



Northern Ireland
Assembly

**Committee for Enterprise, Trade and
Investment**

**OFFICIAL REPORT
(Hansard)**

**Inquiry into Developing the Northern Ireland Economy
through Innovation, Research and Development:
University of Ulster**

8 March 2012

NORTHERN IRELAND ASSEMBLY

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Members present for all or part of the proceedings:

Mr Alban Maginness (Chairperson)

Mr Daithí McKay (Deputy Chairperson)

Mr Gordon Dunne

Mr Paul Frew

Mr Paul Givan

Ms Jennifer McCann

Mrs Sandra Overend

Witnesses:

Professor Tony Bjourson University of Ulster

Mr Tim Brundle University of Ulster

The Chairperson: Our next item of business is an oral submission from the University of Ulster. The papers on this item are in members' packs, and include the University of Ulster's very detailed and helpful response to the inquiry, for which we are very grateful. Briefing the Committee are Tim Brundle, director of innovation, and Professor Tony Bjourson, director of the Biomedical Sciences Research Institute. We are very pleased to have you here today and look forward to hearing what you have to say. We already have your written submission, but I invite you to make an opening statement.

Mr Tim Brundle (University of Ulster): We would be delighted to do so. We will make a few opening remarks and briefly take the opportunity, on behalf of the University of Ulster, to reinforce and echo some of the comments made this morning by colleagues from Queen's. We are very thankful for the opportunity to be here and thankful that the inquiry is taking place. It is certainly welcomed by the university. We are very pleased to be providing evidence to you.

As it says in our submission, we are a unitary institution. As you will be aware, we have four main campuses across Northern Ireland: Belfast; Coleraine; Jordanstown; and Magee. We are a modern, leading university. We have a strong regional mission, which I will come to later. We have performed exceptionally well in developing and enhancing the relevance and quality of our research, innovation and taught programmes. We have established excellence in chosen research areas and contributed substantially to developing regional, economic and societal capacity through technology and knowledge transfer. We are a major contributor to research and innovation capacity in Northern Ireland in support of local business and industry. We have a research strategy that focuses on a selective prioritisation

based on performance, and our research base has strengthened and expanded rapidly in respect of funding and quality. We have established research institutes in 16 disciplines across the university.

Following the publication of the results of the 2008 research assessment exercise, the independent and authoritative 'Times Higher Education' league tables of research quality placed the university in the top third of UK universities, ahead of many longer-established universities. Of the 25 disciplines that we submitted to the RAE in 2008, 21 had research assessed as being world-leading, with a four-star ranking, and biomedical sciences, which Tony Bjourson leads, nursing and Celtic studies were each ranked in the top three in their field in the UK.

Essentially, at its heart, the University of Ulster is about the creation of knowledge through research and the dissemination of that research through teaching and innovation. The production of high-quality, high-impact research is essential to maintain the intellectual and civic mission of the university, and the diffusion of research outputs into the economy are led, internally, by the university's office of innovation, which is, in effect, our one-stop shop for innovation at the university and, externally, by our wholly owned knowledge transfer and investment company, Innovation Ulster Ltd. We believe that a buoyant research base is important, not only for our collective education — that is, is the collective education of the people of this region — but for economic growth and social and civic advancement. We believe that creation and diffusion of knowledge are critical to development, not only economic development.

We welcome the inquiry, and we are hoping that the research and the evidence that has been presented to the Committee will have an impact so that we will increase the levels of research activity and innovation activity in Northern Ireland and the competitiveness of the companies in the region. It will also have a social impact on the back of that greater level of research and greater level of diffusion of the outputs of research into society.

I am Tim Brundle, director of innovation at the university, and I am also chief executive of Innovation Ulster, which is our technology transfer vehicle. I am also a board member of Invest Northern Ireland, and I am a director of a number of start-up companies that are based on the outputs of research. We were hoping to have with us Professor Hugh McKenna, but, unfortunately, he had to fly off to Italy. I am very grateful that Professor Tony Bjourson, director of the Biomedical Sciences Research Institute, is able to join me. Tony is an academic who has led a world-leading research institute.

I will amplify some of the comments that our colleagues at Queen's made a moment ago. The levels of business impact that we see are increasing from the outputs of research. We have seen a much higher degree of engagement from business into university research and development activities, and we have seen a higher outflow of research into the economy. We have seen a much higher degree of engagement from academics in business activities. We reckon that, in 2011, around 37% of our academics are working with companies today. There are a number of reasons behind that. Not only are they seeing the institutional benefits from engaging with industry, both to their teaching and research endeavours, but, as the changes have been made to the research assessment exercise and research excellence framework, we see a much higher degree of emphasis placed on impact. That is the translation of research outputs into the economy, including providing competitiveness for industry; policy inputs and impacts; and societal inputs and impacts. That diffusion is becoming increasingly important for the university sector across the UK, and we are seeing the benefits of that.

I will also highlight some comments that were made about economic strategies. At the University of Ulster, we also have an alignment between our corporate goals, the draft economic strategy and the objectives of various task forces and strategy documents in Northern Ireland. There is a strong alignment there. Historically, where the region has fallen down, as Scott Rutherford indicated earlier, is in the implementation. One thing to note is that, when we are dealing with innovation and research-based competitiveness in industry, time is a massively important factor for those companies and projects. One of the examples that was provided earlier was of the knowledge transfer partnership (KTP), where we have, in effect, lost two years of enhanced funding into industry. That is two years of activity that did not happen in a proportion of companies in Northern Ireland. That programme is still running, but at a lower level than it could have been. Therefore, we have lost opportunities for our companies to have an impact.

The Higher Education Innovation Fund was also highlighted: we believe that there was around a 16% drop in that. That is the interface between the universities' research world and the economy. That interface translates one into the other and grabs requirements from industry and brings them back into research. We have reduced the level of that activity by 16% at a time when we are highlighting the importance of innovation and R&D to the economy.

I will also touch very briefly on issues of bureaucracy, which is a problem that presents many barriers. Cherry Pipes presented evidence to the Committee some weeks ago, and it highlighted that it was spending around £35,000 to get a European framework project proposal prepared. We have seen a range of figures. Anything from £15,000 up to £45,000 is a typical investment to get the project off the ground. This is a competitive environment, and the chances of proceeding with those are small. Therefore, a high degree of investment is required from what is essentially a small-business economy. There is an opportunity there for assistance from government to help those companies to overcome the burden of getting engaged in those programmes.

I can give an example of the grant for the research and development programme that is run by Invest Northern Ireland. It provides a very small amount of money to companies that have research concepts that will apply to their competitiveness. It provides a very small amount of money to get those projects off the ground, to get them scoped out, to undertake some validation of the technology and to develop a full project proposal. Therefore, that is grant assistance to get them to the point where the project can start in earnest. That is something that we found very welcome, and it provides more opportunities for collaboration with the universities.

I could go on for hours, but it is probably best that I do not.

The Chairperson: Thank you very much, Mr Brundle. What you have said is very interesting. I would like to expand a little on the relationship between the university and Invest Northern Ireland, because you seem to have emphasised that in your written and oral submissions. No matter how good the relationship is, it can always be improved. How good is it, and in what way can it be enhanced?

Mr Brundle: It works on a number of levels. If you take the example of foreign direct investment, foreign direct investors typically target Northern Ireland because of the quality of the skills here. In looking at that, they are essentially looking for the quality of graduates. When they look at the graduates, they are looking for their availability and their depth of knowledge, as well as for quality and price points. Therefore, as Invest Northern Ireland promotes inward investment to Northern Ireland, we have an active dialogue about our course content and outputs from the university. As Invest Northern Ireland increasingly targets more knowledge-based projects internationally, we find that there is a higher degree of research activity within those projects. Therefore, those companies are looking to the universities to identify the depth of research capability in the university and the specificity of that research to the requirements of those companies, and we are continually involved in that dialogue.

That is happening on one level, which is a good thing. Secondly, as company expansions are ongoing across Northern Ireland, where the expansion is based on new technologies or research work, that is something that the universities are commonly engaged in, so we will often be a collaborating partner with companies that are experiencing that level of expansion.

On a third level, Invest Northern Ireland provides finance to assist our commercialisation efforts. That is the outflow of our research into the economy in Northern Ireland. To give an example, one scheme that it operates is the proof of concept scheme, which provides a financial contribution to academics who have ideas that may have commercial potential. That helps to de-risk the projects and validate the scalability of the technology arising from the research. It helps us to engage with the marketplace and ensure that the emerging technology is industrially relevant. That scheme has been very effective. Invest Northern Ireland also makes a contribution to the Higher Education Innovation Fund administered by the Department for Employment and Learning. Those are all areas that are beneficial and things that are working well.

The Chairperson: You also identified the 16% drop in the Higher Education Innovation Fund for research. That was also mentioned by Queen's. That is a local decision.

Mr Brundle: It is.

The Chairperson: You would also characterise that as not a very positive way of dealing with what we need to be doing now, which is to try to enhance our research capability. I just want that on the record.

There was also a very useful reference in your submission — you did not refer to it in your oral presentation — to the role of venture capital in development here, including business development, industrial development and research. How important is that? It does not seem to be given much prominence. There does not seem to be the same level of venture capital being used here in Northern Ireland as in other parts of Europe.

Mr Brundle: No, indeed. Venture capital is incredibly important as a tool to help exploit the economic value of research. If we are to start companies on the back of our research and engage with early-stage, high-technology, knowledge-based companies, those companies have a reliance on private equity, whether that be seed capital, angel investment or venture capital. Scaling those companies and making those opportunities so as to make that research pay for Northern Ireland requires those sources of capital, and venture capital is one. We certainly need an awful lot more venture capital in Northern Ireland.

The Chairperson: Can I just stop you there? I am sure you are absolutely right in that, but it seems to be almost an alien concept to a lot of people in business here. That may be reflective of our risk-averse approach to business and other matters of public policy. How do you attract more venture capital and encourage companies to take up opportunities that there might be for venture capital?

Mr Brundle: I will answer that in two ways. Belfast hosted the annual Irish venture capital conference yesterday, led by InterTradeIreland. At that conference, the sense that the attendees got was that there has never been more demand for venture capital, more need for venture capital or more interest in venture capital, and there has never been so little money available. So, the levels of competitiveness are increasing massively among those companies.

From the university's perspective, we rely on a number of sources of funds to get ideas into the marketplace. We rely on research funds, as you will be aware, and we rely on innovation funds, such as the Higher Education Innovation Fund, to translate that research from the laboratory into an enterprise. One of the comments made earlier was about risk. These are very risky ventures; when they come off, they come off big, and they have a huge economic impact. We need to be doing a lot more of that. However, those kinds of companies are not bankable. They require private equity; they require angel investors, who can give their time, expertise and funds; and they require venture capital. We, as a university, operate our own seed fund; a small venture capital fund from which we have provided some money to our companies to get them started off. That is a private fund, which we created out of necessity, not for any financial return. We did that because there was market failure in that area. We then sought venture capital money all around the world, to try to get those companies scaled. Take the deals that we have done over the past year; we have done around 12 venture capital deals over the past 12 months. Of those, I believe that nine have leveraged venture capital or angel money from outside Northern Ireland, and six have leveraged venture capital money from the United States, most specifically from Silicon Valley.

Ms J McCann: You are very welcome to the Committee. Can I just pick up on the role of Invest NI? It was mentioned earlier that you are on the board of Invest NI, so you are probably well placed to answer some questions. The paper says that Invest NI is not actively bringing research opportunities to the university —

Mr Brundle: Yes.

Ms J McCann: — and that it could do more to identify sources of match funding. It goes on to say that there needs to be a closer connection between Invest and the universities to develop that shared understanding. In some of the presentations that we have received — you will have heard me mention

this earlier — it is very clear that people are saying that there needs to be one place, if you like, where support and all that can filter through. I know that the draft economic strategy calls for an innovation council. Do we need to have a fresh look at this? Do we need some sort of structure for the business organisations that are interested in research and development, the universities, the regional colleges and SMEs? Do you feel that there is now a need for that to happen? Would that be placed, for instance, in Invest NI, to replace whatever is there at the moment? Do you sense that that would be a good way of going forward on that?

Mr Brundle: Invest has an active European team that is brokering links between companies and universities in Northern Ireland and elsewhere in Europe. That is something, certainly, to be welcomed. The point for the universities is that we go out and win our own business, whether that is with companies that Invest is promoting, with which we will go and seek research partnerships, research council money or European framework money. It is the research institute directors and their teams in universities who are the most active in pursuing that activity. Tony can come in on that in a moment.

I think that a one-stop shop is a very interesting idea, not only to bring together the market intelligence about research opportunities that exist, which might be principally in Europe but could be elsewhere, but to have those collected. It would also provide practical assistance in helping people access that money and remove the many barriers that exist between the applicants and the funds. There are a number of roles that such a thing could play.

To go back to the innovation council idea, we are big fans of MATRIX and the work it has done to plot a technological progression of Northern Ireland and identify opportunities there. It is not a scientific advisor to the Assembly or the Executive. That is something that I do not feel we are sufficiently providing for. Tony, do you want to say something on that?

Professor Tony Bjorson (University of Ulster): I agree with Tim when he said that one of the failures was implementation. He mentioned MATRIX, and I was part of its life and health sciences horizon panel, where there was a very strong commitment and buy-in from the major stakeholders involved in the various sectors, whether in ICT, life and health sciences, etc. In the life and health sciences sector, the first report of MATRIX was in 2008, I believe, and this is 2012. I am still waiting to see its implementation, quite honestly. I think that an innovation council is a great idea, but it cannot be another talking shop. There have to be clear, dynamic, time-limited deliverables for achievement and roll-out of recommendations.

The life and health sciences MATRIX panel recommended home-based care and personalised medicine as two of its priorities for the next five to 10 years for Northern Ireland. We are four years into the 10 years. We are rolling out personalised medicine, but we are, essentially, doing it ourselves, for example, at the Clinical Translational Research and Innovation Centre (C-TRIC) in Altnagelvin. That was a recognition that you need to bring all of the stakeholders to the party. You need clinicians who use drugs and devices, you need the researchers like us, who develop them, and you need commercial companies, because, as university researchers, we can come up with the best drugs or the best diagnostics in the world, but, unless they are commercialised, quite frankly, there is going to be no benefit for any patients. If you think about it, how many times have you gone to a hospital or clinic and been given a drug or prescribed a product that did not have a company brand name of some sort on it? That is because there have to be all the regulations associated with that.

There is gap between discovery at the laboratory bench and clinical utility. The office of innovation at Innovation Ulster has a series of gates, which I commend. One of the weaknesses that we saw was in bringing the stakeholders together. For the majority of clinicians, their day job is treating people. They do not really get paid to be businessmen. The majority of them give freely of their time. Similarly, my day job is doing research and teaching. I am not, first and foremost, a businessman. I do that through our office of innovation. Creating a stakeholder forum was required, so I suppose C-TRIC was a relatively low-cost initiative that brought in the clinicians; businessmen, in the form of drug companies or diagnostics companies; and, the most important component, the patients, because you must have representation from all of the stakeholders. So, although I recognise that an innovation council would be an excellent idea, I urge that time-limited delivery is key.

Ms J McCann: Whose responsibility is that commercialisation of the product now? It is obviously not happening. How do you think it could happen in a future structure?

Professor Bjourson: I would hate to create the impression that commercialisation is not happening.

Ms J McCann: But it is not happening at the level that it should.

Professor Bjourson: Yes. The other issue is that it is probably not a good idea to copy people, because you will only end up being second best. We had huge problems establishing the Clinical Translational Research and Innovation Centre. People said, "There are no examples of it elsewhere. Do you expect us to take a risk and put funding into that sort of initiative?" We said that we have to be creative and innovative, but we did not have an exemplar model to point to. Academics, by nature, are risk takers. Research is a risky business, and whether it is facilitated by Invest Northern Ireland or government, academics will endeavour to achieve their objectives. I think that the policy pursued by the University of Ulster, in the form of establishing the Ulster Innovation Fund, addresses that in many ways at a university level, with the board of the company calling in academics for their expertise. I think that people are sometimes very hesitant to put their hands up and say, "I am not the best person to answer that question. We maybe need to take advice on that". I think that we do pretty well at providing that in the office of innovation.

Mr Brundle: From a commercialisation perspective, our role is to de-risk a project and to make it as attractive as possible in order to get industry to take the lead. We want companies, ideally local ones, leading those types of projects. However, in many cases, they are not going to take raw data and research out of the laboratory, because that requires investment, be it through proof of concept or venture capital.

Mrs Overend: Thank you very much for your presentation. You are obviously passionate about the subject. You mentioned that there seems to have been an increase in R&D in recent times. Can you provide statistical evidence of that? There are more links with small and medium-sized enterprises (SMEs) than I had first anticipated, or maybe it is just a case of my knowledge being increased. Is there something that we can do to promote how successful such links are? Surely we should use that as an opportunity to get the message out so that more SMEs engage in R&D.

Mr Brundle: I agree completely. We have a number of data sources that we will be able to share. One of the data sources we use is an annual survey, the 'Higher Education — Business and Community Interaction Survey', which each university in the UK is required to complete. It is very detailed and sets the levels of business and community engagement. We can provide the raw materials and benchmarks for that to the Committee.

Mrs Overend: What I am saying is that we are so busy getting on with the work when we should be using the opportunity to promote what we do and to get the message out about what opportunities are there.

Mr Brundle: I agree completely.

Mr Dunne: Thank you very much for your presentation. We were impressed by your enthusiasm and knowledge of the subject. I think that you had the benefit of listening in on our previous questions. We were intending to run along similar lines for both parties, but we will maybe have to change that plan slightly. My points relate to funding. We have found that there is great frustration, especially among manufacturers and those carrying out research, because of the problems in accessing European funding. You said that the university has 25 framework projects. Do they relate to European funding?

Mr Brundle: Yes.

Mr Dunne: They do? Solely? So, you have gone through that pain barrier and have been able to access the funding. Why do you think you have succeeded where others have failed?

Mr Brundle: First, I do not think that we have gone through the pain barrier. We are still in pain.
[Laughter.]

Professor Bjourson: With European framework programmes, it is critical to have the appropriate networks in place. I have been involved in all types of research funding.

Mr Dunne: Mainly the pharmaceutical type?

Professor Bjourson: I was involved in the yeast genome sequencing programme in Belfast years ago. They are fundamentally different projects, and the different types of funding are quite different. The UK-based research council funding is, primarily, individual principal investigator-led. Historically, research councils have focused funding primarily on basic research that does not or would not in the past have commercial exploitation as the primary objective. It is where a single lab or a single researcher applies for a research programme of £300,000, £400,000 or £500,000. That is critical as well, because that basic-discovery, curiosity-driven research, which, when you analyse it, may not have any obvious commercial exploitation potential, is still the bedrock that, eventually, is the foundation of applied research. It is a balanced portfolio, which includes funding for basic research and intermediate research.

The EU framework programmes in particular involve multiple partners.

Mr Dunne: That is where small firms find it frustrating.

Professor Bjourson: It must be extremely difficult.

Mr Dunne: It is.

Professor Bjourson: Never mind the European framework programmes, a lot of the funding bodies require bureaucracy, administration, filling in time sheets and auditing. My personal view is that it is extremely difficult for small companies in particular.

Mr Brundle: There is a role for government — directly or by sponsoring — in finding a solution to take a lot of that administrative pain away from all of us. We are a large university, and we have a very skilled team of research administrators, but those programmes are still difficult for us, never mind how difficult they must be for a start-up company or an SME.

Professor Bjourson: An academic mentor being costed into the proposal is a possible solution.

Mr Brundle: We have seen some examples, elsewhere in Europe, where there are consulting companies and parts of government that provide administrative resource, drafting resources and financial planning resources to help companies into framework programmes. We have not been terribly active on that here.

Mr Dunne: We visited a large pharmaceutical company that does a lot of R&D work. It has some reservations about the support that it gets from Invest. That day, the emphasis was on more money being required from government for the sort of development work that it does. It works on pharmaceutical R&D, and the benefits that flow from that are great and would be good for the health service and the economy.

Professor Bjourson: As a university, not through any government directives, we have gone out to industry and asked local companies in Northern Ireland, such as Randox, Almac, Norbrook and Warner Chilcott, and companies in the Republic of Ireland a simple question, which is, "how can we help?" That does not mean that we are a charitable organisation; we have to cover our costs as well. There are ways in which you can help each other for mutual benefit. For example, if we are appointing new members of staff for taught programme delivery and we happen to know that a particular pharmaceutical company has an interest in a particular disease area or a particular drug, we can write that into the job specification of the person who we are recruiting anyway. Once that person is appointed you have an immediate alignment between the university department and the commercial company, and nobody has spent an extra pound. That is the strategy that we are embarking on.

We are basically asking the companies how we can better align our business objectives as a university research organisation or higher education institute with them as a commercial company so that it is a win-win situation for both parties. We are not being driven to do that. We see that as an absolute requirement. Rather than going to companies, as universities may have done historically, and saying that they should be doing this or that, we are basically asking what they need from a product development perspective but also from the taught programme provision perspective. We ask them whether the graduates or postgraduates that we, as a university, are generating are fit for purpose for their workforce. We have invited industrial representatives onto our course validation advisory teams, for example. They have ownership of it. If the courses are not fit for purpose, we know. We have tailored and altered our taught programmes to better align and provide a highly skilled workforce, not just for our current indigenous companies.

Tim and I were talking about, and some of you might be aware of, the Global Pharmaceutical Centre of Excellence that came to Northern Ireland looking to locate here. It was a good example where there was a better connect between the stakeholders, including the university, politicians and the regional council. In talking to those foreign direct investors, what is important for them is not only the availability of a skilled research institution, either Queen's University or the University of Ulster, but a ready supply of a highly skilled workforce — we can provide that information for them — and also the quality of life, because if teams are moving from other countries to here and bringing their families, they want to know what the quality of life is, whether the education system is good and whether there are nice beaches. We talk about better connections, but that connection between the whole package, from an Invest Northern Ireland perspective, is quite important. It is not my job to act as a tour guide. Everybody has their remit, but I would suggest that joining up that circle and describing and presenting the entire package is very important for foreign direct investment.

Mr Brundle: He is not a bad tour guide. *[Laughter.]* I read the evidence from the visit to Almac with great interest.

Mr Dunne: That is what we were hinting at earlier.

Mr Brundle: An issue for a company like that, which is highly innovative, with a high degree of economic impact, will be the amount of money and the amount of time it takes to get something from the laboratory to the market place. You are talking about seven to 12 years. We are facing exactly the same issues. Taking research from Tony's research institute into the marketplace might take four years of development activity before we even get outside the university, after which there could be another six or 10 years of development. That is a lot of time and costs an awful lot of money. We do not have the money available to do that in Northern Ireland at the moment. If it is research in the life sciences, which is an area in which we have some of the most skilled research and some of the most valuable intellectual property — it is a real jewel in our crown — we cannot take that right through to the marketplace because of the limitation of funds. So, what will tend to happen is that the university will invest in that and undertake some early-stage development work in Northern Ireland. Then, the onward benefits will be exploited elsewhere in the world. The fact that they are out there and will reach the bedside is a good thing. Benefits will flow back into the universities or the companies on the back of that, but we are only seeing a small proportion of the economic value that we could accrue if we had the investment funds available to us.

Mr Dunne: Is there a real role there for Invest to move up to the next stage in support of R&D? It is a high-risk area, and government probably does not see that as where it wants to go. It is maybe difficult for you to answer that. Your enthusiasm has come through today. We perhaps need to look at that issue more, because somebody will have to move forward on it.

Professor Bjourson: There was a strategic decision in the Republic of Ireland to focus on the pharmaceutical sector, and it has representation from every major pharmaceutical company in the world.

Mr Dunne: Manufacturing?

Professor Bjourson: Manufacturing and research. The pharmaceutical sector and the type of jobs that it provides are highly paid and highly skilled and are protected, to some degree, from an economic downturn. People get sick, probably sicker, in an economic downturn. So, government may want to take strategic decisions at a higher level to ensure that there is top-level support for the ecosystem and for developing, for example, the pharmaceutical sector in Northern Ireland. Northern Ireland is limited in its size, so I do not think that it is feasible to do it in isolation from the UK and the Republic of Ireland. However, we can strategically target a sector such as that and provide the soft landing for foreign direct investors in the form of friendly tour guides. *[Laughter.]*

Mr Dunne: From the universities. Thank you very much.

The Chairperson: We have come to the end of our questions. Once again, I thank you for your oral and written submissions. They were very interesting and very helpful to us in our inquiry.