

Advanced Research and Invention Agency (ARIA) Bill Commons Committee stage

12 April 2021

The [Advanced Research and Invention Agency \(ARIA\) Bill](#) was introduced to the House of Commons in March 2021. This contains proposals to establish a new independent research body to fund high-risk, high-reward scientific research. This is proposed to sit independently of UK Research and Innovation (UKRI), which delivers the majority of public funding for research and innovation in the UK. See [How does the UK government invest in R&D?](#)

The UK National Academies are working together to ensure that ARIA will strengthen the UK's internationally outstanding track record of excellence in research and innovation, maintaining the UK's attractiveness for people from around the world to work, collaborate and invest.

This document highlights the following questions raised by the proposals in the Bill and provides a list of probing amendments that could be used to seek further clarification.

- What is the relationship between ARIA, the UK and devolved governments, and UKRI? How can we ensure that the work of ARIA is sufficiently distinct and complementary to the work of UKRI?
- ARIA is intended to have a tolerance for high-risk, high reward projects that is distinct from other existing components of the research and innovation system. Does the Bill enable this?
- Is the minimum lifespan of ten years sufficient time to assess the effectiveness of ARIA, given that high-risk, high-reward projects are unlikely to yield short-term economic returns? How can we ensure that future governments provide financial support for ARIA?
- What is the rationale for deciding the desirable proportion of public investment into R&D that should be directed through ARIA going forward?
- Government has said ARIA will not be tied to a single research focus, industry or government department 'customer', but in exercising its functions ARIA must have regard to the desirability of doing so for the benefit of the United Kingdom in a number of ways. Are these criteria appropriate to guide the operation of ARIA?
- What experience, expertise and other criteria should be represented on the ARIA Board including steps to ensure diversity and inclusion? What considerations will be made by the Secretary of State when recruiting the Chair, CEO and the ARIA Board? How will the appointment process operate?
- Is the definition of 'scientific knowledge' and 'scientific research' sufficiently broad to recognise the breadth of disciplines that may valuably contribute to high-risk, high-reward scientific research.
- What is the definition of 'invention' with regard to ARIA?

Probing amendments do not seek to make changes to the wording of the Bill but trigger a discussion during Committee stage for clarity or explanation on existing points in the Bill. All the points below are suggested as probing amendments to seek further clarification at this stage.

Clause number and title	Proposed probing amendment	Amended clause	Rationale	Background
2 ARIA's functions	<p>Page 1, clause 2, line 8, replace from '(1) ARIA may' to 'advance scientific knowledge' with</p> <p>"(1) ARIA may— (a) carry out research into science, technology, humanities and new ideas, (b) facilitate, encourage and support research into science, technology, humanities and new ideas, (c) facilitate, encourage and support the development and exploitation of science, technology, new ideas and advancements in humanities, (d) facilitate, encourage and support knowledge exchange in relation to science, technology, humanities and new ideas, (e) collect, disseminate and advance knowledge in and in connection with science, technology, humanities and new ideas, (f) promote awareness and understanding of science, technology,</p>	<p>2 ARIA's functions</p> <p>(1) ARIA may— (a) carry out research into science, technology, humanities and new ideas, (b) facilitate, encourage and support research into science, technology, humanities and new ideas, (c) facilitate, encourage and support the development and exploitation of science, technology, new ideas and advancements in humanities, (d) facilitate, encourage and support knowledge exchange in relation to science, technology, humanities and new ideas, (e) collect, disseminate and advance knowledge in and in connection with science, technology, humanities and new ideas, (f) promote awareness and understanding of science, technology, humanities and new ideas, (g) provide advice on any matter relating to any of its functions, and (h) promote awareness and understanding of its activities.</p>	<p>To establish whether ARIA's functions are sufficiently distinct from those of UK Research and Innovation (UKRI) and that sufficient mechanisms are in place to ensure that the work of ARIA is complementary to UKRI.</p>	<p>ARIA has been established to fund high-risk, high-reward scientific research that carries a high risk of failure. Are its functions sufficiently distinct from those of UKRI (both shown below) and how will it be ensured that the work of ARIA is complementary to UKRI? To initiate a discussion on this, this probing amendment gives ARIA the same functions as UKRI – this does not reflect the Academies' wishes.</p> <p>ARIA Bill 2 ARIA's functions (1) ARIA may do, or commission or support others to do, any of the following— (a) conduct scientific research; (b) develop and exploit scientific knowledge; (c) collect, share, publish and advance scientific knowledge.</p> <p>Higher Education and Research Act 2017 93 UK research and innovation functions (1) UKRI may— (a) carry out research into science, technology, humanities and new ideas, (b) facilitate, encourage and support research into science, technology, humanities and new ideas, (c) facilitate, encourage and support the development and exploitation of</p>

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	humanities and new ideas, (g) provide advice on any matter relating to any of its functions, and (h) promote awareness and understanding of its activities.”			<p>science, technology, new ideas and advancements in humanities, (d) facilitate, encourage and support knowledge exchange in relation to science, technology, humanities and new ideas, (e) collect, disseminate and advance knowledge in and in connection with science, technology, humanities and new ideas, (f) promote awareness and understanding of science, technology, humanities and new ideas, (g) provide advice on any matter relating to any of its functions, and (h) promote awareness and understanding of its activities.</p> <p>The Government policy briefing provides further clarity on its intention for ARIA to be a complementary part of the UK R&D landscape.</p> <p><i>“We will establish ARIA as an independent body, outside UKRI, but ensure, through multiple open communication channels, that ARIA will be a complementary part of the UK R&D landscape.</i></p> <p><i>The ability of ARIA to invest in high risk and novel funding approaches has the potential to complement the work of UKRI. A strong partnership between the two agencies will ensure, the UK can benefit from the unique role of both organisations in the funding</i></p>

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				<i>landscape and enable UKRI to fulfil its key role as the steward of a vibrant and inclusive research and innovation system that maximises the benefits of investing in R&I for the whole country. We will ensure that particular attention is given to ARIA's relationship with Innovate UK, considering the key role Innovate UK plays in investing public funding to help businesses scale-up and commercialise technology."</i>
2 ARIA's functions	<p>Page 2, clause 2, line 10, insert after 'contributing' '(whether directly or indirectly)'</p> <p>Page 2, clause 2, line 14, replace 'in the United Kingdom (or in the United Kingdom and elsewhere)' with '(whether in the United Kingdom or elsewhere)'</p>	<p>(6) In exercising its functions, ARIA must have regard to the desirability of doing so for the benefit of the United Kingdom, through—</p> <p>(a) contributing (whether directly or indirectly) to economic growth, or an economic benefit, in the United Kingdom,</p> <p>(b) promoting scientific innovation and invention in the United Kingdom, or</p> <p>(c) improving quality of life in the United Kingdom (or in the United Kingdom and elsewhere) (whether in the United Kingdom or elsewhere)</p>	<p>To establish the rationale for the "criteria that ARIA must have regard to the desirability of" in delivering its functions.</p> <p>In particular, to establish whether the stronger requirement on ARIA to contribute to economic growth and economic benefit in the UK than that on UKRI is consistent with the higher tolerance for failure that a high risk, high reward body will require.</p>	<p>The criteria that ARIA must have regard to the desirability of in exercising its functions differ slightly from those of UKRI (see below). It would be helpful to understand the rationale for these differences and how they enable ARIA to conduct high risk high reward research and innovation activities.</p> <p>Higher Education and Research Act 2017, Clause 95 (4) Arrangements under this section must require the Council concerned, when exercising any function to which the arrangements relate, to have regard to the desirability of—</p> <p>(a) contributing (whether directly or indirectly) to economic growth, or an economic benefit, in the United Kingdom,</p> <p>(b) advancing knowledge (whether in the United Kingdom or elsewhere and</p>

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				whether directly or indirectly) in, or in connection with, science, technology, humanities or new ideas, and (c)improving quality of life (whether in the United Kingdom or elsewhere)
2 ARIA's functions	Page 3, line 15, insert after "and elsewhere)" ", and (d) complementing the work of UK Research and Innovation."	(6) In exercising its functions, ARIA must have regard to the desirability of doing so for the benefit of the United Kingdom, through— (a) contributing to economic growth, or an economic benefit, in the United Kingdom, (b) promoting scientific innovation and invention in the United Kingdom, or (c) improving the quality of life in the United Kingdom (or in the United Kingdom and elsewhere), and (d) complementing the work of UK Research and Innovation	To establish the relationship between ARIA and UKRI, and how it will be ensured that the work of ARIA and UKRI are sufficiently distinct and complementary.	A new funding agency is welcome to provide positive disruption and encourage healthy competition and collaboration across the research and innovation ecosystem. Links to other organisations should be thought through, to avoid confusion for the user and any unproductive rivalry with the existing components of the UK's research and innovation landscape, most notably UKRI. The Government's policy briefing on ARIA acknowledges the need for a productive relationship between ARIA and UKRI, but more assurance in this area would be welcome. What will ARIA's relationship with UKRI be? Is there provision for UKRI and the broader system to learn from ARIA's novel funding mechanisms?
3 Ambitious research, development and exploitation: tolerance to failure	Page 2, clause 3, line 18, delete 'significant'	3 Ambitious research, development and exploitation: tolerance to failure In exercising any of its functions under this Act, ARIA may give particular weight to the potential for significant benefits to be achieved or facilitated through scientific research, or the	To establish whether this clause as worded is sufficient to give ARIA the ability to fund high-risk, high reward projects.	ARIA has been established to fund high-risk, high-reward scientific research that carries a high risk of failure. This clause sets out ARIA's tolerance to failure, allowing it to choose to fund high-risk projects. Ownership of failure and fast-decision making will be essential. With high-risk

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		development and-exploitation of scientific knowledge, that carries a high risk of failure.		<p>high-reward projects, support must be available to drive progress but also be willingly withdrawn if projects are not advancing as expected. Being willing to take calculated risks should never mean wantonly wasting taxpayers' money.</p> <p>The potential benefits of research may not be clear at the outset. This probing amendment seeks to ensure that this clause provides sufficiently to enable ARIA to fund high-risk, high reward projects.</p>
4 Grants to ARIA from the Secretary of State	Page 2, clause 4, line 26, after 'interest)' add 'and the proportion of the total UK R&D budget that these should represent'	(3) The conditions may, in particular, include provision under which sums paid by the Secretary of State under subsection (1) are to be repaid (with or without payment of interest) and the proportion of the total UK R&D budget that these should represent.	To establish whether it would be appropriate to set a desired proportion of the UK R&D budget that might be directed to high-risk, high-reward funding through ARIA.	<p>A budget of £800 million over this Parliament has been earmarked for ARIA.</p> <p>It is unclear what proportion of public R&D investment might be directed through ARIA going forward and the rationale for deciding this. This scoping amendment seeks to explore whether there is a desirable proportion, and whether any protections are needed to ensure that investment in ARIA does not draw away from other investment priorities that ensure the health of the UK research and innovation ecosystem, within which it operates.</p>
8 Power to dissolve ARIA	Page 3, clause 8, line 20, replace 'ten' with 'twenty'	(2) Regulations may not be made under this section within twenty years after the date on which this Act is passed.	To establish whether ten years is sufficient time to assess the effectiveness of ARIA, given that high-risk, high-reward	ARIA has been established to fund high-risk, high-reward scientific research, which is unlikely to yield short-term economic returns.

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			projects are unlikely to yield short-term economic returns.	<p>Recognising this, a clause within the Bill restricts the power to dissolve ARIA until ten years have passed.</p> <p>Studies suggest that there can be a considerable lag between research and impact. On average it takes 17 years to develop a new idea into a medical product available to the public.¹ Is ten years sufficient to assess the success of ARIA?</p> <p>ARIA has been committed £800 million over the course of this Parliament². It would also be helpful to probe what provisions have been made to encourage future governments to continue to fund ARIA for the period prescribed.</p>
Clause 12 Interpretation	<p>Page 5, line 10, insert 'and the humanities' after 'social sciences'</p> <p>Page 5, line 13, insert 'and the humanities' after 'social sciences'</p>	<p>"scientific knowledge" means knowledge in, or in connection with, any of the sciences (including the social sciences and the humanities) or technology, and includes the results of scientific research;</p> <p>"scientific research" means research and development in any of the sciences (including the</p>	To establish whether the definition of 'scientific knowledge' and 'scientific research' cover the breadth of disciplines which offer value to the undertaking and implementation of high reward research	<p>ARIA will focus on delivering economic benefit across the UK rather than a single customer; servicing a broad customer base will require an equally broad focus of research topics and the expertise they draw on.</p> <p>To achieve its functions – conduct scientific research; develop and exploit scientific knowledge; and collect, share, publish and advance scientific knowledge – ARIA must improve</p>

¹ RAND, OHE, HERG (2008) *Medical Research: What's it worth?*

² HMT, (March 2020) *Budget 2020*

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		social sciences and the humanities) or in technology.		translational research with a focus on pulling through discoveries into products and services. Expertise from the social sciences and humanities are key to understanding the adoption of new technologies and programmes.
Clause 12 Interpretation	Page 5, after line 13, insert “invention” means the process by which ideas are converted into value — in the form of new and improved products, services and approaches’	(1) In this Act— ... “invention” means the process by which ideas are converted into value — in the form of new and improved products, services and approaches.	To establish the meaning of “invention” in the title and functions of ARIA	ARIA has been established to pursue high-risk, high-reward research programmes. In exercising its functions, it must have regard to “promoting scientific innovation and invention in the United Kingdom” It would be helpful to better understand what is meant by the term ‘invention’ and how this is distinct from innovation. The proposed definition used in this probing amendment is an existing definition of innovation [Investing in Innovation , Royal Academy of Engineering, 2015] intended to prompt a discussion of how the term ‘invention’ should be understood in the context of this Bill.
Schedule 1, Clause 2, Membership	Page 6, line 24, insert new subclause ‘(5) The chair and Secretary of State must, in appointing the executive and non-executive members of	(5) The chair and Secretary of State must, in appointing the executive and non-executive members of ARIA, have regard to the desirability of the members (between them) having experience of -	To establish what expertise and experience should be represented among ARIA’s members, including steps to ensure that these appointments consider	The ARIA Bill does not prescribe the desirable experience that members of ARIA should have. In contrast, the Higher Education and Research Act (Schedule 9, clause 2) prescribes desirable experience that members of UKRI should have between them, including:

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	<p>ARIA, have regard to the desirability of the members (between them) having experience of -</p> <p>(a)research into science, technology, humanities and new ideas,</p> <p>(b)the development and exploitation of science, technology, new ideas and advancements in humanities, and</p> <p>(c)industrial, commercial and financial matters, the charitable sector and the practice of any profession.</p>	<p>(a)research into science, technology, humanities and new ideas,</p> <p>(b)the development and exploitation of science, technology, new ideas and advancements in humanities, and</p> <p>(c)industrial, commercial and financial matters, the charitable sector and the practice of any profession.</p> <p>(d) relevant experience in relation to at least one of Wales, Scotland and Northern Ireland.</p> <p>(e) diversity and inclusion</p>	<p>diversity and inclusion, and whether it would be helpful for the Bill to prescribe this.</p>	<p>(a) research into science, technology, humanities and new ideas, (b) the development and exploitation of science, technology, new ideas and advancements in humanities, and (c) industrial, commercial and financial matters, the charitable sector and the practice of any profession.</p> <p>And</p> <p>desirability of the members including at least one person with relevant experience in relation to at least one of Wales, Scotland and Northern Ireland.</p> <p>Given that, as the government policy briefing sets out, shaping the research, culture, and setup of ARIA and its position as a distinctive part of the UK's research funding landscape lies in the hands of the CEO, the appointment of ARIA's executive and non-executive members will be crucial to its success.</p> <p>Is there experience that it is important for ARIA to have represented among its membership that could helpfully be prescribed in the Bill?</p>

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	<p>(d) relevant experience in relation to at least one of Wales, Scotland and Northern Ireland.</p> <p>(e) diversity and inclusion '</p>			How will the government ensure due consideration of diversity and inclusion?