30	Books and equipment	£464
Car and public transportation	€82	Travel	£2,096
Health insurance	€66	Health insurance	£160
Telephone, internet, TV	€33	Leisure	£1,190
Recreation, culture, sports	€68	Household goods	£363
		Insurance	£42
Total	€794	Total	£13,175

48. The heavy dependence on loan-based support in England for both tuition and living costs has encouraged the idea that taxpayers have withdrawn from funding higher education. But, while the Higher Education Funding Council for England (HEFCE) no longer provides any teaching grant for most classroom-based disciplines, such as arts, humanities and social sciences, the withdrawal of public support is partial rather than complete. As well as the continuance of teaching grants for higher-cost subjects, such as laboratory-based disciplines, and non-repayable maintenance grants (at least until 2016/17), there is a substantial future cost from the cancellation of unpaid student loans. Current estimates are that around 45p in every £1 loaned out will be written off. Some believe the total long-term cost of the system for taxpayers may be similar to the costs before the tuition fee

cap was raised to £9,000 in 2012, reflecting the increased overall resource – although Andrew McGettigan's recent work for HEPI suggests many widely-used figures 'cannot be accurately presented as the government's loss on loans without qualification.'[55] Announcements in the Summer Budget of 2015, including the replacement of maintenance grants with larger loans and consultations on freezing the £21,000 repayment threshold and reducing the discount rate applied when costing the loans, could all affect future calculations of the Resource Accounting and Budgeting or RAB charge.

49. According to the OECD, Germany spends a little over 1 per cent of its GDP on public funding of higher education, while the UK spends a little under 1 per cent. However, the value of student loans (including the money expected to be written off) does not appear as public spending in the OECD data, which flatters Germany.

50. Andreas Schleicher of the OECD has argued that England's student loans should be regarded as an investment in the future, despite the substantial and controversial loan write-off costs:

> *Sure, those loan and grant systems cost money, and have shifted risks to government which will end up paying for any bad debt. Indeed, it is very likely that repayment rates will end up a lot lower than what the [UK] government anticipated. But these costs are just a tiny fraction of the added fiscal income due to better educated individuals paying higher*

taxes. Keep in mind that the added tax income of those graduates who end up in employment, on average over £80 000 in the UK, is many times larger than any conceivable bad debt.[56]

2: Internationalisation

International students

51. There are stark differences in the funding of international students in Germany and the UK. In Germany, there is free tuition for all: international students as well as home and EU ones.[57] In the UK, higher fees have long been charged to (non-EU) international students than to home ones, including in Scotland (which does not charge any fees to home or EU students).[58] The extra revenue from the UK's 435,500 international students is believed, in the right circumstances, to extend opportunities for home students and to cross-subsidise their teaching, as well as to fund research.[59] So, from the perspective of the UK (and other countries with fee-based higher education systems), the German position looks generous. An American postgraduate student with no fees and a scholarship from the DAAD (German Academic Exchange Service) recently told the BBC:

> *When I found out that just like Germans I'm studying for free, it was sort of mind blowing … I realised how easy the admission process was and how there was no tuition fee. This was a wow moment for me.*[60]

52. There is less demand from international students to study in Germany than to study in English-speaking countries, so arguably Germany can afford a more generous offer. However, Germany's more welcoming approach encapsulates a wholly different attitude to the contribution

international students make to their host nation. When calculating the value of incoming students, Germany considers the post-study work contribution they make, such as income taxes. The DAAD has calculated that, if 30 per cent of international students in Germany remain in the country to work for five years, then the cost of educating all international students is recouped.[61] In contrast, the UK Home Office regards it as a failure that so many – actually possibly fewer than one-in-five students – are thought to stay in the UK, and the Conservative Party's winning election manifesto promised tougher enforcement action after international students finish their course.[62]

53. There are different views on whether the no-fee system is sustainable. Wolfgang Hermann, President of the Technical University of Munich:

> *If we ignore the question of how to finance an outstanding university in the future we will not continue to have outstanding universities in Germany. … Education, teaching and research are very intimately connected with money. That's a global law we cannot escape.*[63]

On the other hand, for a country with an ageing population, integrating an influx of newcomers by educating them in universities can help prepare for the future. According to Sebastian Fohrbeck, Director of Scholarships at DAAD:

Keeping international students who have studied in the country is the ideal way of immigration. They have the needed certificates, they don't have a language problem at the end of their stay and they know the culture.[64]

54. One intriguing difference is that German universities do not use recruitment agents. Because they do not charge tuition fees, which can subsidise agents, the model would not work as well. Moreover, the focus for recruiting international students is on specialised postgraduate study, where it is typically a more intricate process. Instead of relying on agents, German universities have placed offices in target countries to discover potential international students (and undertake other functions alongside). For example, Freie Universität has invested in offices in Beijing, Brussels, Cairo, New Delhi, New York, Moscow and São Paulo.

55. It is conceivable that the debate over the UK Government's attempt to renegotiate the terms of membership of the EU, prior to the forthcoming referendum on membership of the EU, could encompass the rules on student fees. Currently, students from other EU nations are treated like home students for the costs of tuition when studying in the UK: they pay no tuition fees in Scotland and face no upfront tuition costs elsewhere, benefiting from taxpayer-backed tuition fee loans, which are often hard to collect from former EU students who return home.

56. A system resembling the US system of in-state / out-of-state fees, where local students pay less, could limit demand for studying in the UK. That would cause a problem for universities but could support the Home Office's target of reducing net inward migration, which has been disrupted by incomers from the EU, and also reducing taxpayer subsidies to people whose families are not UK taxpayers. The United Kingdom Independence Party 2015 election manifesto noted:

> *We are currently obliged to give tuition fee loans to EEA students as a condition of our EU membership, but as of March 2013, only 11 per cent of EU domiciled students were making any repayments. As student loans include a huge subsidy from the taxpayer and because repayment rates are so low, we will not give tuition fee loans to EEA students when we leave the EU. They will of course be welcome to apply for places at UK universities as self-supporting international students.*[65]

On the other hand, allowing universities to charge full international fees to students from the European Union might provide a financial incentive to do so, just as the ability to charge full fees to other international students is a 'pull' factor.

57. Given the absence of tuition fees and generous funding rules for international students in Germany (and other EU states), it is not easy to see which other EU nations would support a change to the current rules as part of the UK's

renegotiation. Moreover, the Universities for Europe group, launched by Universities UK in July 2015, is concentrating on the benefits to universities of EU membership rather than lobbying for specific changes.

Post-study work

58. Germany has recently adopted a more generous post-study work offer: graduates from other countries are allowed to extend their residence permit for up to 18 months after completing their studies for the purpose of looking for employment.[66] In contrast, the UK tightened up the rules for international students in 2012 by ending the Post-Study Work visa category, which had allowed former students to stay in the UK for up to two years in order to seek employment. Now, former students must secure a graduate-level job with a salary above a minimum bar (or a training offer or become a 'graduate entrepreneur').[67] Prior to the 2015 election, the Home Secretary, Theresa May, even floated the idea of forcing international students graduating from UK institutions to return home before applying for a job in the UK. This was blocked by her ministerial colleagues, although students at college are being banned from switching to a work visa while in the UK.[68]

59. Evidence suggests the UK's approach to post-study work is having an impact on perceptions of the country as a place to study. PwC and London First have found three key areas of concern among international students and alumni from London higher education institutions: the ending of the Tier

1 (Post-Study Work) visa; the short length of the four-month grace period between graduation and the expiry of a student visa; and the complexity of the visa system, including the number of changes. They concluded:

> *These concerns were raised in relation to the reasons students come to the UK to study. Studying in the UK is expected to improve a student's career prospects and many respondents commented that, as international students pay high tuition fees which is a big investment, they expect to be able to put their skills into practice and gain work experience in the UK after graduation.*[69]

60. There is pressure from business and universities to liberalise the post-study work rules.[70] A modest further relaxation of the rules, which occurred for PhD students in 2013, is not inconceivable but – given Whitehall turf wars – neither is a further tightening up. The political picture is complicated by the fact that, as part of the Smith Commission review on the further devolution of powers to Scotland, the Scottish National Party, the Labour Party, the Liberal Democrats, the Green Party and even the Conservative Party all agreed to:

> *explore the possibility of introducing formal schemes to allow international higher education students graduating from Scottish further and higher education institutions to remain in Scotland and contribute to economic activity for a defined period of time.*[71]

61. Experience of the 'Fresh Talent: Working in Scotland' initiative of 2004/05 could be instructive. This was designed to encourage international graduates from Scottish universities to stay by letting international students work in the UK for two years without a Work Permit. It caused friction with universities elsewhere in the UK and the principle was extended beyond Scotland (prior to more recent crackdowns), suggesting that devising a more generous post-study work offer limited to Scotland will be tricky.

Plans for growth

62. Germany currently educates around 300,000 international students and it is the most popular non-English speaking host country for international students. The top five countries sending students to Germany are: Turkey; China; Russia; Poland; and Austria. This list has little overlap with the top five countries sending students to the UK: China; India; Nigeria; Malaysia; and the United States.[72] The German Government's 2014 Coalition Agreement states:

> *We want to ensure that the number of foreign students rises by approximately one third to around 350,000 by the end of the decade. We want to achieve an increase in the mobility of German students.*[73]

63. This would still leave German universities educating fewer students from other countries than UK universities already do, but it incorporates more ambitious language and a more ambitious target than the UK's equivalent aspiration. The

international exports strategy, published by the Department for Business, Innovation and Skills in July 2013, says: 'it is likely that the UK overseas higher education student numbers will increase by 15-20% over the next 5 years.'[74] Growth at this rate would, however, be above that achieved since 2010, which has been sluggish to non-existent. According to the British Council, 'The UK's recent growth in new international enrolments for higher education courses is overshadowed by a continued decline in UK's market share of new international students'.[75] In his first speech as Minister for Universities and Science, Jo Johnson included a commitment to increase 'education exports from £18 billion in 2012 to £30 billion by 2020.'[76] However, it is hard to see how substantial progress can be made on current policies – unless it is to be achieved via transnational education delivered in other countries rather than within the UK.

64. The German Government is also ambitious on outward mobility, with their Coalition agreement setting a challenging goal for the end of the decade: 'We intend that one in two graduates will have gained study experience abroad.'[77] Around 134,000 German students are currently studying abroad and the top five countries for hosting German students are: Austria; Holland; the UK; Switzerland; and the United States.[78] The number of German students studying in the UK (21,237) is over ten times as high as the number of British students studying in Germany (2,057).[79]

65. The UK Higher Education International Unit adopted a *UK Strategy for Outward Mobility* at the end of 2013, supported by BIS and HEFCE, but it eschewed any numerical targets for outward mobility other than merely seeking to 'Reiterate the UK's commitment to the European target that, by 2020, 20% of students across the EHEA have an international mobility experience as part of their studies.'[80] In his first speech as the Minister for Universities and Science, Jo Johnson spoke of the need to encourage more British people to study abroad but it is clear inward and outward mobility both have a more concentrated focus in Germany than in the UK.[81]

66. However, this does not mean UK universities lack an international outlook. One of the league tables run by the *Times Higher Education* ranks the world's leading universities according to their international outlook on the basis of: the proportion of international staff; the number of students from abroad; and the share of research papers co-authored with someone from one or more other countries. The UK has two universities in the top 10, 11 in the top 25 and 39 in the top 100; Germany has none.[82]

Policy responsibility

67. One striking difference between the approach of the UK and Germany is who has responsibility for the internationalisation of higher education. In particular, the responsibility for educational exports is not limited to the education arms of the German federal government but is shared more widely. For example, the German Foreign Office has its own Directorate-General for Culture and

Communication, which emphasises the soft power benefits of educating the future leaders of other nations. This provides funding for institutions such as the Goethe-Institut and the Alexander von Humboldt Foundation as well as the DAAD, which arguably organises the systematic internationalisation of higher education in more detail than any comparable body in other countries. Similarly important is the Federal Ministry of Education and Research (BMBF), which funds campaigns such as 'Study in Germany – Land of Ideas' and 'Research in Germany – Land of Ideas'.

68. This bears some resemblance to how it used to work in the UK, with more than one government department taking responsibility. Until 2006, applications for UK visas were dealt with by Entry Clearance Officers overseen by UK Visas, which was jointly owned by the Home Office and the Foreign and Commonwealth Office. From 2005 until 2009, a register of education providers maintained by the Department for Education and Skills and the Department for Innovation, Universities and Skills was used to determine student visas.[83]

69. Today, the UK Home Office has sole responsibility for migration – with predictable results in terms of policy. In Germany, the government has explicitly incorporated a warmer welcome for international students into their priorities for internationalisation. In the UK, government policy has reduced the warmth of the welcome provided to international students – for example, through new health charges and immigration checks by landlords. Inefficient systems for registering with the police are another source of frustration. Julia Goodfellow, Vice-Chancellor the University

of Kent and President of Universities UK from 2015, recently warned:

> *I've got a thousand more overseas students coming to university in Kent – I've got to bus them down to Ashford post office, they have to stand in line there, all 1,000 of them, to get their visas … I'm sorry, but that's not being made welcome.*[84]

Appointments

70. One big advantage of the UK over Germany, however, is that German professors are generally civil servants. Compared to Britain, which has some of the most autonomous universities in Europe (according to the European Universities Association), government involvement can make for slow and clunky staff appointments in Germany and place an obstacle in the way of building an international academic community.[85] So a successful and outward-looking university like Freie Universität, where one quarter of doctoral students are from abroad, still only has 10 per cent of its professors from other countries.

71. It is a mixed picture though. Over 90 per cent of postdocs at Max Planck Institutes are non-German. Around 40 per cent of newly-appointed professors at Goethe University in 2013 were from abroad, reflecting the fact that the institution has had greater autonomy from the state of Hesse since 2008, when it became a foundation under public law. Goethe University is now a direct employer of its staff, which has reduced appointment times from months to weeks, and owns its land.

72. The technicalities of making an appointment are not the only obstacle to staff promotion in Germany. According to the European University Institute, personal contacts can be vitally important to promotion prospects in Germany: 'there is a widespread belief that positions at universities are given on the basis of personal contacts' in place of merit. This is thought to work against the interests of non-German academics: 'it is not easy for foreigners to start an academic career in Germany.'[86]

73. Moreover, the number of tenured professorships can limit staff turnover and hamper promotion:

> *'We need more professorships in Germany, but there is no money at the moment for establishing more of these positions,' explains Henning Rockmann, head of the legal department of the HRK. Universities are being encouraged to look beyond 'this special position of professor' and to create new posts in teaching or research, he says.*[87]

74. This can make it harder for international academics to secure internal promotion than it is for them to secure their first post. According to Wolfgang Herrmann, 'If you are interested in moving up the hierarchy you have to change university … which really makes no sense'.[88] Institutions in other nations, such as the United States, offer more tenured positions, with internal promotion opportunities built in.[89]

75. Moreover, the freedom that institutions have to recruit staff within the UK is felt by some academics to encourage an excessive focus on managerialism rather than more traditional forms of academic governance, while the German system may provide more security of tenure.

3: Research

Co-operation

76. Despite the sharp differences between the German and UK higher education systems, there are some clear similarities. Indeed, in certain respects, the two countries have more in common with each other than they do with other nations in the European Union (EU). For example, in each of the two countries, the other is a core partner for research: the UK produces more joint publications with Germany than with any other nation apart from the United States; and Germany produces more publications jointly with the UK than with any other country apart from the United States. Between 2008 and 2012, there were over 45,000 collaborative publications between the UK and Germany.[90]

77. Germany and the UK are also the two biggest beneficiaries of EU research spending. When the UK's Department for Business, Innovation and Skills, assessed the success of the two countries in securing funding from the EU's Framework Programme 7 (FP7) for cross-country research, it concluded:

> *The UK is a strong player in FP. Only Germany has a greater level of involvement in successful projects in terms of funding awarded. … The UK is involved in more successful projects than either France or Germany*.[91]

The replacement of FP7 (2007-2013) with Horizon 2020

from 2014 had led to further success for both the UK and Germany. In June 2015, the European Research Council awarded Advanced Grants to 38 British researchers and 33 German researchers, with 45 grants for projects hosted in the UK and 29 for projects hosted in Germany. No other country performed as well in either category.[92]

Concentration

78. According to some of the key metrics measuring higher education in different countries, the UK strongly outperforms Germany. The *Times Higher Education* World University Rankings measure universities on: teaching; research; citations; industry income; and international outlook. The UK has almost twice as many institutions in the Top 100. It also has twice as many in the Top 100 of the Shanghai Jiao Tong World-Class Universities league table.[93] On a broader measure of the top 400 universities, the UK still outperforms Germany and it is only when taking the entire top 500 institutions in the Jiao Tong index that Germany marginally outperforms the UK. This confirms the Germany university system in less hierarchical than the UK one.

UK and Germany universities in two global league tables

	Times Higher Education World University Rankings 2015		**World-Class Universities Shanghai Jiao Tong 2014**	
	UK	Germany	UK	Germany
Top 10	3	0	2	0
Top 100	11	6	8	4
Top 200	29	12	20	13
Top 400	45	28	33	30
Top 500	-	-	38	39

79. The Ranking of National Higher Education Systems produced by Universitas21, 'the leading global network of research-intensive universities', looks at: resources; environment; connectivity; and output. The UK comes eighth and Germany comes fourteenth. However, when the results are adjusted for levels of local economic development, the UK does significantly better on output and connectivity, but much worse on resources, and rises up the table to second place. Germany, on the other hand, falls in every category and ends up twenty-sixth.[94]

80. However, league tables risk creating a false impression of the two countries' relative strengths because nations with a clear hierarchy of universities, such as the UK, tend to outperform other countries with less stratified higher education systems. Moreover, league tables focus on degree-awarding institutions and exclude research-only bodies: even though they are typically a measure of research strength above all, only institutions with teaching functions are generally included. Much German research takes place in non-teaching research institutes: there are around 1,000 public and publicly-funded institutions for science, research and development across Germany (not including those run by private companies). The German Max Planck Society say that, if they were to feature in the Jiao Tong table, they would appear as the top-placed European institution. Entering at number five, they would displace Cambridge and push Oxford out of the top 10 altogether.[95]

81. The picture is a moving one, not least because of recent policies in Germany aimed at encouraging and concentrating university-based research at a subset of institutions. Historically, German universities were not thought to differ substantially in quality from one another. But the Excellence Initiative (*Exzellenzinitiative*), established in 2007, was explicitly designed to recognise and encourage difference and it is now on its third wave (2012-2017). Debates in Germany over the right level of research concentration sound familiar in the UK. However, the Excellence Initiative has gradually been diluted since it began and has been caricatured by some as 'excellence for all', whereas in the UK it is thought austerity, which has led to a cash freeze in much public research spending, has encouraged further concentration.

Complexity

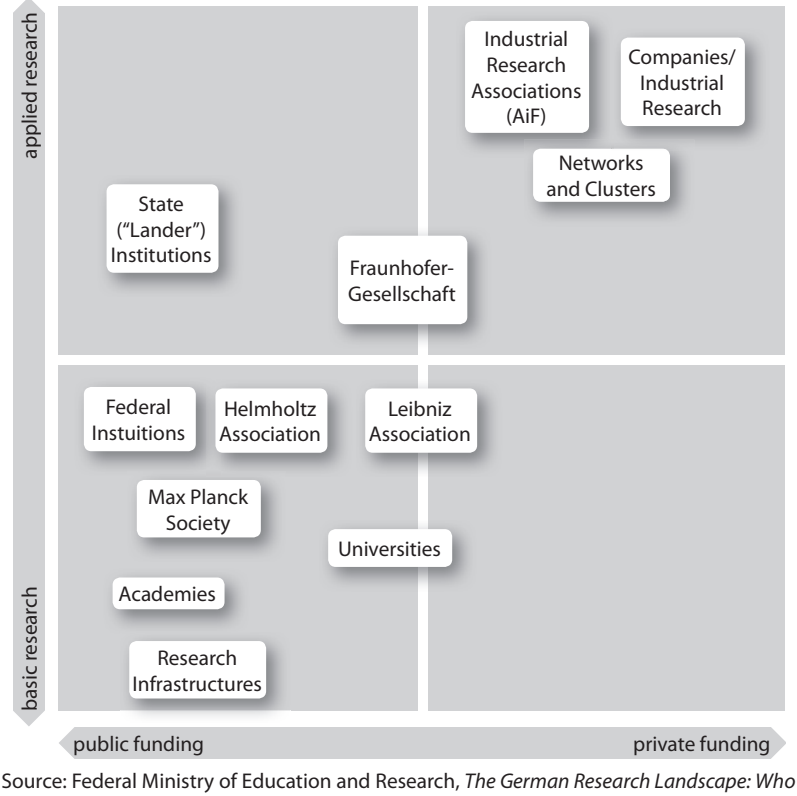
82. To British eyes, the importance of non-teaching research institutes hints at a defining feature of the German research landscape: complexity. As shown in the diagram below, the public and publicly-financed bodies with an interest in research include:

- 40 federal bodies, such as the Institute for Materials Research and Testing or BAM;
- the 16 *Länder*, which fund research and run 130 research institutes;
- the Max Planck Society, which focuses on basic research;
- the Leibniz Association, an umbrella organisation for

89 research institutes considering issues of national importance;

- the Helmholtz Association, which is the largest scientific organisation in Germany and seeks to address major challenges; and
- Fraunhofer Centres, which conduct applied research for private and public enterprises and for the general benefit of the public.

Germany's research landscape



Source: Federal Ministry of Education and Research, *The German Research Landscape: Who does research in Germany?*, p.4

83. Some of the institutional boundaries are clear. For example, the Max Planck Society funds basic research in its own institutions. Some of the bodies are analogous to those in the UK. For example, the Catapults centres are based partly on Fraunhofer Centres. But others can only be fully understood through a knowledge of German history and political geography. For example, the jurisdiction of the influential Berlin-Brandenburg Academy of Sciences and Humanities is, as its name implies, much more limited than that of the British Academy, reflecting its Prussian roots. Article 38 of the German Unification Treaty of 1990 integrated the former East German science and research landscape into the West German system, which helps explain the role and longevity of the Leibniz Association as well as its comprehensive presence in the states formerly in East Germany.

84. In contrast to Germany, the UK operates as a relatively unified research area. The main parameters of the UK's dual support system for funding research, with project-based research funding from the UK-wide Research Councils and Quality-Related (QR) research funding available from the funding councils on the basis of the UK-wide Research Excellence Framework, has proved relatively stable when compared to other publicly-funded services.[96] But it has also evolved to become more complicated in recent years. For example, the funding agencies in the four parts of the UK distribute their QR money according to different formulae.

85. Meanwhile, non-teaching institutions have come to greater prominence. A desire to improve the links between research and industry led to the establishment of the Technology Strategy Board in 2007 (now Innovate UK), which funds closer-to-market ideas. Catapult centres, which were first rolled out by the Coalition during the 2010 to 2015 Parliament, are explicitly based on the German Fraunhofer Centres but, unlike them, each one has its roots in a university (or more than one university). The UK is arguably shifting, slowly but discernibly, towards the current German model characterised by research institutes with looser links to universities. For example, the Crick Institute for biomedical research, the Sir Henry Royce Institute for advanced materials and the Alan Turing Institute for big data are top-down foundations and have not grown naturally out of higher education institutions. Moreover, the terms of reference of the official review by Sir Paul Nurse on how the Research Councils can support research in the most effect way raise a different future:

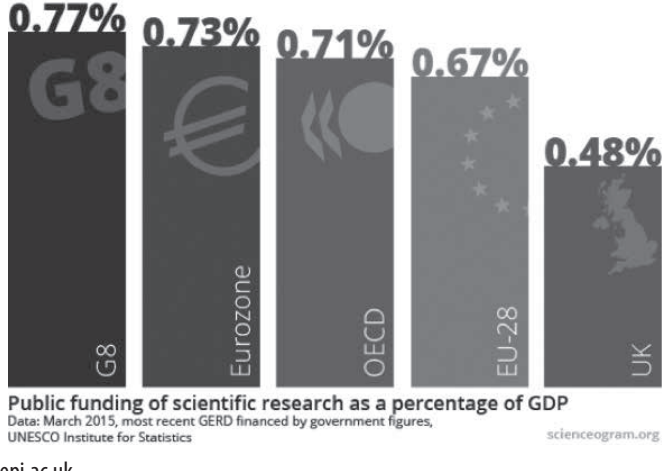
> *Should the funding of research councils be directed almost exclusively to the university sector, with organisations such as the Meteorological Office, the Health and Safety Laboratories and the National Physical Laboratory out of scope?*[97]

86. The German research landscape is shifting too. Although the German tradition appears stable, some German research institutes want to work more closely with degree-awarding institutions, as in the standard British model. For example, in Frankfurt joint appointments between Max Planck Institutes and Goethe University have occurred at professor level. The

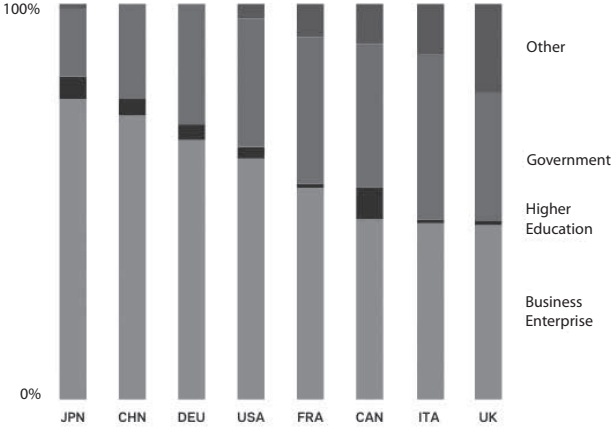
Karlsruhe Institute of Technology was founded in 2009 after a merger between the long-standing Universität Karlsruhe and the Forschungszentrum Karlsruhe, which had originally been founded as a nuclear research centre in 1956.

Funding

87. Germany spends substantially more on research and development than the UK – in 2011, for example, Germany's Gross Domestic Expenditure on research and development was more than double that of the UK ($80.4 billion versus $36.5 billion).[98] In 2013, Germany's research and development budget was 2.85 per cent of GDP, close to the EU target of 3 per cent by 2020, while the UK's was just 1.63 per cent.[97] It is not only when compared to Germany that the UK underperforms. In terms of public funding, it spends less than the average for the G8, the Eurozone, the OECD and the EU – reproduced with permission from Science is Vital's scienceogram.org website.



Research and development expenditure by source of funds



Source: Elsevier, *International Comparative Performance of the UK Research Base – 2013*, 2014, p.18

88. The composition of research and development is notably different too. In the UK, research and development expenditure 'is proportionally greater in the Higher Education sector [27 per cent] and lower in the Business Enterprise sector [62 per cent] than for most comparator countries'.[100] The proportion of total research and development spending that comes from government is similar to elsewhere – 32 per cent in the UK and 31 per cent in the G8 – but the proportion from business is much lower, 44 per cent compared to 61 per cent for the G8.[101] Instead, the UK research base receives more from other bodies, such as charities, and from abroad than other comparable countries. This could have profound consequences.

Taken together, this pattern of GERD expenditure distribution may – at least in part – explain the UK's relative strength in university-derived research outputs such as publications and

citations … and its relative weakness in terms of technology outputs such as patents.[102]

89. The UK is the most productive research nation in terms of articles and citations per unit of research and development expenditure, ranking first amongst comparator countries on these two indicators.[103] On the other hand, it is not gaining as much as it could from the potential crowding-in effect, when public expenditure triggers extra private funding.[104] Yet there is a risk that policymakers can interpret the efficiency of the UK research base in terms of citations as weakening the case for more resources.

90. During his time as Minister for Universities and Science (2010-2014), David Willetts claimed the relatively low total for public and private research and development spending in the UK helps explain the apparently unbalanced nature of the UK economy:

We are living now with the long-term consequences of the failure to have a policy backing these key technologies. Look at the business sectors where we are strong – creative industries, financial services, construction, new web-based services. They all share a crucial feature. They are all areas without capital-intensive R&D. So paradoxically the very aversion to backing particular technologies with R&D has itself contributed to a change in the structure of the British economy – an economy which innovates but does not do as much R&D as many of our competitors.[105]

European funding

91. The 7th Framework Programme for Research and Technological Development (FP7), which ran between 2007 and 2013, was designed to help the European Union become 'the world's leading research area'. Before it was replaced by the new Horizon 2020, there were 601,000 applicant organisations and individuals and almost 136,000 proposals, 19 per cent of which were successful. These successful projects had a total cost of €62.9 billion, with a requested contribution from the EU of €41.7 billion.[106]

92. The UK and Germany were the two top performing countries. The UK ranked first among the 28 EU states for the number of applicants (73,877) and the requested financial contribution (€30,552 million) and scored above average (seventh) for the proportion of applications that were successful (22.7 per cent). Germany ranked second for the number of applicants (71,609) and the requested financial contribution (€29,918 million) but had an even better success rate (fifth) than the UK. This meant Germany pipped the UK both for the share of funding (€7,136 million versus €6,940 million) and also the number of participants (18,088 versus 17,561). Together the two countries, took around one-third of FP7 funds and, for each country, the other was the top partner, with 26,300 collaborative links.[107]

93. Although the overall performance of the UK and Germany was clearly very similar, the detailed data reveal a stark difference: the depth of involvement in FP7 by higher

education institutions. In the UK, 'Higher or secondary education' accounted for 60.3 per cent of all participations and 70.7 per cent of the share of funding. In Germany, this category accounted for only around half as much: 33.7 per cent of participations and 37.7 per cent of funding. The top four performing educational institutions across the whole EU were all English universities in the Oxford-Cambridge-London 'golden triangle' (the University of Cambridge, the University of Oxford, Imperial College and University College London), while the top-performing German educational institution (the Karlsruhe Institute of Technology) was placed thirteenth and had fewer than half as many participations (340) as either the University of Cambridge (737) or the University of Oxford (719). In contrast, Germany had three organisations (the Fraunhofer Institutes, the Max Planck Society and the German Aerospace Center) in the top 10 research organisations, while the top-performing UK research organisation was placed twenty-seventh (the Medical Research Council). In the UK, over eight times as much FP7 income went to educational institutions as to research organisations (8.3 per cent); in Germany, research organisations obtained a similar proportion of FP7 income (33.3 per cent) as educational institutions. Overall, the UK had more than twice as many educational institutions (14) in the top 50 as Germany (6), while Germany had more research organisations (six versus four).[108]

FP7 Participation by type of organisation

€/%	Education	Private	Research	Public	Other	Total
UK	4.9bn/70.7	€1.3bn/18.1	0.6bn/8.3	0.1bn/2.1	0.1bn/0.1	€6.9bn
Germany	2.7bn/37.7	€1.9bn/26.8	2.4bn/33.3	0.1bn/1.3	0.1bn/0.9	€7.1bn
FP7 total	19.3bn/43.5	€11.0bn/24.7	12.0bn/26.9	1.2bn/2.6	1.0bn/2.3	€44.4bn

Figures rounded to the nearest €0.1 billion and the nearest 0.1%. Sums may not total due to rounding.

94. The UK seems to be seeking no changes to Horizon 2020 as part of the pre-referendum renegotiation on the terms of EU membership. This could prove to be a missed opportunity: it could have made sense for the UK Government to ask for a commitment to its long-term future or for a long-term commitment that EU research funding will remain excellence-based or to request that the EU research budget should be ring-fenced more securely. Research funding is one of the few areas of EU spending where the UK is an unequivocal net beneficiary and recent top-slicing of the Horizon 2020 budget has caused grave concern to UK vice chancellors, whose positive Universities for Europe campaign also seems not to be making any specific demands on the future of research funding.[109] Given that Germany does so well out of EU research funding, it could potentially have been an area of British-German co-operation during the renegotiation discussions, but neither the UK Government nor the university sector appear to have pushed for this.

95. The UK debate over Europe has an analogy in the debate over Scottish independence. In that referendum campaign, the SNP Scottish Government argued that a yes vote would make little difference to UK-wide research funding: 'We plan

to continue to participate in the current common research area ensuring that Scotland's research continues to be available across the UK to benefit both Scotland and the rest of the UK.'[110] This was robustly refuted by the UK Government at Westminster, but the 'no' side in the EU referendum campaign is similarly likely to argue that we can leave the EU and still work collaboratively on research while winning European research funding, as Norway does.[111]

Innovation

96. The differences in research and development spending help to explain the results of the European Commission's categorisation of nations according to the vibrancy of their innovation base. Germany is placed in the top category as an 'Innovation Leader' while the UK performs less well and is in the second category as an 'Innovation Follower' (above 'Moderate Innovators' and 'Modest Innovators'). The gap between the two countries is thought to be growing: in 2014, the EU found Germany was the Innovation Leader with the most improved performance while the UK was the Innovation Follower with the lowest improved performance.[112] However, the UK outperforms Germany in the EU's 'open, excellent and effective research systems' category due to its more international outlook: 'The performance of Germany, one of the Innovation leaders, is relatively weak, in particular due to a relatively low share of non-EU doctorate students.'[113]

97. It is currently unclear how the UK will get close to meeting the EU target of 3 per cent of GDP spent on research and development by the end of the decade. However, Germany is likely to remain a guiding light for those who want it to happen. For example, the UK's Campaign for Science and Engineering has lobbied for a formal target to 'increase investment in R&D over 10 years to reach the level of USA and Germany'.[114]

Conclusion

98. Compared to Britain, German universities appear less autonomous and less well funded but more equal to one another. They perform less well in the global league tables but this is largely a reflection of the amount of world-class research undertaken in non-teaching research institutions rather than an obvious sign of weakness. To British eyes, the German research landscape looks comprehensive and business-focused but also excessively complicated. Ironically, UK universities, with their greater autonomy and a higher proportion of the country's research compared to their German counterparts, are closer to the model of higher education developed by the Prussian Alexander von Humboldt, which is characterised by institutional autonomy and research-led teaching.

99. There is little sense that the German higher education system is on the brink of major reforms of the sort that have happened in some other countries in recent years. This allows a resolute focus on internationalisation, at least where students (rather than staff promotion) are involved, but many British – and perhaps some Australian and American – observers might be tempted to question whether two particular features are sustainable: the reliance on so much taxpayer funding for teaching both home and international students; and a research system that artificially downplays Germany's strengths in the key international metrics. In turn, German observers of the British system might well criticise the lack of prestige given to the vocational pathway in the UK,

the low research and development spend, the relatively cool welcome offered to international students, the tendency to nudge former international students to return home after the completion of their studies and the high levels of graduate debt.

100. In the months ahead, as the UK prepares for a referendum on its continued membership of the EU, one area of potential common cause between the UK and Germany is supporting the collaborative excellence-based research projects of Horizon 2020. Indeed, the extent of the British-German partnership in academic research is an exemplar for how independent nations can work together for the common good.

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