HOUSE OF LORDS

Science And Technology Select Committee

Corrected oral evidence: Valedictory session with former CEO of UK Research and Innovation

Tuesday 28 October 2025

10.15 am

Watch the meeting

Members present: Lord Mair (The Chair); Lord Borwick; Lord Drayson; Lord Lucas; Baroness Neuberger; Baroness Neville-Jones; Baroness Northover; Lord Ranger of Northwood; Viscount Stansgate; Lord Stern of Brentford; Baroness Walmsley; Baroness Willis of Summertown; Baroness Young of Old Scone.

Evidence Session No. 1 Heard in Public Questions 1 - 16

Witness

I: Professor Dame Ottoline Leyser.

USE OF THE TRANSCRIPT

1. This is a corrected transcript of evidence taken in public and webcast on www.parliamentlive.tv.

Examination of witness

Professor Dame Ottoline Leyser.

Q1 **The Chair:** Good morning. Welcome to this meeting of the Science and Technology Committee. This is a session we are having with Professor Dame Ottoline Leyser. It is a valedictory session in the sense that she was chief executive of UKRI for five years. We are very pleased to be asking her to talk about her experiences and her views, perhaps for the future as well.

Perhaps I could start. You have obviously had an important and challenging role as CEO of UKRI. We would like to invite you to reflect on that in an opening statement. What do you think the highlights are of what you have achieved? What has changed at UKRI over your time in that post? What were some of the major challenges facing UKRI and the areas where you would have liked to have done more? We would like to hear about all those things and there are more questions as well, so perhaps you would like to start.

Professor Dame Ottoline Leyser: Thank you very much, and thanks very much for the opportunity to speak to the committee.

I took the role because, rather obviously, I think that UKRI is a critical national asset. I think that there is widespread agreement that research and innovation are central to our efforts to rebuild our economy and public services. I have felt for quite a long time that balkanisation within the research and innovation system is one of its greatest weaknesses in a system that overall is incredibly strong and internationally competitive.

I do not think that we will ever be able to invest on the scale of some of our major competitors—the USA, China, and so on—so the way that we can stay at the leading edge is through smart portfolio management and join-up. We have both the scale as a country and the geographical closeness to allow us to work intelligently in that way. That is what I think UKRI can support: that connected diversity that is key.

My priorities at UKRI were to evolve the organisation from its very early stages into an organisation that was able to do that. I would say a core part of that was an evolution in the concept of what UKRI actually is. When I started, there was a strong prevailing view—both inside the organisation and outside—that UKRI was in some way a tenth thing on top of the nine councils that are part of UKRI, and its job was somehow to work in a top-down, controlling way. I think that is not at all the way in which we need to operate.

In fact, overall, research and innovation are always about how you capture the vibrant bottom-up creativity, and support and enable that in a way that can then be channelled at current and future priorities.

Therefore, my key goal was to move away from thinking of UKRI as a top-down tenth thing into defining UKRI as its nine parts. UKRI is the nine councils, and it is about precisely the diversity of expertise across those councils and their deep relationships with their various communities, whether that is a disciplinary community, as in the case of the research councils, or a sector community, as in the case of Research England and Innovate UK. It is about capturing that diversity of expertise, creating an opportunity for the nine executive chairs to choose how to work either locally through their individual councils or collaboratively in various tripartite and bipartite collaborations, or fully collectively across the whole of UKRI. The executive chairs are empowered to do that in a way that allowed us collectively to maximise the benefit for the UK's research and innovation system, and fundamentally UKRI is about fostering that excellent joined-up and connected research and innovation system in the UK.

We came a long way on that journey and there is now a lot of excitement in the senior leadership team at UKRI about the opportunities to make more of the investment, which we channel on behalf of taxpayers, by working in that collaborative way so that every pound is working as hard as it possibly can. I think that evolution has been crucial in allowing us to deliver on the early promise of the creation of UKRI.

There are a number of things one can point to as exemplars of that. I am pleased about the cross-research council interdisciplinary responsive mode scheme. That is a fully bottom-up open call that people can bid into to do a project that does not fit into any one council, so that in principle there is a path through which any of those great bottom-up generated creative ideas can be funded.

Of course, as I said, there is a lot of opportunity in capturing our amazing research base and focusing it on key priorities. Therefore, we have been able to do things like build joined-up programmes on some of the critical technologies—quantum AI and so on—and then think about the key pillars of the research and innovation system and how we can best support them, whether that is on infrastructure in a co-ordinated portfolio or, for example, evolving the PhD studentship funding programme into a more coherent form. Then, obviously, there are those bottom-up ideas and the

innovation, and the way in which we can connect all that into key priority sectors, for example, in the industrial strategy. That is the goal: to foster bottom-up creativity in a way that links it to national priorities. As I say, I think that the cultural evolution in the organisation came a long way over the five years towards capturing those benefits.

If I had to point to challenges, there were quite a number. The one that I think is perhaps most relevant for looking forward is data. If UKRI is going to continue to build its expertise as a high-quality portfolio manager for public investment in R&I, we need high-quality, real-time data about where exactly the thousands and thousands of investments that UKRI puts in every year are going. What are the new trends coming from the bottom up in the new grant applications we receive? What is working and what is not working in the various more co-ordinated programmes?

Building the right data systems to allow us to work in that way was slow across the time that I was CEO. We came a very long way, but it was a frustration for me even joining the organisation. I have to say that after two years we were still on nine different ledgers for the financial flows across the organisation. We only managed to get over that, into one, right at the end of my term. I think that continuous, thoughtful investment in the data systems and architecture will be key to realising the opportunity that we have from the creation of UKRI.

The Chair: Thank you. That is helpful. We obviously have a lot more questions.

Q2 **Viscount Stansgate:** Good morning, Dame Ottoline. The Government have said that UKRI will now have, "A refreshed mission" with "a renewed focus on economic growth". The committee has just concluded an inquiry into science and technology for economic growth and scaling up companies, which you may know about, and that will be published soon. The report emphasises how this needs to be a whole of government effort led from the top of government. As an early-stage funder of research and innovation, what role do you think that UKRI should play in supporting economic growth? How do you balance that with supporting the blue skies research that may pay off but over a much longer period?

Professor Dame Ottoline Leyser: Yes, that is a huge question and a key question for the UK. I think that because it covers all sectors and all disciplines, UKRI is a key node in the research and innovation system that can allow the aligned and co-ordinated approach that we need.

I am a huge fan of the science and technology framework that sets out the list of things that anyone in government needs to think about in the context of research and innovation investment. That includes the investment that comes through R&D and the huge amount of money going through public procurement. We can leverage that to boost economic growth through innovative companies and at the same time, of course, boost productivity in our public services. Therefore, procurement, regulation and strong, clear, consistent policy stability and messaging about what we are trying to do in both a national and an international context is a clear way to think about a co-ordinated approach right across government that we need.

UKRI is a strong national asset in allowing us to work in that way because it is that connected node in the system that can also work right across government. Another thing that we worked hard on during my time as CEO was building up those relationships with all government departments. When Lord Vallance was GCSA, we worked to make sure that the science budgets were increased in all government departments, and then UKRI worked strongly with departments, quite often co-investing, sometimes just delivering fully managed programmes. That provided inherent connectivity across government in the research and innovation investments, which we could go much further on integrating and thinking about along with those other aligned policies.

In terms of renewed focus, which comes from what I hope is now a period of policy stability with the new industrial strategy, that provides the directionality that I talked about where we capture the extraordinary vibrance of our research base to deliver on those key stated national priorities. I have never seen there being much conflict between the blue skies part of the portfolio and that focused part because they are interdependent. Again, Lord Vallance is very clear about that. We need the vibrancy of our blue skies research base to support all those things. It is important to point out that that is not just the discoveries and the ideas. The people, the skills, the infrastructure and so on that support that discovery base also support the innovative businesses and innovation in public services that go with it. It is a balanced portfolio and that is something that UKRI working across government can help to deliver.

Q3 **Baroness Willis of Summertown:** Good morning. This is very interesting already. You mentioned you need more data. The question I want to focus a bit more on is what you think needs to change about how the UK operates, either on its own or in co-ordination with other parts of government, to help support

economic growth in a measurable way. As you know better than anyone, it is coming under pressure to demonstrate this. I did read your valedictory speech to the Science, Innovation and Technology Committee, and you spoke a lot about procurement. Where does procurement fit within this way of measuring success that it is making a difference in UK growth?

Professor Dame Ottoline Leyser: Yes—partly where I think the data is so important is in being able to demonstrate how funding flows are currently operating. UKRI has a huge portfolio of investment in studentships, fellowships and other skills agendas in different scales of infrastructure—the big national infrastructures and the small infrastructure on the ground—and various ideas across discovery through to applied landscape.

Our investment in innovative businesses and our investment to deliver on key stated national priorities, like the Government missions, is a big portfolio and it is critical that every pound delivers on multiple things. Part of the challenge we have had is a way of thinking about investment in research and innovation that says, "We want X. Therefore, we will define a pot of money over here that will be delivering X and then we will create a pathway that can demonstrate this pot of money is delivering X". It just does not work that way. That is very inefficient, very bureaucratic, and not an effective way to deliver on the outcomes that people want to see.

However, it is difficult to generate the trust and confidence that the investment is flowing in the right way and having the right impact unless you can produce these dynamic reassessments of the portfolio regularly, demonstrating that, for example, there is an increased take-up in the open response mode calls in particular areas. The data are to do with understanding but also demonstrating what the current portfolio looks like and how the interventions we are having are shifting that portfolio over time in different directions. Those are quite input-led data, but they are important, particularly, as I say, to allow us to get to the place where we are confident that we do not need a ring-fenced pot of money to do every new thing.

The outcomes-focused metrics are actually much more challenging, I would say. They are not impossible, but they are challenging precisely because a lot of them are long-timeframe outcomes and they are multi-actor outcomes. We want high-productivity economic growth. That is brilliant. There is a set of things that we can measure in that context, I think, and that could be patient capital and so on.

It is harder to say that what UKRI is doing is the cause of our economic growth in five years' time. Therefore, as a management tool, those long-term outcomes are quite difficult. In the end, you wind up having to track a suite of shorter-term things that are not the outcomes you are interested in—economic growth—but you think they are correlated with them. They are things like private sector investment and job creation and those kinds of elements, which we do track and can demonstrate. Usually, they are more closely associated with particular programmes rather than being integrated across the entire portfolio.

Baroness Willis of Summertown: Can I just ask a follow-up question? I was wondering about that higher-level outcome focus. Clearly, there are particular products that—for want of a better word—are now being used. They are being used in the economy. They are used in the medical sciences. They are used in the engineering sciences—engineering biology. Some of those have come through from the original funding of UKRI. They got one of the early start-up grants and you can track those through. Does the UKRI look from the top down to say, "Actually, this now represents a substantial part of the UK portfolio in this particular subject", and then work the cost backwards?

I can completely see the bottom up, but I just wondered more about the top down. That is where my thoughts about procurement come in—whether the procurement figures can be used in some way as a metric, as well as something that we need to be encouraging the Government to do more of.

Professor Dame Ottoline Leyser: That is an interesting question. You are right: there are examples where, yes, you can effectively build those case studies demonstrating the year-on-year shift in the nature of the investment that has gone along with then building new industrial sectors. Things like quantum might be a good example of that because there has been a 10-year programme in quantum technologies that have worked hard to create that fully joined-up system.

Looping back to what I was saying at the beginning, there is an extent to which our opportunity, as a country, is to create those—to really try to shorten the pathways between the discovery and the outcomes in the real world by that careful co-ordination. We are able to do that in a way that is much more challenging for larger, more complex nations. You are right that working backwards to demonstrate that it can work, and therefore that we can use it in different contexts, is an important way to go.

Q4 **Baroness Young of Old Scone:** Can we turn to Innovate UK? It has been on a bit of a journey over the last 10 years or so, and there have been odd mutterings in the undergrowth about Innovate UK losing its close connection with business and becoming more like the culture of the research councils and closer to academia. Tell us your view of where Innovate UK has been going and coming and what the future should hold.

Professor Dame Ottoline Leyser: The position of Innovate UK in UKRI is critical to creating that join-up that we need, and we need a strong interface between the business community and academia. That is key to making the most of the internationally leading discovery base. At the same time, we need Innovate UK to be the connector through to the other public investments in business: the British Business Bank, the new National Wealth Fund and so on. They have built strong relationships with the stock exchange and so on, so it is that join-up that is critical.

I have never understood the arguments, whether they are about Innovate UK or other parts of UKRI, that somehow being part of one organisation was going to crush the diversity that is there across it. The whole point about UKRI is to bring together and benefit from that diversity, so anything you do to get rid of it is directly counter to the way the organisation needs to go. That does not mean to say we cannot do a good job of harmonising, where appropriate, to reduce bureaucracy and friction and make it much easier for all kinds of organisations to interact with the research and innovation system. The expertise in innovative businesses and business engagement is utterly critical to how UKRI needs to function.

In terms of its journey, for me, because it is the part of UKRI that is perhaps closest to policy, it is the part that particularly strongly needs policy stability to be able to function effectively. The new industrial strategy I hope provides that stability and will allow it to focus its extraordinary skills effectively to pull through and drive forward the key priority industrial strategy sectors and the adoption and diffusion of the critical technologies that go with those things. That ability to focus and to pull is, of course, critically dependent on its join-up with the research base supported through the research councils.

Baroness Young of Old Scone: Do you think that it still has some of the characteristics that it had at the start, which was, as well as being focused on formal research activity, also being able to respond to what I would call bright ideas from industry?

Professor Dame Ottoline Leyser: Absolutely. Innovate UK is totally business focused. That is its focus, and its connection to the research base is entirely mediated through the needs of business and creating that join-up through a whole variety of mechanisms. I do not think there has been any loss of focus on businesses. In fact, you could argue that, for example, the ramp up in the delivery of those small business grants, the smart grants, has gone too far the other way in that there is too much unfocused investment allowing all those businesses to apply, which is a huge endeavour. There are thousands and thousands of businesses across the country, and it has created a huge amount of work to support those completely open calls. Maybe a more sensible use of the money would be to focus it on, for example, industrial strategy sectors more strongly.

Q5 **Lord Drayson:** Dame Ottoline, you have already described UKRI as a portfolio manager, so just turning to the question of science-based scale-ups within that portfolio, during your tenure how would you rate the ability of UKRI to assess and identify which companies that you were supporting had the potential to scale up significantly and make a meaningful impact on economic growth? The Government have expressed their desire—I think Lord Vallance—to create Britain's first trillion-pound company. Does UKRI have the skills to be able to identify those potential businesses?

Professor Dame Ottoline Leyser: I do not think that it is UKRI's job to identify the businesses. It is UKRI's job to make sure that the start-ups and spin-out companies that we support are in the best possible position to scale up. It is about generating scale-up ready companies rather than identifying them after they have appeared miraculously, so to speak. There is work on that.

You have spent a long time looking at scale-up recently, so I am sure you are all extremely aware of the challenges, but one of them is overly early incorporation, particularly in spin-out companies. They are incorporating to access early-stage finance too early, and they are unable to develop their idea to the point of proof of concept in a convincing way, so in the next round they lose the funding. We now have much more focus on those proof-of-concept funds in UKRI to keep ideas out of the incorporation phase until they are much further along. That means that when you go into your series A, you are further along and you have a much better chance of being able to work through into the next phase.

Another key element for getting companies through into that scale-up phase is markets and support for accessing markets overseas. Then public procurement is critical if we can link through. Innovate

UK needs to be very active in allowing companies to connect through to those markets.

Where it perhaps relates most directly to your question is the scale-up funds that need to come from the private sector and perhaps also BBB and the National Wealth Fund. It is a due diligence provision, which Innovate UK does.

Lord Drayson: Focusing on UKRI's role in this process of innovation, you have already highlighted certain areas of science—quantum and AI, for example—as having a disproportionately large potential in terms of economic growth. What I am trying to understand is how you see the role, or perhaps you do not see a role, for UKRI in helping to identify those potential scale-up ready start-ups.

Professor Dame Ottoline Leyser: UKRI and the data we have has been important in informing government strategy on which sectors we should all focus on. As I was coming to towards the end of my overly long answer to the first part of your question, where I think we have a more direct role is that part of the challenge has been in releasing the patient capital locked up in the major UK asset managers to support those companies. That is not a culture or a habit that those asset managers have any more, and I think that UKRI has a role in helping the asset managers to find those companies through supporting due diligence.

Asset managers invest in companies—in businesses. They do not invest in technologies. It is not enough just to have a fancy technology. You have to have a strong business model that goes with that to be confident that that company is a winner. That is where I think that Innovate particularly has a key role to play. That only works at the end of a much longer process of ensuring that the companies that are created are in a position to motor at the point when they are ready to accept those major asset investments.

Lord Drayson: So you see Innovate's role partly in those links with British Business Bank, the National Wealth Fund and the private sector, do you?

Professor Dame Ottoline Leyser: Yes.

Lord Drayson: How well do you think Innovate UK does that currently, and what is your assessment of how it is seen by private investment?

Professor Dame Ottoline Leyser: I think that Innovate has worked hard over years to build a strong relationship with the British Business Bank. It has an MoU. We did an analysis—looping back to a previous question—of companies that had resulted from research council, followed by Innovate, followed by British Business Bank, followed by private investment. There are good examples of companies that have been across that path.

Innovate now also runs a scheme that is all about co-investment. It has assembled private sector investors who are interested in investing in innovative businesses and into a portfolio and this match-making activity with innovative companies that are appropriate for those investors, doing the due diligence and providing confidence for those investors that those are the best companies to invest in.

Reputationally, I think that there is always a way to go—we all can continue to improve for ever—but I also think that it has come a long way in building the relationships needed to be a trusted partner in that endeavour.

Q6 **Lord Stern of Brentford:** Thank you, Dame Ottoline, for all that you have done over the last five years and the sense of purpose, coherence and excellence you have brought to that.

My question builds on the line of discussion that has already developed around strategy. Clearly, an outfit with a budget per annum approaching £9 billion quite rightly will get a lot of scrutiny. The National Audit Office, of course, is a big part of that, and you will be keenly aware of its review where it said that the Government do not have an overall picture of what they are asking UKRI to do and complained about goals not being specific, measurable or time-bound, making it difficult to measure success.

What do you think a strategy looks like in the sense of something as big as this and something looking at a challenge as big as this? My own view is that if you make it too specific, too measurable, and too time-bound, you trivialise a lot of very difficult issues. At the same time, you obviously want to have measures of success in relation to a clear strategy, so what do you think a strategy looks like? Do the Government understand what drives economic growth? Do the Government understand what economic growth means in terms of sustainability? You talked about the economy and public services. How does economic security fit with that? What is sustainable growth? How do you look at timeframes?

Those are not easy questions, but if the Government are going to articulate a strategy, they have to say something about them and

they have to show some understanding of what growth means and what the drivers of growth are. How do you think that strategy should be put together? Have the Government set out clearly enough what they want UKRI to do?

Professor Dame Ottoline Leyser: That is a huge question. From the point of view of the UKRI strategy even, which is a tiny subpart of that wider cross-government, high-productivity growth strategy, even within UKRI our strategy is a very high-level strategy. It is about thinking about the key components that an excellent research and innovation system needs and balancing investment across those, which is people and skills, infrastructure geographies and places, and ideas of all kinds, innovation, particularly business-led innovation. Then a section that we called in the strategy impacts, which is the key priorities that we are currently seeking to drive forward, whether that is particular technology sectors or industrial sectors.

Those are the components and we argued that, to make that hum, we needed across those to think about change across axes of diversity: Have we got the right diversity of all sorts across those components, and are they properly connected? Are we thinking hard enough about resilience for that sustainability that you need, and is that properly engaged with all the other stakeholders that need to be part of the system, whether that is policymakers across government or publics, for example? That was our strategy, and the NAO was critical of it because it did not include a list of specific, measurable objectives and so on.

My view is that at that high level it is very difficult, as you say, to become sufficiently specific. Indeed, a move to that specificity undermines what you are trying to do in the context of dynamic portfolio management and balance, perhaps well illustrated with something like the infrastructure portfolio. About 10% of UKRI's budget goes on infrastructure, large and small. The things you would want to measure across the entire portfolio are: do people think they have access to the right infrastructure? What you would expect would be a very mixed bag because always there will be people saying, "No, no, no, I need something else".

It is not necessarily the thing you want as a target, but for any one infrastructure project, absolutely brilliant: you can put in place a very SMART goal about exactly when it has to be delivered, how many people will be using it, by what time point and what proportion of those will be industrial versus from the research base—all those things. I think that the NAO way of working works

brilliantly at a slightly lower level of granularity than the high level that a lot of these wider strategies need to operate at.

Balancing those things is very difficult. Then when you, as you asked, zoom out to the whole government, that is where you wind up with something like the science and technology framework. It is a framework for how you work, not so much a strategy that gives you those specific time-bound goals. I think that it is about confidence then. Government need to develop the confidence to work in that way that follows a core aligned purpose rather than to feel it cannot possibly demonstrate value for money unless everybody is following along a little SMART goal with a time-bound output target. Fundamentally, there is an issue of trust and confidence that you can build with dynamic data monitoring, as I have talked about, but not through anchored lockdown SMART goals at that high level.

Lord Stern of Brentford: Thank you very much, Dame Ottoline. I think that we can—at least in my case—share the caution about over-specificity at the overall strategy level, although of course it kicks in as soon as you go a step down.

You have mentioned the industrial strategy as one link and the framework as another link, but do you think that overall strategic story or guidelines from government is articulated clearly enough? You can have clarity without excessive specificity. Is the process of generating those overall strategic goals sound in your view? What interaction between UKRI and the Government could give greater clarity on strategy?

Professor Dame Ottoline Leyser: As I say, building collaborations across government for UKRI has been really important. I think that we are well interfaced, particularly through the chief scientific advisers network, across departments. There is an opportunity to be clear about articulating all those high-level strategies very rapidly. In the industrial strategy, the sector plans are much better able to come up with those SMART goals than the entire strategy, which is organised very much along the science and technology framework basis, so I think it is possible.

Could there be greater clarity? Yes, and I also think that there is an opportunity through the missions to illustrate how this works in delivering for people. I am excited about the R&D missions accelerator programme that Lord Vallance has put in place, which is aiming really closely to couple the research base with the policy needs for those missions in an iterative loop. It is that relationship that we need to build the confidence and trust that I am talking

about and to build ways of working across government that are inherently open to that R&D engaged approach.

Lord Stern of Brentford: So it is partly educating government and responding to government at the same time.

If I could come down just one level, you emphasise the portfolio approach and, given the magnitude and the range, that is surely right. What criteria do you bring to judge that portfolio, stepping one down now from the discussion we have just had? Clearly, there is the excellence of research and the growth story, the commercialisation and the technology, but you must evaluate that portfolio against criteria. How do you think through those criteria in assessing your portfolio?

Professor Dame Ottoline Leyser: We built a balanced scorecard approach, as we called it, with quite a lot of input measures, but then near term more output or outcome measures and then slower-term measures. We tracked that as a key management tool, watching for shifts in things like the proportion of our grants that had international collaborators, the proportion of our grants that had business collaborators, the straightforward publication metrics that we look at and job creation metrics on a slower timeframe, particularly in the context of Innovate UK's portfolio.

There were a large number of numbers that were comparatively straightforward to collect that we tracked to understand how that portfolio was working, as well as much broader intel. Again, this is a key strength of having those deep relationships right across the community, in universities, in businesses and in institutes. Within the disciplinary communities people were raising concerns about PhD student recruitment and raising concerns about their access to key kit. All that you feed in to build that balanced portfolio in the best way that you can.

With the opportunity, as I keep saying, for £1 to do lots of things, you can invest in training for clean energy in the north-east in a way that ticks multiple boxes that you would never be able to do if you had a ring-fenced pot that was supposed to be targeted at one set of things. It is dynamic and that is partly why I keep going on about our data systems, because better data systems would make life a lot easier for working in that way.

Lord Stern of Brentford: Can you can get that richness of data without burdening individual researchers with the constant reporting across a whole range of things?

Professor Dame Ottoline Leyser: Yes, which does not mean to say that we do not need researchers to report. We ask them to report once a year, which does not seem to me to be too horrendous, given how much taxpayers' money they are spending. It is important because the outcomes and the outputs that we are interested in are very diverse. It is not just papers, which we might be able to capture automatically, but the public engagement activities they are doing, the policy engagement and the business relationships they are building. Those are not standardisable, visible things.

The other key opportunity is to work much more closely with other funders to be able to harmonise systems so that our researchers are able to put all the information they want in one place, so that everybody can get it all, so that you are not multiplying reporting to different organisations and so on.

The Chair: Baroness Walmsley, do you want to ask about outcomes?

Q7 **Baroness Walmsley:** Yes, thank you. You talked about clarity and the role of different parts of government. My question is: in response to the national audit report, which Lord Stern mentioned, it is planned that DSIT should set out a series of outcomes and objectives against which UKRI and the UK's research and innovation spend will be measured. What do you think are sensible outcomes that the UK should aim for, which UKRI could actually measure and deliver? Do you know how DSIT is identifying these outcomes and objectives and how it is getting on with it? Is DSIT the right department to do it?

Professor Dame Ottoline Leyser: When UKRI was formed, a set of objectives were set out for it and both the Grant review and the NAO report felt that it was time to refresh those—I would agree. There has been a lot of work on refreshing those objectives and I understand they are on their way to publication. What we come out with, though, as I have just been discussing with Lord Stern, is a tension in the fact that those objectives are bound to be quite high level: make sure the UK has the right skills, make sure the UK has the right equipment—those kinds of things—and the SMART or time-bound measures that are important for tracking progress and delivery.

What I think will happen is a very high-level set of objectives and then much shorter-term immediate targets that will change and that will be refreshed every year, for example, in a way that the core objectives themselves will not; they will remain stable. Then the outcomes that the Government will be seeking will be relatively

short-term outcomes: train X thousand PhD students in this area, for example. That will be a way to tension between the need to keep an eye on the whole system and its health and vitality but also the need to demonstrate that the direction of travel is the direction of travel that the Government want.

Who should be setting those things? This is where those relationships ought to be. If we have trusted relationships with government, we work together to pool our expertise on what the most appropriate targets would be, working with our key stakeholder communities. Where I think it is crucial is to get that cross-government join-up so that the key outcome ambitions of the Department for Transport, the Department of Health, Defra and so on are considered fully in the priorities in the short term for UKRI.

Q8 **Baroness Neville-Jones:** To change the focus for a moment and perhaps talk about the impact on research of the higher education funding crisis, the reason that matters particularly in the UK is because we are an outlier in conducting so much of our research in the academic sector and our universities. In addition—and this is where the funding crisis comes in—that research is cross-subsidised on the student intake and is not funded at full economic cost. The committee feels that this is potentially a very serious looming problem for research, which we are right at the brink of.

I do not know if you would agree with that analysis, but we would be interested to know what you would like to see the Government do to mitigate this problem. It is clear that we are going to go through a period of government austerity in public expenditure. I do not suppose the academic sector can be any exception from that, but how do you think the universities could cope with that? What do you think of the situation, and how do you think the universities are best advised to adapt the way they operate to the likely fiscal circumstances that we are going to experience?

Professor Dame Ottoline Leyser: This is a key challenge facing the UK at the moment. We have a truly excellent research base across our universities. The connection between research, teaching and skills development is a real strength. I also think that our dual support system is a key strength of our university sector. One-quarter of UKRI's budget goes straight into universities in block grants. It is in the English context, recognising that those equivalent funding streams in Scotland, Wales and Northern Ireland are separate. In the English context, that is 64p in the pound for the money that goes in through the UK-wide research grants and so on, which are funded at 80% full economic costs, although the analysis says that they are only funded at 70% full

economic costs because the applicants do not ask for the 80%. It is quite a complex situation. In principle, for public funding through that dual support system, there is 100%.

The universities are currently massively incentivised, I think, on volume. There is a whole variety of quite perverse incentives that create a situation where universities are expanding their research effort to capture all kinds of benefits. One is: if you have an awful lot of academic researchers, that is the volume measure through which the research excellence framework allocates its dual support funding that I talked about, so you are incentivised to have more and more and more of those people.

The way international league tables work has incentivised that volume in a variety of ways, so I think that universities have been pulled into a situation where income generation requires them to spread their research investment incredibly thinly. They have chosen then to invest money, which comes in through overseas student fees, into research to allow them to do that.

I would say that the biggest thing that needs to change is those incentives. We need to get away from the idea that more is better and to think very hard about how effectively to do less, but to do it so well that our competitiveness is not damaged by that. I think that is possible but what it requires is incentives to focus on strengths across the university system, and those will be different in different institutions. So diversity across our institutional landscape, with each institution focusing on its strengths and incentivised to collaborate with others so that we actually capture the benefit of that diversity, is where we need to be.

The current system has somehow driven, as I say, incentives to increase volume but also, worryingly, homogenisation, because a lot of that has been on competition between universities against a very narrow set of criteria, whether that is the international league tables or the REF rules. We need systems that incentivise diversity and reward collaboration. Those are the important things that I think we can do and what I hope is possible in the evolution of the REF, for example, and in the way that we are thinking about regional investment.

Some of the most impressive and inspiring things I saw, I think—as CEO, you go to some of our major cities around the country or even some of the smaller ones—was how the big research-intensive universities work closely with the more vocationally focused teaching universities and local further education, for example, to build a local innovation ecosystem that is anchored in

that area and building on the strengths of that area. We need to be able to encourage that.

The thing that worries me most about the current situation is the speed at which universities are having to respond to the financial situation they are in and the risk, therefore, of an unco-ordinated consolidation that does not allow time to consider the unique strengths of each place and how that can be complemented at the level of the wider whole-country system. That is another thing that I think we need to do at a national level. There is clearly a role for government in that, recognising, of course, that universities are crucially independent organisations and need the freedom to develop their strategies. That does not mean they cannot be helped from a co-ordinating point of view and definitely helped from an incentives point of view.

Baroness Neville-Jones: You are talking about quality rather than quantity: more hub and spoke and inter-university collaboration, which obviously does mean not acting individually on the problem, which is indeed what is happening at the moment. However, if you do all that as a university, do you reckon that the Government will not respond by simply reducing the amount of money, in view of the declining quantum of research? Is there a danger that all it leads to is just a reduction in the rations?

Professor Dame Ottoline Leyser: The challenge at the moment is that universities are currently investing billions of their own money every year in research, and they can no longer afford to do that. I suppose there is a simplistic danger that in reshaping to be more effective and efficient in the way that we are talking about, the Government would respond inappropriately by reducing the research fund. I would hope not, precisely because there is this widespread understanding that investment in research and innovation is critical to the rejuvenation of our economy, particularly regionally around the country.

If the university system can demonstrate that they have a strategic grip and they are working collaboratively across the country—and there is fantastic data about how universities as anchor institutions are driving up local economic growth—they can strongly make the case for, if anything, increased public investment through that route, because you can demonstrate the alignment to the key economic growth objectives that the Government have.

Baroness Neville-Jones: If the student intake is likely to decline, which means that the proportion that the university can fund based on students will also decrease, do you conclude that the

Government are going to have to face up to funding at 100%? Is that something that we ought to be saying?

Professor Dame Ottoline Leyser: The Government already fund at 100%. There is a dual support system, so 64p to a pound goes in through the block grant and there is 80% full economic costs on government grants, so there is actually 44p to the pound, which allows universities to invest strategically to work with charities, for example, which fund at considerably less than the full economic costs of that.

The full economic costs argument at 100% is an interesting question for other funders. Should we try to be encouraging charities to support a higher proportion of the full economic cost, for example? It is a little bit of a red herring in the overall question about financial sustainability of universities and how to ensure that we have the right volume of high-quality research going through the system. The income streams that have supported that are overseas students. It is quite difficult, I would say, to predict the direction of travel with overseas students, given the geopolitical complexities there are in the world.

There is an interesting question about our approach as a country from the point of view of visas and so on, and what we want to see in welcoming overseas students to the country to benefit from our fantastic education system but also to contribute to our economy. We know that in particular areas, in highly skilled jobs, that international flow will always be important despite our brilliant local talent pool. The notion of an isolated research and innovation system not fully open to international exchange is not helpful. We need the right level of brain circulation, as they call it, rather than brain drain in the research and innovation system.

None the less, that as an income stream to universities is not an absolute requirement for the high-quality, focused research and innovation system that we need. We can operate a high-quality system with less of that cross subsidy if we go for, as I say, that focused diversification across the sector with collaboration between organisations. I think that there is a lot to be gained from the increased efficiency that that will provide.

The Chair: Baroness Northover, Dame Ottoline has covered international students quite comprehensively just now. Is there anything else you want to add? We are running short of time.

Q9 **Baroness Northover:** I simply add that I was very interested in your replies there and the effect of the reduction of international students for the reasons that you have given. You have talked

quite a bit about trying to work across government, so I wonder to what extent have you been arguing the case that the Treasury, the Home Office and the Department for Education all need to be considering the effect of their policy in this area. You have said, in effect—as Baroness Neville-Jones mentioned—quality, not quantity, but you have also said that we need international students. We need that international flow for what they contribute. What have you been able to do to try to get the cross-government approach to this sector and to economic growth that you have mentioned in your other answers?

Professor Dame Ottoline Leyser: This is an important point about having coherent policies for research and innovation right across government in different departments, particularly in the higher education sector. Over many years, there has been an evolution of where responsibility for different parts of the system has sat, with research now through DSIT, separated from higher education, which is in the Department for Education. Join-up between departments is critical. I would say that it has worked differently well at different points during the time that I have been doing this job.

On top of that, as you say, it is key to join up both of those things with questions about immigration and the visa system in the Home Office. Again, we talk continuously to all those departments. There are inherent tensions between different policy objectives—the desire to reduce immigration, for example, and the desire to stimulate an innovation-led economy—and those are tensions that have to be navigated. An optimal path across them has to be found. That is a question of continuous dialogue. We continue to try to talk with all the relevant actors and put forward the evidence that we have.

For example, one area of focus has been a little bit further down the pipeline, in the movement of researchers post education or post PhD. We know that we have a very expensive visa system compared to other countries, particularly with the health surcharge, and we have been able to at least get to the point where we can now include on our research grants the costs for those visas so that they are not being met by the researchers themselves, who can face very big charges moving to this country in order to push forward our research goals funded through UK Government research grants. There is continuous engagement to make sure that everybody at least knows the consequences of the decisions that are being made.

Q10 **Baroness Walmsley:** Dame Ottoline, in taking evidence for our

recent report we heard from Tom Adeyoola, the new head of Innovate UK. He told the committee that Innovate's grant application process would need to be "rebuilt from the ground up" because it could currently be overtaken by artificial intelligence. Does the same apply to UKRI grants more broadly? We know you have been very clear that you ask people to disclose whether AI is used in grant applications. The question is: is this broadly happening, and how do you think things like that will proceed in the future? How should UKRI respond to this new situation?

Professor Dame Ottoline Leyser: AI is changing everything. It is very exciting and we need to work in ways that capture the benefits but mitigate the risks. That is important.

More generally, the situations of Innovate and of the research councils are substantially different because Innovate is dealing with thousands of small SMEs competing for funding. As Tom says, you can get AI to write your whole thing for you, and there are relatively few ways to check whether the applicant can deliver what they say they will deliver if AI has written it for them.

In the research base, funding from research councils is going into research institutes and universities primarily, and the lead applicants and indeed the application team more broadly will provide track record information that includes their capability to deliver, what they have managed to do before, and so on and so forth. That provides a much more straightforward assurance that whatever is written in the grant application, whether it is written word for word by the applicant or enhanced and supported by AI, they will be able to deliver. There are slightly different situations for the two.

That does not mean to say we should not be thinking hard about the role of AI in writing grants to start with. I think that it is very positive in many ways for helping people write a clear grant, improving people's English and the way it is set out. There has always been a concern that one is awarding grants to people who can write well rather than people who can do good science, and if that is levelling the playing field from that point of view, I think that is a positive.

Then there is an interesting question, particularly as AI continues to evolve at an astonishing rate: when will AI be able to think of better experiments than the applicant, when will it be able to think of more interesting hypotheses than the applicant, and does that matter? If brilliant hypotheses and experimental programmes are being thought of, and we as people are excited about those and

would like them to happen, then I would say hurrah for AI in helping us.

There is a whole different question in deciding which things to fund because I think the point of doing research and innovation is to benefit people, to improve lives and livelihoods for people. While we may want to have help from AI in helping us to decide which is the best way to do that, in the end it is up to us to make those decisions. Therefore, I think that the role for AI in assessing research applications is very different. In the end, it has to be people who are deciding which science to fund, which research to fund, and which projects are the ones we want to prioritise as communities and as people.

The Chair: Dame Ottoline, we are asking you so many questions and you are providing such useful, comprehensive answers. Are you okay for us to go a little bit beyond 11.30?

Professor Dame Ottoline Leyser: I am, yes, and I am sorry; I will try to be quicker.

The Chair: That was not a criticism; it was just checking that you are amenable to us continuing to ask questions a little bit beyond 11.30.

Q11 **Lord Borwick:** I want to ask about the impact of AI on research generally. There are lots of accusations of AI systems hallucinating references. Were that to happen in conventional research, the Royal Society would ban that researcher from applying for other grants. It would be scandalous if a researcher were to hallucinate references. What do you think will be the future of AI in research, other than the points that you have already made, and how do we deal with this hallucination?

Professor Dame Ottoline Leyser: AI does indeed hallucinate references because it is looking at all the things out there. It is writing. It knows that in the things that it is writing references happen, so it is making up references. It is an inevitable feature of the way those algorithms currently work that they put in references that simply do not exist. It is up to the human readers of those things to know that those references do not exist, and it is not difficult to check whether a reference exists or not.

In the end, it is the responsibility of the people who are using AI to ensure that there is high-quality rigour in everything that emerges. I agree with you that if that is not happening—if people are not putting in the work to do that—then those people need to be

sanctioned. It is their responsibility, if they have signed their name on something, to be confident that it is high quality and robust.

Q12 **Lord Lucas:** DSIT and UKRI have been working on metascience approaches to try to help avoid some of the pitfalls of the scientific process as it currently exists, such as perverse incentives, groupthink, funding new ideas, and so on. How do you think UKRI should look at these initiatives and what role do they have to play in making science itself function more effectively? You referred earlier to diversity of thought. When you are faced with unchallengeable dogma—"You are not allowed to research this"—or exclusive consensus such as I see in fundamental physics, with huge amounts of money going to the likes of dark matter and absolutely nothing going into challenger theories such as quantised inertia, how does UKRI deal with this situation?

Professor Dame Ottoline Leyser: This is core UKRI business: what high-quality peer review should look like. We conducted a huge review of peer review, looking at all the metascience analyses of different peer review systems. As you say, what in the end is needed is diversity. We need a system that is able to support the right balance and portfolio across.

In my experience, everybody says that the balance is wrong—everybody—but they all say that it is wrong in different ways: there is too much of X and not enough Y, or there is too much Y and not enough X. I always found it somewhat reassuring that probably we were getting it not too far off because of that. None the less, I think that you are right. Being clear about what peer review using a particular approach does and does not do, and therefore whether we are using the right range of approaches to make sure that all the things that need to happen do happen, is important.

There are modifications of what you might call the standard peer review process that are aimed at mitigating that average thought problem, such as the so-called "golden ticket" approach, where everybody sitting on a panel has a golden ticket for their favourite proposal and even if everybody else on the panel hates that proposal, that one can go through, for example.

I think that evidenced, thoughtful use of different peer review mechanisms in different circumstances is the way forward, and that is exactly the sort of thing that the metascience unit is working on. Again, given the data system improvements that are coming through the system, I think that will be a very powerful platform on which to optimise our ability to find and fund the right diversity of things, recognising that disruption is important but so is progress on promising current lines.

Q13 **Lord Ranger of Northwood:** Dame Ottoline, thank you very much for your time today—it is very much appreciated—and your candid answers. I can sense your frustration and sense the challenges you have had in getting your arms around this organisation. Years ago, I chaired a research board that was funded by a grant from UKRI. As someone from industry, I had the challenge of working with academics and researchers and trying to bring some discipline, structure, impact and governance—all these things that were alien, a bit, to the academics. There was a bit of tissue rejection: "We will take the money but we do not want all this other stuff."

You discussed data and the need to capture that so that we can have the story and make it clear where, this year, potentially £8.8 billion will be going, as well as the need for better IT. I think the PAC report this year has said that the UKRI does not have a modern IT system, even though it has been a priority since 2019. I take your view and your frustration about there not being the ability to get these data flows or dynamic data monitoring, but is this not more a case of an organisation that needs a different governance structure, and a cultural change as well? If that is the case, how can government help to do that?

Professor Dame Ottoline Leyser: The first thing to say is that new IT systems are going in. The ERP, the enterprise resource planning system, is now in, and the new grant funding platform is also in. It has been built in a very different way and there are still modules that need to be added to make that as powerful as it needs to be. It has been slow getting there but the new data systems are on the way.

I do not think that it is a UKRI culture challenge. Everybody in UKRI loves data and people are excited about the opportunity to access that data, which maps right across the organisation, in a way that supports them in their day-to-day work locally within each council but also globally across them all.

There is always a challenge in research and innovation. There is a tension between the need for that creative, bottom-up freedom to work, to follow your nose and to do what you feel like—that is a key element of our system—and the need to capture that and point it at a defined outcome, which is also important. As I said right at the beginning, the UK's research and innovation system has not been good enough at creating a properly joined-up system so that we can benefit from the wild and free in a way that does not constrain it but captures the extraordinary stuff coming out of it. There are all kinds of elements to that.

One of the things that I have been passionate about the whole time is building much higher diversity in career paths right across the system so that people move between the academic research base, business, policy, and the investor community. That join-up through people, I think, would be transformative.

Q14 **Baroness Willis of Summertown:** You have very much led on to the question I was going to ask about diverse careers and career paths in science. Could you give some examples of how or what UKRI has been doing to try to encourage those linkages or the career paths of individuals? Personally, as a researcher—I have worn a number of hats, like you have—I still think that there is a massive barrier, partly driven by the way that we assess researchers through the REF and the like. I would be interested to know, within your role, what worked. How do we tackle this one?

Professor Dame Ottoline Leyser: There are lots of things. As I say, people would ask me, "What is the one thing?" and I am a systems person so I do not like "one thing". However, the one thing, if I had to pick one, would be career path diversity, precisely because that is a systems property.

What we have done is replaced the standard academic CV, which says, "List your papers and your prizes", with a CV that has a more narrative format and is open to a much wider set of evidence types, which are: evidence your contributions to research or innovation, evidence your contributions to training and supporting others around you, evidence your contributions to the wider research and innovation system, and evidence your contributions to interfacing that with other stakeholders, publics or whatever.

That is in place. It needs monitoring and assessment to see whether it is doing its job, but I think it is a key way to ensure that someone who has had a career in policy, industry or whatever, who is then coming back into academia and applying for grants, is able to evidence their contribution to research and innovation in a way that can be compared with someone who has had a much more conventional career and will have the publications and so on that we now typically look for. Things like that are critical.

I was very interested in the fact that you said, "The way the REF assesses researchers", because the REF is supposed to assess institutions; it is not supposed to assess individual researchers. It is supposed to assess whether an institution is doing a good job with the block grant that we are giving it to provide an environment and invest in a strategy that delivers excellent research outcomes and impacts, and trains the full range of people that we need both in that institution and in the wider research and innovation economy.

We have made it about individuals because the academic research system is very focused on that at an individual level, and that is something else that we need to break. We need to break the idea that research is all about a particular layer of individuals. They are obviously critical but so is all the stuff around them and all the other people working in the system. On top of that, those individuals will be much more powerful if they are incentivised to work in teams and to contribute their expertise to a broader agenda, rather than everybody needing to have their own grant and their own set of publications and demonstrate their individual ability to do everything.

The way the REF has evolved to break the link, for example, between the publications that are assessed, the outputs that are assessed, and the individuals, has been critical. Nick is around the same table, who recommended that some time ago. It was not possible the first time. This time, Research England and the Devolved Administrations, which are in charge of the REF rules, are trying very hard to make that break full so that it is about not individuals but the institution and you can appoint someone who has no publications because it is the collective outputs and outcomes from the institution that matter, not that each person can deliver on those same criteria. That is partly what is driving a lot of the problems that we have talked about across the hour.

Q15 **Baroness Willis of Summertown:** Both of the examples that you have given I completely agree with, having sat on both sides of the table, obviously within Oxford but also on the ERC advanced panel. However, the issue with both of those comes back to the peer review system because however much you try to change that, it still comes down to a group of individuals around a table who unfortunately, I think, however hard you try, will be focusing back on the individual names and the things they have done.

Do you think that we need to change that and bring more external voices—the comments Lord Ranger just made—on to these peer review panels to try to break this system? Currently, it is inherent. Everywhere I go, it is the same peer review voices, and you can see the paperwork in front of you but people still ignore it. I am interested to know whether or not you think there are other things that we could do about the whole process of peer review, which needs to change to move the dial on this.

Professor Dame Ottoline Leyser: There are already, typically, members not from academia on UKRI peer review panels. They are not the majority by any means but they are there. A wider range of career stages is also quite important. We tend to shy away from

having people earlier on in their career and I think that is a mistake. Those people can bring in important insight.

My experience is that peer review panels can be supported to engage properly with what they are being asked to do, both through training and through structured questions about what the panels are being asked to do. Part of the irony with this whole challenge is that we have told ourselves—we have kidded ourselves, almost—that the current system, which is based on a relatively small number of metrics, such as publications and so on, is objective. Peer review panels think that they are doing the right thing. They think that they are being fair by saying that this person's publications are better than this person's, even though we know in our hearts that those judgments are not objective. They are down to a set of other people's opinions, so to speak. Helping panels to step back into a space of responsibility for their decisions across a wider range of criteria is also something that we can work harder on.

The Chair: Thank you very much. The last question—you have been extremely patient with all our many questions, Dame Ottoline—comes from Baroness Neuberger.

Q16 **Baroness Neuberger:** Dame Ottoline, you have already told us that you do not like to be asked about the one thing that you could do, but that is what we always close these sessions with. I am sorry. In your case, we would like to ask you: what is the one thing that you would advise your successor to do or to focus on? Indeed, what area do you think needs the most focus within UKRI, now that you are away from it for a bit? I am very sorry about the "one thing". You can give us two.

Professor Dame Ottoline Leyser: That is all right. As I say, it is systems. It is all about systems. I am excited about the change over the five years that I have been doing the job- the focus on systems across government has increased. People are anxious about how you deal with that but there is proper recognition that you have to think in that systems way. Another challenge I have with your question is that I am clear that Ian has to do his thing. I do not want in any way to suggest that he should do X or he should do Y.

However, in the context of the one thing and my systems focus, I would come back to the data. UKRI has done a huge amount to upgrade its data systems. It has been slow. That will be a continuous process, and I think that there needs to be recognition of the continuous need to invest in data, AI, and all the things that

go with it. We all have to reorient the way we think about things to push that higher up the agenda.

Chair: Dame Ottoline, this has been something of a marathon for you. You have answered so many of our questions and we are very grateful. Your views on your five years' experience of being CEO of UKRI have been helpful to us and we congratulate you for five very successful years. Thank you very much for coming to speak to us. It has been very much appreciated. That now concludes today's public session.