

Science and Technology Committee

Oral evidence: [Balance and effectiveness of research and innovation spending](#), HC 1453

Thursday 28 February 2019

Ordered by the House of Commons to be published on 28 February 2019.

[Watch the meeting](#)

Members present: Norman Lamb (Chair); Vicky Ford; Bill Grant; Darren Jones; Carol Monaghan.

Questions 264 - 386

Witnesses

[I](#): Professor Graeme Reid, Professor of Science and Research Policy, University College London; Professor Colette Fagan, Russell Group; and Gordon McKenzie, Chief Executive, GuildHE.

[II](#): Dr Peter O'Brien, Executive Director, Yorkshire Universities; Professor Jonathan Seckl, Vice-Principal, Planning, Resources and Research Policy, University of Edinburgh; Professor Anthony Hollander, Pro-Vice-Chancellor for Research and Impact, University of Liverpool; and Sarah Haywood, Chief Executive, MedCity.

Written evidence from witnesses:

- [University College London](#)
- [Russell Group](#)
- [GuildHE](#)
- [Yorkshire Universities](#)
- [University of Edinburgh](#)
- [MedCity](#) (joint written submission with the Greater London Authority)

Examination of witnesses

Witnesses: Professor Reid, Professor Fagan and Gordon McKenzie.

Q264 **Chair:** Welcome, all three of you. To start with, I would like to ask whether Members or witnesses want to declare any interests that are relevant to the inquiry. If you have any interests you would like to declare, you can do so as you make your introductions.

We are all really sorry that we are not in Liverpool today. We ought to be there. We know that Liverpool University put a lot of work into organising our visit, which we appreciate. The frustration is that, as things have turned out, we could have been there, but we did not know it at the time and a decision had to be taken based on possible crucial votes today on Brexit. Apologies to everyone concerned, who put so much work into our proposed visit. I will be visiting Liverpool to have discussions that are particularly pertinent to this inquiry. Can we now move to introductions?

Gordon McKenzie: I am Gordon McKenzie, chief executive of GuildHE. For Members who do not know, that is a representative body for smaller and specialist universities. In the context of this hearing, we have a research network, GuildHE Research, which I think is the only non-geographic research network in the UK and is a way of bringing together smaller and developing research environments.

Q265 **Chair:** Do they pay a membership fee?

Gordon McKenzie: Correct. We bring them together, share services and so on.

Professor Fagan: I am Colette Fagan. I am pro-VC and vice-president for research at the University of Manchester. Today, I am representing the Russell Group, which is a membership organisation of the 24 leading research-intensive universities of the UK.

Professor Reid: I am Graeme Reid from UCL where I am professor of science and research policy.

Q266 **Chair:** Thank you very much indeed. To start us off, the emergence of UKRI and the Government's commitment to increase spend on R&D to 2.4% of GDP present us with an opportunity to reconsider the allocation of resources between the two mechanisms for funding universities. Should we use that opportunity significantly to change the balance between the two? Is just tweaking necessary, or should there be no change at all?

Professor Reid: There is a perennial debate about the balance between the two funding streams. I would like to draw out some of the characteristics of the performance-related funding stream—the QR funding stream. I am focusing on that partly because the proportion of the budget allocated through that mechanism has been falling in recent years. There are a number of sources of project funding available to universities. Businesses, the EU, charities and the public sector research



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councils all provide project funding, but only the Government will provide QR funding; there is no other source of that funding available.

Q267 **Chair:** It gives universities scope to determine their own priorities.

Professor Reid: I will give three examples of what it does, because it does things that no other funding can do. That is probably why it has such powerful incentive properties and why universities jump in the direction that QR funding is allocated. First, QR is the thing that provides stable careers for researchers. If you exist in a world of research grants only, many people can be given only short-term contracts because there is no long-term security of funding, so it is the difference between a contract and a career.

Another thing is that it provides universities with agility; it allows them to grab opportunities to collaborate with business, or partner with one another, without going through months of applying for a research grant, by which time their business partner has long since disappeared. The other thing is that it provides financial sustainability when participating in grant awards that are issued at less than the full cost of doing the research. Something has to plug the gap, and QR funding is used some of the time to do that. I could go on, but I hope that is a helpful illustration.

Q268 **Chair:** It is very helpful as a description of what it is good for, but going back to the question I asked, should we use this moment as an opportunity to shift the balance between QR and other more project-specific sources?

Professor Reid: You will get many different answers to that question from different people. My instinct is that we should return to the balance that existed a few years ago.

Q269 **Chair:** In a sense, that is arbitrary, is it not?

Professor Reid: It is a judgment that would be made about the best way to get value for the taxpayer. I would argue that the things I have just described—I could describe many more—are being diluted by the erosion of QR, and value to the taxpayer is eroded with it.

Q270 **Chair:** Colette or Gordon, do you agree with that view? Perhaps I could ask a supplementary along the way. Is it the universal view of universities and research institutes that there needs to be an increase in QR funding and that the proportion of funding going to QR needs to increase?

Professor Fagan: Yes. At the Russell Group we are very committed to the value of QR for the reasons Graeme outlined. I could give additional ones. The value has fallen by 30% over less than 10 years. It makes it much harder to do the things we do very well in this country in science and innovation, building early career routes and facilitating challenge-based interdisciplinary team building and capacity building.



It is becoming much harder to do that and it is forcing quite hard choices about how we use the shrinking pot of QR to support our PGR students in early careers, to facilitate our business engagement and agility in our regional and place-based ecosystems and to fill the gap in the funding that comes through in research awards, which was originally 80%. We are not hitting 80%; it has fallen to about 70% through increasing pressure on universities to do matched contributions. It is even lower in the medical and health areas. Something will give eventually because we cannot afford to support all of the science.

- Q271 **Chair:** Gordon, do you agree with that? To ask you a supplementary, if we increase the proportion going to QR, should it all be done through REF—the research excellence framework—or are there other mechanisms we should be using? If others have a view on that, please come in.

Gordon McKenzie: I think we should increase the proportion of QR, and I give a slightly different reason. From the perspective of smaller institutions and research environments, it is much more equitable. If you can show excellence you will get QR, but talking about a dual-support system with the research councils is a bit of a misnomer, because very many universities get no research council funding at all. It is almost as if you have to have had a research council grant to get one, so it is a more equitable stream of funding and I would increase it.

As to how you allocate that sort of funding, I would like to see more of the sorts of behaviours that we see in the way Innovate UK gives funding, with smaller amounts of money, lower grant thresholds and greater willingness to take risks.

- Q272 **Chair:** Would that be through an adaptation of REF or through other mechanisms to complement it?

Gordon McKenzie: It can be through an adaptation of REF. It can also be through Research England using specific funding streams, and we have some ideas about that.

- Q273 **Chair:** There is an issue, is there not, particularly with small and perhaps growing institutions, that REF is fixed every seven years and you are then stuck with seven years based on the same assessment? Does that need to be tweaked as well?

Gordon McKenzie: That does need to be tweaked, because smaller research environments grow from a relatively low base. They grow in quality and quantity relatively quickly—they have quite steep trajectories—so, if you had a way of being able to feed money in to continue to build their capacity between REF cycles, it would bring a lot of benefits to them and to the partners they work with.

Professor Reid: I would like to add a thought to Gordon's analysis. If REF existed in isolation, I would have a lot of sympathy with that argument, but REF and QR are part of a bigger picture. The current



system is trying to strike a balance between stability and dynamism, and it gets dynamism through the grants and stability—

Q274 **Chair:** But Gordon also says that smaller institutions often do not get research council grants.

Professor Reid: Yes, but there are many sources of grant income, while there is only one version of REF. This is quite nuanced stuff. We are talking about finely balanced judgments, but my instinct is that we should recognise the value of the stability of a long-run REF cycle combined with more dynamic grant awards.

Professor Fagan: In that space, in relation to the various initiatives run through Research England, we have Expanding Excellence in England. There could be an argument for increasing that to provide that form of agility. We also have place-based funding initiatives, and I am sure we will get on to HEIF.

Q275 **Chair:** Is there a danger that, if you increase QR as a proportion of the total, you increase the risk of perverse incentives, behaviours that are designed to get the best possible rating, which can have an impact on research integrity? We know there are perverse incentives in the system.

Professor Reid: I was just wondering why that should be a distinctive characteristic of QR as opposed to a characteristic of research funding in the round.

Q276 **Chair:** It is a question. If you think that is not the case, fine.

Professor Reid: I cannot think why QR should have that characteristic.

Q277 **Chair:** But doesn't the rating become critically important for a university, particularly in England where getting the top rating has a significant impact on how much money you get? Isn't there a danger of some perverse incentives? There is enormous pressure on researchers in the run-up to the rating to secure money for the next seven years.

Professor Fagan: I do not see issues of integrity working through the REF formula as such.

Q278 **Chair:** Perhaps there are other perverse incentives in play.

Professor Fagan: There are pressures to chase research funding, of course, and to secure it through external competitions, for research council funding and from others. As institutions we are attuned to dealing with that in other spaces. Many of the perverse incentives in REF have been removed or mitigated through the recent reform, where we have an obligation to return all of our colleagues with research in their contract, and to look at the team performance of the unit rather than the individual's best four pieces. We are in a space where the combination of that and the emphasis on impact and delivery through various translation mechanisms has allowed us to start to grow a collaborative, challenge-based interdisciplinary balance between discovery and applied research.



Gordon McKenzie: To come back briefly to Graeme's point, and my point about finding a way of gearing funding over the period between REF cycles into smaller institutions, Graeme's point is about the stability it gives you. The problem with grant competitions is that you need a certain amount of capacity to be able successfully to bid into them, and it is about giving people a degree of certainty about their growth between REF cycles. The money involved is small; you are talking about people who get small allocations anyway, but it is a way of nurturing those sorts of environments.

Q279 **Chair:** Graeme, to go back to the point I discussed with you about how we judge the right proportion going through QR, is it ultimately just a value judgment, or is there evidence that UKRI should be considering? How do we measure whether it is delivering the right results, or is it impossible to do that?

Professor Reid: It is somewhere between the two. I cannot point to detailed evidence that will determine the balance of project funding and QR funding. On the other hand, I could point to a couple of things that have happened in the QR space that would argue for an increase. One is that QR has been tapering in size. The other is that the impact agenda has been added to QR and will make up 25% of the QR allocation. Not only has QR been shrinking in total, but the amount devoted to research excellence has been cut to three quarters of the budget. To my mind, that would support the argument for bringing it back up by something like Colette's 30%.

Q280 **Carol Monaghan:** My question has almost been covered, but maybe I could push you a little further, Gordon. You talked about the institutions that you represent being on a steep learning curve and said they are getting better. Do you feel that at the moment you are disadvantaged when pitting yourself against bigger institutions because in many ways they know how to play the system better than your institutions do?

Gordon McKenzie: It is a steep growth curve. They do not have the capacity and the research back office to win competitive bids, and there is an element in competitive bids, particularly through the research councils, of predominance of track record. That was my point about Innovate UK behaviours; there is a greater willingness with smaller amounts of money to take considered risk based on a good idea. I would like to see some of that behaviour coming in and being encouraged.

Q281 **Vicky Ford:** Graeme, you said that QR had been shrinking in total. Has it been shrinking as a total number of pounds or as a percentage of the total?

Professor Reid: As a percentage.

Q282 **Vicky Ford:** As pounds it has gone up, because research funding altogether has gone up, but it has shrunk as a percentage.



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Professor Reid: It has shrunk significantly as a percentage, and it has taken on board an extra function.

Q283 **Vicky Ford:** Exactly, but it has not actually shrunk as pounds. How do we compare with, say, France or Germany?

Professor Reid: Would you mind if I gave you a comparison with the United States instead?

Q284 **Vicky Ford:** I would like both, but our European competitors would be important.

Professor Reid: QR is a distinctive feature of the UK system. If we compare ourselves with France and Germany, they spend significantly more on research as a percentage of GDP than we do and underperform the UK. I cannot give you the causal link between QR and that performance, but it is widely observed that QR enables the UK to outperform its peer group.

If I could just fit in the US, I think there is a closer analogy. In many ways, QR gives universities an income stream that is analogous to the large endowment funds available to the big research universities in the US. Harvard has an endowment of \$40 billion, from which it can draw perhaps 3% per annum. That income has a QR-like characteristic.

Q285 **Chair:** I can see that.

Professor Fagan: The fall in QR has been in real terms; it is 30% in less than 10 years. That is a significant point.

Q286 **Chair:** On Vicky's point, is that the fall in the share of total funding going to QR, or has there been an actual real-terms fall?

Professor Fagan: A real-terms fall.

Q287 **Chair:** Could either of you come back to us with written evidence on that? We need to be very clear about real-terms value.

Professor Fagan: The main point I want to make in response to the question is whether we have got it right. What evidence is there? I draw attention to the World Economic Forum on the UK's system; we are ranked second for the quality of our science. I cannot draw the causal link or put it in a multi-model. We rank sixth for university research-led investment.

Q288 **Chair:** We are punching above our weight.

Professor Fagan: We definitely are. We could sit and debate that, and the debate about the proportionate balance within the mixed model needs to happen, but our model is very successful and it is envied.

Gordon McKenzie: It is a very successful model and it is envied. It is a very successful model in promoting excellence of pure research. If you want something else from your research and development funding, you



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can look at some of the statements from Government, such as the industrial strategy Green Paper, where they say that “in leading innovation nations...a greater proportion of total R&D investment is on later-stage, experimental development. China, for example, currently spends twice the share of the UK.” There are choices about the balance.

Q289 Vicky Ford: A number of the submissions we have had point to the fact that the research councils aim to cover 80% of the full economic costs, but in practice it appears to be nearer 71%. Why is there a gap? Where is that 9% coming from?

Professor Fagan: Part of the gap is because the research councils are themselves stretched and are increasingly asking for matched contributions. There are detailed costings when we make applications, and we use a model across the sector in terms of FEC modelling and the 80%. There is increasing pressure for an institutional match, particularly around medical and health. They are expensive to do, but it is also expensive for us to find the match to help square the circle in that space.

Within that, the ability to succeed through the industrial strategy challenge fund in pulling down R&D also requires a match, which is potentially drawing away from our existing business-funded activity, where our strategic large and small companies recognise costing and pricing, and are currently willing to invest on a 100% formula and cover the costs of the university. Through the industrial strategy challenge fund, there is an additional incentive and support for business, but we still need to find the match from within the university to support the leverage around ambitious R&D investment.

Q290 Vicky Ford: Are there any other comments?

Professor Reid: The official line I remember is that funding at less than full economic cost creates an incentive for efficiency. The person doing the research will drive down the cost in order to match income and expenditure. When people are paying 65% or 75% of full economic cost, it is absurd to imagine that you can balance the books by generating efficiencies. Funders in this country are starved of cash and are trying to get as much as they possibly can. This is not a sustainable funding environment.

Q291 Vicky Ford: But Colette’s point was that it is driving you to find matched funding from other sources.

Professor Reid: The other sources are coming in at less than full economic cost as well. Everybody is asking everybody else to fill the gap.

Q292 Vicky Ford: Would changing the policy to cover 100% of the cost be a good use of any extra funding that could possibly come in because of the target increasing to 2.4%?

Professor Reid: The only bit that is available to the Government is to fill in the research council gap, but that leaves UK charities, the European



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Union and industry all coming in at less than full economic cost. I would not argue for filling in the whole research council gap in one swoop without making any comment to other funders. It is a wider problem than just research council funding.

Gordon McKenzie: Institutions that do not get research council grants would gain nothing from that, and you would see a greater concentration of your additional funding in a particular subset of universities.

Q293 **Chair:** Are student fees effectively cross-subsidising research?

Gordon McKenzie: International students, certainly.

Q294 **Vicky Ford:** Changing the fee model for domestic students is obviously a controversial issue. If there was a change in the fee model for domestic students, would that potentially affect research funding? Can we separate those?

Gordon McKenzie: There have been two reports in the past several months, one from the Higher Education Policy Institute and one yesterday from the Financial Sustainability Strategy Group, saying that at the moment for home students—UK students—cost recovery is at 100%; broadly, the money brought in is meeting the cost. If you reduce the unit cost of teaching, you reduce university income and there is less money to go around for all the things the university does.

Q295 **Vicky Ford:** You are saying that, if you dropped the cost of the tuition that students pay, that gap would have to be filled by something, which could be drawing down on research.

Gordon McKenzie: It could be pushing down on research; it could be a diminution in the quality of teaching.

Q296 **Vicky Ford:** It is not possible completely to separate those two markets.

Gordon McKenzie: No.

Q297 **Vicky Ford:** To go back to 100% full economic cost, you would not support just changing it to 100% cost recovery for the research councils because there is a broader issue; other funders are also not paying the full economic cost. Clearly, some funding less than the full economic cost drives improvements, but when it is below 80%, or even lower, it is not sustainable. Is that correct?

Professor Reid: That is a very good summary. Thank you.

Q298 **Chair:** You could cope with 80%, but going below that is problematic.

Professor Reid: If everything was at 80%, it would be a lot better than it is now.

Q299 **Chair:** You are nodding, Colette.

Professor Fagan: I am with some reservations. Delivering the scale of ambition through the industrial strategy challenge fund of a 2.4% uplift



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on an 80% model will still be a challenge, but it would be a better starting place than where we have currently drifted.

We have talked about mainstream QR in relation to academics, but a stream of the QR is dedicated to supporting PGR training, early career development, industry engagement and so forth. We must not lose sight of that breakdown. Research England collected some evidence on that. After the session, I am happy to provide the figures. In Manchester—the figures I have access to—we look at the funding that comes in against the actual cost of postgraduate research and training. The expectations of what makes a good scientist have increased over the years. There are gaps in all of those areas and they are our platform for the future, not just for current delivery.

- Q300 **Carol Monaghan:** Gordon, in some ways I think you have been taken down a line by Vicky. Maybe I can take you down a slightly different one. Vicky spoke about tuition fees. If you reduce them, you will not be able to afford to deliver at the level you are delivering now. Could I ask you whether you agree with me that, if you reduce or get rid of tuition fees, funding can come from other places?

Gordon McKenzie: Yes.

- Q301 **Carol Monaghan:** You would not necessarily have to dilute your teaching or the quality of the product.

Gordon McKenzie: Absolutely. At the moment, you have a model in England where most of the funding comes from tuition fees and a small amount of money comes from central Government grant for higher-cost subjects.

- Q302 **Carol Monaghan:** Central Government could increase that.

Gordon McKenzie: Central Government could increase that grant, and that would balance it all out.

- Q303 **Darren Jones:** I am interested in the question of early-stage researchers, which you have just touched on, specifically around innovative or entrepreneurial research. Do you know the percentage of QR funding that is linked to being able to strengthen institutions' positions in successfully winning project funding?

Professor Fagan: I can give you a couple of examples of how we have used QR in my own university, Manchester. We could probably provide additional examples afterwards from across the Russell Group. Part of the agility that QR gives you is to invest for the future and to build. I will give three examples.

You will be very familiar with graphene. We would not have had graphene in this country if we did not have the QR to bring the Russian team, embed them, and develop and build in that space. We have Cancer UK in Manchester. We could not afford to make the match that is required for that charity without QR funding. Those are two possible counterfactuals.



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The one I want to focus on at the moment is the investment we are making in digital futures, whether machine learning and AI, through to digital humanities and new ways of learning and researching. Through our QR, we have been able to invest and build capability at all career stages; to look at the synergies between research and investing in our curricula; and to look at business engagement activities and business needs in the local ecosystem of Greater Manchester and the north-west, and with our N8 partners. It gives us a fund that allows us to think strategically about the big issues facing science and the economy we sit in, what we need to do to bring together people who are often working in different spaces, and to build the capacity and pipeline from our undergraduates through early career into leading science.

Professor Reid: Colette has given some vivid examples. I was going to try to answer your question from a different direction. QR funding is a devolved matter, so each of the four nations of the UK determines its own level of QR funding. If you look at the ability of each of the four nations to capture research grants, you get a little glimpse of the relationship between QR and research grants. I have the numbers in front of me.

Wales has 5% of the UK population. The Welsh Government decide to pay out 4% of the total QR: 5% of the population, 4% of QR and 3.5% of total research income. By contrast, Scotland has 8% of the UK population. The Scottish Government decide to pay out 13.7% of QR, a heavy over-investment, and Scotland captures 13.4% of total research income. There are not many data points, but there is quite a high coincidence of the QR level and the total amount of research funding that is won.

Q304 **Darren Jones:** One of the comments that has come to us is that institutions are spending QR funding in order to bolster their position to win project funding. If that is true, my concern is how much QR funding is available for innovative or entrepreneurial research, especially at the early stages? The problem is that there is not much data to give us a clear view on that.

Professor Reid: I am not sure that I would draw such a sharp distinction between the two. Colette's examples were vivid, and I could give others. There will be some examples where QR funding was used to create a research domain that was not ready to bid for funds, right at the very earliest stages of a research domain. But you still might find that other funding partners want to come in on the act, so just because you are at the very frontiers of research it does not mean that you have to be on your own all the time. There is a distinction, but it is not a terribly clear one.

Q305 **Darren Jones:** How much engagement is there with individual researchers or research institutions when deciding how QR funding is spent on strategically new and innovative areas of research? Is it an institutional level decision that you then tell everybody about, or is there



proactive engagement at research group level?

Professor Fagan: I could not speak for all 24 universities in the Russell Group, but I can give a flavour. The universities are to a greater or lesser degree involved in consultation and strategic setting, running open competitions and looking to support the best science within their university, and building up relationships from that. We would not last long in terms of our legitimacy, or in delivering really good science, if it was all a central top-down process. The REF gives us a very good signal through outside validation of where our good science is and where our excellence is, to build on.

Q306 **Darren Jones:** One of the criticisms we heard from a previous panel was that, because QR funding goes in at institutional level, it does not necessarily flow through to the highest-performing research groups.

Professor Reid: There is quite a high degree of transparency. Researchers know their research power, and its volume and excellence, so there is a pretty high degree of transparency. In UCL, the pattern is that a great deal of QR goes into the high-performing research groups; it goes to places where it was earned.

Q307 **Chair:** But it is up to the institution.

Professor Reid: It is up to the institution, and the institution will reap the reward, or otherwise, for the wisdom of its allocation. Not all of the money goes to the high-performing research groups, because some is deployed in the creation of tomorrow's high-performing research groups.

Q308 **Chair:** There could be said to be an unfairness, could there not, in what you have both said, Graeme and Colette? You are able to use your QR funding to develop new areas that might lead to growth in the future, but why should the existence of particular strength of research in an institution result in that institution being able to build those new areas? They might be entirely separate from the centres of excellence in your institution, whereas another institution is not able to build new areas, perhaps in another part of the country where less money from public sources is going into research. They are then prevented from building their new areas because they do not have existing centres of excellence elsewhere in the institution. Is there not a potential unfairness?

Professor Fagan: No one funding mechanism will solve the different issues. We need funding mechanisms that build excellence from fledgling, emerging activities, and Research England has some mechanisms to do that. We also need to be able to build on existing good science bases to develop excellence there, whether it is supporting the areas that are seen to be leading in the REF and building postgraduates around them, or maintaining and building the PIs who are leading excellent labs in that space, and making judgments to build other parts of that.

If I could give you a sense of it, again from the Manchester figures because I have those, having talked to the Russell Group in various



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forums when looking at strategy and thinking about evidence, most of the QR follows the excellence. When it arrives at Manchester, we know our mainstream; we know there is a part about supporting where our PGR students sit in the university, so there is no behind-the-scenes diversion into other pots other than supporting research. Our QR in 2016-17 was £69 million. Of that, we held less than £5 million at the centre for discretionary activity. The rest followed where the PGR students were; where the excellent labs were; and where the excellent historians, without expensive labs, and with a diminishing research council pot, were continuing their excellence.

Q309 Darren Jones: My last question is whether you feel there is any room for reform around funding for early-stage researchers. A universal basic research grant model has been suggested, whereby early-stage researchers get a universal pot of funding. Is that something you think has legs, or do you think the system is fine as it is?

Professor Fagan: We have a number of innovative funding streams through UKRI to support future leaders. We had excellent versions of that through Horizon 2020. I am concerned about the balance between supporting the individual and growing the collective team that we increasingly need for the big challenges, as well as the big discovery questions. If you trace everything through the individual, it does not always foster or incentivise collaborative team building.

Gordon McKenzie: I agree with the author's articles and his point about the Matthew effect—unto those that have shall more be given—particularly for research council funding, but focusing the proposal on basic research for science is an interesting solution to a problem we do not have. If we have a problem in the system, it is translational and closer to market funding. All that said, I think UKRI should be encouraged to look at fresh ideas for allocating public R&D funding.

Q310 Bill Grant: Maybe we can look at the role of science and innovation in regional development and the changes in funding for it. You will be aware that European structural funds are designed to support regions, raise their profile and improve equality in those areas. The Government intend to replace that important funding by the UK shared prosperity fund, which is quite innovative, although we do not have any facts or figures or know the value of it. It will, hopefully, be equal to or even greater than European structural funds.

Do you think the new fund should be designed specifically to support science and innovation activities? How can we bring forward the priorities of the science and innovation community for that fund? Would UKRI be a key player, or a role player, in taking forward the priorities and needs of that community with the new fund?

Professor Reid: We know very little about the shared prosperity fund. I am happy to give some thoughts on what I think it should be, but as far as I am aware nobody else shares those views. The Government some



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time ago said that they would introduce something that looked a bit like regional development funding from the EU.

Q311 **Bill Grant:** Similar.

Professor Reid: They have been pretty silent in recent months as far as I can tell. It will coexist with the Government's policy of increasing total research investment in the UK to 2.4% of GDP. In that fantasy world, we will not have just a replacement for European funding; we will have a regional development fund that is running in partnership with an aggressive expansion of research investment. I think there is every reason to try to bring the two together.

Q312 **Chair:** Into a single structure.

Professor Reid: No. I would prefer harmony rather than unity, because I do not think that regional development is exclusively a research and innovation issue. There are important issues about transport infrastructure and, in some places, housing and so on.

There is potential to use the shared prosperity fund to attract business investment in R&D to parts of the country that have the potential not only to host the R&D but to see economic regeneration through the location of the R&D. It would be a pity if the shared prosperity fund was modelled too closely on European funding. It should be modelled on the UK's domestic needs, particularly in the context of the 2.4% agenda.

Professor Fagan: Some of the real success of delivery is building the local regional ecosystem and getting stakeholders lined up. It is about the fund; it is about the LEPs; it is about the health infrastructure in that space and working out shared industrial strategies. I use industrial in the widest sense, not just heavy industry but digital, creative and related activities.

Q313 **Bill Grant:** Do I take from that that you are with the Government so far, but you need more and better information flow in relation to their aims and aspirations for the new fund? You would not wish it to mimic or replicate the previous model. We need to remodel it to suit the regions and areas, and it should not be from a central point; it should go out to the regions.

Professor Reid: I am reserving judgment on the administration of it because there are arguments for and against centralisation, but otherwise I agree very much with your summary. This is an opportunity to create something for the future of the UK rather than just mimicking the European model we have had.

Q314 **Bill Grant:** Can we look at the Higher Education Innovation Fund, which I think is known as HEIF? Is it as effective as it could be? I understand that since 2011 there have been restrictions on universities and organisations that fail to secure external funding above £250,000. Is that a weakness in the system? How could we improve the system, or is it working



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perfectly well?

Gordon McKenzie: From the perspective of my members, it is a weakness; 21 of my members lost HEIF funding in the 2011 allocations.

Q315 **Bill Grant:** Would the weakness be in the arbitrary figure of £250,000 external funding?

Gordon McKenzie: Yes. There is a complicated allocation method, but basically they run the numbers. If a university is going to get less than £250,000 at the point when they run the numbers, it gets nothing and that money goes back into the pot, so 21 of my members lost their capacity to grow knowledge and exchange work in 2011.

A lot of evaluations of HEIF have shown it to be an effective fund, rather than some of the arguments about QR, in terms of building capability and capacity, making it possible to invest in staff, back office and so on, and making it possible for you to take up new opportunities and build relationships with partners. It is potentially a very good fund.

Q316 **Chair:** Should we scrap that threshold or just reduce it?

Gordon McKenzie: Scrap it. With a rising budget I think you can afford to scrap it.

Q317 **Chair:** Graeme, your mouth opened and then closed.

Professor Reid: It sometimes does that, Chair.

Q318 **Chair:** Would you like to say something, or did you think better of it?

Professor Reid: The argument for a floor is that there is a de minimis level of funding. This is £250,000 for a whole institution; it is not for one project but for an entire organisation. If you take away the floor, are we going to say that you are going to give an institution £100 or £10,000? It gets to a point where the money is so small that an institution cannot do anything with it.

Q319 **Chair:** Colette, can you arbitrate between the two of them?

Professor Fagan: I wish. Let's have a go. I would look to highlight the administration of the fund and make good use of the delivery. The beauty of the fund is that it comes in against a business plan for the organisation. Producing that and running it brings its own costs, but at the moment those are reasonable and proportionate. I can now have two business development leads rather than 0.10% of a business lead. There are certain investment costs where you reap rewards above a certain floor. I would not want to get into the precise floor, but the extreme example of £100 everywhere will not make good use of that money.

Gordon McKenzie: One could make slightly absurd points, but there needs to be either no floor at all or a very much lower one. People have lost their capacity to invest. Again, this a geographically concentrated fund. Most of it—a high proportion—goes to institutions in London.



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Q320 **Bill Grant:** In summary, it is a very important funding stream. I take the point about not diluting it too far. Maybe we can have a look at the threshold, but we cannot afford to dilute it to a small level.

Professor Fagan: Yes.

Chair: We have agreement. Excellent.

Q321 **Carol Monaghan:** We know that a large proportion of R&D funding is going to the London area and the golden triangle. I like talking about the golden strip from the east to the west coast of Scotland, but I suppose the golden triangle is better known. Is it a problem that there is such concentration? Is it the result of critical mass? If that is the case, how do we grow research and research teams in other areas?

Professor Reid: We have to be careful to solve the right problem. The golden triangle is a peculiar entity that includes the sparsely populated east of England, as far as North Norfolk, Chair.

Q322 **Chair:** North Norfolk does not get much of this.

Professor Reid: Exactly. It includes the sparsely populated east of England, very heavily populated London and the peculiar entity called the south-east of England, which runs from Oxford all the way through to the heel of Kent. It is rather odd to bunch them all together and say, "Gosh, look at how much money goes there."

A lot of money goes to London, but there are an awful lot of researchers in London. The Economic and Social Research Council did an interesting study looking at the success rate of different universities in their bids to research councils. It found that there was hardly any variation at all. A lot of money goes to the places that submit a lot of bids. I have a table in front of me that shows the percentage of total R&D investment as a percentage of local economies. Normalise the data by the size of the economy, and the four regions that have the least research-intensive economies are Yorkshire, the north-east, Wales and London. London gets a lot of money, but it has a lot of people bidding for money. I appreciate that that is part of a bigger debate, but I want to caution against the assumption of high concentration in the golden triangle.

Chair: Could we have a Manchester response?

Q323 **Carol Monaghan:** Maybe I can repeat the second bit of my question. How do we grow research elsewhere, with the concentration?

Professor Fagan: I am here to speak for the Russell Group, not Manchester. We cannot solve everything through one funding mechanism. The funding mechanism around balance in the QR and UKRI is about supporting and growing research science excellence. To move and grow that in areas where there is less of it, outside the golden triangle or the golden strip, is an important part of economic development, but the best way of addressing it may not be through the mechanisms of diluting QR or research council funding. Within Research



England, there are mechanisms to do this. HEIF is one area, allowing for the discussion we have just had about where you cut and balance. Investment in places and Expanding Excellence are mechanisms to use.

Q324 **Chair:** Do you think we need to do more of that?

Professor Fagan: We need to look at it in relation to the other sides of investment in growing regional development, which is just as much about housing, transport and the FE and educational pipeline in areas. Taking an excellent group of scientists in a lab—to give an extreme example—and just dropping them somewhere, thinking that it will have a ripple-out effect and multiply for that region, is misplaced. We know from economic regional development science supported by the research councils that that does not work.

Q325 **Carol Monaghan:** I suppose the concern is that, if we do not take action, we will never see new places being developed in terms of research.

Professor Fagan: The action needs to come through different mechanisms.

Gordon McKenzie: To build on that, if you increase funding in areas of translational and applied research, where you have a number of universities outside the golden triangle with particular skills and links to particular capabilities and industries in those areas, that is one way do it, and I would like to see the balance of funding change in that regard. To go back to your earlier question about the balance between national funding and regionally determined funding, and the balance of a shared prosperity fund alongside other funds, that is also something to be looked at.

Carol Monaghan: Is Bill okay to come in? Sorry, I am chairing.

Chair: That is fine. Take over.

Q326 **Bill Grant:** I take the point about parachuting a lab and the expertise that goes with it into a region or a remote area. Does that appear not to have worked as well as anticipated? Is there such a thing in the science and innovation industry as the need for a cluster element? Is that an important player? Places that are not necessarily pursuing the same goal or aspiration can work together in a cluster.

Chair: Can we have a tight response? We are tight on time.

Professor Fagan: Yes. A quick example from Manchester is support for the Cyber Foundry, led by Manchester Metropolitan University and the Greater Manchester combined authority, with input from Lancaster and Manchester, which are part of the wider N8 partnership. That is all about supporting digital skills and development with SMEs and medium companies, and growing the pipeline. It is a collaborative, regional partnership.



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Q327 **Carol Monaghan:** Graeme, you were talking a minute ago about the proportion of funding. What is the best way to measure regional balance, or imbalance?

Professor Reid: That is an extraordinarily difficult question. I have come along with a whole lot of bar graphs that show different distributions according to how you normalise the data, and I do not know which is the right one to answer your question. Just looking at the amount of money going into different regions is a particularly bad way to do it; you will discover that there is very little research expenditure on the Isle of Mull, but you will also find that very few people live there. Figures on raw cash tell you very little and can give quite a distorted picture.

For what it is worth, research concentration is not a uniquely UK phenomenon. Of the 16 German Länder, three take 60% of the money. In the United States, six of the 50 states take 40%.

Q328 **Chair:** Are we all agreed that, whatever mechanism we use, there is value in growing excellence in all regions of our country? If students in Lancashire, for example, want to go into STEM, they need something to see in their locality to inspire them.

Gordon McKenzie: The recent Civic University Commission report made the point that neither national higher education policy nor national research policy has had a place-based element or place-based thinking, and I think both should.

Q329 **Chair:** Are you all agreed on that, just as a yes/no question?

Professor Reid: Definitely.

Q330 **Carol Monaghan:** Graeme, you gave us some figures for Wales and Scotland. Do you have some for England and Northern Ireland as well?

Professor Reid: Yes, I shall go as fast as I can. In England, there is 80% of the UK's QR and 81.4% of total research income. Scotland has 13% and 13%, Wales has 4% and 3.5%, while England is at 80% and 81%. There is very tight linkage between the amount of QR funding and the amount of total income for research.

Q331 **Carol Monaghan:** Would we be better looking at regional distribution of public funding when we talk about investment and R&D, or should we look at public and private together? Is the system at the moment giving us consistent losers? You could leave the second bit. Are we better with public only or public and private?

Professor Reid: I would not try to make a choice. If you look at them both, you get a richer picture of what is going on. Some research areas, such as clinical medicine, will be heavily concentrated in public funding, and others such as engineering or pharmaceuticals will be more heavily concentrated in private funding. I would not try to make a choice between them; I would look at both.



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Q332 **Carol Monaghan:** Are the others happy with that?

Professor Fagan: It is artificial to divide public and private in a number of industries. I am struggling to think of one that would fly just on one form of funding.

Q333 **Vicky Ford:** As an observation, while you are all agreed that excellence should be encouraged across the country, I am also assuming that you agree that it should not be at the cost of diminishing excellence in the pockets where it already exists very strongly. Correct?

Professor Reid: Yes, I made that assumption in what I said.

Q334 **Vicky Ford:** Could you just make that clear for the record? You all agree that it should not be at the cost of diminishing or reducing excellence.

Gordon McKenzie: Can I flip it slightly? I do not want to diminish what is already there, but the intense concentration of what is already there is a product of the way we have done things for decades. If you want your public R&D system to look different, you need to change the balance of what it is doing. That is not about ruining what is already there; it is saying that what is already there has benefited from the way we do things.

Q335 **Vicky Ford:** I want to go back to QR. I am sorry that this is complex. A case has been made to me that for non-Russell Group universities EU funding is often a very significant proportion of their research funding, because they do not get access to so many other pockets. I really hope that we will still be in framework 9, framework 10 and so on, but if we put more of our research budget into QR, will it end up going more to the Russell Group and be even more concerning for non-Russell Group universities? Declaration of interest: Anglia Ruskin is based in my constituency.

Gordon McKenzie: I would give more to QR relative to research councils, but I would also give more to Innovate UK. That would help to solve your problem.

Q336 **Vicky Ford:** But am I right that there could be a concern about the non-Russell Group universities if QR gets tipped more towards the Russell Group?

Gordon McKenzie: The more that we continue to pour money into how we do things now, the more we will tend to concentrate funding in Russell Group universities.

Q337 **Vicky Ford:** I love Russell Group universities as well.

Gordon McKenzie: We all do.

Professor Fagan: I do not recognise that judgment about where the EU funding flows. EU funding flows to research excellence, which we have already talked about.



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Q338 **Chair:** The Russell Group does very well out of it.

Professor Fagan: Research-intensive universities do well out of it, as do excellent teams working in non-research-intensive universities.

Q339 **Vicky Ford:** The point is that the excellent teams working in non-research universities often do not get other sources of funding as much.

Professor Reid: I am a bit concerned that this is becoming a way of dividing public money between universities rather than about actually delivering a benefit to the taxpayer. I just want the money to go to the places that give the best value to the folks who pay for it in the first place.

Q340 **Chair:** Can I clarify one thing with you, Graeme? I think you were commissioned to do a report by the Welsh Government, and you made a recommendation about QR. Is my understanding correct that the level of QR is a devolved matter? Comparing QR with share of population, it looks as if Wales underspends on QR, and Scotland overspends compared with Wales. Is that the correct understanding?

Professor Reid: Yes.

Q341 **Chair:** Choices are made by the Scottish and Welsh Governments about the relative involvement of spending on QR.

Professor Reid: Yes, and then those choices are reflected in the total amount of research income from all sources captured by Scotland and Wales.

Q342 **Chair:** Okay. If Wales was to increase QR spend, it would see a commensurate increase in other income.

Professor Reid: There is persuasive evidence that points in that direction, which was why I recommended to the Welsh Government that they increase their QR spending.

Q343 **Chair:** Have they accepted that?

Professor Reid: They have accepted it and have not yet implemented it.

Chair: Thank you. I do not think there are any other questions. Thank you all very much indeed. It has been a really interesting session. Thank you for your time.

Examination of witnesses

Witnesses: Dr O'Brien, Professor Seckl, Professor Hollander and Sarah Haywood.

Q344 **Chair:** Good afternoon everybody, it is good to see you all. I again ask about declarations of interest. If you have any interests to declare, please do so. Can we have very quick introductions?



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Professor Seckl: I am Jonathan Seckl, vice-principal in charge of resources and research at the University of Edinburgh and an occasional humble hormone doctor in the NHS.

Professor Hollander: I am Anthony Hollander, pro-vice-chancellor for research and impact at the University of Liverpool. I am sorry that we are not welcoming you to Liverpool, but we welcome you there in spirit.

Q345 **Chair:** I apologise again for our failure to be in Liverpool today. It is not our fault, but there you go.

Professor Hollander: Understood.

Dr O'Brien: I am Peter O'Brien, executive director of Yorkshire Universities.

Sarah Haywood: I am Sarah Haywood, the chief executive of MedCity, the life sciences cluster organisation for London and the greater south-east of England.

Q346 **Chair:** Thank you. As I think you all heard, we have been talking about the golden triangle and the apparent concentration of public investment in that part of the country. Is it a good or a bad thing?

Professor Hollander: You might be surprised to hear that I think the golden triangle is a fantastic thing. We have heard that we are No. 2 in the world in performance in research, and that global reputation, which is driven by the golden triangle, is a good thing for all universities in the UK, so I would not do anything to damage the golden triangle. However, I would like to reproduce the model elsewhere, and grow a cluster elsewhere; other clusters would not be the same as the golden triangle but could offer an uplift in regional research capacity.

Q347 **Chair:** Would that be through the same funding mechanism or additional, complementary mechanisms?

Professor Hollander: I guess that will depend on the region you are talking about. For the north and the N8 research-intensive universities, which I am thinking intensively about, it is about the connection between our research quality, which is already demonstrably pretty good, and innovation, where it is much harder to drive that linkage than in the golden triangle. For me, that is the missing piece of the jigsaw.

Q348 **Chair:** I am keen to hear other views, but perhaps I can throw something into the mix, before you answer. The GLA said in its submission to us that "geography should not be a consideration" when making R&D funding decisions. Do you agree? Feel free to answer, giving any contrast with what Anthony has said. Jonathan, you were about to say something.

Professor Seckl: I am not sure that I recognise the golden triangle. I have always thought of a golden quadrangle. My university is fourth in the UK, wedged somewhere between several of the London ones and



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slightly behind Oxbridge in terms of research power and research outputs, with 23 Nobel prizes. We are no slouch.

Chair: Point taken.

Professor Seckl: With our close relationship with our friends in Glasgow, there is a bright apex to the quadrangle.

Where public resources are allocated rather than freely competed for, one has to be aware both of geography and of selectivity. Throwing away public money is as bad as not allocating it to regions that need it. There are ways of thinking appropriately about using the wonderful strengths we have in the university and research system in this country. It really is one of the jewels in our crown. We pretend that we are good at many things, and I gather we are quite good at soccer. But our research is world-leading.

Q349 **Chair:** Do you see a role for some sort of mechanism for getting from good to great in particular regions, building excellence?

Professor Seckl: Yes, that is exactly right. It is one of the things we are trying to do in my part of Scotland—to build alliances and allegiances with other universities with different strengths, so that together we can be something considerably greater than the sum of the parts. It is not an easy undertaking and, of course, relationships can sometimes be fraught, but it is certainly a way of moving things forward and having greater reach than simply our local geography. Perhaps I might have an opportunity to talk a little more about that later.

Dr O'Brien: You have to recognise the importance of geography in these things, particularly in a region such as Yorkshire, when you are looking at how you can drive more demand for innovation and research and development, particularly around the private sector. What is the local and regional ecosystem? When you invest in public R&D, and how it translates into new products and processes and where the sector base is, it is inevitable that you will think about geography and the whole ecosystem that exists in a region like Yorkshire or the wider north of England.

Sarah Haywood: I declare that we receive some of our funding from the GLA.

In response to your question about geography, we believe that money should be allocated on the basis of the excellence of the research proposal and of the research.

Q350 **Chair:** Is there a danger that that just reinforces where the money goes? It keeps building into particular locations where there is existing excellence, and you lose the opportunity to build new centres of excellence.

Sarah Haywood: There is always that risk, but of course there are other mechanisms. From the previous panel, we heard about some of the



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mechanisms that exist to build excellence. We are not arguing from a case of fortress London, or the golden triangle of the greater south-east, at the expense of the rest of the country. We need to recognise, in terms of our aspirations to grow research and development funding as a percentage of GDP, that only a 1:2 ratio of that money is from the public sector, so it is important that we also recognise the role of industry in investing. Of course, industrial investment will often align itself where there is excellence in the academic base. We certainly see that.

Other mechanisms can be used to encourage excellence. We heard in the previous discussion about the opportunities from the shared prosperity fund. That provides a fantastic opportunity to align regional development funding to support the development of excellence in other parts of the country.

Q351 **Chair:** Thank you. I would like a quick response on this, if possible. Do any of you have a view on how best to measure the regional balance of R&D funding? Do we just look at the raw figures, or per capita, and so on?

Professor Hollander: As you heard earlier, choose which you will.

Q352 **Chair:** Exactly, and you come up with different answers.

Professor Hollander: What you need to look at, although it is much harder and takes more time, are outcomes: the effectiveness of the money you are investing in different areas, and how much you need to invest to get a particular increase in GVA, for example.

Sarah Haywood: It is difficult. When we talk about research and development, we are actually talking about a whole range of different activities, some of which have little initial utility. Blue skies research in the first instance is not about application, so it is important that we also think about outcomes and impact in ensuring that we strike a balance between very early-stage and blue-skies research versus that which is much more in the application and development stage.

Q353 **Chair:** Should UKRI be measuring outcomes by region? If so, how should it do that?

Dr O'Brien: In the previous discussion, there was talk about greater understanding and appreciation of place. Within UKRI and other agencies working in this field, we are starting to see that, and we would like to see more of it continue. In particular, how you link research and development to other economic development interventions is absolutely critical, around transport, for example. I would highlight skills as well, and the importance of getting greater skills in a region like Yorkshire and the north of England, and linking that to innovation.

Q354 **Chair:** It goes all the way from skills upwards, I guess.

Dr O'Brien: Absolutely, yes. It is absolutely critical.



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Professor Hollander: One example of a place-based outcome that UKRI should be thinking about is health inequality. Is the blue-skies research that it is funding driving over time an improvement in the health inequality measures that we know affect Liverpool and many other cities in the north?

Q355 **Darren Jones:** We have touched on this a little, but I am interested in the coupling of research and innovation. We have the strength in places fund, which is about coupling “business need that can be met by existing research strengths.” It is £115 million. Is that enough?

Professor Seckl: I do not think we know what strength in places is really about yet. It is still lost in the ether of final decision making, but I doubt that it is enough.

Q356 **Chair:** When are you getting the first allocations?

Professor Seckl: I have no idea. It is lost in process at the moment. It has been terribly slow, but a lot of other things are happening in Britain at the moment that may have delayed it. I cannot quite remember what they are, but I am sure I shall find out soon.

No, it is not enough. It is an opportunity. There were two major bids that my university engaged with. One was an attempt to draw together the rather disparate but very interesting sector of open banking, which is a big issue in the central belt of Scotland. Some universities and the various trade organisations and some of the active players pulled that together, and it was really interesting to try to pull it all together. Another one was to improve the chances of marine engineering in Fife, which, again, is a big issue.

Either of those could happily consume £40 million or £50 million to make a substantial impact. If you are going to make eight or 10 awards across the UK, with an average size of £10 million or £15 million, it is difficult to see that having an impact. It is too little, and the quantum of the awards that have been proposed—somewhere between £10 million and £40 million or £50 million, although that is unlikely to happen—is insufficient.

Professor Hollander: I want to link the question to the earlier discussion about building a cluster from good to fantastic, because I think they are related. It is not just about the funding going in; it is critically about the innovation ecosystem in a geographical area that can capitalise on that funding and other innovation funding. For every pound of research council and related funding that goes into the golden triangle, we know there will be an uplift or leverage of that funding of 82p, which is private sector funding coming in on the back of Government funding.

Q357 **Chair:** It leverages in an extra 82p from other sources.

Professor Hollander: Correct. The N8 universities collectively receive 20% of research council funding, so it is a good cluster, but the leverage is only 48p. For me, that disparity is the nub of the problem. You can



pour money in, but if you do not have the ecosystem around innovation to drive the interactions, it will be very difficult to make it work. That is the problem we have to face.

Q358 **Darren Jones:** Is that just because of where businesses are located, or is it because they already have long-standing relationships with existing universities?

Professor Hollander: It is partly about the behaviour of businesses, and their appetite to invest in research, but it is also about investment houses and investment companies. If we run innovation open events to display IP regionally, we need literally to drag investors out of London; many of them do not want to come, because there are such rich pickings in London.

Q359 **Chair:** It has been too narrow-minded.

Professor Hollander: Yes, geographically narrow-minded. That can be fixed, and we need to do it.

Dr O'Brien: What is interesting about the strength in places fund criteria is the way they talk about bits to be developed after consultation with local stakeholders, including direct engagement with local people. Perhaps that might be the start of a process of looking at how we use this extra research and development fund and innovation investment in a slightly different way, to reach other parts of the sector and other communities and regions. It will be interesting to see, when it comes out of the machine, in effect, who gets that funding. It could be quite interesting to see whether it is the start of doing something quite innovative, if you will pardon the pun.

Sarah Haywood: On the point about strength in places, in common, I am sure, with my fellow panellists, I went to one of the information sessions, and the room was packed. There were a number of sessions run around the country; there was huge interest. Interestingly, there was an unsubstantiated rumour that London should not be applying. We went more for information than with the intention of actually putting something in. It was clear that a very small number of projects were going to be supported and that a very large number of great ideas were being generated. That suggests that there is a fantastic opportunity to grow that kind of mechanism.

Q360 **Chair:** Is it actually built into the criteria that lower-income regions are advantaged compared with London, or is it an assumption or a rumour based on speculation?

Sarah Haywood: I cannot substantiate it, but I think the sense was that it should be supporting other areas.

Q361 **Chair:** Do you agree with that? Are you happy with that?

Sarah Haywood: Yes, I am happy with a mechanism like strength in places, because, as I said previously, I support mechanisms that seed



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and grow excellence. The point about business location and doing things where the businesses are located, aligning the research capability with the business, is really important. That is one reason why the golden triangle is such a success. Of course, as Graeme said earlier, we are actually talking about a much broader geographical area than just Oxford, London and Cambridge.

There are more than 3,700 life sciences companies based in the greater south-east of England, and the last Office for Life Sciences data, from 2017, indicated that there were 5,600 companies in the whole of the UK. There is a clustering and an alignment of research excellence in the academic base and in the industrial base. I am just talking from one particular sector perspective, but it is really important where businesses are located. Developing research capability to support businesses wherever it exists in the UK is really important.

I have one very quick point about what was mentioned about investment. It might surprise you to know that, when we started in 2014 as MedCity, there was no angel network for life sciences in London. We created one and we have had to grow it, but it has taken us five years to make it really successful. Things can be done to bring in the investors and build that, but even in areas where you would expect there to be fantastic investment capability you still have to facilitate it.

Q362 Darren Jones: The requirement for business and research clusters to be together is interesting, isn't it? In Bristol, we benefit from that in aerospace and advanced manufacturing, and the National Composites Centre. One of the agendas behind strength in places is to start to help with some of the imbalances around geography but, from what you are saying, it seems that it cannot just be about programmes of research and university funding. There needs to be something on the business side, too, to incentivise businesses to come away from their comfort zone or their natural geographical zones.

We have heard evidence about R&D tax credits and how they may or may not be efficiently spent. I assume that might be an area where you could incentivise businesses to spend their R&D tax credits in other regions of the country. Do you think that might be relevant to you guys?

Dr O'Brien: Around the business base, it is about understanding the size of businesses. In places where you do not necessarily have any tier 1 or large manufacturers working, and their direct supply chain, it is very difficult at times for smaller SMEs to innovate and engage in innovation activity. One of the things they talk about is time.

If you are going to borrow from banks, will banks lend you money on the back of collateral against an asset or revenue funding, in effect, to do things around skills or something like that? You need to look at the industrial sectoral composition. In certain places in Yorkshire, for example, there is underperformance around business innovation because we have lots of SMEs and smaller companies that may not have the time



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to engage in innovation. That is part of the challenge: how do you work with them so that they can scale up, become bigger and potentially more productive and employ more people? That is the relationship with business.

Q363 Darren Jones: They are not getting a big chunk of the R&D tax credit funding, because they are not big businesses with research facilities.

Dr O'Brien: Or they simply do not have the time to think about it, because they are running their business.

Professor Hollander: This may be controversial, but, for me, geographically based tax credits to incentivise investment in spin-outs and scaling up smaller companies to get them through the difficult years is absolutely critical. That is the bit we need to fix, and there would be a virtuous circle in driving up the volume of high-quality research in universities, because you would create an ecosystem that people want to come into. You can grow the numbers of people who are attracted to working in that environment.

Q364 Darren Jones: As an Opposition MP, it is not normally my job to champion Government announcements, but I noticed in the break that the Government have announced something called university enterprise zones today. Do any of you know anything about that?

Professor Hollander: Yes, we have one, so there may be a conflict of interest in my answering on behalf of my university. I chair the board of directors of Sensor City, the university enterprise zone, jointly between the University of Liverpool and Liverpool John Moores University. It is about growing SMEs, small companies and spin-outs around electronic sensors. We are only a couple of years in and we are building it, but it is a very exciting model.

Q365 Darren Jones: And that model seems to work well in innovation research.

Professor Hollander: It has its challenges, and we are still trying to find our way through it, but it is one of a number of models that can drive innovation in those kinds of spaces.

Q366 Chair: I am interested in the idea of geographically based tax credits. How would it work, as a thumbnail sketch, very briefly?

Professor Hollander: I am not an economist, and I am not sure that I could give you tooth and nail, but I can tell you what I would like to see. I would like those with enough money to invest in exciting opportunities, who are not looking hard at the geographic area I am talking about—the north, but it could be any other area—to be incentivised to do so, to get out of the comfort zone of the golden triangle, where it is easier, notwithstanding the lack of an angel network, and even away from Bristol. I spun out my company in Bristol, where there is a much easier



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system than in Liverpool or Manchester. If the tax credits could incentivise that behaviour, it could transform things.

Q367 **Vicky Ford:** I am just reading the university enterprise zone announcement; it is good to hear. Just to confirm, have the pilots worked well?

Professor Hollander: It is too early to say about Sensor City, but it is working in the sense that we have a fantastic building, and you are welcome to come to see it. We have very good occupancy of small companies. We have laboratories with 3D printing and other technologies that those companies and others outside the building can access. All of that is working.

A good point is that the two universities subsidise that from QR funding; we could not do it without QR funding. If you take away QR funding, you can put in as many enterprise zones as you like and we will not be able to do them. It is not working yet, in that we are not balancing the budget, but we will.

Q368 **Vicky Ford:** But you will. Some more money was announced today; not a lot, but enough to put together the bids.

Have any of you been involved in science and innovation audits? All of you. Good. What impact have they had and how have they been used? If UKRI says that the strength in places fund is not allowing follow-on funding for those audits, has there been any point in doing them, if they are not going to be linked to the follow-on funding?

Professor Seckl: I shall probably be the outlier, so let me start.

Vicky Ford: You will have to be quick.

Professor Seckl: I will be quick. Edinburgh had a science and innovation audit in the first round, and we did not do what other people did. We focused, because we recognised that we did not have heavy industry, or none that was worth an awful lot of concentration in our region. We had wonderful digital and data science, driven by Europe's top university department in that area. We started artificial intelligence, with Stanford, as a subject of inquiry, so it was very powerful, pouring out—

Chair: This is good PR for Edinburgh University.

Professor Seckl: We have been pouring out small companies, including two unicorns, so that is pretty good. We focused on that, and we focused on what we could do as a region, not just in Edinburgh, which is a relatively wealthy city, but in the Lothians and Fife borders, areas that are not quite as well endowed with opportunity. We made a case that investment in increasing capability would be beneficial in terms of jobs, GVA, training, skills, innovation and enterprise. That then appeared in the city deal for our region, and we have had a very heavy investment in the innovation component of our city deal. We are just starting, but we have, for example, put up a nice new university building, on the back of that.



I took a punt, based on the Scottish equivalent of QR, which is how the money is sometimes very helpful, and put up a £40 million building, with one third outward-looking academics, one third talent, mostly postgraduate students, and one third industry. It has an open-plan environment; it was opened in September and is now completely full. Industry ranges from Intel and the Royal Bank of Scotland—massive great corporations—to small NHS units, right the way down to SMEs; 200 spaces have been filled. That is an example of an SIA leading to a strategy, leading to investment in a region and leading, we hope, to major opportunities across a region spanning big universities and small universities, large companies and small companies and capability.

Q369 **Vicky Ford:** A well-focused SIA can have a direct impact. Are there any thoughts from others? Do I have to declare that I have a child at Edinburgh University at this stage?

Dr O'Brien: On the positive side of SIAs, from speaking to our colleagues and members in the Sheffield city region, I know that it enabled stakeholders and the local community and partners to come together to create a vision for the city region around science and innovation. That was very helpful, and they could build from that around the advanced manufacturing centre and health and wellbeing. Similarly, in York, an SIA was incredibly important around investment in the bio-economy.

Q370 **Chair:** But has it led to anything?

Dr O'Brien: I think it has. When I spoke to members, they said that it was important in providing the evidence base that there are particular assets and opportunities that not only the public sector and Government but the private sector should invest in.

There was a challenge for colleagues in Humber and Hull around their chemical and process industry SIA, which they have done not only in their local area but broadly. There is an issue about SIAs and their relationship to other LEP areas, not simply within LEP areas, and the SIA has not really gone anywhere. I guess because of what is happening in the Government it has sort of stuck.

From everybody I have spoken to among our members, I hear that SIAs are really important when thinking about local industrial strategies. There is a strong evidence base through SIAs, and I hope that local enterprise partnerships and mayors will use them.

Sarah Haywood: I am going to be a slightly more cynical voice. They have been an exercise in bringing people together to say, "We are good at this." I personally have not seen the examples that have been cited here of them actually translating through into action, but to pick up Peter's last point, there is an opportunity for them to be used by LEPs and local industrial strategies to help to shape the things they do.

Q371 **Chair:** Is the failure that you see a failure of the idea of the audit, or a failure to take advantage of what emerges from the audit?



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Sarah Haywood: I do not think that it was ever entirely clear what they were going to lead to, to be honest with you. It was a great idea without a sense of purpose.

Professor Seckl: I think I agree with that, although we found a way of using it creatively.

Professor Hollander: I can tell you very directly the benefits that we have had. I was involved in writing the SIA. There were three thematic areas that we described: materials chemistry, infection and infectious disease and high performance and cognitive computing. On the first of those, materials chemistry, we had already built up a lot of infrastructure with Unilever and RPIF funding the Materials Innovation Factory at the University of Liverpool. CEIDR, the Centre of Excellence in Infectious Diseases Research, was hypothesised in our SIA and in the first round of single investment funding through our devolved funding in the Liverpool city region, that has been funded in terms of personnel, and so on. It is already off the ground and will drive SME-related research on antimicrobials and other infectious disease research.

More recently, we have been awarded, through the second round of single investment funding—again we hypothesised this in the SIA—a digital innovation facility, which aims to create over 400 jobs over a 10-year period, with a boost to the regional economy of almost £50 million. We are getting a £5 million investment from the single investment fund. I do not think that those investments in CEIDR or the DIF would have happened without the SIA giving confidence to the Liverpool city region that that is where the money should go.

Q372 **Vicky Ford:** The last Science and Technology Committee report on this issue suggested that there should be a gap analysis to identify where new sectors needed to be developed, rather than just looking at existing areas of expertise. Is that recommendation still a good one? Is there a need for that gap analysis? Do the SIAs look at that, or are they too focused on a region to be able to look at gaps?

Professor Hollander: Investing in gaps is much harder than investing in what is already good. Filling a gap is a national question and not a regional one. Why would Liverpool city region try to fill a gap where it has no chance of local funding?

Q373 **Vicky Ford:** If you knew that there was a gap nationally, would you need to do a regional piece of work to identify which region could help to fill that gap?

Chair: And the gap might be holding Liverpool back. An infrastructure issue might be identified that could leverage extra investment. I see that you are not convinced.

Professor Seckl: We did a partial gap analysis as part of our SIA, but within the focus we had, to see what we needed to do in order to make what was already a capable area world-leading. The answer was that we



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needed to train at scale, so, instead of training 2,000 people a year, we will now be training 10,000 people a year. We needed more money to come in; we needed to be able to bring together enterprise, academia and money. Again, we have been trying to do that. We had that sort of gap analysis, but it was focused on what we were doing.

Dr O'Brien: As local enterprise partnerships in England and metro mayors start to develop local industrial strategies, and are building evidence bases around that and commissioning work, it is really important that that work aligns with any work on thinking about future sectoral opportunities. It would strike me as inefficient and ineffective to have two sets of exercises taking place. When people are trying to look at the nature of regional economies, and where the strengths and opportunities might lie, why not think about doing it in unison?

Sarah Haywood: The only thing I would add with regard to gap analysis is that there could be some merit in doing it, but the analysis needs to be driven by the industrial environment, recognising groups of companies that have synergies, which may not yet recognise themselves as a cluster or a group, and then looking at whether the innovation environment is actually supportive of them and whether there are steps that can be taken. But I think it is very difficult to do.

Q374 **Vicky Ford:** I conclude from this session that the audits have been useful in certain regions when they have been focused on particular areas, but possibly less so in the London area. If I may, I will ask one cheeky question, leading into Bill's question. We have a chart in front of us that shows that Scotland has 8% of the British population but receives 14% of the QR funding and 15% of the research council funding. Is that fair?

Professor Seckl: Why are you looking at me?

Q375 **Chair:** To clarify, I think we have heard that the QR element is determined by the Scottish Government.

Professor Seckl: Is it fair? We have 19 universities and three universities in the world top 100. Is that fair? It is competition and capability. If you are in my university and you look at the distribution of QR, you are slightly miffed, because it is actually more broadly spread. To echo some of the conversation you had with the previous panel, the money is more broadly spread by Government policy.

Q376 **Vicky Ford:** So it is not apples and apples.

Professor Seckl: It is the way it is; you have some great universities and they do well. They win a lot of competitive money. If you have my job, you say, okay, we do really well out of research council competitive funding, and we do well with the EU and the charities, but we do terribly with Innovate. We get 4% of Innovate's money. Why? We do not have much of a strong existing industrial base. It is swings and roundabouts.



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Professor Hollander: Excellence-related research funding is always fair: it is based on fair competitions. Of course, there are always ways you might want to change them, but, essentially, it is fair.

Dr O'Brien: If you look at the total R&D spend by sector, country and region, and you look at Yorkshire compared with the rest of the UK and break that down by business, higher education, government and so on, higher education in Yorkshire is 37.9% of the total amount of expenditure, compared with a UK average of 24.3%. Higher education is an asset in Yorkshire; it gets investment there. We would like more, but the challenge we have is the way we could use that investment and additional investment to crowd in more business investment, because we are much lower than the UK average around private investment. That is a really important part of the discussion.

Q377 **Chair:** On the strength in places fund, you have given the view that it is not enough money. Is it legitimate for the Government to say—I do not know whether they do say this—that, if you are starting off a new fund, you should start off at this level and then build? Would that make sense? You cannot go in with too much to start with, but you learn how best to deploy the money. Would you advocate a growing fund?

Professor Hollander: That is fair. I would certainly advocate a growing fund if we can demonstrate successful partnerships being built. History tells us that these kinds of collaborations really work, when we get the opportunities, but we have to figure out how to make them work and improve the situation.

Q378 **Bill Grant:** I start with a comment rather than a question. I note that there have been 24 Nobel prize winners at Edinburgh. There are 19 universities in Scotland, and many students from all over the UK study in Edinburgh, so it is good investment in that university.

Professor Seckl: Thank you, Bill. Would you like to swap chairs?

Chair: You might mention the University of East Anglia.

Q379 **Bill Grant:** Indeed. My question is about UKRI, which is a relatively new institution and is maybe finding its way, and its relation to Scotland and other devolved areas. Part of the dual support system is devolved, but part is UK-wide. At this early stage, is there sufficient co-ordination and engagement between UKRI and the devolved entities, and the devolved regions, because regions are evolving in England?

Professor Seckl: I think that is probably aimed at me, to start with, unless colleagues are unhappy with that, or unless London has become a devolved area.

Sarah Haywood: Not that I have noticed.

Professor Seckl: Not since we started, no.



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It is early for UKRI. I have to declare an interest, because I chair research grant panels for UKRI. In fact, I was giving out Government money earlier this week. I understand it, and I have chaired panels for Innovate UK, so I understand that side of the system reasonably well. It is early days. UKRI has an enormous opportunity to do good, as would anything that can bring the subsections together.

The previous panel mentioned that research is by and large now a multidisciplinary business, not always, but for the major grand challenges and large sustainability goals in the world, and so on and so forth, it requires all sorts of skills to get a solution; to research it, find it and then persuade the public that they should be willing to accept it. Those are hard things to do, and they require a whole host of skills. UKRI, bringing the research councils under a single heading, has the opportunity to do that. More difficult for it is to bring the enterprise and translational activities together; there are big differences in culture between the research councils and Innovate UK, and I think that will be more of a challenge for it, but it is early days.

In the devolved nations, one of the problems we have is that, when QR or HEIF in the rest of the UK goes up, the Barnett consequentials mean that more money goes to the Scottish Government, but it is not necessarily hypothecated back in. There can be differences and changes in emphasis, but that is part of devolution; it is part of the benefits and some of the challenges of having a devolved system. We have to wait and see.

One way to address that, which is anyway fundamentally a good, is to address the full economic costing gap. That would allow research council awards to flow more fully and put the money where the action is, and allow some of the discretionary gap that comes with devolution to be somewhat reduced. I always find it difficult at university level to argue that we should take the surplus generating activities we do, mostly international student fees, and use them substantially to cross-subsidise research. If the FEC is pushed up, it allows that to become less of an issue; we fully fund research for its own sake, rather than expecting the sector to cross-subsidise, and it removes some of the anomalies that occur from the devolution of the decision making about those movements of money.

Chair: Can you all keep a sly eye on the clock? I am aiming to finish at about 1 o'clock, so perhaps you could bear that in mind as you provide answers?

Q380 **Bill Grant:** Does anyone else want to come in?

Dr O'Brien: A report out this week talked about research as a growth priority for many institutions, increasingly, in the light of that 2.4% target. More research institutions and universities will want to engage with UKRI, and UKRI will, hopefully, be a success. It is not even a year into its operation. It will be increasingly important for the relationship



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between different institutions, with many more institutions in UKRI going forward.

Professor Hollander: I have a two-part answer. The first part is that I have found UKRI very open and engaged. There have been regional meetings, and we have had visits from each of the research councils. In that sense, in the first year of operation, it has been very good.

There is an opportunity for UKRI, particularly given the 2.4% and the need to grow research, with the limit to how far a research base can grow in the golden triangle, because of the costs of estate and bringing people in, and so on. When large centres and top-down projects are envisaged, it could look at setting out rules of competition that are not unconsciously biased towards what is already working in the golden triangle, and could create an environment where you might see more Henry Royce Institute-type centres outside the golden triangle. That would be a big benefit of UKRI.

Q381 **Bill Grant:** Can we look at the quadrangle, pushing up into the north? Apparently, the Scottish Funding Council uses a different formula for translating the outcomes of the research excellence framework into funding for Scottish institutions. What is the impact of that? Does it work well? Should it be adopted elsewhere? Are there negative points?

Professor Seckl: It distributes the money more widely so that universities with good but not great research get more money from it. The disadvantage of the framework is that research is scored from four stars—the best in the world—down to one star and below.

Q382 **Bill Grant:** Is that for emerging or young universities?

Professor Seckl: Younger universities generally have a deficit in top-rated research. Under the Scottish system, the money is distributed a little bit more widely. Nobody gives money below three stars. In the Scottish system, more money goes to three stars proportionately than happens south of the border.

Q383 **Chair:** Do you think that is better than in England?

Professor Seckl: It depends on who you are. If you are sitting in the University of Edinburgh, no, I do not think that it is better, because I am competing for major research council awards and you will not get one unless you have four-star research going on, as we heard from the previous panel, by implication. I have to use my score in REF-QR funding to top up the 80% that I get in FEC, and if I am getting proportionately less of that top-up QR equivalent, I have less money to top it up. The specific figure is that the Universities of Edinburgh and Glasgow bring in two thirds of the research council grants to Scotland, but we get half of the QR matching that.

Q384 **Bill Grant:** If I were the head of the University of the West of Scotland, would I disagree with you on that?



Professor Seckl: Yes, you would, violently.

Q385 **Bill Grant:** I would drop the violent bit. I mentioned it because it is one of the emerging universities that is maybe not getting traction.

In that system, you feel that the established universities are losing out; but it must be good that they are supporting the growing universities—not propping them up; that is not the right terminology.

Professor Seckl: I suggested at the beginning that groups of universities working together is the way to address this. After all, in Scotland we have Scottish pooling. It is not about universities acting in competition with each other; it is about them working in collaboration with each other to deliver things. Using the QR or REG allocation system is a rather blunt tool to do that and causes some perverse problems.

Q386 **Bill Grant:** To sum up, UKRI has a role for cohesion among universities and a role to ensure fairness and sustainability. Would that be a reasonable way forward for UKRI: cohesion, sustainability and fairness?

Professor Seckl: I am not sure they have thought of it in that way.

Bill Grant: Thank you.

Chair: That brings us to a conclusion three minutes before time, which is very impressive discipline from everyone. Thank you very much indeed; it has been an absolutely fascinating session. We appreciate your time.