

Written Evidence Submitted by the University of Leicester (RFA0064)

This response is submitted on behalf of the University of Leicester by Prof Iain Gillespie, Pro-Vice-Chancellor, Research and Enterprise.

About the University of Leicester: Leicester is a leading research-intensive university committed to international excellence, world-changing research and high quality, inspirational teaching. Founded in 1921 as a memorial to the fallen of the Great War, the University of Leicester has a proud history of ambitious projects that lead to amazing discoveries. Leicester is where genetic fingerprinting was invented in 1984 and is home to the team who found King Richard III. In 2021, we will be opening Space Park Leicester which will provide state-of-the-art, high tech facilities for research, development and manufacturing, drawing together industry and academia. We are a leading university in the UK on COVID-19 research, especially its impact on BAME populations.

What gaps in the current UK research and development system might be addressed by an ARPA style approach?

Current UKRI support for blue skies, discovery science, is suffering from years of effective declines in funding. For some research councils the process is so competitive that many “excellent” proposals are not being funded, thus delivering a very poor return for the country on the efforts of the research community to deliver world-leading work. Declining success rates for excellent research are also resulting in risk-averse funding choices, which reduces the opportunity for transformative research - the essential underpinning of any subsequent strategic effort.

The general shift in the funding landscape – away from fundamental research towards more applied research with a clear line of sight to non-academic impact and delivery of relatively short-term societal and/or commercial outcomes – thus is stifling the most innovative, cutting edge research. An ARPA style approach has the potential to redress some of this imbalance, and provide financial support to some of the excellent research that currently goes unfunded. But this will require careful thought as to what constitutes ‘high-reward’ – depending on its scope, the potential for high reward may not be apparent at the time funding is applied for or when the research is conducted.

An ARPA style body also has the potential to redress the increasing concentration of funding into a small number of large grants in a few institutions and to enable creative, groundbreaking approaches to be supported across the full breadth of the excellent UK research base, thus creating exciting opportunities for subsequent innovation.

Current funders also lack the agility (partly because of the way priorities are set by advisory bodies) to pick up quickly on exciting developments coming out of their diminished high- risk research, and focus support to deliver meaningful reward at pace. Thus there is a need for a funder that can bring agility to the landscape, supporting emerging breakthroughs as they happen, rather than several years down the line, tensioned against multiple other demands.

There are many disciplinary-specific examples and types of funding that currently constitute gaps, ranging from major national research programmes (the UK currently lacks a formal Space Programme, for example) to smaller scale high-risk pump priming for research in the tens to low hundreds of thousands delivered through light touch, fast turnaround allocation. Longer term investment in selected areas would be welcomed.

What are the implications of the new funding agency for existing funding bodies and their approach?

Creation of a funding agency focussed on visionary high-risk ideas should not further limit the capacity of existing funding bodies to support discovery-led science. It should not be used as a lever to reduce the existing budgets of research councils, nor to further reduce the levels of funding for discovery science. Instead, it should be complementary to the essential discipline-focused and mission-oriented work that UKRI enables. It is therefore important that support for UKRI-funded standard grants is maintained. Networking and collaborative grants are also invaluable in building the basis for the high-risk, high reward research that an ARPA style body would look to support.

Similarly, the existing Catapult Centres should continue to be supported. An ARPA-like body could learn from the successes and challenges of the Catapult Centres and relevant public bodies that have an R&D role (e.g., the Defence and Security Accelerator). In short, a more managed and directed determination to fund risky research and then invest early in opportunities for impact would complement rather than overlap with our existing research funding bodies.

What should be the focus be of the new research funding agency and how should it be structured?

The UK Research and Development Road Map places strong emphasis on breakthrough technologies and radical technological advancements, but a broader focus that includes research for which technological applications are not yet known should be part of the remit. Otherwise, the target of supporting and incentivising high-risk, blue skies research will be missed.

It is key that there is investment in people, especially early career researchers, who are the future leaders of research fields both nationally and internationally.

It will be important to ensure that the social sciences, arts and humanities are valued and embedded into an ARPA style approach, alongside STEM expertise. These disciplines - including research on behavioural issues and how new technologies may be adopted, equality and diversity implications, and how the past can inform the future – are crucial to our ability to socialise new ideas/technologies and understand social, cultural and ethical implications for their development and application.

We are in support of an organisation that uses theme leadership to enable agile investment across the research continuum, but experience with UK and US funders that have vested such leadership in individuals has, at best, been mixed. We would advocate a small team approach to portfolio management, involving non-traditional as well as traditional research leaders, perhaps from an equity management background where high risk investments have paid high dividends.

What funding should ARPA receive, and how should it distribute this funding to maximise effectiveness?

While they are generally perceived as the gold standard for evaluation, processes based on peer review have their limits because of the well-known biases against risky, innovative and unconventional approaches. The Leverhulme model uses expert peer review but decision-making by a much broader, development-savvy board. An ARPA type agency could learn from this approach and should involve those used to making high-risk investments in decision-making to offset natural disciplinary conservatism.

Involvement of international experts (US, Australia, Europe) in the review process may enable some of the pressures and biases of the national peer-review pool to be offset. Anonymising proposals for review (as trialled by a number of the research councils in recent years) may also help to address

issues with peer review. Canadian funders (with a relatively small pool of internal experts) have made a particularly successful practice of this approach.

What can be learned from ARPA equivalents in other countries?

Refer to comments above. A team-based approach to portfolio management, with non-traditional as well as traditional research leaders could avoid some of the traps of lock-in that have plagued other attempts to drive research through the development continuum.

What benefits might be gained from basing UK ARPA outside of the 'Golden Triangle' (London, Oxford and Cambridge)?

Basing the UK ARPA outside of the golden triangle would: diversify the research base; distribute the economic benefits of research more broadly; build regional capacity; move away from entrenched structures; and increase agility.

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