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Impact through innovation

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Written evidence from PraxisUnico submitted in response to the Business, Innovation & Skills Select Committee inquiry into the Government's Productivity Plan

PraxisUnico is the UK's leading professional association for knowledge exchange and commercialisation (KEC) practitioners. On behalf of our members we work with key sector stakeholders – including HEFCE, RCUK, NCUB, the IPO and Innovate UK – to inform and influence public policy around knowledge exchange and commercialisation. The UK's performance in research-based innovation and associated income is high in terms of global comparisons[i] and we make this submission to the inquiry in order to underline the vital contribution of our membership organisations in the research base across universities, public sector research establishments, and independent research organisations.

The remit of the Productivity Plan is wide-ranging and we confine our comments to those aspects of relevance to the PraxisUnico membership: **Chapter 4** relating to the role of Universities, **Chapter 8** relating to High-quality science and innovation, **Chapter 13** around the championing of enterprise, and **Chapter 14** on international trade and the science base.

1) Do you agree with the Government's assessment of the reasons for the UK's productivity slowdown (as outlined in the Annex to the Plan)? Has the Government acknowledged all of the main causes of the UK's poor productivity growth?

The report (8.1, p.35) draws the link at national level between R&D spending and productivity. The preamble to Annex A (p.77) notes the relatively low level of such investment in the UK, which is well documented and has been highlighted by groups on the business (CBI) and research (CaSE) side as well as in government reports, particularly that by Terra Allas in 2014[ii]. To dismiss this factor (A.20, p.80) on the grounds that the UK nonetheless achieves high levels of research quality as evidenced in citations, is to miss an important part of the 'puzzle'. It is important to ask how long the UK can continue to produce high quality research given the current low, and falling, levels of R&D expenditure coupled with the demise of UK-based industry R&D labs. The rewards that other countries reap from their investment in

R&D have been clear; Singapore is a high-profile example recently quoted in the press, and a country that has extensive and valuable research links with the UK[iii].

We note that the analysis is heavily focused on established economies, whilst a proper positioning of the UK on a global scale needs a better analysis of the impact of huge economic changes in, for example, BRIC countries.

2) One pillar of the Government's plan is to increase "long-term investment". It outlines eight areas with specific measures to increase productivity.

a. *Why has the UK's long-term investment been so low up to now?*
b. ***How can we ensure that the measures relating to long-term investment in the new Plan will continue to contribute to productivity growth?***

Chapter 4 details the importance of world-leading universities in terms of generating the appropriate skill-base for the future. Universities are complex organisations with missions of teaching, research and external engagement that are interlinked. The engagement of UK universities with industry and government bodies, through a wide range of activities both research and skills-related, combine to ensure a relevant curriculum. Leading edge research enables foresight for the future in planning for future skills requirements. Universities are also sources of economic activity and growth through collaborative research, licensing of technologies and spin-out companies.

Chapter 4 also neglects the role of universities in providing an entrepreneurial education for students who in turn create, or play leading roles in, business of the future. Universities and research organisations have a vital and growing role to play in ensuring that graduates, post-graduates and post-docs are equipped with entrepreneurial skills to play their part in building a stronger enterprise culture (13.14, p.62) supported by public funding such as the RCUK's Young Entrepreneur Scheme (YES).[iv]

Chapter 8 acknowledges the documented link between R&D expenditure and national productivity on a global stage. In the preamble to Section A (p.15) the low level of funding for R&D in the UK (compared with the OECD average) is acknowledged, alongside the UK's strengths in Science, based on citations. Given

the growth of scientific endeavour and quality in developing nations, this cannot be an area for complacency. Protection of the science budget coupled with protecting curiosity-driven research (8.3, p.37) may be an absolute minimum to ensure continued success.

Paragraph 8.1 (p.37) acknowledges the strong links between universities and industry, the strong positioning of the UK in the Global Innovation UK and the ranking in business and university collaboration. The UK innovation system is a very complex mixed ecosystem with documented strengths and these existing strengths need to be acknowledged in proposals that seek to enhance productivity. In particular we wish to highlight the following points:

- The report discusses increasing strategic focus by ensuring "*all elements of the funding system are aligned with areas and markets of strategic importance and potential for the UK economy*." To plan on the basis of government predicting future major growth areas for scientific endeavour is to neglect the breakthroughs that can come from single and multi-disciplinary research, and thereby lead to new industries. Universities have important roles as knowledge creators, translators and disseminators in this respect, and different universities will implement these roles in a variety of ways. The role of curiosity-driven research within a diversity of institutions and their external partners, with the flexibility to respond to opportunities, must be protected.

- The Higher Education Innovation Fund (HEIF) is a modest but vital investment that the government has made over the past decade in the capability and capacity within UK universities for knowledge exchange and collaboration. Success in this area is documented through significant growth in relevant metrics (presented annually in the Higher Education Business & Community Interactions survey[v]), as well as expanding the accessibility of universities to industry and other research users in creative ways not easily accessible to metrics e.g. social and cultural impacts as well as student and graduate enterprise. The recent Dowling Review of University Business Collaboration (July 2015) found that HEIF was an "*important and much valued funding mechanism for supporting universities' capacity to engage with businesses* "

and we would endorse the Review's recommendation that this funding is given long term support as a critical enabler of many of the innovation system's highlighted strengths[vi].

- Whilst investment in Catapult Centres is a welcome addition to a complex innovation ecosystem, the relationship between the research base and companies is often a multidimensional one covering skills, use of facilities, advice and expertise, and collaborative research as well as commercialisation of technologies. Many of the research-base contributions to productivity are from the flows of *knowledge and people* through schemes such as Knowledge Transfer Partnerships or other forms of collaborative working, as well as more formal commercialisation of technologies through spin-out and licensing. Any expansion of Catapult Centres should be based on evidence of contribution to productivity – and ensure that direct and long term relationships between companies and universities are supported and enhanced, rather than disrupted or made more arm's length. This is reflected in the Dowling Review's recommendation that "*The metrics used to evaluate Catapults' performance should include indicators that capture the success of their engagement with universities*"[vii].

- Universities and other research organisations have roles at international, national and local geographical scales. Many organisations hold investments in equipment and skilled people (from the UK and overseas) that should be regarded as national assets. The sorts of investments envisaged in paragraph 8.12 will need collaborative strategies that provide benefit across a wide geography to achieve the full productivity potential. Whilst an evidence-based approach to a sense of place within innovation strategy is welcome, we note that the UK is a geographically small country on a global stage, and that we should not dismiss excellence where it fails to sit in an established local cluster.

Point 8.11 (p.38) welcomes the Dowling Review of University Business Collaborations. It then goes on to articulate an ambition for universities to "*drive*

research commercialisation, and increase the income they earn from working with business and others to £5 billion per annum by 2025". This ambition needs to be set alongside the very clear steer from the Dowling Review that universities should not assess the success of commercialisation activities with "*short-term revenue generation*" but rather assess "*their effectiveness in supporting translational activities of the longer term, not short-term revenue generation.*"[viii] Additionally, and importantly, many impacts are not income-related, such as in public health research where interventions can drive down costs or drive up efficiencies by improving population health over periods that won't be captured in short monitoring cycles.

3) The second pillar of the Government's Plan is to encourage a "dynamic economy". It outlines seven areas with specific measures to increase productivity.

a. *What are the main weaknesses of our economy, in terms of dynamism, which are suppressing our productivity?*
b. *Do the measures introduced under in the plan address those weaknesses and are they appropriate?*

In **Chapter 14** the report discusses the importance of international trade, and the broadening of responsibility across government departments for promoting international trade and investment. We suggest that such a review takes account of the body of evidence linking a strong knowledge and research base with inward investment. Universities have global networks, educate students from across the globe, and in some cases also have overseas campuses and satellites. Policy development should recognise the internationalisation of the knowledge base and the contribution this should make. UK research is international in nature attracting academics and students who bring entrepreneurial talent to the UK, and enable us to build future international collaborations.

Policy should also recognise, in the context of international investment, that overseas corporations often acquire our commercialisation successes and that the UK does perhaps need incentives for companies and investors to manage and grow highly successful spin-outs. Despite their success in starting new companies, factors outside the control of universities mean that many fail to grow beyond a certain point.

Investment practices are changing to recognise the need for a long-term, strategic approach to growing highly successful start-ups in the UK from university generated IP (so-called 'patient investment capital'): commercialisation is a long process, with research showing an average of nine years from invention to a commercial deal that is just the start of the road.

Chapter 15 again places emphasis on the role of place to drive innovation. Again we would caution on taking too narrow a geography as a basis for innovation policy. Cities are identified as enablers of "*rapid diffusion of ideas and vibrant competition of firms*" but are not always the appropriate geographical basis to use intellectual assets within the UK to best advantage. Industrial absorptive capacity does not always align with the distribution of the knowledge base. So maintaining flexibility in geography is important.

4) Overall, does the Plan adequately address the main causes of low productivity in the UK (as discussed in Question 1) and will it have the desired results?

Overall we feel that the Plan will not have the desired results for the following reasons:

- It ignores the potential long-term consequences of falling levels of R&D in the UK and instead focuses on short-term revenue generation, such as income from research commercialisation, as measures of success.
- Fails to highlight that many of the research-base contributions to productivity are from the flows of knowledge and people across a wide range of collaboration models, both UK-based and involving overseas researchers and students.
- It proposes aligning funded research to pre-determined 'strategic' areas which endangers the curiosity driven research so important to research breakthroughs in diverse and unpredictable areas.
- It takes a narrow geography as a basis for innovation policy without acknowledging the flexibility needed nationally and internationally for successful collaborations.

PraxisUnico, September 2015.

About PraxisUnico

PraxisUnico is the UK's leading professional association for knowledge exchange and commercialisation (KEC) practitioners. We have over 170 member institutions from the university, public sector research, and commercial sectors. Members are engaged across the whole of knowledge exchange activities to support collaboration and commercialisation in academic and public sector research for economic and social benefit. PraxisUnico provides a voice for the sector and facilitates interactions between universities, public sector research organisations, business and government. It is a founding member of the global Alliance of Technology Transfer Professionals (ATTP) and has delivered professional training to over 3000 individuals from 40 countries.

PraxisUnico supports and enhances the UK's reputation by delivering professional training programmes around the world, promoting best practice in KEC. This includes courses for new and experienced practitioners, encompassing 'Developing Strategic Partnerships' that addresses the skills needed to stimulate new business, grow, and maintain strategic alliances between knowledge generators in research organisations and commercial partners[ix].

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[i] The UK was ranked 2nd behind Switzerland in the 2014 Global Innovation Index https://www.globalinnovationindex.org/content.aspx?page=GII-Home.

[ii] *International benchmarking of the UK science and innovation system*, January 2014, BIS/14/544

[iii] See http://www.cityam.com/222019/singapore-50-lessons-uk-its-stunning-rise

[iv] For example, BBSRC YES is dedicated to raising awareness of commercialisation of bioscience ideas among early stage researchers and encourage entrepreneurial culture for the benefit of the UK economy. http://www.biotechnologyyes.co.uk/biotechnologyyes/index.aspx

[v] Results and analysis of the 2013-14 HE-BCI survey are available on the HEFCE website http://www.hefce.ac.uk/kess/hebci/

[vi] *The Dowling Review of University-Business Collaborations*, July 2015, BIS/15/352. PraxisUnico's submission to the consultation is available at https://www.praxisunico.org.uk/resource/praxisunico-submission-dowling-review-business-university-research-collaborations

[vii] Ibid, p.5, recommendation 11b

[viii] Ibid, p.6, recommendation 19

[ix] www.praxisunico.org.uk