

Science, Innovation and Technology Committee

Oral evidence: Professor Dame Ottoline Leyser valedictory, HC 1020

Tuesday 17 June 2025

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Members present: Chi Onwurah (Chair); Dr Allison Gardner; Kit Malthouse; Steve Race; Dr Lauren Sullivan; Martin Wrigley.

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Witness

[I](#): Professor Dame Ottoline Leyser, Chief Executive, UK Research and Innovation.

Examination of witness

Witness: Professor Dame Ottoline Leyser.

Q1 **Chair:** Good morning. Welcome to this one-off session with Professor Dame Ottoline Leyser, the outgoing chair of UKRI. It is a great pleasure to welcome you here this morning. UKRI commands almost half of the UK's public sector science and innovation funding. As its CEO, you have been in a powerful position to drive our national scientific base and future prosperity. I look forward to learning more about the inputs UKRI has, the structures by which it works and the outputs, or outcomes, that it drives. I would like our Committee to have a real sense of what you have delivered, but let's start off with the classic interview question. How do you reflect on your five years at UKRI? What is the one thing you are proudest of? What is the one thing you wish you had done the most?

Professor Dame Ottoline Leyser: Thank you very much. That is a lovely opening question. It has been a very busy and eventful five years. I came into UKRI at the height of the pandemic, in lockdown. It is an organisation of about 8,000 people, and for the first few months I was running it from my kitchen in Cambridge, so it was a bit of a surreal experience. A lot has happened in between.

UKRI is an extraordinary organisation. It has amazing staff who are really dedicated and expert. That includes the staff who support the deployment of all that public funding, and the staff who run some of our key national facilities, whether that is the ISIS Neutron and Muon Source, the British Antarctic Survey or the Laboratory for Molecular Biology in Cambridge. More than half our staff are on the frontline science delivery side, with fewer than that running our programmes that disburse funding across the research and innovation community.

Why is UKRI such an extraordinary organisation, apart from all the wonderful people who work there and are dedicated to doing a fantastic job for the UK research and innovation system? It is because of its ability to join things up. It is the extraordinary power that we have to connect the research and innovation system across its many axes. That is connecting research to innovation; it is connecting across disciplines; it is connecting the policy community to the academic community, the business community and the investor community. All of that is possible because UKRI exists as a key node in the system that covers all disciplines and all sectors. That is enormously important for the UK.

Why is it important? We are a fantastic research and innovation nation, and that is a key part of our future. It is something where we are universally acknowledged to be internationally leading and is the way we are going to turn around our economy. We will never have the scale of investment of some of our competitors like the US or China, but what we can do is invest really smartly in a fully joined-up way to shorten the distance between discovery and public good, and to ensure that every pound we put into the system does multiple different things. That is the



power of UKRI, and it has been a huge privilege to be with UKRI on its journey to delivering on that extraordinary opportunity. It is perhaps not surprising that one of the things I have done over the time I have been CEO is to provide advice to other nations who are now looking to emulate our success and bring together their disparate research funders into single bodies.

It has been a huge privilege. It is a key organisation for the UK now and into the future. I am very excited about the momentum we have generated, and passing that over to Sir Ian Chapman to take forward.

Q2 Chair: Great. That is a very inspiring assessment of the organisation. Is there anything that you think you could have done better or that you wish you had done—just to bring you back to that question?

Professor Dame Ottoline Leyser: Absolutely. As I say, it is a new organisation. When I came in, it was two years old. It consists of nine parts brought together. As anybody will know who has ever worked in an organisation that is a relatively new merger—if you want to put it that way—there is a huge amount of work to do to make it function well. That work is at the technical level, with all of the IT systems, platforms and data systems, as well as hugely at a cultural level to bring together all the different people with different cultures in different parts of the organisation to capture the benefit of that diversity. Those two strands have been key to moving forward.

The tech platform side has been quite a struggle. I am very excited that we have come a long way through that now, and I am handing over something way more functional to my successor. I wish we had been able to go faster on that, but these things are very challenging, and one has to take them carefully because mistakes are incredibly costly. Getting to that point faster would have been really helpful.

Q3 Chair: That is getting to the point of having a shared technology platform for back office and organisational functions. We will probably talk about that in more detail later. I want to follow the money, as it were, and ask you a couple of questions on UKRI funding, as it is almost half of our public sector funding.

Last week, or the week before, the Government announced £86 billion of funding for cross-government research and development spending by 2030, which means an annual spend of £22.6 billion by 2029-30. As you know, having been in the organisation since 2020, that target of £22 billion has been announced multiple times, first in March 2020 with a target date of 2024-25 and then in the autumn 2021 budget with a different push-back target date of 2026-27. Now it has been announced again. How do you deal with changing financial envelopes? How much of that do you expect to go through UKRI?

Professor Dame Ottoline Leyser: As I am sure colleagues are aware, after a spending review a budget is allocated to each Department. We are now working closely with our host Department, DSIT, to figure out how



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their budget should be delivered and how much of it should, therefore, be delivered through UKRI versus through other organisations or indeed directly via DSIT.

One of the things we have been able to do across the five years is to build close relationships right across Government, with all Government Departments. While you are absolutely right that we are about 45% of public sector investment in R&D, other Government Departments are 55%. I have been keen to drive that up because it is so important that research and development are embedded in policy delivery right across Government. We are absolutely here for all Government Departments to help them in that delivery.

In addition to the core budget we will get through DSIT, I fully anticipate to continue to grow the budget that we deliver on behalf of other Government Departments, which in this SR period was about £2 billion. That connectivity is critical. You are absolutely right that it has been super-important to drive up that overall investment as the way we are going to be able to build ourselves out of the economic fragility in which the country finds itself, in a way that connects things. It is not just about investing in R&D; it is about investing in R&D in a way that connects through to company growth so that the R&D is pulled through to deliver high-quality products for people.

We also need to think about regulation and, critically, public procurement so that those high innovation companies supply services to our public services, which will drive up quality in the public services and boost economic growth through investing in those companies. That join-up is critical, which is the huge opportunity from DSIT. That is why it is such an exciting time at the moment.

You asked specifically about how it has been to manage budgets in a changing environment.

Q4 Chair: A changing financial environment; yes.

Professor Dame Ottoline Leyser: It has been, indeed, challenging. Again, it is one of the strengths of UKRI that because we are a big chunk of public sector investment, one of the things we have been able to win over the years is much more flexibility across our budget lines so that we can flex across those to ensure that we balance the many priorities that the Government want us, quite rightly, to deliver in the context of making really sure that the rock-solid foundation for UK research and innovation is there. We absolutely have to continue to invest in skills, in people, in infrastructure and in the curiosity-driven research and ideas that fuel the future. That platform is what we build. We also are able to build what I think of as docking stations for the key Government priorities that link through into the priorities of all Government Departments. That portfolio management role allows us to flex when priorities and budgets change. It is challenging, but one of the USPs of having a UKRI is that it is easier to do that.



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Q5 **Chair:** You are versed in dealing with flexible and ambiguous spending environments. I think that is what you are telling us. UKRI's budget and intended funding allocations for 2026-27 have yet to be confirmed. That is 10 months away. When do you expect those to be confirmed?

Professor Dame Ottoline Leyser: There is a desire in DSIT to move forward as quickly as possible with the next phase of allocations, but it is not entirely straightforward. I expect it to be confirmed some time in the autumn. That is typical. Actually, that would be quite early for us compared to some years, when we have struggled to get our budget confirmed in time for the start of the new financial year.

Q6 **Chair:** Which is not a desirable outcome or position to be in.

Professor Dame Ottoline Leyser: Indeed.

Q7 **Chair:** Once funding is allocated—say for this financial year—you develop delivery plans for UKRI. For 2025-26 we have not yet had the delivery plan for UKRI.

Professor Dame Ottoline Leyser: That's correct. It is important to point out that most of the funding that we deliver supports activity over multiple years. It is not the case that you get to 1 April with a blank sheet and then build your entire delivery portfolio. It is actually quite the opposite. The vast majority is already committed to programmes that started or are in the pipeline as we run through the current financial year. Those delivery programmes are also very much up and running, but they have not been published yet. We expect to publish those for the next two years to the end of our current five-year strategy in the coming months.

Q8 **Chair:** In the coming months?

Professor Dame Ottoline Leyser: Yes.

Q9 **Chair:** Anything more precise than that?

Professor Dame Ottoline Leyser: My successor will need to come in and sign off on them, so I cannot commit him.

Q10 **Chair:** What you are saying is that there is ongoing funding and then, when the actual allocations are made, you understand how much more or how much less than predicted you have. Then you flex around that and the delivery plan is updated to reflect it.

Professor Dame Ottoline Leyser: Indeed.

Q11 **Chair:** That is very helpful. Finally, do you expect more research councils to initiate voluntary exit schemes for staff in order to cut costs, as the Science and Technology Facilities Council has reportedly had to do?

Professor Dame Ottoline Leyser: We are not currently anticipating the need for any further voluntary exit schemes, either for our staff in operational delivery of our funding programmes or for those who are running our major facilities, which is the case for STFC.



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Chair: Thank you very much.

Q12 **Kit Malthouse:** Hello again.

Professor Dame Ottoline Leyser: Hello.

Kit Malthouse: We last met at a very snazzy party at the Roundhouse, you may remember. We had a fascinating discussion about decision making in plants, which is your specialism, I think.

Professor Dame Ottoline Leyser: Yes, indeed.

Q13 **Kit Malthouse:** I want to ask you some questions about the industrial strategy but, before that, we have talked a lot about input so far. Could you make it live for us? Obviously, the purpose of UKRI is to stimulate commercial success. Are there a couple of commercial success examples that you can point to during your tenure where you would say, "You know, here's the product"? We have talked a lot about the 86 billion quid and all the rest of it, but what comes out of the other end of the sausage machine?

Professor Dame Ottoline Leyser: Many things come out of the other end of the sausage machine, which always makes it a little bit difficult to illustrate with power the extraordinary range of things that we deliver. Let's think about the quantum sector, for example. It is an area where we are really leading. There is an amazing quantum cluster around Glasgow with photonics that is really driving forward economic growth in that area. That is very much how we need to think about it: local clusters across the whole country—

Q14 **Kit Malthouse:** I understand and I'm not asking you to choose between your children, but are there a couple of companies that have listed, or is there a product that we all have in our hands? If Elon Musk was able to create the largest company in the world in less than 10 years, is there something that you can point to and say, "You might now know it, but UKRI started this"?

Professor Dame Ottoline Leyser: Goodness.

Q15 **Kit Malthouse:** Do you want to think about that?

Professor Dame Ottoline Leyser: I will think about that. I am thinking about the autonomous vehicle unicorn that we supported. There are a lot of those kinds of things. I can give you a statistic, which is that 80% of spin-outs based on UKRI input and start-ups are typically still active five years after their start, whereas the national average is only 40%. The companies that we are building are there for the long term and are indeed feeding into that grow and scale pipeline. That scale-up is critical to the next phase of UK economic—

Q16 **Kit Malthouse:** To be honest with you, this was part of the reason I was asking. We have heard from others—certainly from some of our innovators who have come at the start of our meetings—that we are excellent at the primary science and we are pretty good at the start-up,



but beyond that there is the valley of death where it all fizzles and dies. As a Committee, we are concerned about that phase of the evolution of these businesses. While we can pump £86 billion in at the front end, and this Government are continuing the enthusiasm for science, which to be fair the last Government also had, I worry slightly that we are pushing on a string if all that IP we are creating is disseminating around the world and not turning into the unicorns that we have. To be honest with you, given the amount of money we are putting in, the fact is that we call them unicorns because they are uncommon. I am not sure they call them that in the US.

Professor Dame Ottoline Leyser: They do, actually. It is a global term. The UK in Europe is leading for unicorn creation. None the less, the point you make is really important and well made. There is a huge amount of work going on to secure that journey from spin-out or start-up through to scale-up.

Q17 **Kit Malthouse:** Sorry to interrupt. We are all allocated a certain amount of time, so forgive me. This comes to the second thing I want to ask you about, which is that over the last 20 years there has been a fruitless quest by Governments to produce the kind of capital that we need to fund our scientific endeavour. I am old enough to remember—it might have been at the start of your tenure, maybe under Philip Hammond as Chancellor—the patient capital review, run by Damon Buffini. I don't know if you remember that one. That was just one of the latest. What work is UKRI doing beyond the funding of primary social science to stimulate that central bit of the market?

Professor Dame Ottoline Leyser: That is a really important question. There are many things that need to happen to do that. From a UKRI perspective, our role is early in that pipeline, if you want to think of it as a pipeline, but none the less the way we think about it is to do everything we can do to make what we call scale-up ready start-ups. It is making sure, for example, that companies do not incorporate too early. We have a new proof of concept fund going in to get great ideas to the point that when the company spins out or starts up, they are far enough along the development pipeline that they can attract capital in, and that capital will give them the runway to get over the valley of death, and then a much wider range of skills packages that go along with the notion of investment through Innovate UK.

One of the things I am really excited about is a comparatively new programme that Innovate UK runs on investor partnerships, where they bring together venture capital companies which invest alongside Innovate UK in new products and innovations. Effectively, therefore, the Innovate UK expert review process helps to provide due diligence for the investor community. That is another area where, because of the challenges of the last few decades, the investor community does not necessarily have the expertise in innovation that it needs to be confident in investing. Those are the kinds of things that we can do. Of course, there is also support



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for the new Mansion House reforms, and those kinds of things, to get money out of the major asset funders, like pensions, into companies.

Q18 Kit Malthouse: Some of us are not convinced by that, but we'll see. I don't want to put you to too much effort as you go back to your life as a botanist, but could you possibly do us a couple of kind of storyboards of where the system has worked for a particular company, and where it has not?

Professor Dame Ottoline Leyser: Yes. We have quite a number of very good case studies, which of course disappeared out of my head when you asked me.

Q19 Kit Malthouse: That would be great, because these conversations all become a bit dry, and about numbers and aspirations, and we need to make it live.

Professor Dame Ottoline Leyser: I agree, yes.

Q20 Kit Malthouse: I want to ask you about industrial strategy. I am also old enough to remember eight—six, five—great technologies under David Willetts, and the evolution into Theresa May's industrial strategy, and all the rest of it. I am sure you have been interacting with the latest iteration that will come along, including the life sciences plan—a particular passion of mine. Is that how science works? Does it neatly fit into a planned economy?

Professor Dame Ottoline Leyser: Science totally does not, but this gets back to what I was talking about before. The UK has a huge strength in the foundation, which is the extraordinary discovery science and the skills base that generates the fuel—the fire that lights broader economic delivery. That connectivity is important. It is at that later stage where we need prioritisation and focus. That is something that can come out of an industrial strategy.

Q21 Kit Malthouse: But at the level where you operate, with the primary science, we have certainly heard in the Committee and from others that it is kind of random. Human ingenuity, to a certain extent, is random.

Professor Dame Ottoline Leyser: It is certainly serendipitous; let's put it that way. I am sure you heard Minister Vallance speaking eloquently about what he considers to be his three top priorities for science, but also for UKRI. A big chunk of that is what he calls curiosity-driven research. That is the fuel—the ingenuity and creativity that create the new ideas that you absolutely cannot predict, which pop up all over the place. That activity simultaneously trains a very wide range of people in research and innovation; PhD students and post-doctoral scientists, but also technicians and project managers, and all those people. It is an incredibly powerful investment for the UK to support that foundation. Then, as you say, mirroring your—

Q22 Kit Malthouse: Governments love to say "We want to win in these



technology areas,” rather than, “We’ll throw a hell of a lot of money at the wall and some of it will stick,” which is, broadly, another way of describing curiosity-driven research, because they can communicate it to the public. You don’t feel that that kind of top-down approach constrains your ability to support the PhD student who accidentally discovers the cure for blindness in rats.

Professor Dame Ottoline Leyser: Absolutely. It cannot, because then we will not have the fuel for the priorities that the Government want to direct. This is why I talk about it as a platform with docking stations that UKRI builds. As we have already described, that is 45% of the funding. The other 55% is driven by absolute Government policy priorities in different Departments. Our ability to dock in with those and support their delivery is also critical. It is all about balance. Overall, research and innovation—managing it and leadership in it—is about being able to capture that bottom-up creativity and harness it for top-down priorities. That is the job.

Q23 **Kit Malthouse:** Particularly, just to finish off, I guess—I hope—there is an acknowledgment in your strategy that, essentially, even a dead end is a discovery.

Professor Dame Ottoline Leyser: Absolutely. There are so many completely serendipitous discoveries, things that are started for one purpose that turn out to be incredibly useful for something altogether different. That, again, is where UKRI, which brings together all the disciplines and sectors, is so powerful. One of the things that I am really excited about is our completely cross-UKRI so-called response mode programme, which allows people from across disciplines to win funding to research whatever they want in a fully interdisciplinary way.

Q24 **Kit Malthouse:** Finally, within the framework of an industrial strategy that is trying to point the UK in particular areas—effectively, to pick winners—if you said, “You know what, we’ve got this amazing thing that we’ve discovered and we need industries 8, 9 and 10 to slot in alongside,” do you feel that you have the flexibility to do it?

Professor Dame Ottoline Leyser: Absolutely.

Kit Malthouse: Great. Thank you.

Chair: Thank you, Kit.

Q25 **Steve Race:** To follow on from Kit’s questioning, I suppose that UKRI and others are beaver away providing the fuel that, as you say, will light the fires; but it doesn’t feel like we have been lighting enough fires across the UK economy. Certainly in the last 15 to 20 years we can compare ourselves with our European neighbours and say we are doing better than them; but if we look the other way, to America, the enormous growth in the US economy over the last 15 years has far outstripped anything here, or elsewhere. What, from your perspective and your time at UKRI, do you think are the main barriers to setting alight all the



research that is being done? Is it going to be solved by the industrial strategy, and some of the things that are coming in? We have had quite a lot of industrial strategies.

Professor Dame Ottoline Leyser: Join-up across Government is very important, and the industrial strategy and, indeed, the Government's missions are very helpful from that point of view. To my mind, the answer to your question comes in the science and technology framework, of which I am a huge fan. It sets out the 10 different things you need to do to create the really successful research and innovation ecosystem that allows one to deliver for the country's bottom line, which is so important.

I have already pointed to public procurement, which is a huge opportunity. We are concerned, for example, about funding for our health service, for defence and for our police. If we are able to link the funding that we put into them for the delivery of frontline public services to our innovative businesses that provide new solutions to the problems that those services face, it is a win-win. We have not been good enough at public procurement, whereas in the US they are incredibly effective at pulling through their research base by pointing it into their various public services. Things like that are transformative. Industrial strategy, missions and cross-government join-up are an important part of making the whole system work together effectively.

Q26 **Chair:** Thank you. I have a couple of follow-up points. There have been attempts at what I think is called procurement for innovation, or innovative procurement, to address the challenge that you gave. Have they been successful? Has UKRI been involved in programmes of that kind?

Professor Dame Ottoline Leyser: Yes. Innovate UK has been delivering on those programmes, and they are moderately successful, but to my mind it is the next stage that is important. It requires an innovative civil service and a willingness to drive them through, to buy solutions rather than products. We have a tendency in public procurement to wind up sticking to the rules in a very rigid way that specifies products. Instead of saying "I want a solution to this problem: the ability to test rapidly for cholesterol"—to invent something on the spot—they say, "I want one of these widgets, please." That has to change. We have to procure solutions, not products.

Q27 **Chair:** I think I would agree with that, but you are also putting the question and responsibility on to Government procurement, rather than UKRI. To come back to something for which you are certainly responsible, which is the allocation of funding for primary research, you and Kit agreed that a lot of that might happen anywhere, and could not be predetermined; but in truth a lot of the funding is quite predetermined, and it goes where it went before, in terms of the REF and other curiosity-driven research. Have you looked at more innovative ways of funding, such as the golden lottery kind of thing, where it is pure chance whether you get funding? Have you looked at ways of breaking the cycle by which



those who were funded in the past are funded in the future, where it is necessary?

Professor Dame Ottoline Leyser: It is a really interesting question. The golden ticket is not a lottery; it is to do with the fact that on a peer review panel every member has what is called a golden ticket and can pick a project that they really want. The decision falls to one person, rather than to a committee. There is a view that decisions by committee tend to average. There are a lot of innovations in peer review.

Q28 **Chair:** There is a lottery funding process.

Professor Dame Ottoline Leyser: There is a different system, which I can get to in a minute. We conducted a significant review of peer review, to find out all the different interventions that people are using around the world to address different challenges in peer review. We have set up, in collaboration with DSIT, a so-called metascience unit, to run experiments exactly to test how we can innovate in the peer review process and make sure we deliver across the breadth of things we would like to fund. One of those, indeed, involves a partial lottery, where peer review panels select the very top grant applications that everybody agrees absolutely need to be funded, and weed out those that everybody agrees do not need to be funded; then all those in the middle go into a lottery. We have been running trials of versions of that for a little while, and they deliver what they deliver.

Q29 **Chair:** And what is that?

Professor Dame Ottoline Leyser: Well, your question is whether they send money where it would not have gone, and, unfortunately, one never quite has a parallel control system. You never know where it would have gone had you not done that. Where we have looked at whether they improve the diversity of applicants, they have a limited ability to do so. They contribute but do not completely deal with it. Of course, it is a lottery, so you have to deal with the fact that sometimes it will make those kinds of statistics look worse; randomly, all the people you picked will be from where those products would previously have gone.

One needs a variety of mechanisms for making sure that we fund the right range of things. We have, for example, worked very hard on ensuring that we shift funding outside the greater south-east and right across the UK over this spending review period. Our budgets have gone up, and an additional half a billion pounds has gone into the greater south-east, and an additional £1 billion has gone outside it. We are now in a position where more money goes outside the greater south-east than into it. We can absolutely work to change the funding flows.

Chair: We will probably come back to regional distribution, which is a very important point.

Q30 **Dr Gardner:** We have been talking about how we can get some equity in where we fund regionally, so that we do not just go to where there was



prior funding. That also made me think about individuals. You mentioned diversity. Having sat on a number of funding panels in the past, I have seen the embedded bias in the thinking processes. Even if you have an equitable panel as to male and female, to make it simple, there is still a bias in the topics chosen for funding, which is often not equitable. Also, there is a belief that one must have an awful lot of experience to be a trustworthy recipient of funding, which creates an imbalance between—I will be very basically honest—the old, male professor, as opposed to the innovative scientific researcher, who is often female.

What have you done to try to address that? Do you think you have addressed it in any way? I know that Tom is planning to continue that, but what have you done to date?

Professor Dame Ottoline Leyser: Tom is at Innovate UK—

Dr Gardner: Yes. Sorry.

Professor Dame Ottoline Leyser: Although they are also very interested in the diversity statistics of founders, that is a slightly different challenge from the research base. This is something that I am extraordinarily interested in, for a variety of reasons, not least that it is so important to capture the right diversity of activity. It is quite a challenge to ensure that we are excited about novelty and fund it because, by definition, it is novel. It arrives and you think, “What’s this? Will it work?” All kinds of mechanisms need to go into place to support that.

Q31 **Dr Gardner:** I am not just talking about novelty in terms of the topic. I am looking at where there have been huge gaps in funding, where what should not be novel is novel because the focus has always been on certain areas and types of individuals. We know that female researchers find it much harder to get funding.

Professor Dame Ottoline Leyser: That is actually not true. The success rate for female researchers across our portfolio is the same as for male researchers. The challenge we have is—

Q32 **Chair:** Across all disciplines, though?

Professor Dame Ottoline Leyser: Pretty much, now. Absolutely. The challenge we have is that fewer women apply, so we need to work very hard to support our communities across the country, to ensure that everybody is able to bid for our funding, and is supported to do that. We need to think hard; another example where we are running trials through the metascience unit is double blind peer reviews, where you do not know who the person is when they apply for funding, and it is based on the project rather than on the CV. That is another example of the kind of change we are testing, to see how we can shake things up a bit.

Dr Gardner: You have hit on an important point, about how we develop a funding ecosystem that encourages female researchers to apply. Maybe



the current competitive bidding-type approach is not the way. The golden lottery system was mentioned, and there might be other ways we could encourage normally more reticent researchers.

- Q33 **Chair:** Thank you, Allison. I am sure that is something Lauren will want to follow up on. I will just take Chair's privilege, Dame Ottoline, and ask, yes or no: do you think that the best applicants for research—best at writing the application—are the best researchers? Is there a skillset in common between research and applying for research grants?

Professor Dame Ottoline Leyser: That is a very interesting question, which begs a yes or no answer, but the answer is that there is a significant overlap in the skillset.

Chair: That is helpful.

- Q34 **Dr Sullivan:** To build on what Allison was saying about women applying for stepping-up positions, I was a recipient of a Daphne Jackson fellowship, having taken a career gap to have a family. Are there models that apply in Europe, where one-year maternity cover is covered and it is almost paused, so you can continue the research? I stepped away because I knew that the science research would suffer if I wanted to have a baby so I took a step out to teach and then came back, but that is incredibly disruptive and hard—with all those challenges. Is there some thinking in that space about how we support women? Growing up in that space it was, "You get tenure. Then you can have a family." That could be 35 or 40. That is a long time, potentially, to balance, and it probably puts some women off pursuing a fabulous career in science, which is so rewarding.

Professor Dame Ottoline Leyser: Our terms and conditions absolutely allow people to take time out for that reason. I have two children. I had them before I had tenure. My experience overall is that our system is very competitive. There are far more exciting ideas than there is funding to support them. It will always be competitive. We always have to find ways to mediate that competition, to try to ensure that we have the right diversity of activity, as you said, to really fuel the system we want to fuel.

There is an irony in the fact that trying to make the competitions fair has resulted in the rules for winning them contracting down to a relatively small number of things that people consider to be more objective. That has contributed to the pressures in the system for everybody to deliver against a very narrow range of things. It increases the pressure in the system and reduces the diversity of activity that we support. For me, the key shift that speaks to everything that we have talked about so far is to foster an environment with huge diversity in career paths.

The pressures that you talk about come back to the fact that we think about a research career as, "You go to university and you never leave." To stay on that path you have to deliver, and continue to deliver, on a set



of narrow criteria. That inherently reduces the diversity in the system, and increases the pressures. It has resulted in the things that we value across that career being not the same as the values of the people who come into the system to make the world a better place. They do not see their values reflected in the system's reward structures.

It has been huge to try to change that, and to try to support people to take much more diverse career paths through the research and innovation system, which will speak to a much wider range of people's ambitions and therefore support a much wider diversity of people to meet those ambitions, and it will also connect the system, inherently. If people move through it, they take with them their skills, know-how and networks, and that is one of the things that joins up the investor community to the start-up community, and so on.

We have done a number of things, which I am excited about, that should shift that; for example, changing the curriculum vitae that we ask people to put in with their grants away from, "Please list your publications; please list your previous grants," which is of course very unhelpful to people with a different kind of background, to, "What have you contributed to research"—whatever that might be—"or innovation?" "How have you supported those around you; what else have you contributed to the research and innovation system, and how are you engaging with elements outside the system?" It is narrative, evidenced and robust.

The idea is to help people to track those diverse career paths, so that they can be considered for a grant, for example. It is side by side, regardless of whether you have gone into a practice-based career and come back round into the research base, through some alternative approach, gone out into industry and come back through, or gone out into policy. That, I think, is critical, and is the change that will be transformative for all the things we have been talking about. It reflects the fact that different people have different desires at different points in their lives and we need people to have the opportunity to meet their ambitions, and contribute to the UK and its vibrancy and wellbeing going forward.

Q35 Dr Sullivan: That is really interesting. Thank you. How has your working relationship with the Government changed since July 2024? Or has it changed?

Professor Dame Ottoline Leyser: Obviously, I was excited about the creation of DSIT as a kind of hub for research and innovation in government, and the science and technology framework as part of that. Since the election, of course, we have Minister Vallance as the Science Minister. Talking about career path diversity, he is one of the few people who has worked in academia, industry and policy, so he really gets the join-up and how all of that needs to work together. That is certainly extremely exciting. I think there is a huge opportunity with DSIT and that ministerial input, and with the Government's massive ambition to work in a different way, joining up across Government and delivering on national



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missions. We are absolutely poised for a transformation if we can really make it work. I hope Ian will be able to pick up that baton and run with it.

Dr Sullivan: Brilliant. I think some of my other questions have been covered.

- Q36 **Chair:** Great. We hear a lot about the Government's huge ambition in working for science and innovation to be at the heart of the growth of NHS Fit for the Future, and the opening of opportunities, and that is very positive. We also see a number of announcements about funding, such as a big pot of money for the AI action plan. Others will come from the industrial strategy. Are you involved when there is an announcement about funding for something to do with science and innovation, and do those moneys come from your budget sometimes? How does it work?

Professor Dame Ottoline Leyser: It depends on the precise activity. Certainly, we are involved in conversations right across Government on research and innovation priorities and how they can best be delivered. Where it makes sense for us to deliver them—we are, as we have heard, the expert and innovative public sector funder of research and innovation—absolutely, we are delivering for many Government Departments, as well as, obviously, for DSIT; but sometimes it does not make sense and it is much more sensible for another organisation to do it, or for Government to deliver directly, depending exactly what is in question.

- Q37 **Chair:** For example, is the funding for the AI action plan coming from the UKRI budget?

Professor Dame Ottoline Leyser: It doesn't quite work in that way. There is the DSIT budget, and there is the part of the DSIT budget that is allocated to us. It is not as if there is a UKRI budget, until DSIT has figured out which bits it wants us to deliver and, therefore, what budget we need to do that. I anticipate that we will deliver a significant number of things from the AI action plan, but not all of them, and we will have the budget to do that as part of that announcement of the funding going forward.

- Q38 **Chair:** Okay, so it is not known yet, but you anticipate that funding will follow delivery; so whoever is delivering it will get the money for it. That is helpful.

We talk about the inputs and emphasise the outputs as being really important. I will go back to looking at the outputs as metrics. It is very important to tell the story, and any examples you have; but how do we measure the success of UKRI's performance and is there real-time data monitoring, for example, of its impact?

Professor Dame Ottoline Leyser: That is another very topical and important question. One of the things that we have done over the last few years has been to develop what we call a balanced scorecard of



metrics that we track actively. The quarterly performance pack tends to include more of the immediate upstream input measures, but annually we have a balanced scorecard that tracks the longer-term output and outcome measures. Tracking those in real time does not make a huge amount of sense, because they do not change quickly in real time.

If we are talking about something like the health of our research base, we might be interested in things like the field-weighted citation index. How are the papers being produced in the UK cited worldwide? The answer is very impressively; we do very well on that metric, and the papers that are supported by UKRI funding do better, in that measure, than papers not supported by UKRI funding in the UK. The field-weighted citation for UKRI-funded papers is higher than for those of, for example, the National Science Foundation in the US. That gives us some assurance about the research we are funding, and have funded over a number of years, because it is a seriously lagging measure. You do the research, write up the paper and publish it. It takes some years to figure out how cited it is. It is a lagging measure, but by that measure the work we have invested in is work that people are excited about and are citing and it is, therefore, useful and valuable. There are a number of different metrics of that sort that we track.

Q39 Chair: You cited one very interesting metric with regard to papers. You must be aware that both the National Audit Office and the Public Accounts Committee have criticised the lack of performance metrics. For most of our constituents, published papers might not be what they are looking for in understanding how £86 billion—I know it is only a proportion of it—is going to drive our economy or our wellbeing. In addition, your strategy and objectives were criticised by the NAO as not containing anything specific or measurable. How do you respond to that criticism going forward? In such a tight fiscal environment, public confidence in the outcomes from this investment is really important. How would you respond to that?

Professor Dame Ottoline Leyser: It is indeed crucial, and our job is to get the best value for money for every pound we invest and we need to be able to demonstrate that. The last time I was sitting before a Committee it was the Public Accounts Committee, and you can see the input we made to that. Patrick is working across DSIT to set new overarching objectives for us. Those will have key output and, I hope, outcome measures. The challenge we have is that most of the outcomes people care about and the things that really matter to people on the ground are quite long term—for example, high-quality jobs, improved productivity in the NHS and a huge range of things like that. It is quite challenging to find a relatively limited number of those outcome measures that speak to people about what we have delivered from the investment that has run through us, and drive the right kind of incentives in how we invest.

We have clear measures for specific programmes where it is easier to say, "What's the purpose of this programme, and what should we be



delivering from this programme rather than from the entire set of activities?" For example, the UKRI challenge fund that was linked to the previous industrial strategy had a KPI of leveraging private sector investment at the time of input. We ran that for a few rounds and were quite successful at it, but we discovered that if you did that, you crowded out the involvement of SMEs because they were not able to put in the money up front. We then changed the way we were measuring it to capture much longer-term leverage, which changed the companies with which we were working and arguably had a bigger impact, but you cannot demonstrate that at the moment you put in the money; it takes several years. We need to be quite sophisticated in how we develop those measures so they drive the right behaviours and deliver the outcomes people want to see.

Chair: That is a challenging question, and both Kit and Lauren want to come in.

Q40 **Kit Malthouse:** If I am really honest, I find that response quite disappointing. Given the conversation we had that science is essentially random, I would have thought your main measure of output was hope. We have to have faith that if we put enough money into science that, because we are bloody good at it, the random process of human innovation will eventually, if we enable enough innovators, produce what we need, so it is quite hard to say that we will produce X return on this investment by Y. I don't know whether you agree with this: I once had a conversation with a venture capitalist who said the reason we do not have a comprehensive venture capital industry in the UK is that everybody worked out that returns were broadly random and no one could really out-perform anybody else and so they all went off to be private equity, hence the requirement for Government funding to supplement it because of the unwillingness to take on random risk.

I would be more interested in understanding how exacting you are about demanding performance for the money that is given. It would be interesting to know what kind of process measures you have around the performance of the money. For example, if you fund primary research that produces papers that are to be cited, how quickly is it being done? How demanding are you as an organisation that says, "Lauren, you've been working on this paper for three years and you've had our money for three years. Where's the product?" You are a research scientist, right. If you are putting money into a start-up business on a grant basis, what is your position on the governance of that? Where is the demand on time? How quickly does the money have to be spent? To me, those kinds of exacting measures are about making the machine work on the basis that what is going to come out the other end, as we have already agreed, is probably random.

Professor Dame Ottoline Leyser: That is a very interesting question. As I talked about, there is a foundational platform in which we need to invest. There I completely agree with you. At some level, the field-weighted citation index, for example, is a kind of measure of how



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successful that is in the broader long term. That part is not where you ask directly for the kind of return on investment in pounds. That is your investment for the future; that is the ante you have to put in to win the big prizes that we see.

When it comes to the docking stations for delivering key Government priorities, if it is a priority to boost growth in centres around the UK we absolutely want to know whether or not we are doing that. Built on that platform of randomness, we need to know that we are harnessing that effectively to deliver for different regions in the UK, for public services and all of those kinds of activities. I think it is the foundation versus the docking stations.

Q41 **Kit Malthouse:** Essentially, what you are saying to us is that your outputs are only partially controllable.

Professor Dame Ottoline Leyser: Yes.

Q42 **Kit Malthouse:** They are directable but not controllable.

Professor Dame Ottoline Leyser: That is exactly right.

Dr Sullivan: What you say about how we report back to the public is interesting. Obviously, public money is being spent on science in the hope of making everybody's lives easier, better, more efficient and all those sorts of things. I am hoping to hear stories that because of this we now can screen so many more people and so forth. Academic research papers are very dense; they are for a specific purpose for the peer community to work out what has been going on, but how do we relate that to everybody else, for example saying you should eat cabbages because within them is a fantastic enzyme that helps the microbiome of the gut?

Kit Malthouse: Is that true?

Dr Sullivan: It is; 100% true. Everything I say is true.

Kit Malthouse: I eat a lot of cabbage; I love cabbage.

Q43 **Dr Sullivan:** Fabulous. I think that was from the Crick. Are there packages of those really cool, inspirational things? What are the cool, inspirational stories?

Kit Malthouse: We are shallow politicians. Lauren is totally right. Tell us the stories.

Professor Dame Ottoline Leyser: There is a huge range of things. Part of the challenge goes back a little bit to your question about how we ask individual people to deliver. We have 20,000 projects running at any one time. We cannot go in 20,000 times and individually track each of those things in real time. We capture outcomes through an annual outcome capture mechanism. Feeding back into the question of track record, you have tension there. You want people who have a great track record in delivery to be able to evidence that when they apply for the next set of



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funding. All our projects are time-limited, so it is not that we are indefinitely funding things. They are time-limited and they need to compete again for the next stage. If they cannot demonstrate they have done something useful with previous funding, that matters.

Q44 Kit Malthouse: Within the 20,000 projects you have given money to, there must be some kind of delivery obligation within each project that you monitor. If you get halfway through and somebody is not doing what they said they would do, you get your money back. Right?

Professor Dame Ottoline Leyser: Not really. It is very unusual that we stop projects in the middle, precisely because, as you say, it is not the case that those kinds of projects have a month-by-month delivery timeline. You are doing something challenging and demanding, and it is incredibly poor value for money to start and stop things randomly. You need to give people the time they said they needed to deliver on their overall outcomes, and then you ask them every year what they have delivered and how.

Q45 Kit Malthouse: Among the 20,000 you must have some not actually doing what they said they were going to do.

Professor Dame Ottoline Leyser: That is against the terms and conditions in the grant, and we have assurance processes that go in to try to emphasise that, but it is allowable for people to change what they thought they were going to do. If you discover something brilliant in the middle of your grant, for example—

Q46 Kit Malthouse: That I totally understand.

Professor Dame Ottoline Leyser: They ask for permission and we say, "Yes. That's a brilliant idea." We have a great comms team that tries to highlight exactly those kinds of examples, whether it is changing the way people teach reading in schools through to what you should eat, or a company that has done wonders by finding better ways to clean ambulances, for example, which really speeds up the flow. It is a huge range of things.

We know, for example, from the amazing work of the Discovery Decade project that the Campaign for Science and Engineering has run that what people care about are local things. They care about where they live and the impact for them. I am very keen on exactly the kinds of impact stories you described, but it is also important to create narratives where it is clear that everybody has the opportunity to contribute. Science and technology are not about clever people over there doing things to you; they are about all of us and all of our opportunity to work together in a hopeful and empowered way to make the world a better place. That is something else I have been very keen to try to deliver. We now have a programme of community-anchored research where community organisations are in charge of money to drive local projects they are excited about, whether that is how you encourage people to stay in education for longer, or environmental projects locally. Expert patient



groups are another great example where real people contribute to their future, which is so important.

Q47 **Chair:** What is that community-driven programme called?

Professor Dame Ottoline Leyser: We are running it in collaboration with the Young Foundation.

Chair: Perhaps you could write to us. I wasn't aware of that.

Q48 **Steve Race:** I have a quick question about commercialisation and where that falls within grant applications, terms and conditions and things like that. How much do you push to commercialise through your grants and seek out ideas and research that can be created in new companies? My limited experience of researchers in the UK is that some are quite commercial and some come to be commercial later in their career when they have been persuaded that it is a good risk, but overall the culture—we get a bit of feedback—seems to be that there are citations, reports and peer review journals and potentially it sits on the shelf. Across the board, Innovate is a bit more about commercialisation, I think, but where does UKRI place commercialisation within its remit?

Professor Dame Ottoline Leyser: It is crucial and it is across the board. We are nine organisations working as one. As you say, Innovate UK is business-focused. There is also Research England, which puts the block grants into English universities. There are equivalent funding streams in Scotland, Wales and Northern Ireland. They have an explicit knowledge exchange remit. They are absolutely key in ensuring that our universities become knowledge exchange hubs and anchors in their local region. Those are sector-focused activities, both of which have a strong commercialisation arm. Then we have the seven disciplinary research councils that work right across the piece, including driving commercialisation. It is horses for courses. If you are in engineering and physical sciences, there is a very close relationship with industry, whether that is the primes or the start-ups. It is a much stronger churn.

One of the exciting things about life at the moment is that, for example, the Arts and Humanities Research Council, which you might think would not be very relevant from this point of view, has been absolutely critical in stimulating the creative industries and building links between the university academic base and that extraordinarily vibrant community of quite often micro-companies. We are very good in spin-out and start-up numbers. As we said, it is scale-up that is the problem.

On your overall question about motives, there is a wide range across our research base. The research excellence framework recognises the fundamental publications, but also, crucially, the impacts. That has allowed people to unleash their ambition in that area over the last few decades. There is diversity across the university research base, with people who are really excited about that and people who are not. That is fine, as long as the ideas make it out into the world, whether that is pull-



through from the primes, or spin-outs arising directly from our university institute base with the discoverers as founders. One of the other things people ask is whether the discoverers are the right people to be founders. Do they have the right skillset, and how do we support them either to bring in people alongside them who have that or to upskill in how to run a company?

Q49 Steve Race: On a score of one to 10, where would you place our country in commercialising our research?

Professor Dame Ottoline Leyser: If you go with an international organisation that scored us, we are fifth internationally for innovation in the UK, where commercialisation is obviously a key element. I am trying to remember. We are behind Switzerland, Sweden, the United States and Singapore, quite a range of different sorts of economy. Where on their index we do not do so well—it is interesting because these are things the Government are emphasising—is in the private sector investment that you talked about, capital infrastructure, broad infrastructure and some of the adoption diffusion challenges we have in business, which is another reason why my career path diversity narrative is so important.

Q50 Steve Race: You have referred to Sweden and Singapore, for example. Do they put as much money as we do into R&D?

Professor Dame Ottoline Leyser: They put more money than we do into R&D.

Chair: Proportionately. We are talking about performance measures. Is your intervention about performance measures, Martin?

Martin Wrigley: I have a couple of follow-up questions on some things that have been said.

Chair: Let's finish off on performance before we move on to other areas.

Q51 Martin Wrigley: It is related to performance. I think that what you do is an almost impossible job, Dame Ottoline. Having worked on innovation pipelines in industry and tried to give away money when I was leader of a council, it is so much harder than you might imagine. It is a bonkers thing and I really did not expect to find that. A couple of things you said piqued my interest—details, I'm afraid.

One thing is that you look at the measurement of results once a year. You go out once a year to get people to report back what they have done, at the same time having asked them to forecast when they will get their results. When are you going to move to a system where they report their results as they get them to make sure they are hitting their own forecasts, rather than doing the classic thing of pulling in data once a year, so reports are coming in all the time, rather than just waiting for the end of the year for people to summarise it? I suspect that tends to be easier for the researchers because they are there and current, as opposed to waiting until whatever date in the year when they have to



report, and probably easier for your organisation as well.

As to my second question, you said two things. You said there is no parallel task and we don't know what would have happened if we had invested in other things. A few minutes later you said you proved absolutely that you had the best value for money. Those were your very words.

Professor Dame Ottoline Leyser: I don't think I said I had proved we had the best value for money. I said we endeavour to achieve the best value for money.

- Q52 **Martin Wrigley:** I am not sure how you can put any measurement on that to say you are absolutely getting best value for money. I can understand value for money. I am not sure you can ever claim it to be the best when you do not know what might have happened doing otherwise, and certainly not absolutely. This is not scientifically measurable; at best, it is stochastic in that, as Kit said, it is fairly random. I think there are ways of moving forward from the traditional means of managing such innovation investments. It does not sound as if you are structured to take advantage of that yet.

Professor Dame Ottoline Leyser: That is an interesting question. The notion that we ask people to produce a timeline and stick to it is not correct, precisely because we know that things do not go according to plan in research and innovation, and we do not expect them to go according to plan. When people apply for funding, they need to set out their best guess. If you are proposing a series of experiments, for example, you need to be able to set out that you really can fit those experiments into the time window of the length of the grant and the funding that is available, so I am not suggesting it is a random set of experiments.

- Q53 **Martin Wrigley:** I clearly used the wrong words. Having run so many projects, as Sun Tzu said, no plan stands up to the first engagement with the enemy. Similarly, no project once you have started it runs to the plan you made just before you started it. Even so, you must always have those plans; you must always do them and re-evaluate them. I would expect people receiving grants to be continuously or regularly updating their plans and keeping you informed of that, and also updating their results when they get them and when they are expecting to get them, rather than waiting for once a year. My point is not about sticking to the plan when the money is paid; it is about continuously letting you know how they are doing along the way, rather than waiting for the end of the year and saying, "How did you do?", and you are told, "It all blew up nine months ago. Sorry."

Professor Dame Ottoline Leyser: As I said, if a grant-holder wants to change something significantly and is no longer aiming for what we would call agreed or related objectives, they need to tell us up front. It is not good value for money for us to be continuously collecting that step by step. What would we do with it? Would we be looking at 20,000 lines of



data coming in every day and saying, "Is this good enough or not?" How would we know whether it was good enough? Would we have to have peer review? There is a practicality issue about the value of that kind of reporting in the context of research and innovation where we know that things will change, and change fast.

We have an annual reporting cycle because we absolutely require all the receivers of our grants to tell us what they have done. We do not give them the final slug of money unless they are telling us, because we need to capture those outcomes. There is a very wide range of outcomes. They are not reporting, "I did this experiment and got this result." They are reporting on the extent to which they engage with the publics where they are, the extent to which they have also engaged with industry and have built new collaborations, and the results and outcomes they were thinking about in the primary part of their programme. The annual cycle is to do with the kind of mandated requirement for people to report. We have no problem with people reporting more often than that if they need to, but it does not help us in managing our overall portfolio for them to be continuously feeding in at that kind of level. You are frowning.

Martin Wrigley: Yes, because you jumped from annual to day by day, which was not what I meant and not what I said. I was talking about looking at the relevant milestones and reporting as they hit their milestones, rather than doing an annual reporting cycle. The logic is not annual or daily or what to do with it; it is how accurate your data is at any given moment and what you take from that. The analysis that you do every year you could do at any time, as opposed to waiting for a massive effort when it comes in. To wait for a yearly cycle strikes me as an odd way to work, as opposed to having people report in as they hit their milestones.

Q54 **Chair:** I totally understand your point, Martin. Can we clarify whether the annual reporting is on 1 January when all your 20,000 programmes report, or is it a year after they start?

Professor Dame Ottoline Leyser: There is a window in which people log into an electronic system and report across a range of activities. It is a window in the spring when they do it. It is partly the notion that every project has milestones that you hit. They mostly don't work that way because of the dynamism, change and flexibility in how they run, so we are engaged with a different kind of portfolio and endeavouring to manage it as an overall portfolio, which overall delivers high-quality outcomes. On the investment comparison, you get your value from betting not on individual programmes but on a portfolio.

Q55 **Dr Sullivan:** You said you were managing 20,000 different programmes that are going on at the moment. Is that the maximum that you think you can manage? Is that the minimum? Is it somewhere in the middle? Where do you think it can go?



Professor Dame Ottoline Leyser: They are projects, not programmes. This is quite important. Some of them are grouped into programmes, and where there is a programme with multiple projects we look more continuously at what that overall programme is delivering. Some of the challenge programmes, for example, often report at programme level, which is a kind of amalgamation of what is going on at project level. A lot of people when they think about us will be thinking about the individual bottom-up project grants that we put into universities, for example. There are not 20,000 of those, but there are multiple thousands and they are very flexible. Typically, they have about three years of funding to investigate a particular area. Those have to operate with freedom and flexibility to pursue their overall question in a dynamic way as they move forward. It varies. I have lost your original question about programme reporting.

Chair: Of the 20,000, how many are reporting?

Q56 **Dr Sullivan:** Is that going to be the limit? I guess it is a molar ratio. How many UKRI people do you need to manage how many other projects that are going on? Is it scalable, or is it at the point where it is at the limit?

Professor Dame Ottoline Leyser: It is scalable. By bringing UKRI together as one organisation we significantly increase overall efficiency by having one organisation rather than nine. If we wanted to scale and do additional programmes we would need more people, but it is an overall scalable endeavour. Of course, with our lovely new IT platforms we hope it will be more efficient and effective at being able to capture some of the key data.

Q57 **Chair:** Thank you. We will be moving on to AI, which is an interesting transition.

The Committee is concerned with, and it is a justified concern, the level of bureaucracy on individual projects in terms of reporting to a timetable laid out by UKRI rather than in accordance with their own priorities and their own deliverables, and with the level of bureaucracy for UKRI in managing all this. One thing is that 20,000 projects is not a huge number for some global organisations. There are project management and, indeed, organisational reporting platforms that have ways of addressing that. I take it that the IT programme that you are talking about can reflect that.

We are looking at three different things. Patrick Vallance talks about three different types of funding: the curiosity-driven research where it is unplanned and you fail and fail until you succeed; the applied, which is more planned and with an outcome; and Innovate UK, the more commercialised area. I would have expected each of those buckets to have qualitative and quantitative, quantitative being the numbers and qualitative being narratives. The stories that we have heard are so important. Perhaps you or UKRI could write to us to tell us how you report on each of those three key types of activity and how that



addresses some of the issues that the Committee has raised. Does that work?

Professor Dame Ottoline Leyser: I can absolutely do that. It speaks very much to your point. In the bottom-up curiosity-led stuff, which is a lot of exciting and specific projects, we absolutely expect a different type of reporting from when we are running programmes aimed at delivering particular Government priorities. They work in different ways. From a bureaucracy point of view, I have to say that asking people regularly to report is not what they want.

Q58 **Chair:** Sorry, that was not Martin's point. Martin's point was asking people to report in accordance with their timelines. That was your point, wasn't it, Martin?

Martin Wrigley: Yes.

Chair: That is a different approach. That is what we want to look at.

Professor Dame Ottoline Leyser: Yes, I understand the point. However, asking people to report once a year is not a huge bureaucracy for them. It really is not.

Q59 **Chair:** The Committee may have heard other assessments from some of the people and organisations we have talked to of the level of bureaucracy associated with reporting on a set of things imposed. It is the impression the Committee has. We look to have an evidence basis in your response to assess that.

Professor Dame Ottoline Leyser: I would be very interested. Indeed, we regularly ask the community how they would like to report, and the answer is not, "According to my timeline"; it is usually, in brackets, "Not at all." I don't think that is acceptable.

Q60 **Chair:** Maybe that is also somewhere AI can help in identifying what should be reported on without having bureaucracy on either the reporter—

Professor Dame Ottoline Leyser: Yes. You are absolutely right that as we evolve our outcome collection system we embed in it tools that ensure that as much of the information we need as possible is automatically captured from information that is out there already rather than asking people to fill it in. I agree with you that historically that collection system has been very clunky to use. It has improved over the years, and we are about to go through another cycle of significant improvement.

Chair: Great. That is a fantastic transition to AI more generally in UKRI's work.

Q61 **Dr Gardner:** Yes, it is to do with how AI projects are funded and to ensure that they do not hit that stumbling block of getting as far as pilots and then not getting deployed. The reason I have noticed is that they have not thought post-deployment about how those technologies would



be governed, and that causes a lot of reticence. I sat on a number of panels, mainly in NIHR, looking at AI projects, and it was quite noticeable how some applications made no allowances for how they would be ethical, responsible, safe and secure participatory AI—patient/public participation is in-built in health applications—although some would. At that point—this was a few years ago—there was little acknowledgment when funding AI projects that the funding body should have some responsibility for making sure that what it is funding is ethical and trustworthy.

In some of the NHS AI awards of, say, £140 million for things in health, when I was speaking to some of the applicants, I noticed that they hit stumbling blocks because they realised they had not thought about post-deployment monitoring and governance and making sure that it was safe and ethical. They would apply for another £100,000 and it was rejected. Not getting past the early start-up phase was really hard, and they could not scale up and pass out because the governance was not there. Very simply, how does UKRI ensure now that the AI projects it funds are ethical, trustworthy and responsibly governed? What mechanisms do you have now to make sure that happens?

Professor Dame Ottoline Leyser: I will speak to two things on this. First, all our project assessment, whatever the area of the project, comes with both peer review and expert panels. They are explicitly asked about ethics and trusted research and innovation, research security and so on. That is embedded into how we think about all our projects. Secondly, we have funded major national programmes on embedding ethics into the AI landscape more generally, and those programmes are helping both companies and researchers to navigate exactly this landscape of new technology and new applications all the time with the very challenging ethical considerations that go with them. Upstream, embedding that whole thinking in the AI research community is important. We have, as I say, a couple of major national programmes working to support that upstream embed that is so important.

Q62 Dr Gardner: I led on the ethical funding for trustworthy AI project with BCS and the Health Foundation, so I have to be honest about that. Way back then, we had problems that a lot of researchers were not, at that point, aware and trained about AI and the risks of AI and how they had to mitigate those risks. One of the solutions was a design of the application form for the bid where we prompted them to ensure that their AI innovations were following the guidelines as well as thinking post deployment. I know this goes against them because the application forms for research are terrible anyway, so we tried to be as kind as possible.

Professor Dame Ottoline Leyser: Absolutely. As I say, our application processes inherently embed that regardless of what you are applying to do. Ethical considerations—

Q63 Dr Gardner: I am not talking about broader ethics. I am talking very specifically about AI in terms of dealing with bias—what mechanisms and



what standards they might be wanting to adhere to, and that sort of thing.

Professor Dame Ottoline Leyser: One of the challenging things about these platform technologies right across the piece is that we have people applying AI in health where there are very different ethical considerations from people applying AI in grocery sorting or something, so it is not possible to come up with blanket arrangements. It has to be individual researchers engaging deeply and thinking about what they are doing, why they are doing it and how they embed an ethical approach to that up front. That is what we ask our panels to assess.

Q64 **Dr Gardner:** How do you monitor going forward that they are maintaining that process and building it into the technology?

Professor Dame Ottoline Leyser: If they are developing a technology that they are deploying, those deployment processes should have the ethical considerations embedded. We are back to the challenge with procurement at some level. We have to create the whole system so that the pull requires ethical consideration, as well as it being considered up front in the push. It is a systems-level property; you cannot anchor it in one part of the system.

Dr Gardner: I always separate ethics and governance. Governance is how you manage it. Understanding that and naming no names for any particular type of project, this is a broad question—

Q65 **Chair:** Sorry, Allison, can we clarify whether you have to identify in an application if you are using AI? There is an issue as to whether or not AI is a new or unique ethical consideration. If I apply to say I am going to do some research or innovation, do I have to identify whether I am using AI?

Professor Dame Ottoline Leyser: We ask people to say whether they have used AI to produce their application, because obviously people are using it to improve the quality of their narrative. We do not allow our peer reviewers to use it to produce their peer reviews because we do not want them to put the application, which is confidential, into the public domain. Anyhow, we are asking them for their opinion, not the opinion of some AI. Where people have an overall programme of research, we absolutely expect them to tell us the tools that they are going to use to do their research.

Q66 **Chair:** Are they required to?

Professor Dame Ottoline Leyser: They are required to tell us how they are going to do their research. There isn't a specific requirement that says, "If you're going to use AI, you need to flag it in flashing lights," particularly since the use of AI is now everywhere. If somebody is using it to help them with their literature research to underpin their programme, that is again a different thing.



Q67 **Chair:** I understand that. If you say you are going to research the emotional response of children to teachers and you are using AI, having question and answer set-ups is very different from having AI recording everything and then putting some programme on it that concludes from eye movements what the children's emotional reaction is. Would you have to identify the tools?

Professor Dame Ottoline Leyser: That would fall under the rules for any research project that involved human subjects, and you would absolutely have to say what you were going to do and how you were going to do it. That would include if you were using AI.

Q68 **Dr Gardner:** I am annoyed that I did not think of those questions myself. They are brilliant questions. Going back to the point that I made and linking back to the scale-up, I know quite a few projects with AI that have got to a certain point and then they have not been deployed. They fall and they cannot scale up. The health tech community tell me that they are fed up with more pilots. There are lots of pilots and lots of trials, but scaling up and deploying stops. You talked earlier about helping people to do that transition. Like I said, some of the problems that block people are due to lack of confidence in the AI system and the lack of governance processes around it. What learnings have you taken from previous AI funding programmes to ensure that the innovation is safe to deploy at scale and people can be assured that what they take on is safe and well governed?

Professor Dame Ottoline Leyser: What you are talking about there is essentially a challenge with regulation. Regulation is quite often viewed as an inhibitory thing, but actually it can be a hugely enabling thing. Finding ways to provide assurance about different AIs in different contexts is a key part of what the DSIT AI programme has been about, and then how you link that through into a regulatory environment where you know that AI is being deployed in a huge range of different contexts. You cannot have generic AI regulation because it depends absolutely on where and how you are deploying it. With things like explainability and needing to understand exactly how AI is making its recommendations, there are contexts where that really matters, and then there are contexts where it matters less. There is an exciting regulatory challenge, which the Regulatory Innovation Office is looking at now, in how you take cross-cutting technologies that are changing everything, with AI very high on the list, and ensure that they can be successfully deployed right across the piece, given the amazing and transformative potential for them, in a way that is sure-footed because of the regulatory and governance environments that we have. From our end, we absolutely have a role to play in that, but at the deployment end we do not have responsibility for how things are deployed in the pension system. We cannot; it is a long way from our jurisdiction.

Q69 **Dr Gardner:** Should it not be part of your responsibility that what you fund is deployable, otherwise it hits that block?



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Professor Dame Ottoline Leyser: The challenge that you have identified, though, is that there are no good definitions of deployability, because those require the regulation. What is deployable is not defined yet, and it will be different in different sectors.

Q70 **Dr Gardner:** Thank you for that. Your answers were very close to my heart. It is an argument that I have been making for a while. You have to look at how you regulate these technologies differently from generic software. I agree with you that it is a challenge that we need to look forward to. Looking forward, how will UKRI be involved in delivery of the recommendations set out in the AI opportunities action plan and my favourite recommendation, which is recommendation 28 about AI assurance? Other recommendations are allowed.

Professor Dame Ottoline Leyser: Where we have a key role to play in some of these issues is in the basic research that goes on to understand how we can develop more explainable AIs, and therefore the assurance process will be easier. That is not at the level of particular companies developing AIs for particular things; it is way back in the lab and how we develop AI algorithms and so on that are inherently explainable. There is that element to it, for sure. There are a lot of recommendations in the AI opportunities action plan, and some of them are directly related to our delivery. We will be directly delivering a lot of the skills interventions, whereas for some of the other interventions we are there as a source of expertise and advice, but the delivery will be from other organisations.

Q71 **Dr Gardner:** It makes sense that you would be involved in the skills delivery and helping researchers go through their fellowships. Is that what you are referring to with that one?

Professor Dame Ottoline Leyser: Yes.

Q72 **Dr Gardner:** Thank you. Finally, how will UKRI be involved in the work of the sovereign AI unit announced at the spending review? And please help me out with this one. What do you understand by the phrase "sovereign AI"? That intrigues me.

Professor Dame Ottoline Leyser: I will probably get back to you on that one because it is quite broad and there are different strands to it; and I do not want to get it wrong. As we said earlier, one of the amazing things about the UK is our extraordinary research and innovation system. We cannot be complacent about that. It is a very competitive world. How do we make sure we are riding on the front of the wave on all that? That is a large focus for that activity.

Dr Gardner: So that we keep and develop the technologies here. Thank you.

Chair: If it is any consolation, we asked Patrick Vallance the same question, and he could not answer it fully either. As sovereign AI is mentioned a number of times in the strategic defence review, the Committee thinks it is quite important that we understand what it is.



Q73 Steve Race: Moving on to something that I hope is close to your heart, the bioeconomy, and the initial outputs from the Global Centres competition, where are we with the funding that has gone in?

Professor Dame Ottoline Leyser: We have a major set of programmes on the bioeconomy. We have been investing in it for a very long time, largely through EPSRC as well as through some of the other councils. It is a key part of the engineering biology priority that we have been supporting for a long time. It is very exciting, and there are many different strands. It loops into the net zero decarbonisation challenge. Fossil fuels are, essentially, the products of photosynthesis from millions of years ago. We need to flip to alternative ways of sourcing those feedstocks into our industries, and one of those is in the products of photosynthesis from now, which is therefore an immediate carbon capture and recycle opportunity. A lot of bioeconomy investments are to do with sustainable fuel replacements, a whole range of different applications where we are looking to replace the major industrial feedstocks that have been based on fossil fuels with alternative sources, many of them to do with waste or waste agricultural products. It is exciting.

Q74 Steve Race: Where are we on the journey at the moment?

Professor Dame Ottoline Leyser: Where are we on the journey? It is a long journey. We are a significant way along it. There are some exciting demonstrator activities in industry. We are looping back to innovation clusters. Yorkshire is a major centre for a lot of that bioeconomy innovation, and they are looking to scale up a lot of their activity from that point of view. We are motoring along on the journey.

Q75 Steve Race: Fair enough, thank you. On plant science projects more generally aimed particularly at tackling global issues like climate change, food security, biodiversity loss and different ways in which we grow food, I went to Rothamsted recently in Harpenden, which is a fantastic scientific centre globally for this sort of science. What is UKRI's role both now and going forward in supporting that? Perhaps you might touch on the ODA cuts to research and partnership working as well.

Professor Dame Ottoline Leyser: Yes. That is a huge domain. One of the huge strengths of the creation of UKRI is our ability to think about things like the net zero challenge in a proper, integrated systems way. We put about £800 million a year at the moment into a very wide range of activities that contribute to that overall endeavour, ranging from the sustainable fuel replacements that we have just talked about right through to carbon capture efforts and innovative biodiversity monitoring approaches. It is a huge portfolio because it is a major re-engineering of our economy and the way we work and the way we think about things that has to happen, and will be critically dependent on design, behavioural science and so on. That level of interdisciplinarity is something that we can bring. One of our core strategic themes, "Building a green future," looks at that.



We have a lot of cross-UKRI work on food, right from farm to fork. There is a very broad set of things that you need to do to bring together the UK's food system. We tend to think about it as farming and production, but actually there is all the processing and packaging, right through to behavioural considerations in how we support people to make healthy choices and contribute then to the health of the nation. Those kinds of cross-cutting activities are wired into the way we think about things. One of the things that the NAO was very keen to think about in its report is how we make even more use of that portfolio-level analysis across everything that we do to tackle some of those huge issues.

Q76 **Steve Race:** ODA?

Professor Dame Ottoline Leyser: ODA, yes. This has been one of the most difficult things that we had to deal with across the time I have been doing this role. During covid, there was a sudden reduction in Government ODA funding, and it came at a time when there had been a really insightful policy to support official development assistance through research and innovation. We set up a number of very major programmes that were anchored in research and innovation in the UK and in partner countries building trusted partnerships. The benefits, by definition, were primarily aimed at benefits in those developing countries, but of course they were supporting researchers right across the UK at the same time.

That sudden drop in funding resulted in something quite unprecedented for UKRI, which was the potential to have to stop programmes in the middle, which is incredibly challenging and particularly problematic in that case when we had built trusted partnerships with developing countries. It was heartbreaking. We were able to work with the brilliant university sector such that, although there was a major reduction in funding, in the end almost no projects were stopped. They were de-scoped and they were slowed down, but almost all the projects at least proceeded. None the less, it was so hard to do and caused so much stress, anxiety and pain in the community that it has created a situation where people are concerned about ODA funding for research and innovation because nobody wants to live through that again. We have tried to work in ways that build partnerships with the countries that we need to work with that are not critically dependent on a defined ODA stream.

The challenge with ODA is that because it works to a Government percentage it is capped. It is not to do with budgets; it is to do with caps. You cannot spend more than that amount of money on ODA, so it creates an unusual constraint. We have tried to continue partnerships in ways that blend different types of funding so that we will not again hit that cap problem and have to stop funding things because we cannot move money from one budget into that budget.

Q77 **Steve Race:** That is interesting. Even if you wanted to and you thought there was science worth doing with partner countries, you would not necessarily be able to because there is a cap.



Professor Dame Ottoline Leyser: For ODA, absolutely.

Q78 **Steve Race:** Are you saying that you are trying to redesignate programmes or run them slightly differently?

Professor Dame Ottoline Leyser: We can run collaborative programmes with other countries where there is a good scientific justification to do it, so we do that. Where we have worked to demonstrate that they meet the ODA requirements, they become labelled as ODA and then they are capped.

Q79 **Steve Race:** We heard from some stakeholders recently that ODA was the only way in which you could run real partnerships in developing countries because of the way it is set up: you can share that funding and you run a joint programme, whereas for general scientific research projects, a researcher here would have to apply and get the funding, and then a researcher in a developing country would have to find their own funding. Is that right? That is why it does not work in terms of running as a non-ODA funded project.

Professor Dame Ottoline Leyser: It goes country by country. We are able as UKRI to put some funding directly into other countries, and there are examples where we do that. That is an important part of our international collaboration portfolio. It is not the case that it is impossible to work with one of those countries without a designated ODA pot, but of course it is very case by case. There needs to be UK-based justification for doing that in the context of putting UK money into another country.

Q80 **Chair:** Perhaps you could write to us setting out some of the rules and opportunities about that. As you may be aware, the Committee has launched an inquiry into science diplomacy, and this would be an interesting contribution to that.

We are running over time, but we haven't finished on the future of research and innovation. We must not miss out the future, particularly with regard to the UK's university system. I put down a written question to the Secretary of State for Science, Innovation and Technology regarding how he was ensuring the continuation of UK research in the higher education sector. The UK is unique in the proportion of research that happens in universities. The Minister's response was that protecting funding for R&D was ensuring its future. That is obviously important, but do you have other concerns, as well as the R&D budget, about the future of university research, particularly its financial stability?

Professor Dame Ottoline Leyser: You are absolutely right that the HEI system faces significant financial challenges at the moment. This is a matter of concern from the point of view of both its teaching and training roles and its research roles. The underpinning causes come from the fact that the financial models for universities involve multiple funding streams. Universities have been strongly incentivised to increase the volume of their research, and they have done that by electing to spend funding that they generate through surplus generating activities.



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Teaching for overseas students generates a surplus, and they have chosen to invest that in research and innovation. There is a significant amount of university money invested in research and innovation, and that funding stream is now significantly reducing for a whole variety of reasons, not least the changes in the visa regimes for overseas students that have reduced the number of overseas students applying to come to universities in the UK. That creates a challenge in the system.

My view is that there will inevitably need to be some kind of consolidation across the university landscape. That will not necessarily be a huge negative for the UK's research and innovation endeavour, but it needs to happen in a co-ordinated way so that universities lean into their unique strengths. One of the challenges we have had with the way that we have asked universities to compete for funding is that we have used a relatively narrow set of criteria, and the result is that universities have all been competing against the same criteria. That has driven harmonisation across the system, which is not desirable. We need diversification. We need assessment systems that support universities to develop their unique strategy linked to where they are in a country, which other universities are near them and what their opportunities are. Managing that transition effectively is going to be a real challenge.

Q81 **Chair:** Thank you. To be clear, by consolidation, you mean a reduction in the number of universities.

Professor Dame Ottoline Leyser: Not necessarily. If universities are trying to compete by relatively unstrategic expansion in their research activity, they might be researching across a very wide range of topics, and it might be much more sensible for them to focus on a smaller range of topics.

Q82 **Chair:** That would be a reduction in the number of departments.

Professor Dame Ottoline Leyser: Potentially, or within departments. You can think about it at multiple different scales.

Q83 **Chair:** One of the earliest victims, if that is the right word, of this uncertainty has been the arts, humanities and social sciences in terms of reports that I have of departments that are reducing in size. Do you agree with that? What do you think the consequences are for our research landscape?

Professor Dame Ottoline Leyser: As a result of the really quite sudden financial pressures universities are facing, they are making decisions locally unilaterally. I would like to find a way to be able to do that in a more co-ordinated way across the country so that we are not losing key capabilities. In the arts and humanities, most of those decisions are driven by teaching. They are driven by the fact that the courses run by those departments are no longer popular with students. There is a very interesting question about how one creates teaching opportunities and builds courses in universities for 21st century arts and humanities, digital humanities, a lot of the things that we were talking about earlier with the



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creative industries, and combining arts and humanities and other disciplines in ways that really appeal to young people who are excited about the role of those rich disciplines in tackling some of the world's challenges. For me, the focus would be on how we think about teaching in the arts and humanities subjects, which is not my remit at all, to create courses that are really attractive to a wide range of students.

Dr Gardner: I understand that. We see music courses being shut down. You could make an argument for looking at the use of digital. A big worry for me is the loss of philosophy as a subject and those critical thinking skills. I would worry about that narrowing down too much. We still have to protect some of those and maybe look at how we sell them and support those types of subjects a little bit more.

Q84 **Chair:** I think, Dame Ottoline, that you are referring to that, inasmuch as it would be a more co-ordinated approach. My final question, because this is so critical to the future of R&D, is who is responsible for developing that co-ordinated approach with regard to consolidating support for the higher education sector in the future?

Professor Dame Ottoline Leyser: The huge strength of our system is the marriage of the teaching and the research side of things. There is a dual responsibility for DFE and DSIT, and they are working very closely together to think about the challenge, and that is important. Of course, we can supply information on where there is critical infrastructure and critical capability to support that. There is also a challenge with the regulation of mergers. Part of the reason universities are unable to talk to one another is that they are not allowed to co-ordinate what they do with their teaching programmes. That needs to shift. The CMA needs to adjust its thinking about that so that people can do it more effectively.

Q85 **Dr Gardner:** There is a narrowing to very pure subjects, yet we see a lot in applied situations in industry that a multidisciplinary approach is important. Do you think that as part of that consolidation maybe we should be looking at more multidisciplinary universities and approaches to teaching, and maybe even to research and development?

Professor Dame Ottoline Leyser: Absolutely. That has been a growing trend over the years in all kinds of ways, because those disciplinary boundaries are very much where a lot of the exciting stuff happens.

Back to the joy of UKRI, we have been able to drive up interdisciplinary research in a whole variety of ways, both outcome-focused and on the bottom-up random creativity side. We completely need to think in those terms, both in the context of the teaching and training that goes in and in the context of research, and help to manage the transition in a way that preserves the extraordinary strengths that we have and allows them to evolve and adapt to the future opportunities that we also have.

Q86 **Chair:** Thank you. Perhaps we could write to the Secretary of State for DSIT to ask how he is working to co-ordinate that important support for



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the future of the higher education sector in the context particularly of our research and development base.

Dame Ottoline Leyser, you have been with us for almost two hours. We very much appreciate your commitment to this session. It reflects the interest that the Committee has in the work that you have done and the work that UKRI will continue to do. I offer my thanks to you on behalf of the Committee not only for this session but for all your work and time at UKRI and for all that you have done.

Professor Dame Ottoline Leyser: Thank you, and thanks to the Committee for keeping this agenda high in Parliament. It is really important. Thank you.

Chair: Thank you very much.