

October 2021

Evaluation of the Fund for International Collaboration (FIC)

**Baseline and Interim Process Evaluation –
Executive Summary and Main Findings
Report**



Version 1.6

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Table of Contents

EXECUTIVE SUMMARY	2
SUMMARY	5
1 The evaluation of FIC	14
1.1 Study objectives and phases	14
1.2 A mixed methods approach grounded in a Theory of Change	15
2 Main findings from a process perspective	20
2.1 Introduction	20
2.2 A dedicated Fund created to fill a gap in the funding system	20
2.3 International collaboration in research and innovation allows the UK to tap into expertise and research capital elsewhere, expanding the frontier of what would be possible nationally	21
2.4 FIC sits alongside other initiatives to support international collaboration	22
2.5 It adds value by providing a dedicated Fund targeting priority countries and by encouraging funder to funder relationships, which in turn could lead to more sustainable results	24
2.6 Advance knowledge of FIC funding waves helps in establishing the best portfolio of programmes to support Fund objectives	26
2.7 A clearer strategic steer could help Councils in targeting and selecting opportunities	27
2.8 The Strategic Opportunities Stream is a welcome addition to a Fund that intends to capitalise from emerging opportunities, but there is currently a lack of transparency or awareness	29
2.9 FIC adds to a suite of Fund level approaches that are strengthening cross-Council working	30
2.10 There are opportunities for greater sharing and learning between programmes	31
2.11 Project applicants reported high levels of satisfaction with FIC programme processes	32
2.12 Project applicants report widespread delays and challenges, but are positive about being on track to achieve their objectives	34
3 Main findings from an impact evaluation perspective (baseline and early progress)	36
3.1 Introduction	36
3.2 FIC has successfully delivered and attracted additional resources to fund international collaboration in research and innovation	36
3.3 It has increased the funding available in the UK to conduct research with key priority countries, but to a limited extent	37
3.4 FIC has allowed the strengthening of partnerships between funders, demonstrating that successful international collaboration is built over time	41
3.5 Uncertainty remains about sustainability as partners in the UK and abroad would struggle to identify sources of funding to continue (research) partnerships	47
3.6 Researchers and innovators agree that the international collaboration funded by FIC (projects) has allowed them to access knowledge, expertise and infrastructure that does not exist nationally	48
3.7 FIC has removed certain barriers to international collaboration, mainly related to funding and collaboration frameworks, but many others (not explicitly addressed by FIC) still remain	49



3.8	It has facilitated new collaborations among researchers and innovators	51
3.9	There is early evidence of initial gains in terms of better understanding of research and innovation partners' research agendas and capabilities, and improved skills and capabilities of working in international teams	52
3.10	It is too soon to present evidence on R&I outputs, but data collected will allow the tracking of results over time, and some interesting results have started to emerge	54
3.11	And researchers and innovators agree that access to FIC has been critical in obtaining the results so far	61
3.12	There is also evidence of wider opportunities being pursued by collaborators	61
3.13	FIC is contributing to supporting BEIS and wider Government objectives, mostly by adding value to science diplomacy efforts	62
3.14	Findings are in line with international experience	64
4	Concluding remarks and recommendations	66
4.1	Concluding remarks	66
4.2	Recommendations	66

Tables

Table 1	FIC funding in comparison with examples of other international collaboration initiatives	23
Table 2	FIC Portfolio of programmes	24
Table 3	FIC Portfolio of programmes – partner countries	25
Table 4	UK collaboration with FIC priority countries in Horizon 2020 (EU contribution in £m)	40
Table 5	FIC Additionality in relation to the development and strengthening of funder-level partnerships	42
Table 6	Enabling factors and barriers	46
Table 7	Sustainability	47
Table 8	New and existing partners	51
Table 9	Summary of first-time collaborations between FIC project partners	52
Table 10	Improvements in understanding and likelihood of collaborating	53
Table 11	Change in skills and capabilities to working in international teams	54
Table 12	Co-publications (UKRI) between UK and FIC priority countries (% that include partner country, average across periods)	57
Table 13	International co-publications between UK (and selected comparator countries)	57
Table 14	TRL progression	58
Table 15	Other R&I outputs	58
Table 16	Other R&I outputs, per £m invested	59
Table 17	Outputs emerging from projects	60
Table 18	Research proposals	62

Figures

Figure 1	Key findings on early progress _____	3
Figure 2	FIC objectives, themes and key evaluation questions _____	15
Figure 3	Evaluation methods _____	16
Figure 4	Overview of stakeholder groups consulted _____	17
Figure 5	FIC logic model and alignment with evaluation themes _____	19
Figure 6	Satisfaction with project application processes amongst successful (left) and unsuccessful (right) applicants _____	33
Figure 7	Project progress, delays and issues _____	34
Figure 8	Impact of COVID-19 on FIC projects _____	35
Figure 9	Number and value grants allocated to grants/projects with at least one FIC priority country _____	38
Figure 10	Motivations for working with overseas partners _____	48
Figure 11	Advances in research and innovation due to collaboration _____	49
Figure 12	Barriers to international collaboration (and overcoming / lessening these through FIC) _____	50
Figure 13	What would have happened in the absence of the FIC funding (for projects) _____	51
Figure 14	Share of international co-publications between UK (and selected comparator countries) _____	56
Figure 15	Importance of international collaboration in achieving results _____	61

Boxes

Box 1	Approaches to support international collaboration _____	22
Box 2	Research Councils – % increase in value of grants due to FIC (2017–2018 versus 2019–2020) _____	38
Box 3	Countries – % increase in value of grants due to FIC (2017–2018 versus 2019–2020) _____	39
Box 4	Summary of key findings form literature review _____	64



Evaluation of the Fund for International Collaboration

Process evaluation and early findings

Version History

Version No.	Date	Details of changes included in Update	Version reviewed by
1.1	7 th June 2021	Initial Draft	UKRI FIC team, UKRI Evaluation team, FIC Working Group
1.2	21 st June 2021	Addressed comments on v1.1	UKRI FIC team, UKRI Evaluation team, Evaluation Advisory Group, NPIF Evaluation Oversight Board
1.3	14 th July 2021	Addressed main comments on v1.2	External copy editor (before submission) International Committee
1.4	9 th August 2021	Addressed all comments on v1.2 and 1.3	UKRI FIC team, UKRI Evaluation team
1.5	1 st September 2021	Addressed all comments on v1.4	UKRI FIC team, UKRI Evaluation team
1.6	18 th October 2021	Addressed all comments on v1.5	



EXECUTIVE SUMMARY

The Fund for International Collaboration (FIC) is a £160m UK Research and Innovation (UKRI) fund that aims to enable the development of strategic partnerships with global Research and Development (R&D) leaders and address a key gap in the national research and innovation (R&I) funding portfolio. Its high-level objectives are:

1. To **enable UK researchers and innovators to collaborate with the best international partners**, to carry out world-leading research and innovation which delivers new knowledge and societal and economic impact to the mutual benefit of the UK and partner countries.
2. To **support Department for Business, Energy and Industrial Strategy (BEIS) and wider Government objectives**, including science diplomacy, enabling the UK to strengthen its collective voice in research and innovation policy.

The Fund has awarded £153.4m to 33 programmes so far. These are then being implemented by UKRI Councils, in various combinations, and in collaboration with overseas funding agencies from 22 different countries. As of March 2021, 424 grants and innovation projects had so far been awarded by these FIC programmes, alongside several investments in infrastructure.

UKRI has commissioned Technopolis to undertake **a process, impact and economic evaluation of FIC**. The aims of this exercise are: (i) to inform ongoing and future improvements to the Fund, in order to maximise the value of public funding (and in particular, the possibility of future growth of FIC), (ii) to demonstrate what the Fund has delivered for taxpayers, and (iii) to help UKRI build the evidence base on “what works” in internationally collaborative R&I.

The evaluation is asked to consider three broad themes to address the aims of the evaluation and to understand how effectively FIC has met its objectives.

- **Theme 1:** Enabling funding. Reducing the barriers for accessing and applying for international collaboration R&I funding
- **Theme 2:** Developing partnerships. Enabling, strengthening, deepening and broadening relationships: within the UK and internationally; at all levels (funders, institutions, individuals); and both within and beyond FIC
- **Theme 3:** Deepening R&I. Supporting R&I within new and existing areas of strategic importance across the UKRI international portfolio.

For each theme, and in line with our Theory of Change for FIC, we covered the effects at two levels: at funder level (Tier 1) and at the level of researchers and innovators (Tier 2).

The study is taking place in four phases, over the period from June 2020 to January 2025. This report represents the main output from the second phase and covers:

- A baseline, which will allow the tracking of outcomes and impacts as the programme evolves, as well as evidence of early progress towards impact
- An interim process evaluation, which analyses the extent to which (and how) FIC is working and being delivered as intended

The report draws on a mix of methods and evidence sources, including: a desk-based review of programme documentation and data; a bibliometric analysis; analysis of secondary data sources; consultation with 89 stakeholders via interview and workshops; surveys of 403 successful and unsuccessful UK applicants to FIC programmes, as well as international participants in UK-led grants; and the development of a series of 5 in-depth case studies that focus on the UK’s evolving relationship with international funders across five priority countries.

The figure below presents **headline findings from the evaluation on the early progress of FIC** in relation to its two main objectives and three headline themes.

Figure 1 Key findings on early progress

Objective 1	Findings	
Q. To what extent (and how) has FIC enabled collaboration between the UK and the best international R&I partners?		
 Theme 1: Enabling funding	Tier 1	<ul style="list-style-type: none"> FIC is the UK's only non-Official Development Assistance (ODA) fund dedicated to developing relationships at the <i>funder</i> level It has successfully (and rapidly) awarded £153.4m to 33 programmes so far It has increased the funding available in the UK for R&I international collaboration with FIC priority countries, but only to a limited extent (~8% of the value of all UKRI grants with these countries 2019-2021) given the size of the Fund relative to pre-existing international activities It has successfully leveraged £197m in match funding from overseas funders, plus a further ~£31m in contributions from UK and overseas funders that go beyond match funding commitments to FIC It has facilitated collaborative frameworks that will make it easier to collaborate with international partners (funders and researchers and innovators) going forward
	Tier 2	<ul style="list-style-type: none"> 55% of the unsuccessful applicants to FIC programmes (researchers and innovators) have not pursued their project idea in the absence of FIC funding, and a further 16% have done so but with fewer or no overseas partners, showing the importance of FIC funding for internationally collaborative R&I (and the limited availability of alternative funding sources)
 Theme 2: Developing partnerships	Tier 1	<ul style="list-style-type: none"> FIC has strengthened partnerships between UK Councils and overseas funders via: <ul style="list-style-type: none"> Continuation of partnerships via follow-on funding into new or existing areas A first possibility to have a concrete (funded) opportunity to collaborate Bringing together organisations that have never collaborated before The UK has a long history of collaboration with many FIC priority countries and, as such, many partnerships pre-existed the Fund. Unsurprisingly, FIC additionality has been higher among novel partnerships. At this point in the evaluation there is limited evidence on how those partnerships have evolved (thanks to FIC), but this is expected to materialise in the future
	Tier 2	<ul style="list-style-type: none"> FIC has created new collaborations among researchers and innovators. 38% of the partnerships supported by "FIC projects" (grants funded by FIC programmes) are with new overseas partners. 84% are new to UKRI (i.e. combinations of organisations funded for the first time by UKRI) It has improved the ability of UK researchers and innovators to work with international teams, and increased understanding of their capabilities, research agendas and priorities

Q. To what extent (and how) has FIC delivered knowledge impact, economic impact (for the UK and high performing R&I nations) and societal impact?

 <p>Theme 3: Deepening R&I</p>	<p>Tier 2</p> <ul style="list-style-type: none"> • Researchers and innovators agree that FIC projects have provided access to expertise, knowledge and research infrastructure that does not exist nationally, and that is critical to attaining their objectives • It is early days for many FIC projects (and some awards are still to be made) but some have already made progress in terms of advancing the Technology Readiness Level (TRL) of their solutions and in creating new research tools, models and materials • More importantly, we find that FIC is producing more outputs per £ million invested than all other UKRI grants that support international collaboration (with FIC priority countries) in terms of numbers of publications, new research databases and models, new research tools and methods, and software and technical products.
	<p>Tier 1</p> <ul style="list-style-type: none"> • Outputs are expected in areas of key strategic interest for the UK and its partners, including AI and healthy ageing (for example), but also in terms of business acceleration and internationalisation

Objective 2	Findings
<p>Q. To what extent (and how) has FIC strengthened the UK's collective voice in R&I policy?</p>	
	<p>Evidence emerging from case studies being developed for the study (each focused on the UK's relationship with an overseas funder in one of the FIC priority countries) points towards five routes by which FIC is delivering on its objective of supporting Government objectives, including science diplomacy:</p> <ul style="list-style-type: none"> • Offering an interesting example of an instrument for funding international collaboration that countries would consider emulating • Providing funding to fulfil or follow up on political commitments and common aspirations between the UK and partner countries • Acting as a platform to systematically identify joint opportunities or capabilities • Leveraging and adding value to the work undertaken by other government organisations, including the UK Science and Innovation Network • Providing an opportunity to increase awareness and perceptions of the UK as a potential partner for research and innovation in the future <p>The first four routes are facilitated by the nature of the Fund, which focuses on funder-to-funder relationships.</p>



SUMMARY

This study

FIC is a £160m UK Research and Innovation (UKRI) fund, launched in 2018, that aims to enable the development of strategic partnerships with global R&D leaders and address a key gap in the national research and innovation (R&I) funding portfolio. It sits alongside other new cross-UKRI funds and forms part of a package of measures to maintain the UK's global R&D leadership and thereby deliver against the ambitions of the Industrial Strategy (that set out the need to remain connected to other leading international sources of ideas and to make strategic choices to maximise international collaborations) and the subsequent International Research and Innovation Strategy (that set out the intention to build and promote international partnerships and seek opportunities for collaboration to deliver shared objectives).

UKRI has commissioned Technopolis to undertake a process, impact and economic evaluation of FIC. The aims are: (i) to inform ongoing and future improvements to the Fund, in order to maximise the value of public funding (and in particular, the possibility of future growth of FIC); (ii) to demonstrate what the Fund has delivered for taxpayers; and (iii) to help UKRI build the evidence base on “what works” in internationally collaborative R&I.

The study is taking place in four phases, over the period from June 2020 to January 2025. This report represents the main output from the second phase and covers the assessment of the baseline and early progress (impact evaluation), as well as the interim process evaluation. This summary sets out the key findings from these, together with recommendations for the future. Further evidence that substantiates these findings is presented in the Main report (below) and in the accompanying Technical Report.

The baseline analysis focuses on comparisons with a period prior to FIC, including presenting statistics prior to 2019, or by collecting information from stakeholders in terms of “changes” enabled by FIC. It also captures information on the counterfactual scenario, either in a qualitative way (via analysis of results enabled by FIC that would not have been possible by other means) or in a quantitative way (presenting comparisons with benchmarks or control groups whenever possible or relevant). Our analysis focuses on what FIC has delivered in comparison with other means of supporting international R&I collaboration (i.e. Business as Usual), such as bilateral programmes funded through Council core budgets, or the welcoming of international partners in proposals for UKRI Council grants. Comparisons with other specific national and international programmes were deemed not appropriate (given differences in scope). Finally, the study does not explore, in a systematic way, what the results would be of delivering FIC in a different way (e.g. different budget or different countries in scope), as this would require a full ‘options appraisal’ (which is beyond the scope of this evaluation).

Main findings from the interim process evaluation

FIC provides an additional, dedicated Fund that addresses a gap in the UK funding system, providing the opportunity to pursue activities that would not otherwise have been progressed.

It emerged in recognition of the importance of supporting internationally collaborative R&I to expand access to ideas, talent and investment, and the desire to offer (non-ODA) funding for collaboration with key priority countries that were not explicitly covered by other UKRI Funds. While UK Councils already collaborated with most of these leading developed research nations, funding was (increasingly) limited and international opportunities were being missed or de-prioritised.

[For further evidence, see Section 2.2 of the Main report]



FIC allows the UK to tap into expertise and research capital elsewhere, expanding the frontiers of what would be possible nationally.

The internationalisation of R&I has been observed across different countries and fields/sectors, and is increasingly needed to address global or societal challenges. International engagement provides a vital underpinning to research excellence, and there is a wide consensus that it improves the quality and impact of research. It can also be important for accessing unique resources or capabilities, maintaining involvement, or accessing new networks or markets.

[For further evidence, see Section 2.3 of the Main report]

FIC sits alongside other initiatives to support international collaboration.

There are different ways in which the UK and governments around the world provide support for international collaboration and most countries have an increasingly varied portfolio of relevant initiatives. In many cases though, this does not include stand-alone programmes with earmarked budgets, as with FIC. However, FIC is a relatively small investment in comparison with other key UK initiatives to support international collaboration (e.g. contributions to ESA, CERN or Horizon Europe) and its achievements should be viewed in this context. FIC's relatively small size also has implications for the ability to attribute impact to the Fund, and so the evaluation is exploring FIC's direct contribution, rather than just examining what is happening at a macro level and attributing these changes to the Fund.

[For further evidence, see Section 2.4 of the Main report]

FIC complements the existing international collaboration activities of Councils by providing a dedicated Fund targeting priority countries and encouraging funder-to-funder relationships.

The addition of FIC funding has been positively received across all UKRI Councils, as it offers the opportunity to fund international collaboration that would not be possible via other means, or to do so at a scale that is not usually feasible. Also, other than Official Development Assistance (ODA) programmes, there is no other UKRI fund dedicated to developing relationships at the funder level and so FIC offers the opportunity to build deeper, more stable and longer-lasting relationships for the UK. The FIC portfolio currently consists of 33 programmes, with a budget of £153m and collaborations with 22 different countries (further awards are expected). These programmes then support a range of activities to establish and develop connections between research and innovation communities, identify common areas of interest, and develop common research agendas, helping to enable future collaboration.

[For further evidence, see Section 2.5 of the Main report]

The experiences of two waves of programme selection suggest that advance knowledge of FIC funding helps establish the best portfolio of programmes to support Fund objectives.

The need to deliver in-year spend in 2018/19 meant the process for allocating wave 1 funding was run to tighter timescales than wave 2. This was reflected in feedback from Councils, who regularly highlighted that the timetable for wave 1 was too short, with only limited opportunity to identify, discuss and prepare programme ideas. As a result, there was a tendency to propose programmes based on established funder relationships and initiatives, already well-developed ideas, and where spend could commence quickly. Whilst the short timescale was necessary, the implications of this are somewhat at odds with some of the strategic ambitions of the Fund. By comparison, wave 2 was anticipated, allowing more time to explore possibilities, plan, engage and think strategically about the best opportunities. This is reflected in the scoring data, where a greater proportion of wave 2 bids were considered above the basic threshold for funding (they were scored as at least satisfactory for each of the four essential criteria).

There is now widespread concern amongst Councils that any future wave of FIC funding might repeat the experiences of wave 1. There is a need for clarity (and forewarning) of the timing, scale and priorities of any potential future funding, such that Councils are given the best



chance to explore and develop new opportunities (internally and externally), can sustain current developments and achievements (and not mislead, frustrate or disappoint overseas partners), and are able to prioritise what to bid and when. This is particularly important if the Fund wishes to encourage and support the development of new relationships between UK and overseas funders, rather than just the strengthening of existing linkages.

[For further evidence, see Section 2.6 of the Main report]

A clearer strategic steer could help Councils targeting and selecting opportunities.

The funding criteria for selecting programmes (and choice of priority countries) were broadly seen by programme leads as appropriate for the objectives and intentions of FIC. However, there were calls for additional clarity and specificity in several areas that it was felt would aid programme idea and proposal development. This includes the importance attached to multi-disciplinary/Council activity, the BEIS/UKRI international goals and priorities that programmes should align with, the rationale for the choice of priority countries, and the likely scale of programmes that will be funded. The additionality criteria and guidance could also be improved to focus more on complementarity and added value with respect to existing initiatives. The evaluation team's review of the guidance leads us to concur that the main criteria were well aligned with the logic and intended outcomes of the Fund, but that all of the areas suggested above could also usefully be revisited. FIC's relatively small budget contrasts with a high level of demand and lots of potential opportunities for international programmes. Additional guidance would help steer Councils towards the most appropriate ideas to develop and propose, helping the Fund to better achieve its aims, while reducing wasted resources.

The scale of ambition for FIC (its objectives and scope), was considered by many of the Council representatives consulted to be too great, given the scale of funding available (overall, per country and for individual partnerships), with the risk of creating a thinly dispersed and uncoordinated portfolio of programmes. Additional funding might help achieve critical mass. Alternatively, a more targeted and coordinated approach might enable the Fund to achieve more with its resources.

The processes and administrative requirements for programme bidding were generally regarded as lean, light touch and straightforward. However, suggestions were made that Councils be able to provide a view on the relative importance or prioritisation for their bids, and that bidders be given an opportunity to answer questions or defend their proposal. Concerns were also raised about the extent of relevant thematic/sectoral expertise on the selection panel, as well as about the consideration given to the relevance of cross-Council and multi-disciplinary working, or of funder-to-funder collaboration in different contexts.

[For further evidence, see Section 2.7 of the Main report]

The Strategic Opportunities Stream is a welcome addition to a Fund that intends to capitalise on emerging opportunities, but there is currently a lack of transparency or awareness.

A separate mechanism – the Strategic Opportunities Stream – exists for opportunities that do not fit with the timescales of the standard FIC programme selection process, with ringfenced funding available to support such activities. As of March 2021, two additional programmes had been awarded through this route (further awards may be made here).

There was variable awareness of this scheme's existence across the various consultees from Councils, and for many programme leads it remains something of a mystery. This is partly by design, given that it is a relatively small pot of funding. Nevertheless, there is widespread support for such an agile stream that can react quickly to emerging opportunities and challenges, support wider diplomatic activities and government priorities, or that might help address challenges associated with fixed FIC spending timetables. There was universal support for maintaining the Strategic Opportunities Stream, and perhaps even expanding it, in future.

[For further evidence, see Section 2.8 of the Main report]

FIC adds to a suite of Fund-level approaches that are strengthening cross-Council working.

Councils were encouraged to bid jointly for FIC funds, although this was not essential, and the majority of the resulting portfolio of programmes (19/34) does involve two or more Councils. The Councils are accustomed to working together, including on international endeavours, and have been doing so for many years. As such, no significant issues were reported with cross-Council working in the early implementation of FIC programmes.

The opportunities of FIC are reported to have further encouraged and incentivised cross-Council collaboration. The centralised funding pot also provides additional “neutral” resources that encourage greater openness and flexibility. However, it has to be noted that this added value (“neutral” resources) is a characteristic that FIC shares with other (Fund level) investments implemented by the National Productivity Investment Fund (NPIF).

Several programme leads also highlighted that cross-Council working can help to align interests with overseas systems that are not structured similarly to the UK. Many of the overseas funders involved in FIC programmes (for example the National Endowment for the Humanities in the US, the Natural Science Foundation of China, or the Social Science and Humanities Research Council of Canada) have remits that cut across those of individual UKRI Councils.

Cross-Council working on FIC programme development and implementation is also already showing signs of longer-term benefits. Councils regularly reported to the study that this had led to the identification of other opportunities to work together, both directly relating to current programmes and more generally. Individual interactions had also provided greater insight into how other Councils work, including an opportunity to share good practice.

[For further evidence, see Section 2.9 of the Main report]

There are opportunities for greater sharing and learning between FIC programmes.

The FIC team was commended by programme leads for its support in adjusting to and learning the relevant administrative and reporting requirements for FIC and these are now generally seen as appropriate and straightforward as a result. There is also appreciation for the fact that the information being provided is actually being viewed and used. Similarly, the FIC Board¹ noted that the information from programmes was timely and of high-quality, already providing useful insights into emerging findings and impacts. However, there were some suggestions for improvement made, including less frequent reporting (which has already been addressed) and improved lines of communication with programme leads.

The FIC working group (consisting of Council representatives, the FIC team, an overseas team representative and individuals from UKRI cross-cutting functions) is working well in terms of sharing information and views around particular issues and challenges relating to FIC, and there is a desire to further strengthen the use of this platform going forward. There is, however, less opportunity for cross-Fund learning and sharing between other programme leads (not with the working group). It was suggested that additional groups might be considered, tied to particular partner countries.

[For further evidence, see Section 2.10 of the Main report]

Project applicants reported high levels of satisfaction with FIC programme processes.

Successful UK project applicants were mostly positive about their experiences of the application process across different FIC programmes. Two FIC-specific elements that were highlighted included specific support being provided to engage with potential overseas partners and the benefits of allowing single submissions for multi-Council/country awards.

[For further evidence, see Section 2.11 of the Main report]

¹ The Fund is overseen by the FIC Board, which consists of internal and external stakeholders. It hears advice on programme delivery and performance and takes decisions on where to start/stop/change live investment activity.



Project applicants report widespread delays and challenges but are positive about being on track to achieve their objectives.

A slight majority (56%) of project participants reported some delays or issues with their timetable, with widespread disruption caused by the coronavirus pandemic. As a consequence, around half (47%) of survey respondents reported having requested an extension to their project deadlines. Despite these issues, however, the great majority (70%) of participants also reported that their project was still on track to achieve its objectives.

[For further evidence, see Section 2.12 of the Main report]

Early findings from the impact evaluation (At funder level (Tier 1) and at the level of researchers and innovators (Tier 2))

FIC has successfully delivered and attracted additional resources to fund international collaboration in research and innovation (Tier 1).

FIC has awarded £153.4m to programmes so far (31 programmes through the two main waves of competition, plus 2 programmes through the Strategic Opportunities Stream), and is on track to surpass the match funding commitments made by overseas partners at the bidding stage (which totalled £205m, in cash and in kind). It is also estimated to have leveraged a further ~£31m in additional resources so far through the projects funded by FIC programmes.

[For further evidence, see Section 3.2 of the Main report]

It has increased the funding available in the UK to conduct research with key priority countries (Tier 2).

FIC has increased the pool of resources made available via UKRI to conduct projects with overseas researchers and innovators, but this additional funding is relatively small compared with pre-existing investments. In 2020, for instance, UKRI (excluding FIC) awarded £533m to 1,205 grants that included the participation of at least one FIC priority country (as Co-Investigator / project partner), while in the same year FIC programmes awarded £56.4m to 213 grants (based on data from Gateway to Research, using project start dates, and excluding infrastructure investments).

Even if the total value of FIC is compared against UKRI funding of grants with FIC priority countries in the period 2019–2021, it would equate to just 8% of the total (£160m versus £2bn). This is a reflection of the size of the FIC investment, but also of the UK research and innovation system (and its active participation in international collaboration).

Despite the relatively small investment made through FIC, the data shows that (in 2020) the Fund has added resources to a declining pool of funding available for collaboration with FIC priority countries. This additional resource has also increased the value of grants awarded by ARHC and NERC for international collaboration by more than 5%, which is a substantial contribution, and between 2%–5% for ESRC and MRC. The increase is less prominent for BBSRC and Innovate UK.

In terms of geographic spread, the Fund has meant a substantial increase in resources (grants) available for collaborations with partners in South Korea, which did not appear as partners in other grants registered in Gateway to Research (GtR) for the period of analysis (although, this may be an issue with the recording of the GtR data). It has also meant an increase of 2%–5% in resources (grants) available for collaborations with partners located in Brazil, China, India and Japan, and a more modest increase of less than 2% for collaborations with partners located in Canada, Ireland, Israel, Norway, Sweden and the United States.

Other mechanisms, such as the EU Framework Programmes, also offer the opportunity to partner with FIC priority countries. Data from Horizon 2020 shows that between 2018 and April



2021 the UK has actively partnered with organisations in these 13 countries, and that the total value of the EU contributions (to UK participants in those projects) has amounted to £2.9bn.

However, FIC funding offers some advantages over other sources, as it is geared towards supporting funder-level relationships, which in turn are expected to be more strategic and long lasting (and early evidence suggests this may be the case in the future). The top-down approach also means being able to provide more strategic steer to the research and innovation activities conducted with key partner countries, focusing on areas of common interest and potential mutual benefit (including climate change and health, healthy ageing and business internationalisation, to name a few).

[For further evidence, see Section 3.3 of the Main report]

FIC has allowed the strengthening of partnerships between funders, making clear that successful international collaboration is built over time (Tier 1).

FIC has supported the development and strengthening of partnerships in the following ways:

- Continuation of partnerships via follow on funding into new or existing areas of collaboration
- A first possibility to have a concrete (funded) opportunity to collaborate
- Bringing together organisations that have never collaborated before

Our analysis, based on case studies, shows that FIC's additionality is varied and higher when the partnerships (extent of collaboration before FIC) are relatively new. It also shows that, at this stage of the evaluation, progress with strengthening those partnerships is still limited. However, those involved expect these partnerships to further evolve over time.

In contrast, across all programmes case studied, pre-existing funder-level relationships have been flagged as an enabler, providing further evidence that successful partnerships take time to materialise and evolve over time. This means that even if, in those cases, FIC's additionality may be slightly lower, the strength of pre-existing funder-level relationships facilitates programme design and implementation, and this is a trade-off that future iterations of FIC may like to take into account.

The support received from the FCDO Science and Innovation Network (in particular in the case of Japan) and of the UKRI International Offices was also pointed to as a facilitator for initial mediation with partners and identification of collaborative opportunities.

[For further evidence, see Section 3.4 of the Main report]

Uncertainty remains about sustainability (beyond FIC), as partners in the UK and abroad would struggle to identify sources of funding to continue (research) partnerships. Supporting the development or strengthening of funder-to-funder relationships (through FIC) is likely to promote sustainability, but further sources of funding will also be an important factor in realising this. It is not a failure of FIC that it is unable to offer longer term funding certainty, however the risk of non-sustainability is an important consideration for UKRI more generally, both in terms of reaping the full benefits from FIC, and in thinking about future international funding. Additional follow-up funding could help to realise some of the opportunities identified through these first rounds of FIC funding. Otherwise there may be opportunities missed to keep developing areas of research and innovation that are of key strategic importance for the UK and partner countries.

[For further evidence, see Section 3.5 of the Main report]



Researchers and innovators agree that international collaboration funded by FIC (projects) allows them to access knowledge, expertise and infrastructure not available nationally (Tier 2).

Survey results show that access to critical knowledge and expertise, research infrastructure, contacts, networks and markets, are all strong motivations to take part in grants funded by FIC programmes. Furthermore, even at this early stage in projects, UK successful applicants and international partners state that these have led to advances in research understanding that would not have been possible without the overseas partners (91% and 96%, respectively), or advances in innovation solutions that would not have materialised without the collaboration (84% and 92%, respectively).

[For further evidence, see Section 3.6 of the Main report]

FIC has removed certain barriers to international collaboration, mainly related to funding and collaboration frameworks, but many others (not explicitly addressed by FIC) still remain.

There are many barriers faced by researchers and innovators that may preclude them from being able to undertake international collaboration, with financial considerations, the existence of collaboration frameworks, and information about overseas markets and actors appearing as the top 3 barriers reported among UK successful FIC applicants. Data collected via survey shows that projects funded via FIC programmes have lessened those top 3 barriers. One relatively important barrier that still remains is the issue of mobility and recruitment.

Half (54%) of successful applicants stated via survey that they would not have continued with their project idea in the absence of FIC funding. In line with this, 55% of unsuccessful applicants have not continued with their project ideas, while the remainder have carried on, but often with fewer or no international partners (16%), or at a different scale, scope and/or timetable (32%). This shows the importance of FIC funding to pursue the ideas put forward by applicants, and that suitable alternative sources of funding were often not identified.

[For further evidence, see Section 3.7 of the Main report]

FIC has facilitated new collaborations among researchers and innovators.

For UK-based participant organisations we find that 38% of their overseas partner organisations in FIC projects were new. On average, that equates to 2.2 new overseas partners per project. There are also new partnerships supported with UK organisations (21%, 1.3 on average).

[For further evidence, see Section 3.8 of the Main report]

There is early evidence of gains in terms of better understanding of the research agendas and capabilities of partners (researchers and innovators), improved skills and increased capabilities to work internationally.

A large majority of UK successful applicants and international partners (98% and 100% respectively) state, via survey, that participation in their project (funded by a FIC programme) has already led to a better understanding of their partners' capabilities (either to a great extent or to some extent). Participants also agreed that their experiences in projects have improved their ability to work with international teams. These are strong results in their own right, but also intermediate steps towards fruitful future collaboration.

[For further evidence, see Section 3.9 of the Main report]

It is too soon to present evidence on R&I outputs, but data collected through the evaluation will allow the tracking of results over time, and some interesting results have started to emerge.

It is early days for many FIC projects and COVID has generated some further delays in activities.



For those projects geared towards developing technology-based solutions, there is some progress being made in terms of Technology Readiness Level (with the percentage reporting higher TRL levels increasing from the point of application to the current position). FIC projects have also started to produce other R&I outputs, including new research databases, models or tools and new or enhanced products, process or services.

More importantly, we find that FIC is producing more outputs per £ million invested than all other UKRI grants that support international collaboration (with FIC priority countries) in terms of publications, new research databases and models, new research tools and methods, and software and technical products.

As stated above, and as indicated by stakeholders (via survey and interviews), it is in most cases too early to fully assess outputs, and more are expected in the coming months and years.

The case studies also reveal areas of potential future impact. Again, it is too early to report on outputs/outcomes but expected results from these examples include:

- New knowledge into areas of strategic importance for the countries involved (including the UK), with insights for policy makers and industry
- New solutions in areas such as AI and environmental waste
- Business acceleration

UK successful applicants and international partners agree that FIC has been critical in obtaining the results so far.

[For further evidence, see Section 3.10 and 3.11 of the Main report]

There is also evidence of wider opportunities being pursued by collaborators.

The survey of UK successful applicants reveals that there is growing joint activity among partners, with an increase in the number of research proposals that organisations (or university departments) are submitting with their overseas FIC partners. This exceeds the growth in the number of proposals with other international collaborators (a difference of 25 percentage points), implying that FIC is indeed enabling the identification of wider opportunities beyond what is usually possible via other UKRI grants.

In fact, 83% of UK successful applicants and 91% of international partners agree or strongly agree that the (FIC) call/competition has led to the identification of wider research opportunities with partner countries and the UK, respectively.

[For further evidence, see Section 3.12 of the Main report]

FIC is contributing to supporting BEIS and wider Government objectives, mostly by adding value to diplomatic efforts (a country level effect).

Evidence emerging from case studies points towards 5 routes to FIC delivering on this objective:

- Being identified as an interesting example of an instrument funding international collaboration that countries would consider emulating
- Providing funding to fulfil/follow on political commitments/common aspirations
- Acting as a platform to systematically identify joint opportunities & capabilities
- Leveraging and adding value to the work undertaken by other government organisations
- Providing an opportunity to increase awareness of the UK as a potential partner

The first four routes are facilitated by the nature of the Fund, which focuses on funder-to-funder relationships.

[For further evidence, see Section 3.13 of the Main report]



Recommendations

Based on this assessment of the baseline and early progress towards impact, as well as the conclusions drawn from the interim process evaluation, the evaluation team has put forward a series of recommendations for the current Fund and any potential future iterations, as well as for monitoring and evaluation efforts of FIC and the Technopolis evaluation team. A summary of recommendations is provided below, while further details can be found in the main report (Section 4.2).

For the ongoing implementation of the current FIC, we recommend that:

1. The UKRI FIC Team ensures that insights and conclusions emerging from the FIC Board meetings are shared with all programme leads, either directly or via Council representatives
2. The UKRI FIC Team considers trialling additional meetings that bring together all FIC programme leads operating in particular countries to share knowledge and experiences

For any potential future wave of FIC funding, we recommend that:

3. UKRI seeks further funding to support a continuation of FIC
4. UKRI communicates future funding plans and timelines as soon as possible to Councils, such that they are given sufficient forewarning to explore possibilities, as well as plan, engage and think strategically about the best opportunities
5. The UKRI FIC Team recommends each Council make full use of the UKRI overseas offices and the SIN to explore future opportunities and to facilitate early dialogue with partners
6. UKRI seeks to increase the scale of FIC, making more funding available for future waves. If more resources are not available, UKRI should consider a narrower or more targeted approach to FIC in future (e.g. with fewer countries or key partners)
7. Regardless of the size, UKRI should consider a specific (ring-fenced) pot of funding for newer or more novel partnerships/programmes, as well as an enlarged ring-fenced allocation of funding to the Strategic Opportunities Stream
8. Once the future structure and strategic focus of the Fund is decided, UKRI should look again at the choice and wording of criteria used in any bidding templates or panel assessment guidance to ensure that these remain fit for purpose and to address current uncertainties

For current and future monitoring and evaluation, we recommend that:

9. The Technopolis evaluation team considers options for increasing response rates from business participants in future survey iterations
10. UKRI and the Technopolis evaluation team considers reallocating some of the resources within future phases of the evaluation in order to expand the number of case studies being developed to cover additional funders in some of the other priority countries, with a focus on less well-established relationships (prior to FIC)
11. UKRI works towards putting in place systems (more widely) that ensure future applicants agree to their details being used and shared for the purposes of evaluation
12. UKRI (evaluation team) reviews with Councils the information on international participation in grants recorded in GtR to improve completeness
13. UKRI maintains current programme monitoring activities for FIC



1 The evaluation of FIC

The Fund for International Collaboration (FIC) is a UK Research and Innovation (UKRI) fund that aims to enable the development of strategic partnerships with global R&D leaders and address a key gap in the national research and innovation (R&I) funding portfolio. It sits alongside other new cross-UKRI funds and forms part of a package of measures to maintain the UK's global R&D leadership and thereby deliver against the ambitions of the Industrial Strategy.

FIC was established to serve as a facilitator and enabler of research and innovation international collaboration, providing long term funding to UKRI Councils in order to advance, enhance or expand their international cooperation activities. Its **high-level objectives** are:

1. To enable UK researchers and innovators to collaborate with the best international partners, to carry out world-leading research and innovation which delivers new knowledge and societal and economic impact to the mutual benefit of the UK and partner countries.
2. To support Department for Business, Energy and Industrial Strategy (BEIS) and wider Government objectives, including science diplomacy, enabling the UK to strengthen its collective voice in research and innovation policy.

1.1 Study objectives and phases

UKRI has commissioned Technopolis to undertake a process, impact and economic evaluation of FIC. The aims are: (i) to inform ongoing and future improvements to the Fund, in order to maximise the value of public funding (and in particular, the possibility of future growth of FIC); (ii) to demonstrate what the Fund has delivered for taxpayers; and (iii) to help UKRI build the evidence base on "what works" in internationally collaborative R&I.

The study is taking place in four phases, over the period from June 2020 to January 2025. The planning phase concluded with the delivery of an Evaluation Framework report (December 2020). The current baseline and interim process evaluation phase then runs to August 2021.

A series of **evaluation questions** were developed for the study, with the FIC objectives and the aims of the Fund in mind. There are five headline questions, plus a longer list of sub-questions, which are summarised below. The full list can be found in Appendix A of the Technical Report.

- **Process evaluation** – There is one overarching question, which asks for an assessment of **the extent to which (and how) the FIC is working and being delivered as intended**.

Sub-questions then indicate particular areas to explore, including programme selection, the scale/timing of waves, the rate of funding release and leverage, while perceptions of stakeholders more generally (on what is working more or less well with delivery, and why) should also be captured, with lessons identified for future waves or similar funds.

- **Impact evaluation** – There are three key questions here, requiring assessment of **the extent to which (and how and why/not) FIC has delivered across each of the main areas of intended impact**: (i) enabling collaboration between the UK and the best international partners; (ii) delivering knowledge, economic and societal impact; and (iii) strengthening the UK's voice in international R&I policy.

In addition, there are several supplementary areas of investigation, which include: unintended outcomes and impacts; the effectiveness of the approach to supporting internationally collaborative R&I; and if/how FIC has provided insight to support the targeting of future international collaboration.

- **Economic evaluation** – The overarching question here asks for an assessment of **the extent to which FIC represents value for money**. This will be based on a comparison between the overall estimated impact and the overall cost of delivery.

To address the aims of the evaluation and to understand how effectively FIC has met these high-level objectives, the evaluation is also asked to consider three broad **themes**. These are shown in Figure 2, alongside the FIC objectives and headline impact evaluation questions.

Figure 2 FIC objectives, themes and key evaluation questions

FIC Objective 1: To enable UK researchers and innovators to collaborate with the best international partners, to carry out world-leading research and innovation which delivers new knowledge, and societal and economic impact to the mutual benefit of the UK and partner countries.		
<u>Impact Evaluation Questions</u> To what extent (and how) has FIC enabled collaboration between the UK and the best international R&I partners?		Theme 1: Enabling funding – Reducing the barriers for accessing and applying for international collaboration R&I funding.
		Theme 2: Developing partnerships – Enabling, strengthening, deepening and broadening relationships: within the UK and internationally; at all levels (funders, institutions, individuals); and both within and beyond FIC.
To what extent (and how) has FIC delivered knowledge impact, economic impact (for the UK and high performing R&I nations) and societal impact?		Theme 3: Deepening R&I – Supporting R&I within new and existing areas of strategic importance across the UKRI international portfolio.
FIC Objective 2: To support Department for Business, Energy and Industrial Strategy (BEIS) and wider Government objectives, including science diplomacy, enabling the UK to strengthen its collective voice in research and innovation policy.		
To what extent (and how) has FIC strengthened the UK's collective voice in R&I policy?		

This report presents the main findings for the interim process evaluation in Section 2, followed by baseline information and early evidence of progress towards objectives (impact evaluation) in Section 3. A series of recommendations, for the ongoing implementation of FIC, for any future potential FIC funding, and for future monitoring and evaluation are then set out in Section 4.

The document is accompanied by a Technical Report that contains a series of supporting annexes that are referred to at various points in the current report.

A first assessment for the economic evaluation (the extent to which FIC represents value for money) will be made as part of the next phase of the study (interim impact evaluation).

1.2 A mixed methods approach grounded in a Theory of Change

The evaluation is based on six main groups of data collection and analysis activities (see Figure 3). Activities took place between December 2020 and May 2021.

Figure 4 then provides a summary of the main stakeholder groups consulted during this phase of evaluation. A total of **89 stakeholders have been consulted via interviews and workshops**, including for the development of 5 in-depth case studies, while a further **403 individuals have input to the study via surveys** (24% of the population approached).² More information on methodology, including a list of contributors is provided in Appendix B of the accompanying Technical Report. Appendix I of the Technical Report then provides the full survey results.

² This includes 147 of 654 successful UK PIs / Cols (22%), 112 of 375 international Cols (30%), and 144 of 670 unsuccessful UK applicants (21%). Recommendations on how to increase response rates in the next iterations of the study are provided in Section 4.2.

Figure 3 Evaluation methods

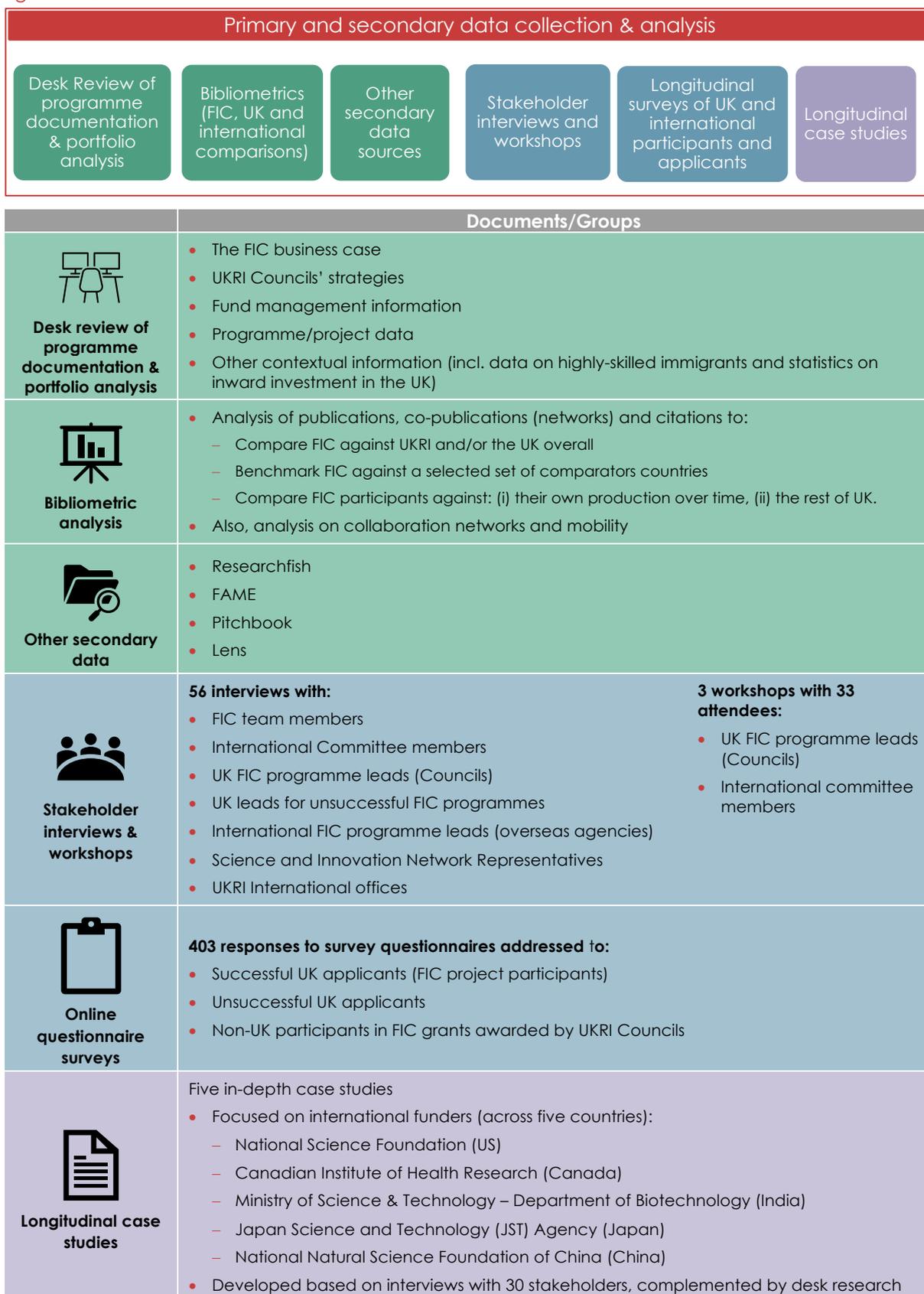
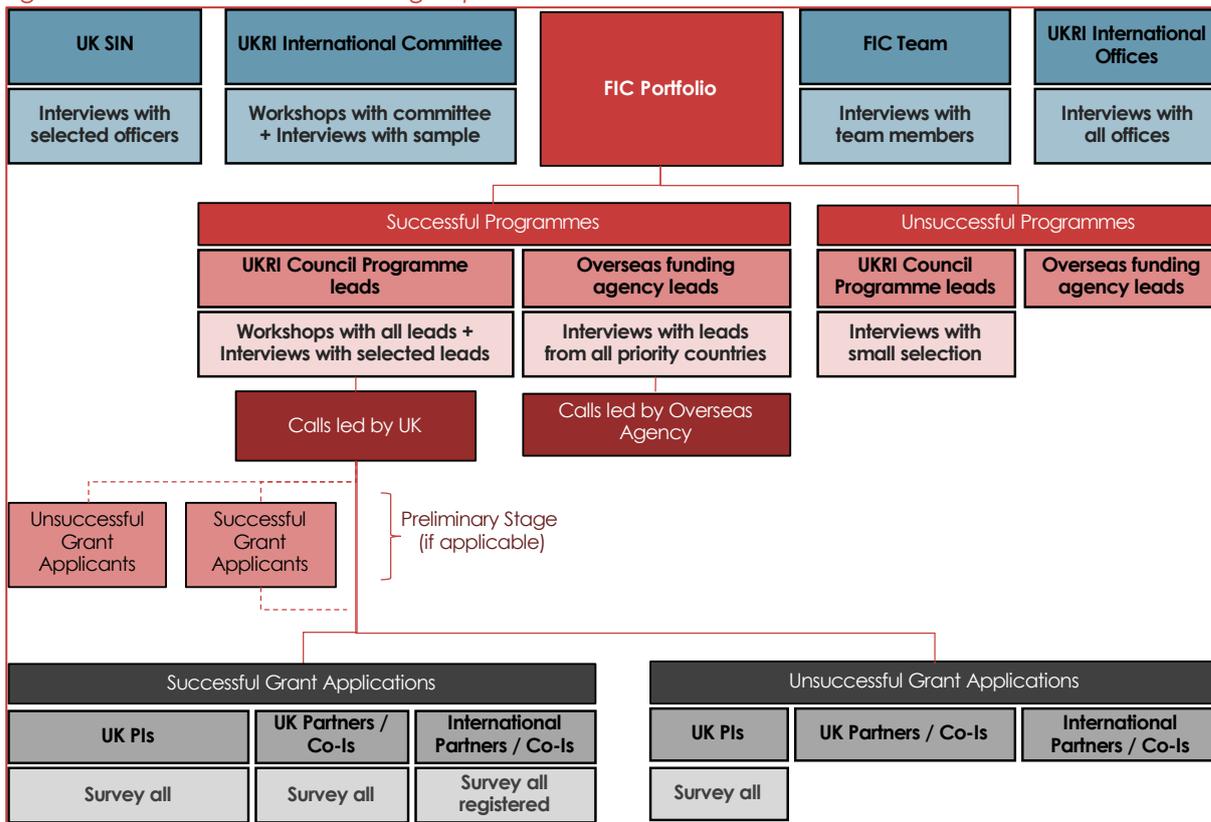


Figure 4 Overview of stakeholder groups consulted



Our approach also includes quantitative and qualitative methods to assess the **additionality and deadweight of the Fund (counterfactual analysis)** to explore:

- What FIC offers that is different from existing activities to support international R&I collaboration
- How outputs and outcomes emerging from FIC programmes and projects compare with a counterfactual scenario, either in a qualitative way (via analysis of results enabled by FIC that would not have been possible by other means) or in a quantitative way (presenting comparisons with benchmarks or control groups whenever possible or relevant)
- How outputs and outcomes emerging from FIC programmes and projects compare with other government interventions, in particular with respect to other UKRI programmes/grants in general and those that include international collaboration.

In line with this approach, our analysis focuses on what FIC has delivered in comparison with other means of supporting international R&I collaboration (i.e. Business as Usual). It does not draw comparisons with other specific programmes, since we concluded during the scoping stage of the evaluation (and in the resulting Evaluation Framework report) that there were no appropriate comparators (programmes) for FIC in the UK or internationally. Additionally, comparisons with programmes supporting national collaborations were not deemed appropriate given that, by nature, they are different in scope. Finally, the study does not explore, in a systematic way, what the results would be of delivering FIC in a different way (e.g. different budget or different countries in scope), as this would require a full 'options appraisal' (which is beyond the scope of this evaluation).

The evaluation has been guided by a Theory of Change (ToC) developed for the programme. This is a programme theory that explains how an intervention is expected to produce its results. It has a logic model as a starting point, which sets out how the various inputs and activities of

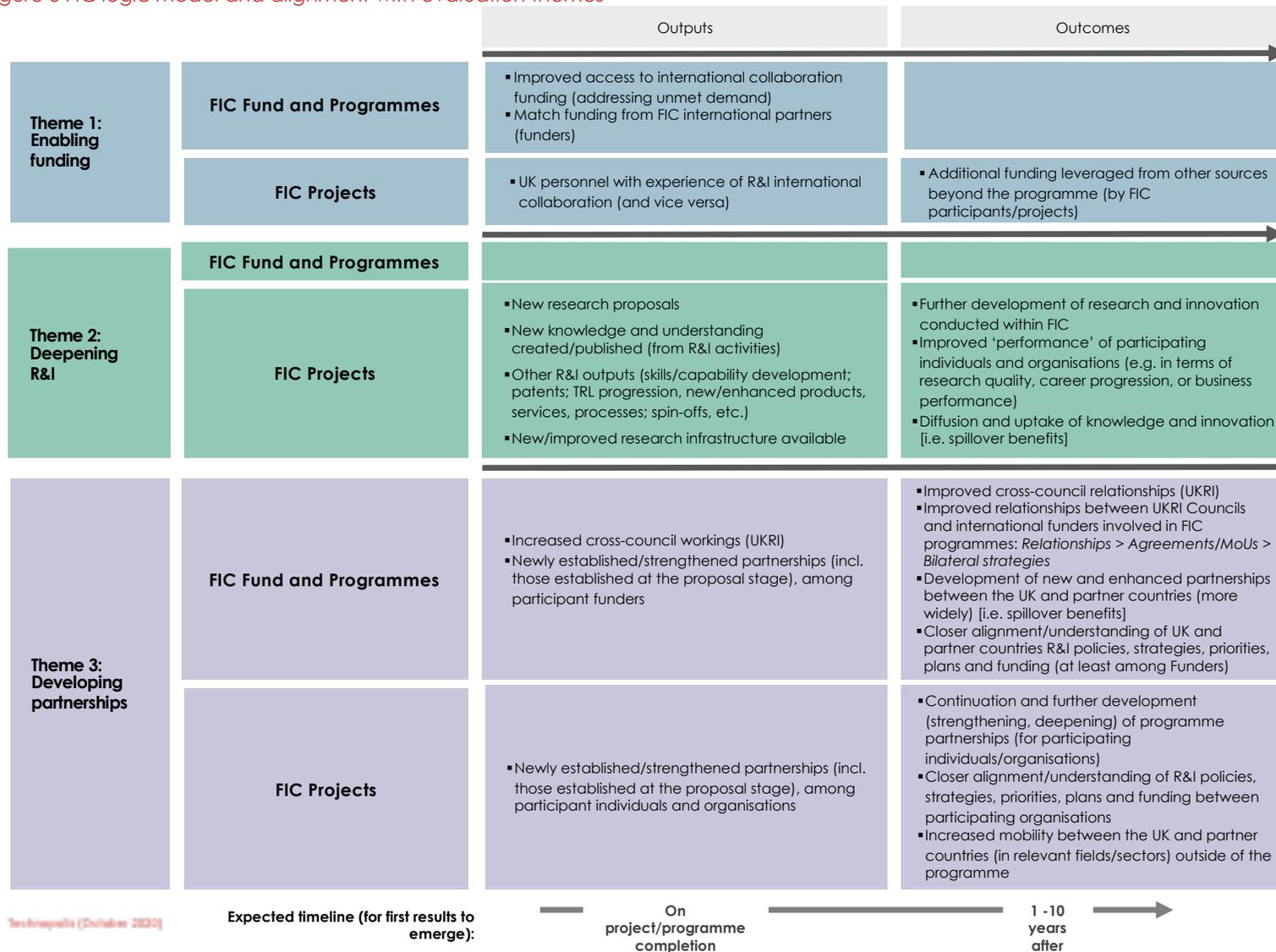


FIC are expected to result in a series of outputs, which then lead to a series of intended outcomes, which in turn contribute to wider and longer-term impacts.

The logic model (see next page) follows a two-tier structure, to distinguish between the activities, outputs and outcomes of the Fund and its programmes, and those of the individual FIC projects. This version also shows alignment with the main themes guiding the evaluation. The focus of the evaluation is Fund-level results. However, some key results of the Fund will materialise at project level, and so the evaluation will also collect evidence in this second tier.



Figure 5 FIC logic model and alignment with evaluation themes



Note: all expected outputs and outcomes are expected to influence the attainment of the high-level impacts.

2 Main findings from a process perspective

2.1 Introduction

This section of the report focuses on providing an interim assessment of FIC processes and addressing the headline question of **the extent to which, and how, the FIC is working and being delivered as intended** (along with a series of related sub-questions that are set out in full in Appendix A of the accompanying Technical Report).

It begins by discussing the origins, rationale and position of FIC within the context of wider policies, support and funding for international collaboration in research and innovation (Sections 2.2–2.5), before going on to address different elements of the fund implementation process, including: the timing and communication of funding (Section 2.6); the funding criteria and programme bidding, assessment and selection processes (Section 2.7); the arrangements for the separate Strategic Opportunities Stream (Section 2.8); the experiences of cross-Council working (Section 2.9); and activities relating to monitoring and sharing of information across the Fund (Section 2.10). Finally, we look at the project level and feedback from participants on their application and award process, as well as project progress so far (Sections 2.11–2.12).

2.2 A dedicated Fund created to fill a gap in the funding system

FIC emerged in recognition of the importance of supporting internationally collaborative research and innovation, and the desire to offer funding for collaboration with particular geographies that were not explicitly covered by other UKRI Funds. As stated in its original Business Case:

“To deliver the Industrial Strategy and in view of our exit from the EU it is vital that we forge partnerships to expand our access to ideas, talent and investment. The Fund for International Collaboration (FIC) is a new UKRI Fund which will address a key gap in our research and innovation funding portfolio and enable us to develop strategic partnerships with global R&D leaders. The FIC will complement our existing funds for international partnerships, the Newton Fund and Grand Challenges Research Fund, which are constrained by being Official Development Assistance. This non-ODA fund will underpin our international strategy by enabling us to develop new programmes of activity with countries identified as key priorities (like the USA, Japan, China, and South Korea)”.

As such, FIC has been set up as a dedicated UKRI funding mechanism to support partnerships with countries like the US, Israel, or Japan (and support non-ODA eligible activities with China and India). The Fund has not been designed to replace or replicate the UK’s participation in EU programmes (i.e. Horizon 2020 or Horizon Europe), but it has welcomed (and funded) programmes that include partners from EU Member States, as well as associated countries.

The FIC Business Case also states that “while the UKRI Councils do collaborate with these leading developed research nations, funding is becoming increasingly limited and opportunities are being missed, putting the UK’s long-term position as a partner of choice at risk”. At the time the Business Case was developed, this risk was expected to be exacerbated if the UK did not manage to secure participation in European Framework Programmes.

The Councils had also experienced a series of tight budget settlements, requiring heavy prioritisation in their portfolios. International budgets were under a lot of pressure, and often did not get prioritised over national opportunities. The arrival of FIC provided an opportunity for

Councils to start thinking about the collaborations they had always wanted to do, but had been unable to fund (prioritise) from internal budgets. Evidence collected by the evaluation via workshops with Councils and case studies demonstrate that the Fund has indeed provided the opportunity to fund activities that would not otherwise have been implemented.

The main policy steer for the establishment of FIC can be found in the 2017 Industrial Strategy White Paper (setting out the need for the UK to remain connected to other leading international sources of ideas and to make strategic choices to maximise international collaborations) and the subsequent (2019) International Research and Innovation Strategy (setting out the intention to build and promote international partnerships, seek opportunities for collaboration to deliver shared objectives, and encourage international connections).

These policy commitments were then underlined emphatically in the UK R&D Roadmap published for consultation in July 2020 (which devoted several pages to keeping the UK at the forefront of global collaboration), as well as in UKRI's Delivery Plan 2019/20 (which stated its intention to support the development and delivery of new international partnerships, building on successful collaborations with global partners, generating a source of UK soft power and opening up new opportunities for export and inward investment to the UK).

Most recently, the government's 2021 'Integrated Review of Security, Defence, Development and Foreign Policy: Global Britain in a competitive age' included the priority action of building a strong and varied network of international science and technology partnerships, "putting science and technology at the heart of our alliances and partnerships worldwide".

2.3 International collaboration in research and innovation allows the UK to tap into expertise and research capital elsewhere, expanding the frontier of what would be possible nationally

Increasing internationalisation of the production of research has been observed across different countries and fields of science,³ while it has also been demonstrated that international collaboration increases the quality and academic impact⁴ of research outputs. More than half of all UK publications are now internationally co-authored,⁵ and analyses have identified a significant "impact premium" for such papers.⁶ Among other theories, it has been suggested that this is because international collaborations involve the best researchers in each country.⁷

A study conducted by Technopolis for BEIS⁸ revealed why key actors in the innovation ecosystem seek to engage with international collaboration. In public sector research, international engagement provides a vital underpinning to research excellence, and there is a wide consensus that it improves the quality and impact of UK research. University collaboration is largely driven by individual academic researchers who might have personal motivations, e.g. aspirations of working with the best and "making a difference".

³ Wanger, C.S. (2005), "Six Case Studies of international collaboration in science", *Scientometrics* Vol. 62, No. 1, 3–26.
Wagner C.S., T.A. Whetsell and L. Leydesdorff (2017), "Growth of International Collaboration in Science: Revisiting Six Specialities", *Scientometrics*, Vol. 110, No. 3, 1633–1652.

⁴ Quality and academic impact are typically defined in terms of bibliometric indicators such as citation impact.

⁵ BEIS (2019) *International comparison of the UK research base*, Published 10 July 2019

⁶ Adams, J. (2013) "The fourth age of research", *Nature*, Vol. 497, pp. 557–560.

⁷ Elsevier (2017), *International comparative performance of the UK research base 2016*, p. 79

⁸ Technopolis (2018) *Drivers and Barriers for Collaboration*, prepared for BEIS (not published yet)

International collaboration is also increasingly needed to address global challenges or to access unique resources or populations, e.g. conducting research on climate change, the Arctic or international measurements standards. These are especially important drivers for academics and government labs. For Public Sector Research Establishments (PSREs), international engagement has a particularly strong focus on societal impacts and is often necessary in order to fulfil their role within the UK research and innovation system.

Research and Technology Organisations (RTOs) are motivated by the need to maintain their capabilities at or close to the technological frontier and access potential new markets through collaborative projects and networks. Similarly, the most common reason for companies to engage internationally is ultimately the prospect of improved competitiveness and profitability, and for many Small and Medium-sized Enterprises (SMEs) it is an important source of financial leverage and a natural step towards growing the business. International engagement also provides an opportunity for both large companies and SMEs to access new markets (geographical and thematic). Large companies attach greater importance than SMEs to more strategic and policy-related engagement, such as access to global value chains, unique facilities and the shaping of research agendas.

2.4 FIC sits alongside other initiatives to support international collaboration

There are different ways in which the UK and governments around the world provide support for international collaboration and most countries have an increasingly varied portfolio of relevant initiatives. In many cases, these are not stand-alone programmes with earmarked budgets (as is the case with FIC), but rather a combination of various elements that enhance or adjust existing funding arrangements and schemes. These may include general administrative rules that allow funding for international projects, agreements with funders in other countries to facilitate joint projects, funding instruments (dedicated or generic) open to applications for internationally-collaborative projects, as well as programme budgets that are available to fund such activities.

The box below showcases six broad types of initiative (although there are overlaps between these), based on our review of relevant activities being undertaken internationally (see the Literature Review in Appendix C of the accompanying Technical Report).

Box 1 Approaches to support international collaboration

- **Big science.** To support (costly) research infrastructure that would be infeasible or uneconomical for most national governments to finance on their own. One of the first, and most well-known, examples in the post-war period is the European Organization for Nuclear Research (CERN),⁹ which involves very significant capital costs. More recent examples (where the UK participates) also include networked infrastructures, such as the Integrated Carbon Observation System (ICOS), the European Space Agency (ESA) and the Square Kilometre Array (SKA).
- **Science diplomacy and international relations.** International collaboration is often underpinned or enabled by diplomatic relations. Intergovernmental agreements or Memorandums of Understanding (MoUs) are agreed between the UK and multiple countries, providing a framework and impetus for further collaboration. Many bi- and multi-lateral agreements also exist between funding bodies to facilitate the funding of collaborative projects at a more operational level. UKRI have several such agreements in place, e.g. with the National Science Foundation (NSF) in the United States and the São Paulo Research Foundation (FASPEP) in Brazil. The UK Science and

⁹ <https://home.cern/> (accessed 16 July 2020)

Innovation Network (SIN) of attachés hosted in consulates and embassies around the world also provides a resource that UK researchers and innovators can draw on for advice and contacts with would-be collaborators overseas. Note that FIC is expected to support these activities.

- **Multi-country R&I programmes.** These include multi-lateral fora and frameworks for R&I programmes, as well as bi-/multi-lateral joint funding initiatives. Both seek to promote international collaboration and address strategic needs that can be more effectively tackled internationally. The European Framework Programmes, currently Horizon Europe, are the prime example of such a multi-lateral framework and are by far the largest of any international collaborative initiative. FIC programmes would also fall within this category.
- **Support for International development.** This has increasingly involved R&I collaboration, as part of the effort to address global societal challenges (e.g. the UN Sustainable Development Goals). In the UK, several large dual-purpose funds¹⁰ have been set up to support ODA-compliant collaborative R&I with developing countries. These include the Newton Fund and the Global Challenges Research Fund (GCRF, profiled below).
- **Opening of national programmes to international participation.** Research funding bodies increasingly have explicit provisions for allowing international participation in mainstream national grants, e.g. as co-investigators in MRC or EPSRC grants. Lead Agency agreements (bilateral agreements to support joint projects through mainstream national grants) also fit here.
- **Other accompanying measures.** A range of other types of scheme exists to support international engagement. For example, support for mobility, often in the form of relatively small grants for travel and conference fees, aimed to help researchers develop their international networks and potentially seed new collaborative relationships that may subsequently be funded by larger grants.

Source: Technopolis (2020)

FIC is a relatively small investment in comparison with other key UK initiatives to support international collaboration (which are different in focus but include participation from some of FIC's priority countries, see examples in Table 1) and its results should be analysed in proportion to its resourcing. This also raises a question of focus and whether or not a narrower geographical scope should be considered for any future FIC, if the level of funding remains the same.

Table 1 FIC funding in comparison with examples of other international collaboration initiatives

Initiative	Geographical scope	Total (period)	Yearly
FIC	Australia, Canada, China, India, Ireland, Israel, Japan, Singapore, South Korea, Sweden, the US and EU Associated Countries (Norway and Switzerland)	£160m (2019–2022/23 ¹¹)	£40m
UK contribution to ESA [1]	22 Member States (covering most of Europe, including Norway, Switzerland)	£1.5bn (2020–2024)	£374m
UK contribution to CERN [2]	23 Member States (covering most of Europe, including Norway, Switzerland and Sweden, but not Ireland), plus various associates and observers (including the US, India and Japan)	--	£144m
UK Membership to Horizon Europe [3]	EU Member States, but open internationally (incl. to FIC priority countries)	~£18bn (2021–2027)	£2bn

Notes: [1] Commitment set up at 2019 ESA Council of Ministers – £1.66bn, figure in pounds based on the exchange rate in 2019). [2] Based on 2019 budget. [3] <https://universitybusiness.co.uk/research/uk-government-announces-250m-for-horizon-europe-costs/> (accessed 4 June 2021)

¹⁰ "Dual-purpose funds" is used to describe the Newton Fund and the Global Challenges Research Fund (GCRF), which aim to support international development as well as R&I or Trade. See e.g. House of Commons International Development Committee (2019), "The Newton Fund review: report of the Sub-Committee on the work of ICAI".

¹¹ At business case the FIC funding profile total was £160m. The initial timeframe was 2018/2019 to 2020/2021, with two post Spending Review commitment years, 21/22 and 22/23. Within the initial timeframes, for waves 1 and 2, the total is approximately £110m. The Fund has been reprofiled since, with most programmes planned to conclude by 23/24.

2.5 It adds value by providing a dedicated Fund targeting priority countries and by encouraging funder to funder relationships, which in turn could lead to more sustainable results

A total of 31 programmes were selected from waves 1 and 2 of the FIC programme bidding process, each with a budget between £650k and £12m (£144m in total). As of March 2021, two additional programmes had also been awarded through the FIC Strategic Opportunities Stream (a separate mechanism for opportunities that do not fit with the timescales of the standard FIC process), with a total value of over £9.4m (further awards may be made here).

Table 2 provides an overview of this portfolio. It shows the number of programmes that are led by each Council,¹² as well as the key features of these programmes (whether they involve other Councils, which wave they were awarded in and whether they are bilateral or multilateral).

Table 2 FIC Portfolio of programmes

Lead Council	Number of programmes led	No. of Councils involved		wave			Involvement of partner countries	
		Single	Multiple	wave 1	wave 2	Strategic Opportunities Stream	Bilateral	Multilateral
AHRC	3	1	2	2	1		3	0
BBSRC	3	2	1	2	1		1	2
ESRC	5	0	5	2	3		4	1
Innovate UK	5	5	0	3	2		4*	1
MRC	6	3	3	2	2	2	5	1
NERC	6	1	5	3	3		5	1
STFC	3	3	0	2	1		2	1
UKRI	2	0	2	1	1		2	0
Total	33	15	18	17	14	2	26	7

Source: Technopolis, based on UKRI data (Master Tracker, as of March 2021).

* Includes one programme that consists of multiple bilateral partnerships between the UK and different countries.

FIC has been set up to support international collaboration, in identified priority countries, via a cross-Council approach. International collaboration is already at the heart of many of the activities supported by the Councils and FIC complements these other activities by supporting international institutional partnerships (in priority countries with a high R&I profile), built around common areas of interest, with joint commitment of resources. Table 3 below shows the countries involved in FIC programmes, while Section 3.3 provides an analysis of collaboration with those key priority countries prior to FIC.

¹² Note that EPSRC and Research England are not listed in the table, as neither organisation is leading a programme.

Table 3 FIC Portfolio of programmes – partner countries

Lead Council	Number of programmes led	Programmes involving priority countries											Programmes involving other countries				
		USA	Canada	Japan	China	India	Israel	Australia	Ireland	Norway	Singapore	South Korea	Sweden	Switzerland	Germany	Brazil	Finland
AHRC	3	1			1				1								
BBSRC	3	3			2	2											
ESRC	5		2	3										1	1	1	France (1), Netherlands (1), Poland (1)
Innovate UK	5	2	2			1	1			1							Any EUREKA member country (1)*
MRC	6**	1	2	1		1	1				1			1			
NERC	6	3	2			1			1			1			1	1	Cote d'Ivoire (1), Chinese Taipei (1), Turkey (1)
STFC	3	2				1	1							1			
UKRI	2			1	1												
Total	33	12	8	5	4	4	3	2	1	1	1	1	1	0	3	2	2

Source: Technopolis, based on UKRI data (Master Tracker, as of March 2021).

* This might include priority countries (e.g. Switzerland is participating), but these are not included within the counts shown. ** Includes two programmes awarded through the Strategic Opportunities Stream.

No other UKRI fund (except Official Development Assistance Programmes) is dedicated to developing relationships at the *funder* level (i.e. between one or more UKRI Councils and their counterparts abroad). This offers the opportunity to build deeper, more stable and longer-lasting relationships for UK research and innovation communities than may be possible through existing (bottom-up) relationships that are being developed amongst individual researchers and innovators. It should also enhance the ability of respective funders to steer resources (top-down) towards areas of (mutual) strategic importance.

The Fund also supports a range of activities to establish and develop connections between respective research and innovation communities, identify common areas of interest, and develop common research agendas, all of which will help to enable future collaborative research activity, possibly supported via joint funder-level initiatives.

The addition of FIC funding for international collaboration has been positively received across all UKRI Councils. Depending on the Council's prior international activity and budget, it has offered the opportunity to:

- Fund international collaboration that would not be possible via other means

For example, representatives from ESRC and AHRC both reported that before FIC, the focus of their international strategies (and investments from core funding) had been on maintaining existing collaborations with European partners, and that this critical, ongoing commitment had curtailed the development of relationships with new partners excluded from ODA funding.

- Fund programmes at a scale not usually/otherwise possible

A good example of this is the UK-India Extreme Photonics Centre (EPIC) programme between STFC and Tata Institute of Fundamental Research (funded by the department of atomic



energy). This programme sits alongside other initiatives between UKRI Councils and its Indian counterparts (which have a long history of collaboration as documented in our case studies, in Appendix G, Technical Report). What makes this programme distinct is the size and duration of the funding, allowing it to support a large number of researchers, working in a series of interconnected work packages, over a long period of time. By comparison, past initiatives have been few in number, small in scale and disconnected. The Newton Fund and GCRF had offered opportunities to establish programmes of work between the UK and India, but the ODA nature of these funds imposed constraints on the activities that it was possible to support. FIC, in contrast, emerged as a better model to develop a mutually beneficial collaboration as equal partners (according to case study interviewees), as it provides funders with greater flexibility to identify priority areas of common interest.

2.6 Advance knowledge of FIC funding waves helps in establishing the best portfolio of programmes to support Fund objectives

There were two **calls for programmes** (wave 1 and wave 2). Each was a competitive process, open to all UKRI Councils – individually, or in partnership.

- The bidding process for wave 1 was launched on 11th May 2018, with bids due by 8th June
- The bidding for wave 2 was launched on 1st November 2018, with bids due by 7th December

The FIC Business Case noted that the need to deliver in-year spend in 2018/19 meant the process for allocating spend in wave 1 would be run to tighter timescales than for wave 2 (when there would be greater engagement and consultation with overseas partners, UK Government Departments and the wider research, innovation and business community).

This was reflected in feedback from Councils, who regularly highlighted that the timetable for the **wave 1 call** was felt to be too short, with only limited opportunity available to identify, discuss and prepare programme ideas (within and across Councils, and with potential overseas partners). As a consequence, there was reported to be a tendency within wave 1 for Councils to put forward “shovel-ready” programmes that were based on established funder relationships and initiatives, already well-developed ideas, and where spend could commence quickly (i.e. where plans were simple or well advanced and/or where funding cycles between Councils and overseas partners aligned). Whilst the short timescale was necessary, the implications of this are somewhat at odds with some of the strategic ambitions of the Fund.

Councils also highlighted that the timing constraints placed on the bidding phase were further exacerbated by the subsequent approvals process (through BEIS and particularly the Treasury), which took longer than expected (programme starts were reported to have been delayed by 4–8 months in many cases). This approval delay also postponed the point at which the programmes could be announced and discussed with relevant communities, creating potential issues with preparedness in the next stage of implementation.

By comparison, the **wave 2 call** was generally considered by those involved to be a better experience. The call was anticipated well in advance, which – alongside a clearer understanding of the intentions of the Fund and experience of implementing early programmes – enabled additional time for exploring possibilities (including through engagement with UKRI overseas offices and SIN teams), better early planning and engagement on possible programme ideas (e.g. preparatory workshops with overseas partners or relevant R&I communities), as well as greater strategic thinking about the best opportunities to pursue, develop and put forward for funding.



It was suggested by individuals privy to the assessment process that the additional time and space available for wave 2 programme idea development resulted in a higher quality bid portfolio. This is reflected in the scoring data, where a greater proportion of wave 2 bids were considered above the basic threshold for funding, which included:

- A score of at least 2 out of 4 (“satisfactory”) for each of the four essential criteria (achieved by 20 of the 26 bids to wave 1 and 20 of the 21 bids to wave 2)
- A weighted score across all criteria and all reviewers of 70% (achieved by 24 of the 26 bids to wave 1 and all of the bids to wave 2)

As reported above, in addition to more preparation time, wave 2 bidders may have also benefited from a clearer understanding of the intentions of the Fund or experience of implementing earlier programmes. These factors may also have had an effect on scores.

Looking forwards, there is widespread concern amongst programme leads that any future wave of FIC might repeat the experiences of wave 1, with funding announced too late to make the very best of the opportunities potentially available. Councils want clarity (and forewarning) of the timing, scale and priorities of any potential future funding, such that they are given the best chance to explore and develop new opportunities (internally and externally), can sustain current developments and achievements (and not mislead, frustrate or disappoint overseas partners) [sustainability is addressed further in Section 3.5], and are able to prioritise what to bid and when (e.g. holding back some proposals for anticipated later waves of funding in order to develop and prepare these programme ideas further). Future plans should also build in sufficient approval time and avoid clashes with other significant processes (for example, spending reviews or programme bidding timelines for other UKRI funds).

If the Fund wishes to encourage and support the development of new relationships between UK and overseas funders, rather than just the strengthening of existing linkages, then advance warning of available funding is important. Alternatively (or in addition), the Fund could support the early stages of these nascent funder relationships in a more targeted way, through specific funding aimed at relationship building and idea development, which might support the early stages of a future full FIC programme (though such support would need to sit alongside greater certainty of further future waves of funding that could progress these opportunities). We see some examples of such initiatives within the current portfolio. For example, the SSH Pump-Priming with Japan programme (FIC-18), which ESRC reported had been valuable for then establishing the UKRI-JST Joint Call on AI and Society programme (FIC2-09).

2.7 A clearer strategic steer could help Councils in targeting and selecting opportunities

Funding was awarded competitively to programmes, based on evaluation of bids against four essential criteria: excellence (the quality of R&I and how this will be assessed); commitment (from international partners through e.g. matched funding); additionality (beyond existing activities funded from core budgets); and alignment (with BEIS/UKRI strategic international goals and priorities). Proposals that included multidisciplinary or multi-Council activity were also considered desirable (though not essential). UKRI, in consultation with BEIS, also identified a list of 13 key target partner countries,¹³ to guide programme development and selection for FIC.

¹³ Currently: Australia, Canada, China, India, Ireland, Israel, Japan, Singapore, South Korea, Sweden, the US and EU Associated Countries (Norway and Switzerland)

The funding criteria (and choice of priority countries) were broadly seen by programme leads as appropriate for the objectives and intentions of FIC. Councils also welcomed the lack of thematic prioritisation and the fact that the issue of research quality was largely left to the Councils themselves.¹⁴ However, there were also widespread calls from Councils for some additional clarity and specificity in several areas that would aid programme idea and proposal development. In particular:

- The importance attached to multi-disciplinary/cross-Council activity in scoring
- The BEIS/UKRI international goals and priorities that programmes should look to align with
- The rationale for the choice of priority countries (collectively, and individually), and whether there will be changes to this list of countries over time
- The likely scale of individual programmes that will be funded

The evaluation team's review of the guidance leads us to concur that these are all areas that could usefully be revisited. FIC is regarded as a relatively small pot of money, compared with Council budgets or other UKRI Funds, and this contrasts with a high level of demand and lots of potential ideas for international programmes. Any additional guidance against the points listed above would help steer Councils towards the most appropriate programme ideas to develop and propose, helping the Fund to better achieve its aims, while also reducing wasted resources. We have recommended (see Section 4.2) that UKRI looks again at the choice and wording of criteria used in bidding templates and assessment guidance before any further iterations of the Fund.

More generally, Councils would welcome some additional steer from the Fund on the expected strategic direction for FIC programmes, rather than the more opportunistic and responsive mode adopted for the first two waves. This would help guide the Councils in their thinking and discussions and reduce wasted time (and the risk of negative impressions left with partner funders). The scale of ambition for FIC (its objectives and scope), while laudable, was considered by many of the Council representatives consulted to be too great given the scale of funding available (overall, per country and for individual programmes/relationships), with the resulting risk of creating a thinly dispersed and uncoordinated portfolio of programmes. Additional funding might help achieve critical mass. Alternatively, a more targeted and coordinated approach might enable the Fund to achieve more with its resources.

For instance, it was suggested by several programme leads that one should think in terms of the UK's relationship with a particular country (or even funder) and how multiple programmes (and multiple waves of programmes) involving different partnerships could support continuous development of this relationship, with each engagement building on, supporting and benefiting the others, creating a critical mass/intensity of activity that could drive real change.

The programme bidding process itself (and the administrative requirements for proposing a FIC programme) were generally regarded as lean, light touch and straightforward. A programme bidding template was provided, which set out information requested of applicants across five sections, with word limits provided (2,400 words in total). This template was widely considered an appropriate length, requiring sufficient (but not too much) depth of detail, and asking for relevant information, evidence and contextual details. The only suggestions made for

¹⁴ The quality of research and innovation was one of the essential criteria assessed as part of programme selection, however bids just needed to demonstrate that all spend would be subject to rigorous quality assessment. For example, where programmes would be running a joint call, the bid should set out how applications would be assessed for R&I excellence.



improvement, by a couple of programme leads in each case, were to find a means for Councils to provide a view on the relative importance or prioritisation that they would place on their various bids, and to give an opportunity for bidders to answer questions or defend their proposal where appropriate (given the limited space to provide information in the template).

Most Council representatives reported having had limited sight of **the bid assessment and selection process itself** (which was seen as problematic in terms of gauging the importance of different criteria and other steers in programme selection). Concerns were raised about the extent of relevant thematic expertise, as well as individuals with a business background and perspective, on the selection panel. In part this was because the panel included representatives from some of the Councils bidding, who then had to leave the room when these bids were discussed (thereby removing the most relevant expertise from the discussion). Some individuals also worried that there was insufficient understanding, or account taken, of the differences that exist across Councils, in particular in terms of the relevance of cross-Council and multi-disciplinary working, or of funder-to-funder collaboration in some cases.

It was also suggested by individuals within UKRI that the formation of the **“additionality” criterion** could be improved. The wording of the bidding template in relation to this criterion asked whether the proposal duplicated other activity, whether it could be funded from core budgets and how it related to existing activities already funded from core budgets. As a result, Councils often focused in this section of their bids on the lack of existing funding available for the programme, or for international activities more generally. However, we understand that the intention for this criterion was a little wider, and this is reflected in the guidance subsequently given to panel members, who were asked to consider the proposals’ complementarity with other international activities, whether it would allow UKRI to develop new strategic relationships with partners in key priorities countries, or to collaborate with an existing partner at a scale, breadth or depth not previously possible, and the extent to which it would complement UKRI strategic priorities and activities (in addition to whether a case has been made that it could not be funded through core budgets). This mismatch between the initial guidance to bidders and the expectations suggested for assessment may help to explain why additionality was the lowest scored of the essential criteria across both waves. The average score given across all panellists and all bids for this criterion was 2.96, compared with 3.48 (for the quality of research/innovation), 3.42 (for partner commitment) and 3.38 (for alignment with priorities).

It was suggested that a future wave of FIC funding should look again at the wording of the additionality criterion and associated guidance, perhaps borrowing from the additional criteria that were introduced for the Strategic Opportunities Stream (discussed in the next section).

Finally, many of those that had been unsuccessful in their programme bid to the first wave of FIC reported having received little or no **feedback**, at least through formal routes, on their proposal, its assessment or the reasons for not being successful. Such feedback was seen as important for learning and for improving the development of future programme ideas, as well as for managing relationships with partners. We understand, however, that a more concerted effort was made in the second wave to provide both written and verbal feedback.

2.8 The Strategic Opportunities Stream is a welcome addition to a Fund that intends to capitalise from emerging opportunities, but there is currently a lack of transparency or awareness

A separate mechanism – the Strategic Opportunities Stream – exists for opportunities that do not fit with the timescales of the standard FIC programme/proposal selection process, with ringfenced FIC funding available to support such activities. As of March 2021, two additional programmes had been awarded through this route (further awards may be made here).



There is a slightly different process in place, where opportunities are identified, elaborated and assessed outside of the main two-wave competitive bidding process. When a new opportunity arises (for example, through the UK's diplomatic missions overseas, ministerial visits or strategic needs), the UKRI International Team assess whether the opportunity is suitable for funding under the scheme and whether the opportunity should be given priority for funding. This assessment is made bearing in mind the size of the funding stream and any known competing priorities.

If deemed suitable for funding, the UKRI International Team and the relevant UKRI Council lead complete a form, outlining the proposed activity. This should demonstrate alignment with a set of five criteria, which are similar to those used for the main waves of competition, but with the addition of fit with one or more Strategic Opportunities Stream categories (R&I that is required for rapid response at short notice; an untapped and unforeseen opportunity that is time critical; and/or an opportunity arising through high-level strategic engagements, resulting in new activities where a timely response is needed). Proposals are submitted to the UKRI FIC team who coordinate assessment by a small virtual panel of representatives from UKRI and BEIS.

There was variable awareness of the Strategic Opportunities Stream's existence and its details across the various consultees from Councils. There appears to have been a lack of communication about this opportunity and for many programme leads it remains something of a mystery (what it is, what it is for, how you access it). This is to some extent by design; it is a relatively small pot of funding that could support, for example, just two or three programmes of the average size of the rest of the FIC portfolio (although it may support programmes that are larger/smaller). We understand that, given the previously mentioned high demand for funding, it has been important to manage expectations about the opportunities available. Nevertheless, there were widespread calls for greater information and transparency. As such, we believe that more could be done to communicate the opportunities of this stream, while also being clear about the scale of funding available, to manage demand.

Regardless of current awareness, there was widespread support for such an agile stream that provided the flexibility to respond more quickly to emerging opportunities and challenges. In addition, some Council representatives also mentioned that they could see value in a stream of funding that could support wider diplomatic activities and government priorities, or that might help address challenges associated with fixed FIC spending timetables (and their potential misalignment with partner funding cycles or those of pre-existing multilateral initiatives). There was universal support for maintaining the Strategic Opportunities Stream in any future iteration of FIC, and perhaps even expanding it (if additional funding were available). Some even suggested that over time the UKRI fund could mainly focus on the Strategic Opportunities Stream, with responsibility (and budget) for the remainder of FIC's current activities being passed to Councils, removing the wave-based competition. We believe that there is value in combining the two routes, since maintaining a degree of centralised resources supports cross-Council collaboration (an objective that UKRI is still committed to pursue more generally). We discuss this in more detail in our recommendations (Section 4.2).

2.9 FIC adds to a suite of Fund level approaches that are strengthening cross-Council working

Councils were encouraged to bid jointly for FIC funds. Proposals that included multidisciplinary or multi-Council activity were said to be desirable (rather than essential) – and they were scored on this criterion, albeit with a lower weighting than the other four (essential) criteria.

The majority of FIC programmes (19 of the current 34) involve two or more UKRI Councils (in one case as many as eight). The Councils are accustomed to working together, including on international endeavours outside of FIC, and have been doing so for many years. However,



the Councils also report that the opportunities of FIC have encouraged and incentivised (but not forced) them to come together more than usual (more closely, more broadly) to think about where they could work together, both now and in the future (within FIC and beyond). This is a common finding across centralised Funds that encourage cross-Council working.

The centralised funding pot provides additional “neutral” resources, which Councils have reported as being positive because it encourages openness and flexibility, and makes it easier to align in areas of shared interest. Councils reported being less proprietorial when developing and implementing FIC programmes, compared with normal, and more focused on supporting the best opportunities, rather than securing a share of the budget for their own purposes. The related suggestion was also made that there was greater openness to funding grants that are at the boundaries or respective Council remits, possibly picking up opportunities that might otherwise fall through the cracks between individual Councils.

Another related reflection from Councils is that the funders in the priority countries are not necessarily structured around the same disciplines as UK Councils, or under a similar umbrella organisation to UKRI. Many of the overseas funders involved in FIC programmes (for example the National Endowment for the Humanities in the US, the Natural Science Foundation of China, or the Social Science and Humanities Research Council of Canada) have remits that cut across those of individual UKRI Councils. Different combinations of UK and overseas partners can therefore be beneficial in helping to align the interests of two differently organised systems.

No significant issues were reported in terms of cross-Council working in the establishment and early implementation of FIC programmes. These arrangements were generally seen to be working well, as they do outside of FIC as well. However, it was highlighted that having one lead Council, with a wider working group that includes the other partner Councils, had been found to be a better model than trying to run a programme entirely jointly.¹⁵

Cross-Council working on FIC programme development and implementation is also already showing signs of longer-term benefits. Councils regularly reported that this had led to the identification of other opportunities to work together, both directly relating to current programmes, and more generally. Individual interactions had also provided greater insight into how other Councils work, including an opportunity to share practices (e.g. in dealing with Covid-19). Councils also reported that, as a result of their interactions with counterparts during the first wave of bidding and implementation, they had felt better placed and prepared to work together in the second wave of FIC bidding.

2.10 There are opportunities for greater sharing and learning between programmes

With FIC being a new Fund, delivered by a relatively new organisation, there were reportedly some initial challenges in adjusting to and learning the relevant administrative and reporting processes. However, the FIC team was commended by programme leads for its support in easing this learning process (coordinating, communicating, answering questions), and FIC’s monitoring requirements and activities are now generally seen as appropriate and straightforward as a result. There is also appreciation for the fact that the various information being provided is actually being viewed and used; serving a purpose, rather than just representing unnecessary bureaucracy.

¹⁵ The extent to which these two approaches have been taken across the portfolio (and beyond), as well as wider evidence of the pros and cons of each approach, could be explored further in future iterations of the evaluation.



Similarly, representatives from the FIC Board noted that the information from programmes was timely and of high quality, already providing useful insights into emerging findings and impacts from the Fund (both at an aggregate level and through individual examples).

However, there were some suggestions put forward by Council representatives for further improvement to the monitoring and reporting systems:

- The narrative templates that programmes were asked to provide each quarter could be updated less frequently, as little changes within this timeframe. [This suggestion has already been addressed, with six-monthly reporting now that programmes are well established]
- Despite the FIC team's efforts,¹⁶ the role and activities of the FIC Board are not clear to all programme leads (who indicated that they had not seen minutes, or conclusions or indications of changed thinking/strategy based on information provided)
- There has been some confusion caused by multiple lines of communication between the programmes and (i) the FIC team directly, and via (ii) the FIC Working Group or (iii) International Committee

The FIC working group, which brings together representatives from the different Councils, along with UKRI (FIC, cross-cutting functions and an overseas team representative) was reported to be working well in terms of sharing information and views around particular issues and challenges encountered within programmes, and in providing information to Councils. Indeed, there was a desire to further strengthen the use of this platform going forwards, with more frequent meetings, more reporting back from individual programmes to the wider group, and more facilitated discussions, to support greater collaboration and sharing between Councils. These suggestions have already been addressed by the FIC team, with meetings taking place every six weeks (rather than every quarter), the introduction of a presentation from one of the Councils at each session, and particular sessions focused on generating ideas for Board papers.

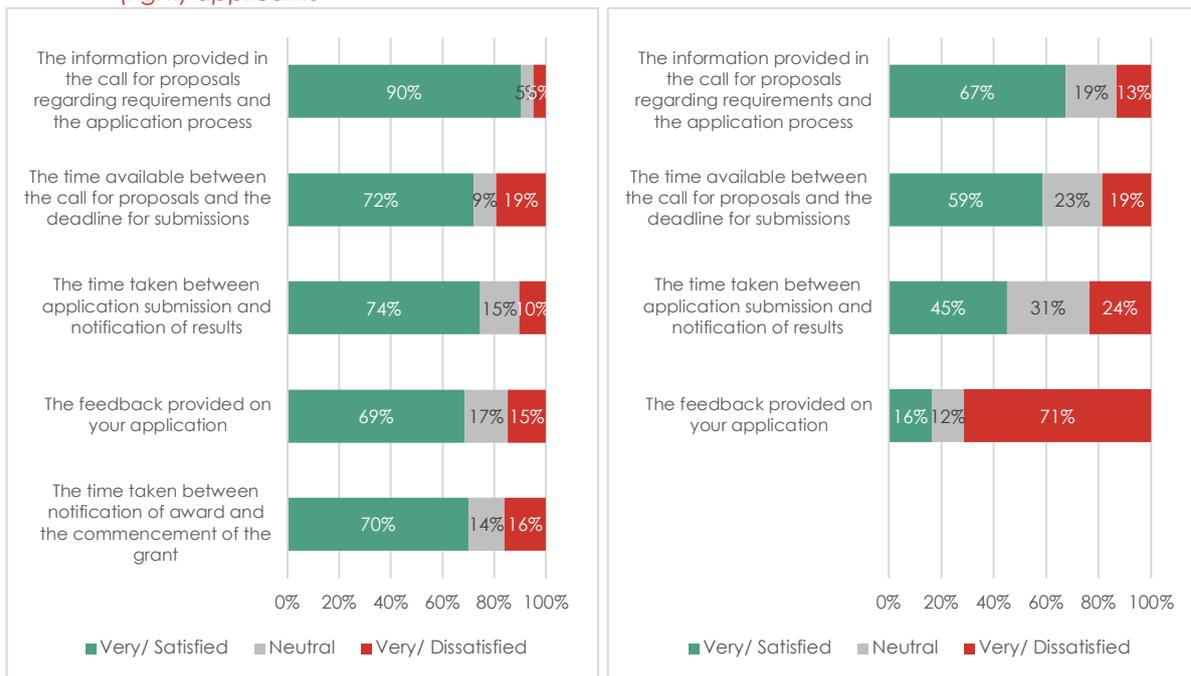
Beyond the international teams, however, there is less opportunity for cross-Fund learning and sharing. Other programme leads (not directly involved in the FIC working group) felt that they have had little opportunity to share experiences so far with counterparts in other Councils. A suggestion was made by several programme leads that sub-groups might be considered (in addition to the main FIC working group), which would bring together representatives from FIC programmes that are working with the same priority country. This could integrate programme leads into FIC sharing/learning activities and, with a tighter focus (a particular country), there may be more immediate benefits to sharing knowledge and experiences.

2.11 Project applicants reported high levels of satisfaction with FIC programme processes

Successful UK project applicants (left side of Figure 6) were mostly positive about their experiences of the application process, with at least two-thirds indicating they were satisfied or very satisfied with each of the steps asked about (call information, time to bid, time to notification, feedback provided, and time to grant). Unsuccessful UK applicants (right side of Figure 6) tended to be slightly less positive across each of these aspects, and in particular in relation to the feedback they received.

¹⁶ We understand from the FIC team that a read out from the Board meeting is provided to Councils and an update is given to the FIC Working Group.

Figure 6 Satisfaction with project application processes amongst successful (left) and unsuccessful (right) applicants



Source: Technopolis (2021). Surveys with UK successful applicants (number of responses, N =137–146) and UK unsuccessful applicants (N=140–145). See Appendix I of the Technical report for further details.

Respondents were also invited to reflect on particular aspects of the process that worked well and compared favourably with other experiences. From the large number of responses provided, there were two groups of comments that were more FIC-specific (rather than more generic good practice for running calls and competitions for funding).

One of these groups related to the importance of support to engage with overseas partners:

The advice provided by Innovate UK regarding formation of partnership and coordination with international partnerships.

The AHRC 2019 seed fund was valuable in selecting suitable partners and preparing the team to bid for the AHRC large grant UK-China creative partnership.

The initial partner finding mission to Canada was very useful in identifying stakeholders.

The second group pointed to the benefits of a single submission for a cross-country or cross-Council award:

It was very helpful not to have to submit a separate US NSF proposal.

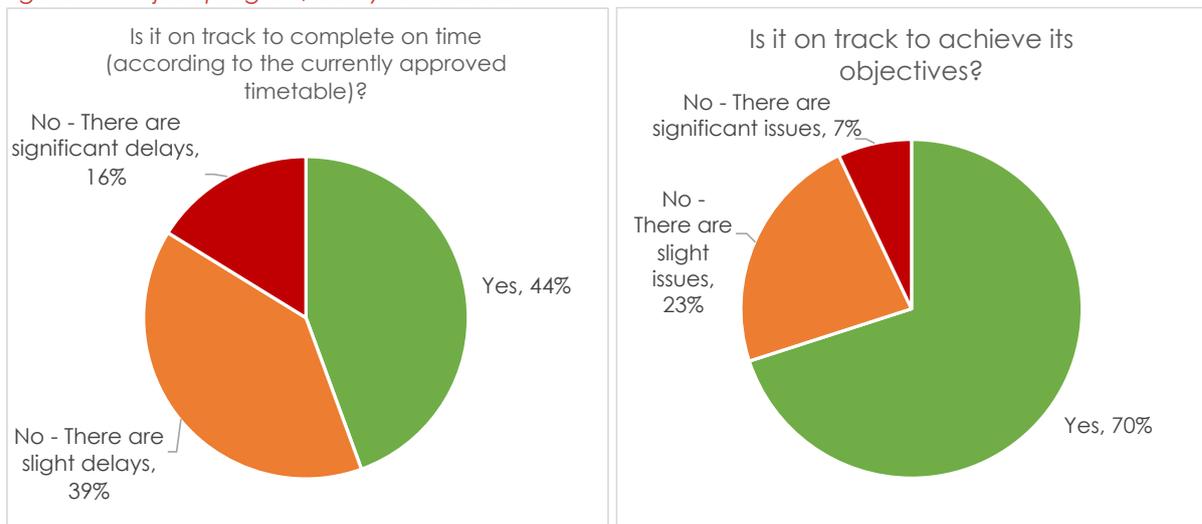
The ability to have a joint proposal reviewed just once through the FIC mode of funding was fantastic.

Combining ESRC and AHRC was great as my work overlaps the two bodies.

2.12 Project applicants report widespread delays and challenges, but are positive about being on track to achieve their objectives

Participants from the UK and overseas were also asked about the progress of their project. A majority (56%) reported some delays or issues with their timetable, although in most cases these were reported as “slight” rather than “significant”. However, despite this, the great majority (70%) of participants reported that their project was still on track to achieve its objectives. Only 7% reported significant issues here.

Figure 7 Project progress, delays and issues

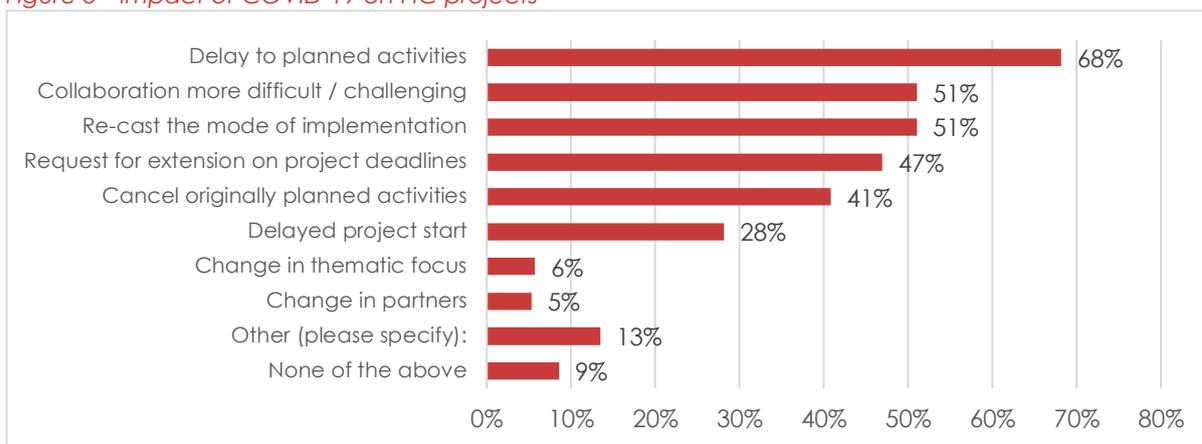


Source: Technopolis (2021). Surveys with UK successful applicants (N=135-139) and international Participants (N=96-98). Results combined (N=231-237).

Participants were specifically asked about the impact of the coronavirus pandemic on their project. The results show widespread disruption, with only 9% of participants reporting little or no impact at all (one-third of these projects concluded in 2019, i.e. before the start of the pandemic). Most commonly, respondents reported delays to planned activities (68%), a need to change modes of implementation, e.g. from face-to-face to online (51%) and generally a more difficult and challenging international collaboration (51%). Just under half (47%) had also requested an extension to their project deadlines as a result of the pandemic.



Figure 8 Impact of COVID-19 on FIC projects



Source: Technopolis (2021). Surveys with UK successful applicants (N=145) and international Participants (N=100). Results combined (N=245).



3 Main findings from an impact evaluation perspective (baseline and early progress)

3.1 Introduction

This section focuses on showing progress so far with respect to FIC's two high level objectives. Whenever possible the information presented draws comparisons with a baseline period (i.e. before FIC programmes, or grants funded by FIC programmes, started), or with a benchmark scenario (i.e. opportunities outside FIC, or what would have happened in the absence of FIC).

As mentioned in Section 1.2, our analysis focuses on what FIC has delivered in comparison with other means of supporting international R&I collaboration (i.e. Business as Usual). Comparisons with other specific national and international programmes were deemed not appropriate (given differences in scope). Finally, the study does not explore, in a systematic way, what the results would be of delivering FIC in a different way (e.g. different budget or different countries in scope), as this would require a full 'options appraisal' (which is beyond the scope of this evaluation).

Note that all figures presented in this section will be tracked over time to capture the evolution of results in the next stages of the study.

The section is organised as follows:

- Sections 3.2 to 3.12 cover **Objective 1**:
 - Sections 3.2 and 3.3 covers Theme 1 (Enabling funding)
 - Sections 3.4 to 3.9 cover Theme 2 (Developing partnerships), first from the funder perspective (Tier 1 in the ToC) and then from the researcher and innovator perspective (Tier 2 in the ToC)
 - Sections 3.10 to 3.12 cover Theme 3 (Deepening R&I)
- Section 3.13 covers **Objective 2**

3.2 FIC has successfully delivered and attracted additional resources to fund international collaboration in research and innovation

FIC has awarded £153.4m to programmes so far (31 programmes through the two main waves of competition, plus two programmes through the Strategic Opportunities Stream). **At the time of bidding, these programmes had attracted match funding commitment from overseas partners (in cash or in kind) totalling £205m.**

As of March 2021, there have been 40 calls by FIC programmes where awards have been made, with a total value of £93m (alongside several investments in infrastructure). Information recorded by programmes on match funding awarded to active / completed grants suggests that this currently totals £197m¹⁷, although there are also indications of other contributions (in-kind) that have not been monetised (FIC tracker, March 2021). This means that with two-thirds of programme budgets now awarded to grants/projects, the programmes have almost reached the match funding commitments made at bid stage.

Additionally, 41% of UK successful applicants to FIC programmes stated via survey that there have been **additional resources leveraged for their FIC project**, beyond the value of the grant

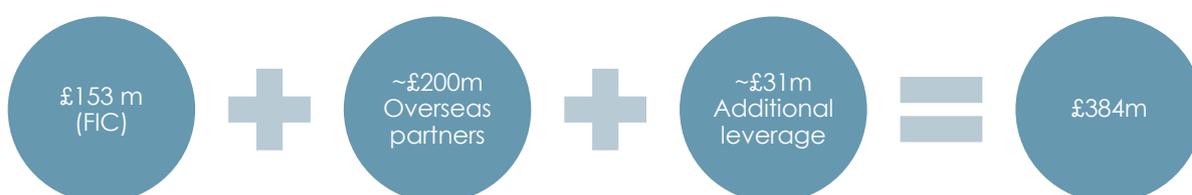
¹⁷ Where figures were not recorded in GBP, these were converted based on the exchange rate on 1st March 2021.

and any match-funding required by the rules of the call. **This amounts to a total of £15.9m** (so far),¹⁸ **almost half of which has been obtained from overseas funding sources.**

- £3.8m from their own organisation
- £4.3m from UK-based funding sources
- £7.8m from Overseas funding sources

This £15.9m leverage figure is based on the survey responses from 120 grants (out of the 424 grants awarded so far), so the actual figure could be closer to ~£30.6m (using an average of £48k per grant, after excluding outliers¹⁹, as indicated by survey responses, applied to the remaining 304 grants for which we do not have information).

All in all, this means approximately £384m in resources for international research and innovation collaboration with FIC priority countries.



3.3 It has increased the funding available in the UK to conduct research with key priority countries, but to a limited extent

FIC has increased the pool of resources made available via UKRI to conduct projects with international partners, but the resources are relatively small in comparison with pre-existing investments made by UKRI, as show in Figure 9. In 2020, for instance, UKRI (excluding FIC) awarded a total of £533m to 1,205 grants that included the participation of at least one FIC priority country, while in the same year FIC funded 213 grants for a total value of £56.4m (based on data from Gateway to Research, using project start dates, and excluding infrastructure investments).²⁰

Even if the total value of FIC is compared against wider UKRI funding of grants with FIC priority countries in the period 2019–2021, it would equate to just 8% of the total (£160m versus £2bn).²¹ Again, this is a reflection of the size of the FIC investment, but also of the UK research and innovation system (and its active participation in international collaboration).

The average value of FIC grants is also considerably lower than the UKRI average with priority countries (£265k versus £442k, on average, in 2020) which reflects in part the fact that FIC has funded several small grants to mainly support pump-priming activities (such as networking

¹⁸ This is higher than what is being reported in Researchfish at the moment, where participants across just 21 projects have reported only £3m in leverage in total.

¹⁹ Outliers are identified as those responses that report a total value of leverage that is 3 standard deviations above the mean.

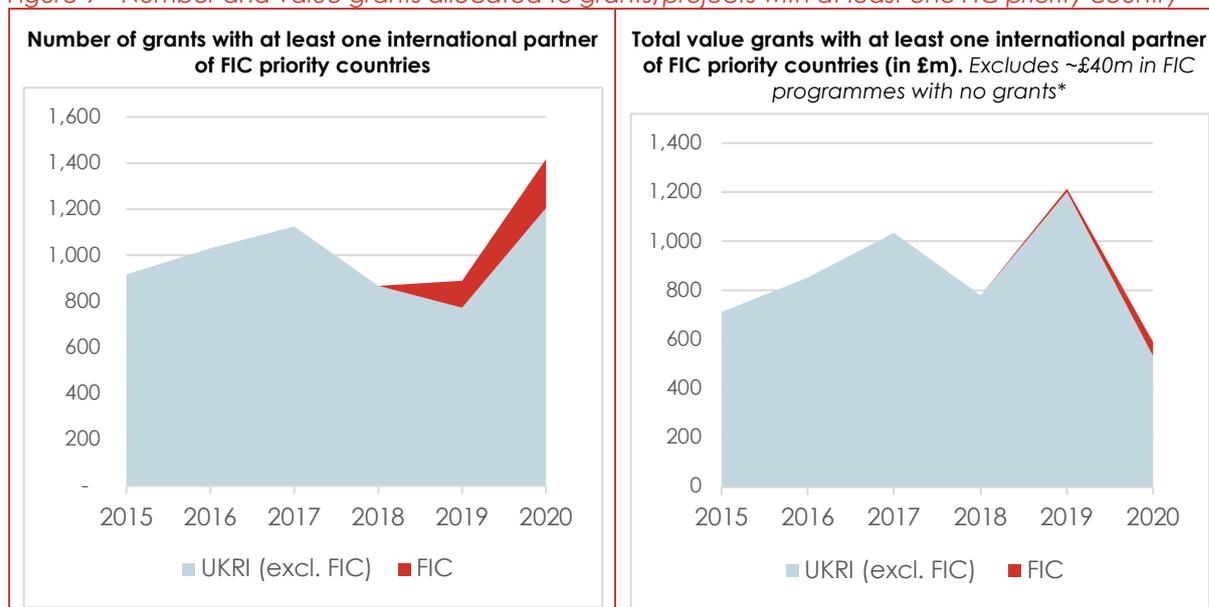
²⁰ The figure also shows an increase in number of grants for UKRI (excl. FIC) in 2020 but a decrease in the total value of those grants (in comparison with 2019), showing that the average value decreased from £1.55k to £0.44k between 2019 and 2020.

²¹ The figures for UKRI (excl. FIC) may also be underestimated as not all grants report their international partners fully.

events) or secondments, as part of its intentions to act as a seed fund to support initial engagements that could help to cement future collaboration activities.²²

Despite the relatively small investment made through FIC, the data shows that (in 2020) the Fund has added resources to a declining pool of funding available for collaboration with FIC priority countries.

Figure 9 Number and value grants allocated to grants/projects with at least one FIC priority country



Source: Technopolis (2021) based on data from GtR. UKRI figures exclude FIC. Years based on the start date of the project. Figures for 2021 excluded as they do not include the full year and distort the trends in the graph. Five programmes to a value of £37m have not issued competitive calls and consequently they will not appear in GtR data. This includes three programmes led by STFC, plus two other programmes that are yet to award grants (but are planning to do so).

These additional FIC resources have increased by more than 5% the value of grants for international collaboration with FIC priority countries for AHRC and NERC, which is a substantial contribution for those research Councils, and between 2%–5% for ESRC and MRC. The increase is less prominent for BBSRC and Innovate UK. Again, this aligns with feedback that the Fund has been a welcome addition to the resources available for international collaboration.

Box 2 Research Councils – % increase in value of grants due to FIC (2017–2018 versus 2019–2020)

More than 5% increase	Between 2% and 5% increase	Less than 2% increase
<ul style="list-style-type: none"> AHRC NERC 	<ul style="list-style-type: none"> ESRC MRC 	<ul style="list-style-type: none"> BBSRC Innovate UK

Source: Technopolis (2021) based on data from GtR. Note: STFC and EPSRC not included as they have no grants issued via FIC programmes (although EPSRC may do so in the future).

In terms of geographic spread, the Fund has meant a substantial increase in resources (grants) available for collaborations with partners in South Korea (which did not appear otherwise as a partner country for grants registered in Gateway to Research for the period of analysis). It has

²² 14% of grants included mainly networking and exchange activities, according to our analysis of GtR.



also meant an increase of 2%–5% in resources (grants) available for collaborations with partners located in Brazil, China, India and Japan, and a more modest increase (of less than 2%) for collaborations with partners located in Canada, Ireland, Israel, Norway, Sweden and the United States.²³

Box 3 Countries – % increase in value of grants due to FIC (2017–2018 versus 2019–2020)

More than 5% increase	Between 2% and 5% increase	Less than 2% increase
<ul style="list-style-type: none">• South Korea	<ul style="list-style-type: none">• China• India• Japan	<ul style="list-style-type: none">• Canada• Ireland• Israel• Norway• Singapore• Sweden• United States

Source: Technopolis (2021) based on data from GtR. Note: Excludes Australia and Switzerland as no grants have been issued with those countries for the period of analysis (up to December 2020) based on GtR data.

As mentioned above, other mechanisms like the EU Framework Programmes also offer the opportunity to partner with FIC priority countries. Data from Horizon 2020 (see Table 4 below) shows that between 2018 and (April) 2021 the UK has actively partnered with organisations based in FIC priority countries, and that the total value of EU contributions to these collaborations amounted to £6.8bn (value of EU contributions to participant organisations based in each of those countries, including £2.9bn awarded to UK organisations).

The results also show that a significant percentage of the total £6.8bn has been awarded to organisations based in China (£1.4m), reflecting in part the growing success of Chinese organisations in securing H2020 funds, but also the size of their research base. In fact, the table below reflects each country's relative success in H2020 (understanding that this analysis only focuses on projects with UK participation).

This provides further evidence of the relatively small investment made through FIC. However, the Fund's added value seems to be more a matter of focus than scale. As stated above, FIC is geared towards supporting funder level relationships, as those are expected to be more **strategic and long-lasting**.

The top-down approach means being able to provide more strategic steer to the research and innovation activities conducted with key partner countries, focusing on areas of common interest and potential mutual benefit (including climate change & health, healthy ageing, and business internationalisation, to name a few). As such, FIC provides the opportunity to target efforts to deliver on funder objectives, and identify opportunities for medium to long-term collaborations (rather than one-off or dispersed efforts), as is further discussed in Section 3.12.

Participation in the EU Framework Programmes clearly offer some advantages, mostly in terms of access to large scale opportunities (where pooled resources mean being able to work on projects of more than £1bn, such as the Innovative Medicine Initiative and Clean Sky).

²³ This data relies on the assumption that GtR accurately records participation from all international partners in each grant. This may not always be the case (as it is unlikely that there have been no grants that included a collaborator from South Korea in the period of analysis). However, this is best source of information available to conduct this type of historical analysis for UKRI and provide a system level view.



However, areas funded by EU Framework Programmes are driven by the priorities of the EU, which may or may not align with UK priorities.

Additionally, access to the EU Framework Programmes could become more limited over time. Recent work programmes for Horizon Europe, for instance, exclude non-EU countries from major space and quantum programmes, to safeguard strategic assets, autonomy and security.²⁴ This may be a growing trend in the future.

The FIC top-down approach also provides a platform for setting up frameworks to facilitate collaboration between researchers, maximising opportunities identified bottom-up (via researcher-to-researcher links). Establishing those relationships may be of growing importance in the future, as countries increase efforts to link up with international partners.

China, for instance, is actively engaging in international collaboration with the UK (and other countries with access to the European Framework Programmes) and is willing to invest a substantial amount of resources to support these activities more generally (this is also showcased in our case study on China in Appendix G of the Technical report). Developing funder relationships via FIC could help to increase the probability of the UK becoming a partner of choice, and may have positive spillover effects for other collaboration (e.g. via Horizon Europe).

As such, FIC is a relatively small investment, but it could be catalytic if it manages to solidify funder-level relationships. However, this may require follow up funding to support the opportunities identified (see discussion on sustainability in Section 3.5).

Table 4 UK collaboration with FIC priority countries in Horizon 2020 (EU contribution in £m)

	2018	2019	2020	2021	Total
Non-EU					
China	319.91	391.53	453.05	213.76	1,378.26
USA	3.81	12.72	29.95	14.83	61.30
South Korea	10.97	7.37	21.54	5.66	45.55
Canada	0.48	2.09	1.73	5.11	9.41
Australia	0.08	0.37	1.31	2.81	4.58
Japan	0.28	0.60	0.12	1.70	2.71
India	1.12	0.37	0.18	0.61	2.29
Israel	0.09	0.36	-	-	0.45
Singapore	-	-	-	-	-
Sub-total	336.75	415.42	507.88	244.48	1,504.54
EU and Associates					
Sweden	255.29	270.78	311.04	147.72	984.82
Norway	211.42	269.85	316.68	103.01	900.96
Ireland	138.09	170.23	179.31	63.56	551.19

²⁴ <https://sciencebusiness.net/sites/default/files/inline-files/Digital%2C%20Industry%20and%20Space.pdf>. Accessed 14 May 2021. See page 280 for example.

	2018	2019	2020	2021	Total
Switzerland	-	0.27	-	-	0.27
Sub-total	604.80	711.12	807.03	314.30	2,437.25
UK	881.09	887.79	750.02	402.74	2,921.64
Total	1,822.64	2,014.34	2,064.93	961.52	6,863.43

Source: Technopolis (2021) based on EU CORDA data. Years are based on the start year of the project

3.4 FIC has allowed the strengthening of partnerships between funders, demonstrating that successful international collaboration is built over time

FIC has supported the development and strengthening of partnerships in the following ways:



Furthermore, evidence collected via workshops with programme leads and case studies show that the strengthening of partnerships has so far supported:

- Better understanding of priorities, processes, and research capabilities
- Identification of future opportunities
- Knowledge exchange
- ... and may enable further leveraging of funding

Table 5 below shows an assessment of FIC's additionality for each of the programmes that have been case-studied (and in relationship to Tier 1 of the ToC, funder-to-funder relationships). It also notes two factors, that based on the evidence, seem to play an important role in defining the partnerships supported by FIC (the nature of the pre-existing relationships and the existence of joined initiatives/strategies). Finally, it also reports on progress so far in terms of further strengthening the partnerships. It shows that FIC's additionality is varied and higher when the partnerships (extent of collaboration before FIC) are relatively new. It also shows that, at this stage of the evaluation, progress with strengthening those partnerships is still limited. However, those involved expect these partnerships to further evolve over time.

Additionally, the boxes presented after this table provide further narrative on how FIC has supported the strengthening of partnerships (based on evidence collected via interviews or case studies).

Table 5 FIC Additionality in relation to the development and strengthening of funder-level partnerships

Case study	Maturity of partnership (prior to FIC)	National joint strategies	Intensity of FIC additionality	Progress so far
United States National Science Foundation	Mature Long history of collaboration in supporting research through bilateral activities and multilateral arrangements	No	Medium / Low It has provided a focal point for discussion at the funder-to-funder level that did not exist before Increase of 1% in UKRI funding due to FIC (*)	<ul style="list-style-type: none"> Strengthening of the partnership by allowing joint programmes at larger scale and with broader scope.
National Natural Science Foundation of China	Mature Long history of collaboration in supporting international research	Yes – UK-China Joint Strategy for Science Technology and Innovation cooperation, 2017	Low Other sources of funding available to progress similar agendas (e.g. ISCF) Increase of 2% in UKRI funding due to FIC	<ul style="list-style-type: none"> The continuation of collaborative activities For Chinese partner, opportunity to fund interdisciplinary collaborative research (and opportunity to test and learn from application and assessment processes)
Japan Science and Technology Agency	Relatively new Extent of cooperation with UK has increased gradually in recent years	No	Medium / High Cooperation in the area of SSH (supported by FIC) is new Increase of 2.8% in UKRI funding due to FIC	<ul style="list-style-type: none"> Increased understanding of common (research) areas of interest & processes Mutual cooperation (ESRC asked to provide feedback on Japanese new national programme) (FIC Objective 2)
Canadian Institutes for Health Research	Relatively new Extent of cooperation with UK has increased gradually in recent years	Yes – STI MoU between BEIS and Department of Foreign Affairs, Trade and Development of Canada, 2017; High-Level Agreement between the Canada Research Coordination Committee and UKRI, 2019	Medium / High Limited resources to collaborate before FIC FIC funding has provided the ability to participate in an international initiative (with various countries) which in turn has allowed funding at the right scale Increase of 0.9% in UKRI funding due to FIC	<ul style="list-style-type: none"> Increased interest in future collaborations, including multilateral partnerships that build on FIC bilaterals New Frontiers Fund in Canada could be main source of matched funding in future New partnership between CIHR and MRC's Neurosciences department Increased familiarity with CIHR's systems and how they work, which would make future collaborations more streamlined
MOST – Department for Biotechnology India	Mature Long history of collaboration in supporting international research	No – However institutionalised dialogues have taken place via the India-UK Science & Innovation Council (SIC) (2006), and UK-India Science & Innovation Task Force (2014)	Medium / Low Other sources of Funding available to progress similar agendas (but mostly ODA) FIC has also allowed a first collaboration between the innovation agencies, and collaboration in areas of common interest (given non-ODA focus) Increase of 2.1% in UKRI funding due to FIC	<ul style="list-style-type: none"> No evidence of further activity beyond existing FIC programmes
Enterprise Singapore (**)	Relatively new Started in 2019	No	High FIC funding has allowed first opportunity to collaborate (via Eureka) i.e. alternative sources of funding were not identified before	<ul style="list-style-type: none"> Testing appetite for collaboration among UK and Singaporean innovators (with demand for calls surpassing expectations) Ongoing conversations on how to progress the partnership, incl. via bi-lateral agreements (and outside the Eureka framework)

(*) Based on statistics presented in Section 3.3 above. (**) Not a case study, but information collected via interviews has provided enough evidence to include this example in our assessment.

Continuation of partnerships via follow-on funding into new or existing areas of collaboration



Collaboration between NERC and NSF GEO

NSF and UKRI have a long-standing, strong, mature relationship and a long history of collaboration in supporting research through bilateral activities and multilateral arrangements. The relationship between NERC and NSF GEO has a long history, for example a barter arrangement for research vessel time has been in place since the 1970s. Much of the research within NERC's and NSF GEO's remit is inherently international, with issues such as climate change and investments such as large research infrastructures spanning international borders and requiring multilateral collaboration.

To facilitate international collaboration, NERC and NSF GEO co-founded the Belmont Forum in 2009²⁵ and established a lead agency agreement in 2015.²⁶ Since then, these organisations have partnered on a number of joint research programmes, including multilaterally on topics such as food security and land use change, coastal vulnerability and freshwater security, and e-infrastructure and data management through the Belmont Forum,²⁷ as well as bilaterally through the Thwaites Glacier programme.²⁸

While many connections between Research Councils and NSF were already established, the larger scale of funding provided through FIC served as a focal point for discussion at the funder-to-funder level. This allowed true co-development of programmes, in contrast to other routes to international collaboration in which UKRI Councils first specify a funding programme before an "international add-on" can be considered. FIC also incentivises Councils to explore new or expanded partnership options, and facilitates multi-Council working by providing a common budget that is not tied to individual Councils. In addition, FIC as a dedicated international funding stream, provided UK Councils with "a spotlight and challenge to think about internationalising key parts of the portfolio which [they] probably weren't able to do previously". Interviewees from UKRI also felt that FIC served as an important signal of the UK's interest in collaboration with non-ODA countries, balancing out the substantial funds dedicated to ODA countries over the last years.

Source: Case Study – United States National Science Foundation (Geosciences) (Appendix G, Technical report)

First opportunity to have a concrete (funded) opportunity to collaborate



Supporting business-led multilateral collaboration through the EUREKA framework – collaboration with Enterprise Singapore

Singaporean interaction with Innovate UK goes back many years, even before the creation of Enterprise Singapore (in 2018) and the relationship has been led by the National Research Foundation Singapore (which funds all the public research initiatives in Singapore).

Initial conversations with Innovate UK to explore a "platform" or space to support innovation and to enable collaboration between businesses in Singapore and the UK started in 2017. That conversation progressed, thanks to FIC, into more concrete actions with participation in the Eureka Global Stars call, which has allowed the UK and Singapore to embark into a more active and focused bilateral cooperation. Innovate UK may not have been able to participate in the Eureka call without FIC funding. (The call includes opportunities to facilitate

²⁵ <https://nerc.ukri.org/research/partnerships/international/belmont/> (accessed 15th April 2021)

²⁶ <https://nerc.ukri.org/funding/available/researchgrants/international/> (accessed 8th March 2021)

²⁷ <https://nerc.ukri.org/research/partnerships/international/belmont/>; <https://www.belmontforum.org/data/> (accessed 8th March 2021)

²⁸ <https://nerc.ukri.org/research/funded/programmes/thwaites/> (accessed 8th March 2021)

and fund joint innovation projects with companies from 14 EUREKA countries, and the UK participation is funded by FIC).

The joint participation in the programme was intended to serve as a platform to test the appetite and demand for business collaboration across the two countries, and as such it has been very successful. The demand for the two calls set up so far has exceeded expectations, and proposals of good quality have surpassed the intended funding support, which has meant being in the privileged position of having to select among a good pool of options. As an example, in 2020 there were 84 proposal submissions to Global Stars for collaboration between Singapore and 14 other countries, 39 of which were for collaborations with the UK.

Going forward, Enterprise Singapore and Innovate UK will evaluate whether or not the rules and structure within Eureka are fit for their purpose (of strengthening the partnership), and whether or not it would be more convenient to set up bilateral programmes.

Source: Interviews with Enterprise Singapore and Innovate UK.

Bringing together organisations that had not collaborated before

Climate, Environment and Health programme and Global Incubator programme



In our case studies, we have found two examples of funders that are collaborating for the first time²⁹. One example is provided by the collaboration between NERC and FORTE Sweden in the context of the Climate, Environment and Health programme, a Belmont Forum call led by NERC, involving eight countries (with FIC funding the UK participation). FORTE is the Swedish Research Council for Health, Working Life and Welfare. Given their remit, they have not collaborated with NERC before, but the nature of the call meant that there was scope to explore the interconnections between health and climate change. The Belmont Forum call would have gone ahead without the UK participation (even though NERC has an active role in setting research agendas within the Forum), and FIC has provided the opportunity for NERC's participation, and collaboration with FORTE. Going forward there may be other opportunities to collaborate (probably still within the context of the Belmont Forum) mostly around the social dimension of sustainable development.

Another example is the collaboration between the Department of Biotechnology (DBT), within India's Ministry of Science and Technology and Innovate UK in the context of the Global Incubator programme. Both Innovate UK and DBT (through its innovation arm BIRAC) had also already (separately) provided support for incubators, but UKRI had not had any collaboration with BIRAC in the 10 years preceding the programme, as sources of funding for these type of initiatives were not available (or at least were not identified by funders), or did not cover the intended scope. This includes the Official Development Assistance (ODA) funding since, in the case of this type of incubator programme, a primary objective is to derive benefit for UK companies. Additionally, the fact that this programme is implemented with non-ODA funding means that there have been fewer constraints in terms of the (technology) areas that can be covered, and that activities can have a commercial focus rather than focus mainly on societal benefits to partners. FIC has, in turn, allowed the opportunity to fund the partnership, and given the flexibility to maintain a commercial focus, for the mutual interest of both organisations.

Source: Interview with FORTE Sweden and Case Studies – United States National Science Foundation and Ministry of Science and Technology, India (Appendix G, Technical report)

²⁹ Others identified outside of the case studies include the 'UK-Canada: Understanding and Adapting to a Changing Arctic' programme and the 'Delivering Healthy Soils: Signals in the Soil' programme.

Additionally, FIC can support the testing of new ways of collaborating. We have found one example of this within the case studies (see box below) where FIC has enabled the UK and China to pursue mutually-beneficial opportunities that might be missed through Official Development Assistance (ODA) funding routes. However, in this case, the added value is not unique to FIC, as there are also other non-ODA initiatives in place between the UK and China.

Testing new ways of collaborating



Healthy Ageing FIC programme

FIC has enabled the strengthening of the pre-existing partnership between UKRI and NSFC, by continuing the gradual increase in collaborative activities that has been happening for many years, and supporting the implementation of the wider UK-China Joint Strategy for Science Technology and Innovation cooperation (announced in 2017). This new strategy outlined several collaborative mechanisms and actions, including an agreement to launch annual “Flagship Challenge Programmes” to address jointly identified priorities in the areas of Healthy Ageing and Agri-tech.³⁰ FIC, through the Healthy Ageing programme, provided the funding needed to fulfil part of this political commitment.

A UK-China agri-tech challenge was also set up (in 2017), led by BBSRC, and funded via the Newton Fund. This means that there were other sources of funding available (before FIC) to support this type of initiative with China. In fact, a large proportion of recent funding for collaboration between the UK and China has come from the Newton Fund and the Global Challenges Research Fund (GCRF), both of which require spending to comply with requirements for Official Development Assistance (ODA). FIC is seen as a complement to these sources, as it does not come with the same requirements and is able to fund different activities and opportunities that would otherwise be missed. FIC allows the setting up of programmes with a focus on advancing the interests of both partners, while the Newton Fund and GCRF require a stronger focus on benefits to partner countries (with benefits to the UK being of secondary order). Looking forward, it is also likely that China will no longer qualify for ODA funding and so FIC is seen as playing an important role in supporting China's transition away from these funds.

Industrial Strategy Challenge Fund (ISCF) programmes (which, like FIC, also provide non-ODA funding) have also been used to fund collaboration between the UK and China, for example in relation to the ISCF Transforming food production challenge programme.³¹ However, ISCF was considered by interviewees to have more onerous reporting and administrative requirements than FIC, which can be prohibitive for relatively small joint initiatives.

According to stakeholders interviewed, the FIC programme represents a change from previous collaborative funding initiatives, given its focus on interdisciplinarity (medical and social sciences in this instance), an area that is relatively new to NSFC. It has offered the opportunity to test and learn from new application and review procedures. (These types of results are likely to also be emerging through activities funded via the Newton Fund or ISCF).

There is no evidence that the programme has leveraged further funding at this stage, beyond the match-funding provided by NSFC for projects. However, there is an expectation that the research partnerships will provide a foundation for future collaboration between the respective communities, while the Joint Commission and biennial meetings between the UK and China will continue to provide a forum for planning for future collaboration.

Source: Case Study – National Natural Science Foundation of China (Appendix G, Technical report)

³⁰ “UK-China Joint Strategy for Science Technology and Innovation Cooperation”, Department for Business, Energy & Industrial Strategy (BEIS) and Ministry of Science and Technology (MOST)

³¹ For example “UK-China: precision for enhancing agricultural productivity”: <https://apply-for-innovation-funding.service.gov.uk/competition/482/overview> (accessed 20 March 2021)

Across the five case studies developed for this study, **pre-existing funder-level relationships** have been flagged as an enabler, providing further evidence that **successful partnerships take time to materialise and are developed over time**. This means that, even if in those cases (were strong relationships existed) FIC's additionality may be slightly lower (as stated above), this factor has facilitated programme design and implementation, and this is a trade-off that future iterations of FIC may like to take into account.

The support received from the FCDO Science and Innovation Network (in particular in the case of Japan) has also been highlighted as a facilitator for initial mediation with overseas partners and for the identification of collaborative opportunities. In the case of India, the support from UKRI India was also highlighted as an enabling factor. This office played a central and important role in providing mediation between the UKRI Councils and DBT, and also prepared the ground for more substantial discussions directly with the UKRI Councils. Through their long-standing relationship with DBT, UKRI India has a portfolio of options for collaboration in areas of mutual interest that can be mobilised when funding is available.

The existing and good relationships mean not only having well-established points of contact, but also an alignment of processes and values. Good funder-level relationships also make it easier to manage certain barriers or challenging aspects of the collaboration under FIC (such as the risk of raising expectations with overseas partners through the FIC process requiring involvement from overseas partners already at the bidding phase).

Short proposal times and restrictions imposed by the response to the COVID pandemic (across all countries) have also emerged as barriers to collaboration (as summarised in Table 6).

Table 6 Enabling factors and barriers

Case study	Enabling factors	Barriers
United States National Science Foundation (Geosciences)	<ul style="list-style-type: none"> Pre-existing relationship and established collaboration processes between NSF and UKRI 	<ul style="list-style-type: none"> Short proposal times and COVID
National Natural Science Foundation of China	<ul style="list-style-type: none"> Well-established relationship and collaboration processes 	<ul style="list-style-type: none"> Short proposal times Challenges around negotiating co-funding before knowing if FIC funding would be available
Japan Science and Technology Agency	<ul style="list-style-type: none"> High level of communication between programme managers Support from SIN officer in Japan FIC Wave 2 (building on Wave 1 success) 	<ul style="list-style-type: none"> Language Reconciling different systems for reviewing open calls (but mostly resolved) COVID
Canadian Institutes for Health Research	<ul style="list-style-type: none"> Alignment of research values, operational process and strategic priorities at funder and national level Pre-existing relationships through multilateral partnerships 	<ul style="list-style-type: none"> Short proposal times and FIC spend profile (time limit) Tri-Council organisation newly formed
MOST – Department for Biotechnology (DBT)	<ul style="list-style-type: none"> Well-established and trusted partnership with DBT Support from UKRI India (mediation and identifying collaborative opportunities at an early stage) 	<ul style="list-style-type: none"> Risk of raising expectations on partner side due to FIC process which requires involvement from overseas partners already at the bidding phase Uncertainty about long-term funding is a risk to further consolidation and development of partnerships

The study has analysed UKRI's log of MoUs (or similar) established with other countries over the past seven years. This analysis (presented in Appendix E of the Technical Report) shows that in 2018 (when FIC was launched) there were already 58 agreements in place between UKRI/Councils and funders overseas, including 14 within FIC priority countries. UKRI has plans to maintain and update this log on an ongoing basis and so the study will be able to track progress over time (in later iterations of the evaluation), compared with this initial baseline position.

3.5 Uncertainty remains about sustainability as partners in the UK and abroad would struggle to identify sources of funding to continue (research) partnerships

Evidence collected via case studies shows that FIC programmes have led to the identification of future opportunities for collaboration, many of which depend on the ability to secure follow on funding (in at least four of the five cases), as presented below.

Table 7 Sustainability

Case study	Evidence of sustainability
United States National Science Foundation (NSF Geosciences)	<p>The process of implementing the FIC programmes has led to an increase in familiarity and trust in each other's research funding systems and laid the groundwork for discussions and future partnering at strategic level.</p> <p>The implementation of these first FIC programmes is opening avenues for future partnering: both UKRI and NSF interviewees compared the current FIC programmes to "pilots", which were successful in establishing partnership processes and enhancing the understanding of each other's ways of working. This experience can now serve as a model (and incentive) for future partnerships, including at an extended scale, for example with other NSF Divisions or US agencies.</p> <p>However, further partnership discussions and relationship building are currently on hold, due to both the COVID-19 pandemic and uncertainty over future FIC funding rounds.</p>
National Natural Science Foundation of China (NSFC)	<p>The UK Councils have a well-established partnership with NSFC which predates FIC. The quality of the collaboration between UKRI and NSFC has tended to improve gradually with each new initiative, and this is also the case here, for example with respect to the peer review process.</p> <p>The processes already in place enable the partners to identify future strategic opportunities for collaboration, but the ability to pursue them will depend on the availability of funding. Several interviewees expressed uncertainty about the upcoming UK government spending review in particular, and the lack of long-term certainty about funding commitments for international collaboration more generally, which may hamper efforts to further build on partnerships.</p>
Japan Science and Technology Agency (JST-RISTEX)	<p>The experiences and success of the FIC programme has increased interest in future collaboration between ESRC and JST-RISTEX and discussions are already underway to explore a range of possible opportunities for future joint programmes. Moreover, the relationship has extended to the point at which JST-RISTEX has since sought ESRC's feedback and support in developing further domestic programmes.</p>
Canadian Institutes for Health Research (CIHR)	<p>There is increased interest in future collaboration, including multilateral partnerships that build on FIC bilaterals.</p> <p>Furthermore, the Canada Research Coordination Committee (CRCC) has set up a £160.3m New Frontiers in Research Fund, which will support international and interdisciplinary research in the next five years. This Fund could be the main source of matched funding, and future collaboration will depend on availability of UK funds and alignment of priorities.</p>
MOST – Department for Biotechnology (DBT)	<p>There is great appetite for collaboration from both DBT and Indian research and innovation communities, and a long history of collaboration. Availability of further funding was not explicitly mentioned as an issue that could threaten the sustainability of the relationships.</p>

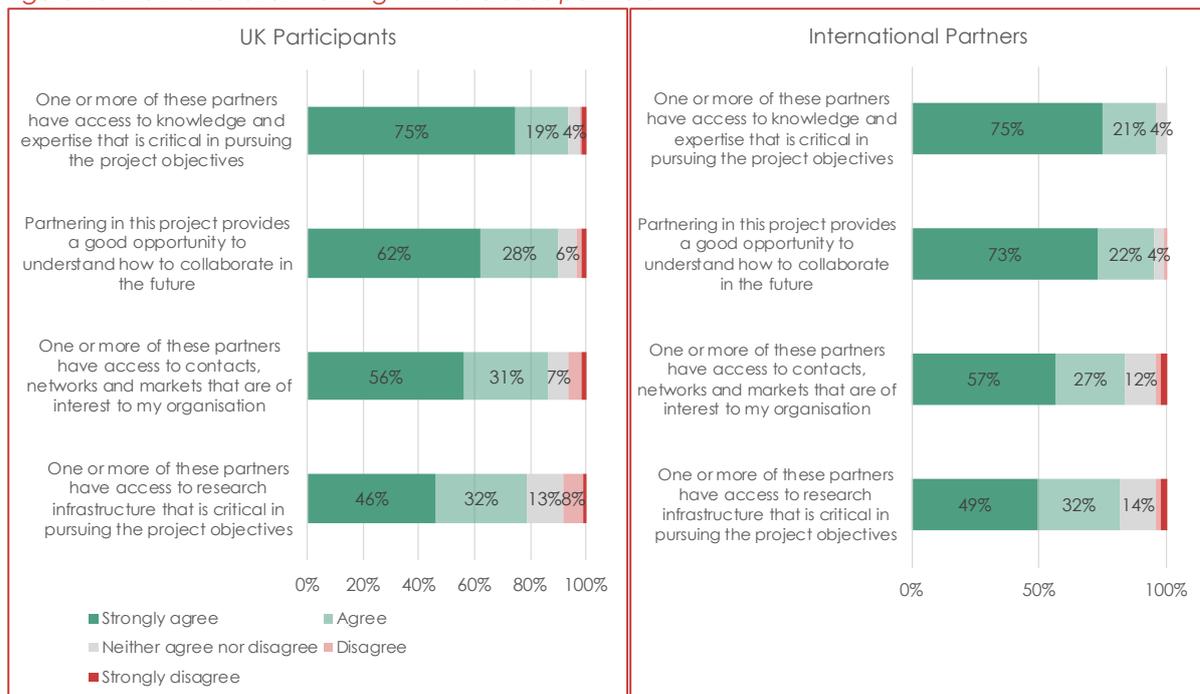
3.6 Researchers and innovators agree that the international collaboration funded by FIC (projects) has allowed them to access knowledge, expertise and infrastructure that does not exist nationally

Access to critical knowledge and expertise, research infrastructure as well as contacts, networks and markets, are strong motivations to take part in grants funded by FIC programmes. A large majority of UK successful applicants (78%–94%) agree or strongly agree that these factors have driven them to work with overseas partners. Similar results are observed among international partners (in grants funded by FIC programmes) (see Figure 10). This confirms the assumption that international collaboration in those projects is seen (at least at the outset of the projects) as an important factor to pursue the project objectives.

Additionally, UK and international participants seem to be motivated by a desire to explore how collaboration would work in practice and 90% and 95% (respectively) agree or strongly agree that partnering in the project provides a good opportunity to understand how to collaborate in the future.

These results go in line with the overall motivations to engage in research and innovation international collaboration, as described Section 2.3.

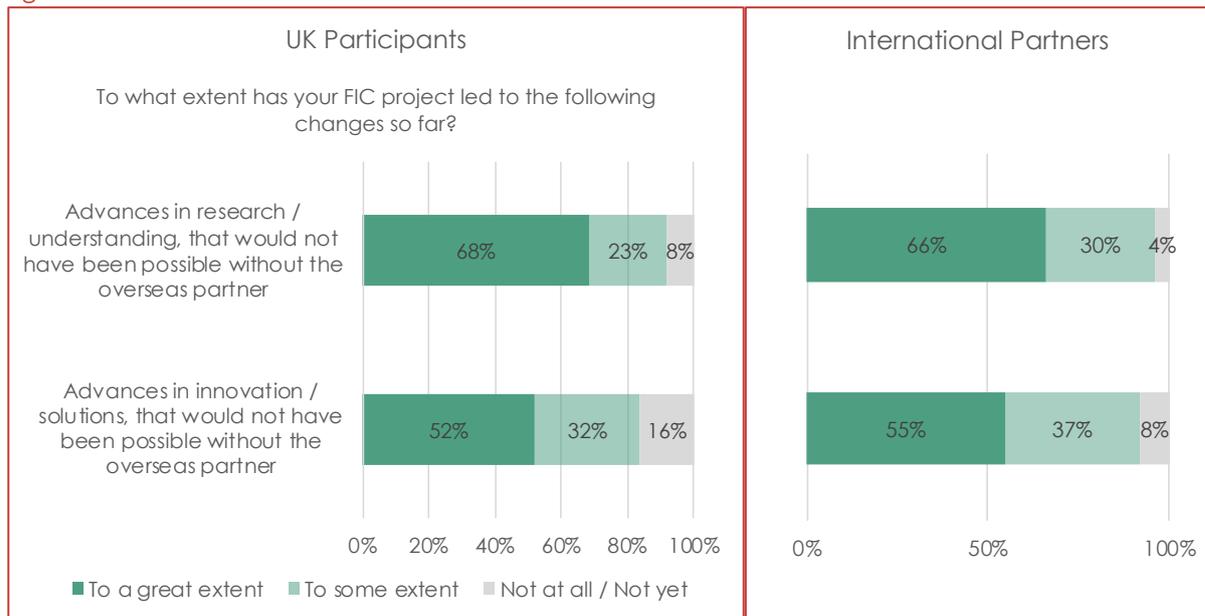
Figure 10 Motivations for working with overseas partners



Source: Technopolis (2021). Survey with UK successful applicants (N=144–146) and international partners (N=99–100)

Furthermore, even at this early stage in their projects UK successful applicants and international partners state that their projects have led to advances in research understanding that would not have been possible without the overseas partners (91% and 96% stating this has been achieved to a great or to some extent so far), or advances in innovation solutions that would not have materialised without the collaboration (84% and 92%) (see Figure 11).

Figure 11 Advances in research and innovation due to collaboration



Source: Technopolis (2021). Survey with UK successful applicants (N=142–146) and international partners (N=99–100)

3.7 FIC has removed certain barriers to international collaboration, mainly related to funding and collaboration frameworks, but many others (not explicitly addressed by FIC) still remain

There are many barriers faced by researchers and innovators that may preclude them from being able to undertake international collaboration. Financial considerations, the existence of collaboration frameworks, and information about overseas markets and actors appear as the top 3 barriers reported by successful applicants (in grants funded by FIC programmes), as shown in Figure 12 (blue bars).

The graph shows the average scores from UK successful applicants, who were asked to rate the importance of these barriers using a score from 0 (“not a barrier”) to 5 (“critical barrier”). Average scores above 2.5 reflect an important barrier. Respondents from academic and non-profit organisations experience similar barriers as those from businesses, but they are more likely to report that language and communication issues act as a barrier.

The figure also shows that projects funded via FIC programmes have reduced the top 3 barriers noted above. The red bars show the average extent to which FIC projects are reported to have overcome or lessened each barrier, using a score from 0 (“not a barrier”) to 5 (“to a great extent”).

One relatively important barrier that still remains is the issue of mobility and recruitment. “Other” barriers also has a relatively high score, but these were only indicated by a small number of respondents (n=19).

Unsuccessful applicants experience similar problems as UK participants, although they are more likely to say that language and communication issues act as a barrier to international collaboration. This problem has an average score of 2.8.

Figure 12 Barriers to international collaboration (and overcoming / lessening these through FIC)



Source: Technopolis (2021). Survey with UK successful applicants. N=125–145. Respondents were asked first to rate the importance of each barrier (blue bars), on a scale from 0 (“not a barrier”) to 5 (“critical barriers”). They were then asked the extent to which FIC projects had overcome or lessened these barriers (red bars), on a scale from 0 (“not a barrier”) to 5 (“to a great extent”). The average response is shown.

Moreover, 54% of successful applicants stated, via survey, that they would not have continued with the project idea in the absence of the FIC funding. Another 16% stated that they would have continued, but with fewer or no international partners, or at a different scale, scope and/or timetable (33%). Only 5% would have continued with the project idea (with none of those changes) (see Figure 13 below).³²

In line with these responses, 55% of unsuccessful applicants have not continued with their project ideas (that were proposed to a FIC programme), or have carried on with fewer or no international partners (16%), or at a different scale, scope and/or timetable (32%). This shows the importance of FIC funding to pursue the ideas put forward by applicants, and that suitable alternative sources of funding were not identified in many cases.

³² 84% of respondents from universities say that they would not have continued with the project compared with 11% of small or medium businesses and 5% of non-profit organisations. However, these figures need to be taken with caution given the small sizes among business.

Figure 13 What would have happened in the absence of the FIC funding (for projects)



Source: Technopolis (2021). Survey with UK successful applicants. N=147

3.8 It has facilitated new collaborations among researchers and innovators

UK successful applicants were asked to indicate how many of their UK-based and overseas partners were existing and how many were new. As shown in Table 8, **46% of all partners counted were new overseas partners. On average, that equates to 2.2 new overseas partners per project.** There are also new partnerships supported among UK organisations (17%, 1.3 on average), so a total of 63% of partners are new overall.

Table 8 New and existing partners

Your partner organisations/university departments	UK-based partner	Overseas partner
Existing partner (i.e. those that your organisation/university department had collaborated in an R&I project with before this application)	1.3 (21%)	1.1 (16%)
New partner (i.e. those that your organisation/university department had not collaborated in an R&I project with before this application)	1.3 (17%)	2.2 (46%)

Source: Technopolis (2021). Survey with UK successful applicants. N=81–125

This is further corroborated by analysis of Gateway to Research. Across the 356 FIC projects recorded in GtR there are 2,259 combinations of bilateral partnerships (i.e. between two different organisations in a consortium). We have searched for each of these same combinations of partners in Gateway to Research outside of FIC, but before the start of the FIC project, and identified earlier collaborations between the same parties in only 16% of cases. **Therefore, in the majority of cases (84%), FIC is providing a first opportunity for collaboration between organisations (at least in terms of grants awarded through UK Councils)** (see Table 9). The difference between these statistics and the figures provided by respondents to the survey may be driven by the fact that the Researchfish analysis focuses on collaborations funded by UKRI, while respondents to the survey are also including collaborations funded via other means (e.g. EU Framework Programmes).

Table 9 Summary of first-time collaborations between FIC project partners

Type of collaboration	Instances of collaborations in FIC	Proportion
FIC collaborations not occurring at an earlier date in GtR	353	16%
FIC collaborations occurring for the first time	1,906	84%
Total	2,259	100%

Source: Technopolis (2021) using Gateway to Research

Submissions via open text in the UK successful applicant survey provide further insights as to how grants funded by FIC programmes have enabled new collaboration.

The FIC project has enabled the establishment of new partnerships with 3 overseas institutions that enable us to study the environment in the partner country, which is much better suited to answer fundamental questions on antimicrobial resistance selection in the environment due to higher pollution levels than in the UK. The cross-country comparison is also highly illuminating.

We have been able to partner with two organisations where one of them could be a customer after the project and the other is the regulatory company that we will need approval from to operate our technology once proven. This is a perfect collaboration.

The FIC project helped create a network of researchers in Japan. I knew them on a personal level, but there was only one person (the Japanese PI) that I had had a tangible collaborative outcome with, prior to the project. The networking grant enabled a flexible way of working together (e.g. workshops, knowledge exchange). It also allowed overseas policy partners to participate, adding further value.

3.9 There is early evidence of initial gains in terms of better understanding of research and innovation partners' research agendas and capabilities, and improved skills and capabilities of working in international teams

A large majority of UK successful applicants and international partners (98% and 100% respectively) state that, so far, participation in their project (funded by a FIC programme) has led to a better understanding of their partners' capabilities, to a great extent or to some extent.

Furthermore, FIC projects are also reported to have provided the opportunity to learn about each other's capabilities, as well as their research agendas and priorities, with around 97% of UK successful applicants and international partners stating that this has been achieved to a great extent or to some extent.

These are strong results in their own right, but also represent intermediate steps that could lead to further fruitful collaboration. In fact, respondents also stated that participation in their FIC project has increased the likelihood of collaborating with their partners again in the future. A slightly smaller (but still large) percentage of UK successful applicants also stated that their project has led to the identification of further opportunities to collaborate.

Table 10 Improvements in understanding and likelihood of collaborating

So far, participation in the project has led to...	UK			Total	International			Total
	To a great extent	To some extent	Not at all / Not yet		To a great extent	To some extent	Not at all / Not yet	
An improved ability to work together	57%	39%	4%	100%	77%	22%	1%	100%
A better understanding of their ways of working	57%	38%	6%	100%	67%	29%	4%	100%
A better understanding of their capabilities	68%	30%	2%	100%	71%	29%	-	100%
A better understanding of their research agendas/priorities	54%	43%	3%	100%	71%	27%	2%	100%
An increased likelihood of collaborating again in the future	73%	23%	3%	100%	74%	26%	-	100%
The identification of further opportunities to collaborate	55%	31%	14%	100%	75%	23%	2%	100%

Source: Technopolis. Survey of UK successful applicants (N=146) and international partners (N=98–100)

Successful applicants were invited to reflect on their skills and capabilities in relation to working collaboratively in international teams, before the FIC project (baseline position) and now (2021), using a score from 1 to 5, where 5 is “excellent” and 1 is “poor”. Table 11 below shows that there has been an increase (of more than 0.8 points) across all categories, which include:

- Ability to access new or better knowledge from overseas
- Ability to access new or better facilities, tools and techniques from overseas
- Ability to navigate different working and research cultures
- Ability to identify sources of funding internationally
- Overall ability to work collaboratively in international teams

Similar results are observed among international partners.

Table 11 Change in skills and capabilities to working in international teams

	UK			International		
	At the point of application	Current position	Change	At the point of application	Current position	Change
Ability to access new or better knowledge from overseas	3.3	4.2	+	3.0	4.1	+
Ability to access new or better facilities, tools and techniques from overseas	2.9	3.8	+	3.1	3.5	+
Ability to navigate different working and research cultures	3.3	4.1	+	3.0	3.8	+
Ability to identify sources of funding internationally	2.8	3.6	+	2.3	3.4	+
Overall ability to work collaboratively in international teams	3.6	4.4	+	3.2	4.2	+

Source: Technopolis. Surveys with UK successful applicants (N=139) and international partners (N=98). Scores present the average result across respondents. Change is measured as the difference in scores for each individual between the "Current" position and baseline ("point of application"), averaged out. + indicates a positive change of 0.5 points or more, + indicates a smaller positive change

Some further reflections were provided, via open question, in the UK applicants survey:

This has been a great project to be involved in. The FIC has allowed us to bring together some of the best scientists in the UK and US to work on a significant research area.

FIC has been playing a key role in understanding how the UK can/may collaborate with international research-industry sectors to maximise its economic outcomes. This experience and knowledge are crucial, especially in post-Brexit UK, and the Chinese market plays a key role in future UK international collaboration.

For academics, this ability to work in international teams may have some impact on research careers. Additionally, 31% expect their experience working with overseas partners within the context of their FIC project to lead to promotion or permanent position (tenure) or accelerated career progression (53%). The extent to which this actually happened will be tracked in the next iteration of study. However, any change is likely to be linked to international collaboration more generally than to FIC.

3.10 It is too soon to present evidence on R&I outputs, but data collected will allow the tracking of results over time, and some interesting results have started to emerge

Progress

At this baseline stage, and in line with the assumptions stated in the ToC, we did not expect to find evidence of substantial progress towards the achievement of R&I outputs, but the data collected does show that progress is already being made.

As reported in Section 2.12, the majority of UK successful applicants and international partners are confident that their projects are on track to achieve their objectives (70%), however, they also acknowledged that there have been slight or significant delays to the original timetable



(56%). Furthermore, nearly all UK successful applicants (96%) stated that their project has been affected by the COVID-19 pandemic in some shape or form.

Outputs

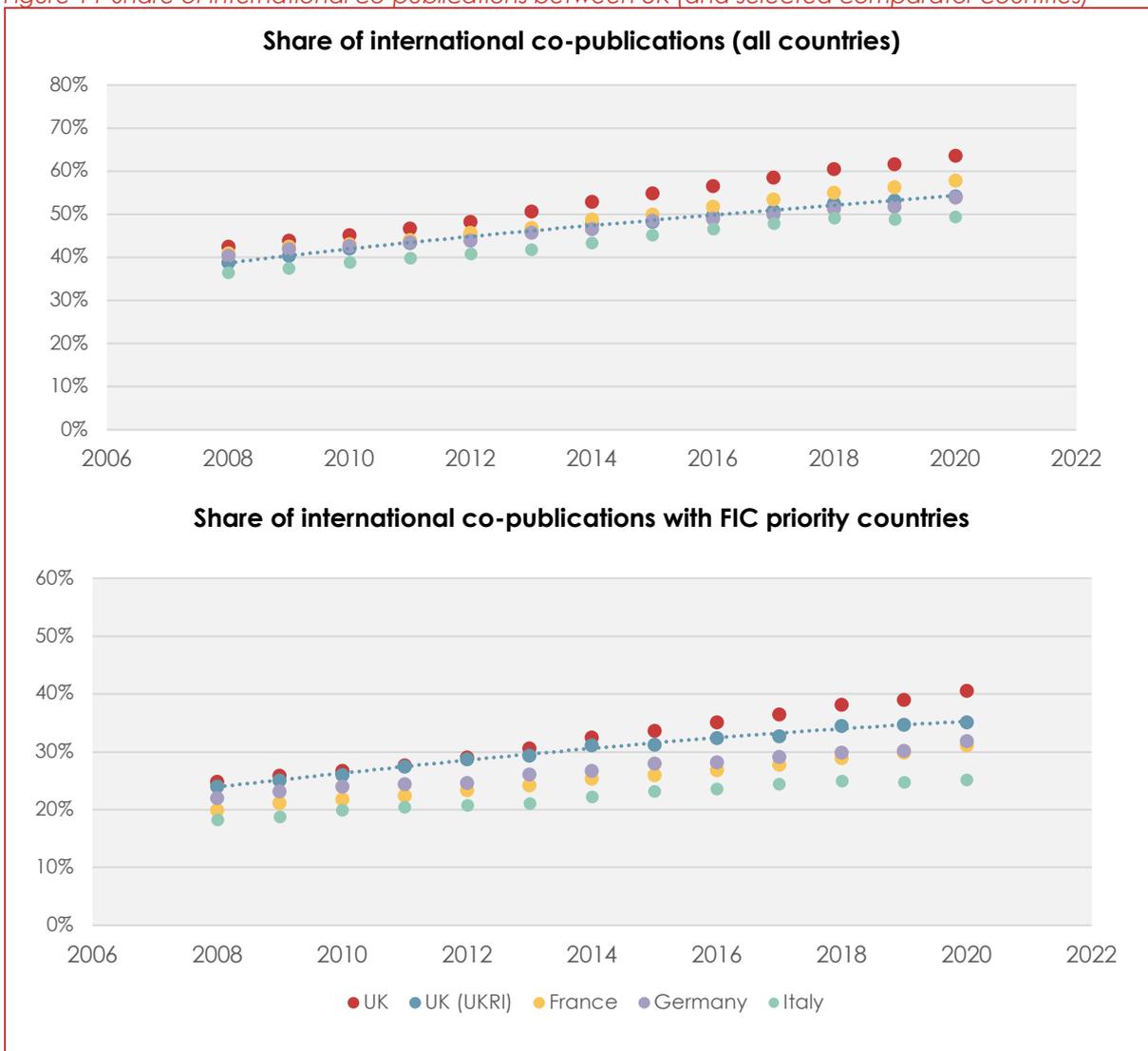
One of the expected R&I outputs of the projects funded by FIC programmes is **publications** co-authored between researchers and innovators in the UK and priority countries. We have collected baseline data to track how this evolves over time. We also present a first analysis of “progress so far”, understanding that at this stage the figures do not yet reflect the effects of FIC, as 2–3 years can pass between the commencement of a project, the preparation of a publication, and its publication in peer-reviewed journals. Also, the analysis on progress so far (which used February 2021 as cut-off date) only includes 49 publications associated with FIC grants at this stage.³³ This includes 14 publications in the field of clinical medicine, 7 in the field of biomedical research and 5 in the field of social sciences, with the remaining publications spread across a further 10 fields.

Further (more recent) updates of Researchfish show that there were twice as many publications associated with FIC grants and this information will be integrated in the next stages of the study (i.e. interim report) (see Appendix H of the accompanying Technical Report for further details).

The baseline bibliometric analysis shows that the UK has high and growing levels of co-publication with international partners, in comparison with countries such as Germany and France (see Figure 14, top panel). A similar trend is observed when only looking at the collaboration with FIC partner countries (see Figure 14, bottom panel). In this case, we observe a continuous increase in international collaboration, but a slight deceleration when only looking at UKRI funded publications (i.e. publications that have UKRI as a funder). This may reflect, in part, an increase in focus of collaboration with ODA countries in recent years.

³³ The bibliometric analysis is based on data extracted from Gateway to Research and Researchfish in February 2021 (to allow for sufficient time to conduct the data cleaning and analysis and inform the first iterations of the report). At this point in time there were 195 publications recorded in Researchfish and associated to FIC. 75 out of 195 publications were matched in Scopus. The 120 unmatched articles could not be found in the database for many reasons (a non-indexed document type, journal not indexed in Scopus, lack of information, etc.). A manual search using the title of these articles was made on 20% of them with no success. From the 75 articles matched to Scopus, only 49 were kept for the analysis. The 26 rejected articles were considered not FIC supported because the period between the grant start date and the publication date was too short (less than 6 months). From these 49 articles, 46 were published by at least one author affiliated with a UK institution and 43 with a FIC researcher.

Figure 14 Share of international co-publications between UK (and selected comparator countries)



Source: Technopolis based in analysis prepared by Science Metrix (2021)

The baseline bibliometric analysis also shows that there has been an increase in collaboration between the UK and each individual FIC priority country (between the pre-FIC and FIC period), in particular China and Australia (2.9 and 1.5 pp increase, respectively) (see Table 12). The figures are based on publications that have UKRI as a funder.

Table 12 Co-publications (UKRI) between UK and FIC priority countries (% that include partner country, average across periods)

Country	2007–2018	2019–2020	Change
Australia	5.0%	6.5%	+
Canada	3.9%	4.6%	+
Switzerland	3.2%	3.8%	+
China	5.0%	7.9%	+
Ireland	1.6%	1.9%	+
Israel	0.8%	0.8%	=
India	1.2%	1.8%	+
Japan	2.3%	2.4%	+
South Korea	0.9%	1.1%	+
Norway	1.7%	2.2%	+
Sweden	3.0%	3.6%	+
Singapore	0.8%	1.1%	+
United States	15.4%	16.6%	+

Source: Technopolis based in analysis prepared by Science Metrix (2021) + indicates positive change of 0.5 percentage points or more, + indicates a smaller positive change, = indicates no change

The increase in international collaboration with FIC priority countries has not come at the detriment of collaboration with other countries. The share has increased by 6.8 percentage points for all UKRI papers between 2007–2018 and 2019–2020, while the share of collaboration with FIC priority countries has increased by 5.3 percentage points during the same period (see Table 13).

Again, these results do not show the FIC effect yet, and in the next iterations of the evaluation we will be able to capture this effect by tracking the trends in the FIC period, as well as identifying which percentage is explained by FIC. The follow-up analysis will also provide evidence on the “quality” of the research being conducted with FIC funding.

Table 13 International co-publications between UK (and selected comparator countries)

Country/Funding sources	Full count			Share of international co-publications (SIP)			SIP with FIC priority countries		
	2017–2018	2019–2020	Change	2017–2018	2019–2020	Change	2017–2018	2019–2020	Change
UK papers	39,391	52,186	12,795	51.9%	62.5%	10.6pp	32.4%	40.7%	8.3 pp
UKRI papers [1]	7,379	10,116	2,736	46.3%	52.7%	6.3 pp	30.2%	35.6%	5.3 pp
FP papers [2]	1,217	2,530	1,313	79.2%	81.9%	2.7 pp	42.5%	47.0%	4.4 pp
Comparator countries									
Germany	33,212	42,466	9,254	49.0%	56.3%	7.3 pp	29.5%	34.7%	5.3 pp
France	22,995	26,361	3,367	47.3%	56.7%	9.4 pp	26.6%	33.0%	6.3 pp
Italy	19,400	28,136	8,736	43.9%	49.4%	5.5 pp	24.1%	27.0%	2.9 pp

Source: Technopolis based in analysis prepared by Science Metrix (2021). Note [1] Excluding FP papers, [2] Excluding UKRI papers

In terms of **Technology Readiness Level (TRL) progression**, Table 14 below shows that there has been a shift towards higher levels of TRL among projects for which this metric is relevant, with the percentage of respondents stating that they remain at the same TRL decreasing and the percentage reporting higher TRL levels increasing (from the point of application to the current position).

Note that only 88% of respondents stated that their projects include Collaborative R&D activities, however, 40% of them also stated that TRL is not an applicable metric (since this metric is only relevant to projects advancing technology-based solutions).

Table 14 TRL progression

	At the point of application	Current position	Change
TRL 3: Research: Experimental proof of concept	56.0% (42)	44.0% (33)	-
TRL 4: Development: Technology validated in lab	40.0% (18)	60.0% (27)	+
TRL 5: Development: Technology validated in relevant environment	25.9% (7)	74.1% (20)	+
TRL 6: Development: Technology demonstrated in relevant environment	24.1% (7)	75.9% (22)	+
TRL 7: Deployment: System prototype demonstration in operational environment	13.3% (2)	86.7% (13)	+
TRL 8: Deployment: System complete and qualified. System/model produced and qualified	12.5% (1)	87.5% (7)	+
TRL 9: Deployment: Actual system proven in operational environment	20.0% (1)	80.0% (4)	+
Not applicable	52.1% (50)		

Source: Technopolis (2021). Survey with successful applicants. N=147

Other outputs

The projects have also started to produce other R&I outputs, mostly new research databases, models or tools and new or enhanced products, process or services. However, as stated above and as indicated by stakeholders (via survey and interviews), it is in many cases too early in the live projects to yet understand the outputs, and more are expected in the coming months.

Table 15 Other R&I outputs

	Percentage of projects reporting output	Average number of output (where reported)	Total number of output reported
Number of new or enhanced products, process or services	20.4%	1.8	54
Number of new research databases, models or tools	40.1%	1.7	102
Number of patents filed	0.7%	1	1
Number of patents granted	-	-	-
Number of trademarks	2.7%	1.3	5
Number of copyrighted products (e.g. software)	6.1%	1.6	14
Number of spin-out companies	1.4%	1	2

Source: Technopolis (2021). Survey with successful applicants. N=147

Researchers and innovators provided some examples of current results obtained through their projects. This included:

- Creating the first genome for a beneficial insect (e.g. pollinators).

- Identification of a specific and significant 3D epigenomic landscape alteration during senescence (biological ageing), which could be a new way of defining it.
- New insights into hydrological aspects of Indian rivers that serve as conduits of antibiotic resistance genes. These insights will be useful to set up follow-up microbiological studies to comprehensively profile these environments.
- Results from several experiments conducted online, both in the UK and Japan, to understand assignment of blame and perceptions of trust in autonomous systems when things go wrong.
- New understanding of the limitations of current policy for UK-China film co-production, as well as the weakness of current distribution mechanisms for British films in China, and for Chinese films in the UK.

Comparison with UKRI

We compare the outputs that have emerged, so far, from UKRI grants that include participation from at least one FIC priority country (excluding FIC) versus FIC grants. This analysis is based on Researchfish (to allow for comparability across those two samples) and focuses on grants that started in 2019. To further improve comparability, the data is expressed in terms of outputs per £ million invested (based on grant value).

Table 16 shows that FIC is producing more outputs per £ million invested than other UKRI grants, in terms of publications, new research databases and models, new research tools and methods, and software and technical products.

These are positive results, but to be taken with caution as these figures will naturally change over time, as projects progress. An updated version of this analysis will be presented in the interim stage.

Table 16 Other R&I outputs, per £m invested

	UKRI grants (excl. FIC)	FIC grants
Number of publications	2.2	4.0
Number of new research databases and models	0.0	0.2
Number of new research tools and methods	0.0	0.1
Number of software and technical products	0.0	0.1
(Number of entries related to) Intellectual property	0.0	0.0
Number of spin out companies	0.0	0.0

Source: Technopolis (2021). Based on Researchfish data.

Researchfish provides little additional narrative on the outputs recorded from FIC grants so far, but further details of a selection of examples are provided in Appendix F.3 of the accompanying Technical Report.

Areas of future impact

Evidence collected via case studies also shows that the programmes and projects are underway, but that there have been some delays due to the COVID-19 pandemic. Again, it is too early to report on outputs/outcomes but expected results include:

- New knowledge into areas of strategic importance for countries involved (including the UK), with insights for policy makers and industry
- New solutions in areas such as AI, environmental waste
- Business acceleration

Further examples are shown in Table 17 below.

Table 17 Outputs emerging from projects

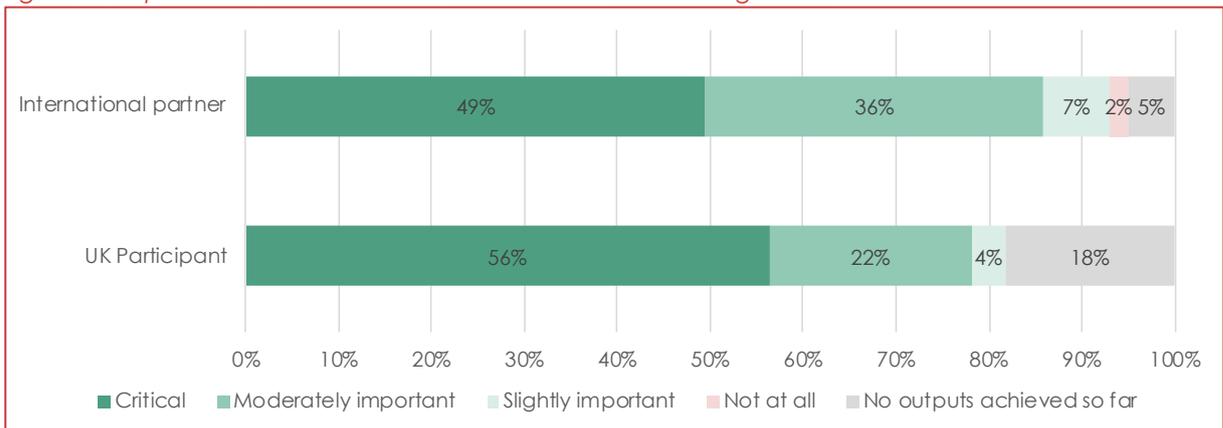
Case study	Progress so far	Future expected results
United States National Science Foundation (NFS Geosciences)	<ul style="list-style-type: none"> • Signals in the Soil and Climate, Environment and Health programmes: Too early to report (and some delays due to COVID) • Changing North Atlantic Ocean: OSNAP observing systems 	<ul style="list-style-type: none"> • (OSNAP observing systems) Insights into circulations in the subpolar North Atlantic over the past two-year period are expected in the near future³⁴.
National Natural Science Foundation of China (NSFC)	<ul style="list-style-type: none"> • Healthy Ageing programme: Five projects running for ~6 months • Too early to report on outputs/outcomes (and likely to be delays due to COVID) 	<ul style="list-style-type: none"> • The programme is supporting collaborative research in an area of strategic importance for both the UK and China • Programme part of a political commitment which should ensure an audience for policy-relevant findings emerging from the funded activities in due course
Japan Science and Technology Agency (JST-RISTEX)	<ul style="list-style-type: none"> • UKRI-JST Joint Call on Artificial Intelligence and Society: Six projects running for over 1 year, and progressing well • UK team have developed an Online Dispute Resolution (ODR) tool which can be adapted to Japanese conditions 	<ul style="list-style-type: none"> • Programme has been valuable thus far to identify the similarities and differences in the social receptiveness to AI between Japan and the UK • If ODR successfully applied this new system could lead to digital transformation in the Japanese legal sector • Projects are expected to provide a platform for effective and sustained dialogue and produce insights with opportunities for practical implementation and policy recommendations
Canadian Institutes for Health Research (CIHR)	<ul style="list-style-type: none"> • NeuroNex, UK-Canada Diabetes Partnerships and UK-Canada Collaboration on AI progressing well • Too early to report on outputs/outcomes • Some impact on the partnership development due to COVID thus far, but not expected to impact in the long-term 	<ul style="list-style-type: none"> • Diabetes and AI areas of research of strategic importance to both UK and Canada, and both expect to provide insights for both industry and policy makers, and support strengthening of transdisciplinary research collaboration across UK and Canada • NeuroNex expected to support development of international multidisciplinary teams across US, Germany, Canada and UK
MOST – Department for Biotechnology (DBT)	<ul style="list-style-type: none"> • Tackling AMR in the Environment: Five projects running since autumn 2020. • Global Incubator programme: Indian component delayed due to COVID but launch should be imminent. • UK-India COVID-19 Partnership Initiative (Strategic Opportunities Stream). Project started in May 	<ul style="list-style-type: none"> • Inform the development of strategies to limit environmental contamination from manufacturing AMR waste. • Enable access and accelerate growth for UK firms in India. • Improve understanding and prevention of COVID-19 among South Asian communities in the UK and India.

³⁴ Note that FIC is funding the continuation of the OSNAP array from 2020 onwards, but previous years were funded through NSF/NERC core funds.

3.11 And researchers and innovators agree that access to FIC has been critical in obtaining the results so far

Furthermore, UK successful applicants stated, via survey, that the international collaboration element of their project has been either critical or (moderately important) in achieving their results (so far) (56% and 22% respectively). Furthermore, none of the UK successful applicants and only 2% of international partners stated that collaboration has not been critical.

Figure 15 Importance of international collaboration in achieving results



Source: Technopolis. Surveys with UK Successful applicants (N=142) and international partners (N=99).

3.12 There is also evidence of wider opportunities being pursued by collaborators

The survey with UK Successful applicants also reveals that there is growing joint activity among partners, **with an increase in the number of research proposals that organisations (or university departments) have submitted with their overseas partners**, as shown in Table 18. This is greater than the growth in the number of proposals with *other* international collaborators, implying that FIC is indeed enabling the identification of wider opportunities beyond what is usually possible via other UKRI grants.³⁵

In fact, 83% of UK successful applicants and 91% of international partners strongly agree or agree that the (FIC) call/competition has led to the identification of wider research opportunities with partner countries and the UK, respectively.

Furthermore, in the case of businesses, 79% of UK successful applicants and 73% of international partners strongly agree or agree that the (FIC) call/competition has led to the identification of wider commercial opportunities with partner countries/the UK.

³⁵ We also asked respondents to provide a value for those proposals but the sample size for those who provided an answer is too small (n=4-17).

Table 18 Research proposals

The number of research proposals that your organisation or university department submitted with ...	In the year before this application	After the FIC project was awarded	Change
... your overseas partner organisations/university departments from the FIC application	118	157	+ (33%)
... other overseas partner organisations/university departments (not those in the FIC application)	453	490	+ (8%)

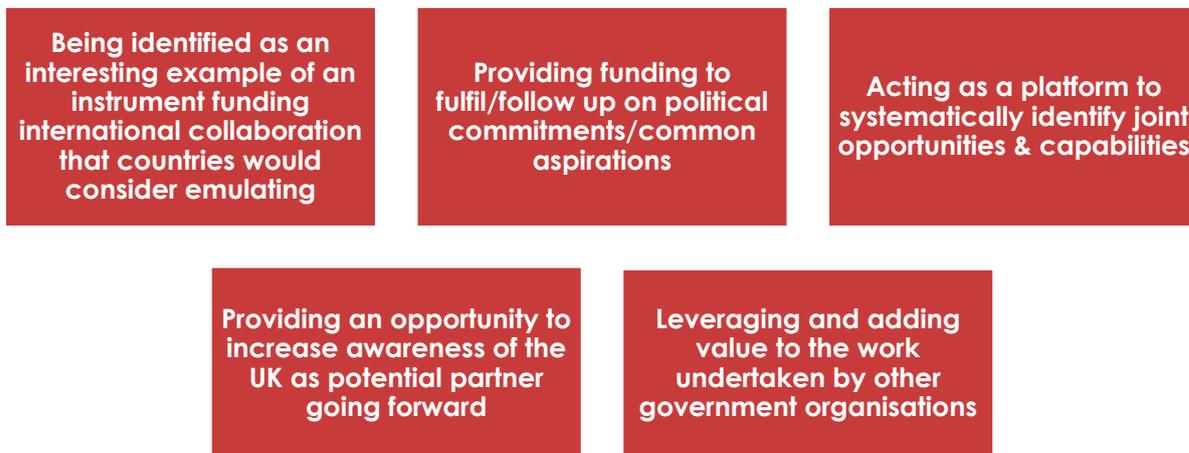
Source: Technopolis. Survey with UK Successful applicants (N=46–80). Value excludes FIC application.

Some further reactions were provided, via open question, in the UK successful applicants survey:

Our project completely transformed our opportunities to do future research and work with other industry partners in the UK and in China. It's the most rewarding project we have ever worked on as a team.

3.13 FIC is contributing to supporting BEIS and wider Government objectives, mostly by adding value to science diplomacy efforts

Evidence emerging from case studies points towards five routes through which the Fund is supporting science diplomacy efforts, with FIC (shown below). Each is discussed further in the text that follows.



- **Being an interesting example of an instrument funding international collaboration that countries would consider emulating**

The FIC funding mechanism has attracted attention and interest at NSF in the US: while the FIC brand has limited visibility within NSF, its novel approach to funding international partnerships, (“a different sort of fund”) has registered among agency leadership.

There is also interest in FIC as a mechanism for supporting international collaboration by CIHR in Canada. Interviewees from both the UK and CIHR noted that the structure and implementation of FIC could provide valuable insights for the New Frontiers Fund, and demonstrated the value of having a funding mechanism aligned to support such international engagement activities. For Canadian partners, the New Frontiers Fund could also be one of the primary mechanisms for providing matched funds to future joint, international collaborative activities with the UK.



- **Providing funding to fulfil/follow up on political commitments or common aspirations**

This has been particularly salient in the case studies with NSFC in China, CIHR in Canada and DBT in India.

The UK has an established relationship with China at both government level (through the “Joint Commission” strategic process) and at the level of funding bodies (between UKRI and NSFC, including via biennial meetings). This ensures that priorities and joint opportunities are systematically identified independently of any specific funding programme. The Chinese partners are also well aware of UK capabilities and strategic priorities. The FIC programme described in the case study has contributed to government aims by supporting the implementation of the Flagship Challenge programme, thereby following through on political commitments. Through this programme, FIC also intersects with the work of the SIN in China.

FIC has also provided a valuable mechanism to deliver the aspirations in the MoU signed between the Canadian Research Coordinating Committee (CRCC) and UKRI, with FIC-supported programmes representing the flagship initiatives of this agreement. For example, the *UK-Canada Collaboration on Artificial Intelligence* addresses and aligns with the priorities set out within this agreement, and demonstrates a new level of collaboration between the two countries, with all major funding partners involved.

In the case of the collaboration with DBT in India, the programmes are, to varying degrees aligned with political priorities in both countries. The Antimicrobial Resistance (AMR) programme, for example aligns with other collaborations on AMR, including health partnership agreed at prime ministerial level on both sides.

- **Acting as a platform to systematically identify joint opportunities & capabilities**

This has been the case for the *UKRI-JST Joint Call on AI and Society*, led by ESRC and JST-RISTEX. In designing and delivering the Joint Call, the two agencies have realised the commonalities in their institutional and national strategic priorities in relation to Artificial Intelligence research. Through the *UKRI-JST Joint Call*, these funding bodies have built stronger mutual understanding of their respective national R&I systems, as well as their operational procedures and requirements in delivering open funding calls. The level of interest in the call and the success of the programme thus far has affirmed a growing desire among researchers in both Japan and the UK for joint research programmes. The experiences and success of the programme has increased interest in future collaborations between the two agencies, and discussions are already underway to explore a range of possible opportunities for future joint programmes.

This has also materialised, to some extent, in the FIC Healthy Ageing programme, which is supporting collaborative research in an area of strategic importance for both the UK and China. Healthy Ageing was the second priority area jointly identified by the UK and China under the UK-China Joint Strategy for Science, Technology and Innovation Cooperation and both countries have launched major initiatives in this area in recent years. In the UK, Ageing Society was also one of the four “Grand Challenges” identified in the Industrial Strategy, while the 2019 Delivery Plan for ESRC (programme lead) identified “Changing populations”, including healthy ageing, as one of six priority areas to address. Applicants to the Joint Call were encouraged to take advantage of research strengths across the two nations proving the incentive to explore those common areas of strength and interest.

- **Providing an opportunity to increase awareness of the UK as potential partner going forward**

While Canada would normally look to its partners in the US (and this will probably always be the case), FIC has made the UK stand out as a good alternative. The FIC programmes presented here, in addition to those with other Canadian partners, have provided the platform for further discussions. They have offered something tangible to engage in and this has opened

the door to explore other areas, with the current programmes providing valuable learning for both UK and Canadian partners to take forward in future collaborations. In this sense, UK interviewees agreed that FIC programmes provided a platform to discuss and share learning in relation to wider activities and strategies for collaboration, outside existing programmes

DBT, in turn, already considers the UK as a favoured partner, and joint calls with UK partners tend to generate a large number of applications. The FIC programmes are therefore helping to sustain a positive perception of the UK as a research and innovation partner. Additionally, the Global Incubator Programme may also help to generate interest in investing in the UK. The fact that it is non-ODA funding also means that there is more space to explore areas of joint strategic importance. Stakeholders also highlight the need for more long-term funding to be able to consolidate the current (positive) position and remain India's partner of choice.

- **Leveraging and adding value to the work undertaken by other government organisations** (in particular the UK Science & Innovation Network, SIN)

In the US, FIC has served as "a useful calling card" for the SIN and has been profiled as an example of the UK's commitment to partnership in discussions with US research and innovation stakeholders, including the US Department of Energy, State Department, and White House Office of Science and Technology Policy.

In Canada, the FIC programmes have been a fundamental driver to the appointment of a new role within the UKRI North America Offices, Head of Canadian Partnerships. This appointment, in part driven by the need for dedicated resource to support the delivery of the FIC programmes with Canada, will also serve to continue to strengthen and build on these relationships through further collaborations and to ensure coordination and coherence in the portfolio of future UK-Canadian collaborations.

3.14 Findings are in line with international experience

Our review of four programmes comparable to FIC, in the UK and overseas, reveals some commonalities with the conclusions emerging in this report, mainly the increasing importance of international collaboration in research and innovation activities, the importance of collaborative frameworks to build relationships overtime, the need for follow up funding to sustain relationships and the challenges in addressing attribution in similar programmes.

The key findings from the literature review are summarised below, while the full review can be found in Appendix C in the Technical report.

Box 4 Summary of key findings from literature review

- The review found that **International collaboration** is an increasingly central part of research and innovation activities around the world, and is supported by Governments in a variety of ways. This includes through "big-science projects" (such as at CERN), science diplomacy initiatives and bilateral agreements, collaborative R&D programmes, and the opening up of national programmes to overseas participants, as well as a range of other supporting activities (e.g. travel grants or exchange schemes).
- While the types of support funded through FIC are found elsewhere, **FIC is unusual** in bringing together a broad offer under one single umbrella (rather than being spread across multiple initiatives) and in providing dedicated long-term funding.
- However, the review also found that several **other countries** are also consolidating their support for international collaboration, with increased investment and stronger central coordination and oversight of increasingly multi-dimensional programmes (or portfolios).
- The review found that successful programmes tend to **build on strong bilateral agreements**, with definite funding commitments. These arrangements can also consolidate and become more efficient over time, as trust builds, and procedures are embedded.

- The collaborative programmes reviewed were found to have been successful in creating new or enhanced collaborations and in funding high quality research. However, the review also found that the **sustainability** of international collaborative activity (i.e. beyond the programme) often depends on the intensity of collaboration that has been supported and the availability of follow-on funding.
- In terms of challenges, the review found that **programme complexity** had often made it difficult for these evaluations to obtain consistent and comprehensive information and monitoring data. **Attribution** also often proved challenging (e.g. due to a complex set of aims and multiple influences). Several different counterfactual approaches are used across the examples examined to assess attribution, with bibliometric methods and surveys of control groups being most common. Finally, **wider impacts** beyond participants often proved difficult to capture through metrics alone and so case studies (combining narrative and metrics) were used in many of the evaluations considered in order to further explore programme contributions in such areas.

4 Concluding remarks and recommendations

4.1 Concluding remarks

This first iteration of the FIC fund-level evaluation (baseline and interim process) has found that both the Fund and its portfolio of programmes are progressing well.

There is early evidence that FIC is making progress towards achieving its objectives, particularly in terms of strengthening new or existing partnerships. A series of further opportunities for international collaboration have also been identified as part of these efforts, but sustainability is at risk given the lack of clarity on available funding in future. There is a risk that achievements and progress made in the first two waves of FIC cannot be fully built upon, that newly identified opportunities cannot be fully realised, and that the UK incurs some reputational damage after creating enthusiasm within priority countries for growing engagement with the UK.

Supporting the development or strengthening of funder-to-funder relationships (through FIC) is likely to promote sustainability, but further sources of funding will also be an important factor in realising this. It is not a failure of FIC that it is unable to offer longer term funding certainty, however the risk of non-sustainability is an important consideration for UKRI more generally, both in terms of reaping the full benefits from FIC, and in thinking about future international funding.

As is to be expected, COVID-19 has slowed down the implementation of programmes and projects to some extent. This may delay the realisation of some of the benefits (mostly R&I outputs), which we will return to look at again in the next iteration of the evaluation (interim impact). The impacts of the pandemic are largely seen as a temporary set-back to original intentions and ambitions. FIC programmes and projects have generally adapted well to the changing circumstances and remain confident that their objectives will be realised.

4.2 Recommendations

Based on this assessment of the baseline and early progress towards impact, as well as the conclusions drawn from the interim process evaluation, the evaluation team has put forward a series of recommendations for the current Fund and any potential future iterations, as well as for the monitoring and evaluation efforts of FIC and the Technopolis evaluation team.

Recommendations for the ongoing implementation of the current FIC

Evidence presented in Section 2.10 showed that, while the FIC team provides Councils with a read out from Board meetings and an update to the Working Group, there is still felt to be insufficient transparency amongst those leading FIC programmes as to the consequences of the information they provide to the Fund. Additional insight into the Board's discussions about FIC and any wider implications could also help incentivise programmes to continue providing good information.

Recommendation 1: We recommend that the **UKRI FIC Team ensures that insights and conclusions emerging from the FIC Board meetings are shared with all programme leads**, either directly or via Council representatives. This could be achieved through providing further encouragement to FIC Working Group members to ensure that knowledge is disseminated to all relevant programme leads on a regular basis.

Evidence presented in Section 2.10 showed that, while the FIC working group (Council representatives, FIC team, an overseas team representative and individuals from UKRI cross-cutting functions) is sharing information and views around particular issues and challenges

relating to FIC, there is less opportunity for cross-Fund learning and sharing between other programme leads.

Recommendation 2: We recommend that the **UKRI FIC Team considers trialling additional meetings based on particular countries.** These sessions would bring together all relevant FIC programme leads to share country-specific insights, experiences, contacts and opportunities. The FIC team could consider starting with one or two of the countries that are most active in FIC programmes, to trial the approach and assess the benefits.

Recommendations for any potential future wave of FIC funding

Evidence in Section 2.5 showed that the addition of FIC funding has been positively received across all UKRI Councils, as it offers the opportunity to fund international collaboration that would not be possible (at least not at the same scale) via other means. Also, no other non-ODA UK fund is dedicated to developing relationships at the *funder* level and so this offers the opportunity to build deeper, more-stable and longer-lasting relationships for the UK.

There is early evidence that the Fund is making progress towards achieving its objectives (see Figure 1 for a summary of key points), particularly in terms of strengthening new or existing partnerships. Section 3.5 shows that a series of further opportunities for international collaboration have also been identified as part of these efforts, but sustainability is at risk given the lack of clarity on available funding in future.

There is a risk that achievements and progress made in the first two waves of FIC cannot be fully built upon, that newly identified opportunities cannot be fully realised, and that the UK incurs some reputational damage after creating enthusiasm within priority countries for growing engagement with the UK.

Recommendation 3: We recommend that **UKRI seeks to obtain further funding to support a continuation of FIC** beyond the current two waves of programmes. The evidence presented in the current report as to the early achievements and potential of the Fund could be used to support a future spending review bid.

Evidence presented in Section 2.6 showed that there is a need for clarity (and forewarning) of the timing, scale and priorities of any potential future funding, if Councils are to be given the best chance to explore and develop new opportunities, can sustain current developments and achievements, and are able to prioritise what to bid and when. This is particularly important if the Fund wishes to encourage and support the development of new relationships between UK and overseas funders (which, as shown in Section 3.4, seem to provide higher additionality), rather than just the strengthening of existing linkages.

Recommendation 4: As soon as possible, **UKRI should communicate to Councils if there will in fact be further waves of FIC funding (and when) (understanding that the future of FIC depends on decisions taken by BEIS and the Treasury)**, to aid planning and preparatory activities, and to help sustain the progress made, relationships developed and opportunities identified through current FIC activities. Ideally, UKRI would be able to specify multiple waves of funding, or at least a longer term commitment, to encourage and support the achievement of strategic importance.

Evidence from across the case studies, presented in Section 3.4, showed that engagement with the UKRI overseas offices and the FCDO Science and Innovation Network (SIN) has been a strong enabling factor for the identification and development of FIC programmes.

Recommendation 5: We recommend that the **UKRI FIC Team encourages Councils to make full use of the UKRI overseas offices and FCDO SIN** to explore opportunities and to facilitate dialogue as part of their early thinking about any future wave of funding.

Evidence presented in Section 2.7 showed that FIC is a relatively small investment in comparison with other key UK initiatives to support international collaboration. FIC's relatively small budget also contrasts with evidence of a high level of demand and lots of potential opportunities for international programmes.

The scale of ambition for FIC (its objectives and scope), was considered by many of the Council representatives consulted to be too great, given the scale of funding available (overall, per country and for individual partnerships), with the risk of creating a thinly dispersed and uncoordinated portfolio of programmes.

Recommendation 6: We recommend that (as part of a future spending review bid) **UKRI seeks to increase the scale of FIC**, given the strongly positive feedback and achievements to date, the scale and scope of ambition for the Fund, and because of the increased demand for funding that is being created through the opportunities identified via wave 1 and 2 programmes / partnerships (while at the same time continuing to support new opportunities to work with other partners, countries and areas).

If more resources are not available (i.e. if funding were to remain at a similar scale to the first two waves), we recommend that **UKRI consider a narrower or more targeted approach to FIC in future** (for example, focusing on fewer countries or key partners – ideally including those already engaged), such that a critical mass of activity can be achieved and a more coordinated and strategic approach can be taken to ongoing relationship development with these funders and countries.

Evidence in Section 3.4 showed that international relationships often take considerable time to fully develop, and many FIC programmes have benefited from years of building trust, understanding and experience of collaboration between the funders and communities concerned. In almost all of the programmes case studied, pre-existing relationships were flagged as an enabler, providing evidence that successful partnerships take time to materialise. Evidence presented in Section 2.6 showed, however, that the programme bidding and assessment processes (e.g. the timing and criteria), along with a high demand for FIC funding, meant that earlier-stage opportunities and partnerships were often de-prioritised.

Recommendation 7: Regardless of the size of FIC in future, we recommend that **UKRI considers a specific (ring-fenced) pot of funding for newer or more novel partnerships/programmes** (a small number of examples of such initiatives can be seen within the current portfolio). These would consist of relatively small awards to support the early stages of nascent funder relationships in a more targeted way, which may then help to ensure a pipeline of opportunities for future ("full") FIC programmes.

For consideration. We recommend that the Fund level approach should still be maintained for a next iteration of FIC (possibly with an expanded Strategic Opportunities Stream and additional pump-priming fund, if resources allow). However, based on the feedback received from Councils, **UKRI should consider shifting to a three-stream model** in the medium term (wave 4/5), as set out in the bullet points below. This suggestion, however, is not based on an options appraisal, as this is out of scope for the current study.

- A sizeable proportion (~60%) of core FIC funding being allocated directly to Councils, based on the current distribution of core funding and ring-fenced for international collaboration (based on simple requirements to fund programmes of international R&I collaboration with funders in priority countries)
- A centrally (UKRI) administered Strategic Opportunities Stream (~20% of available funding) that can capitalise on emerging opportunities and support wider strategic priorities
- A centrally (UKRI) administered fund for programmes of pump-priming activity with particular funders in priority countries (~20% of available funding).

The indicated balance of funding between the three streams is based on the evaluation team's view on the relative proportion of funding that would be appropriate to allocate, provided a future iteration of the Fund retains its current size. For a larger Fund, the relative scale of the two smaller streams could decrease.

This three-stream model could allow UKRI to maintain a strategic steer, through the two central pots and through the conditions attached to the funding provided to Councils, but would also reduce the administrative burden of the Fund, reduce the competitive aspect of current bidding processes (which sit slightly at odds with encouraging cross-Council collaboration), and allow further flexibility to Councils to decide on the areas of greatest opportunity.

Evidence presented in Section 2.7 showed that the funding criteria for selecting programmes (and choice of priority countries) were broadly seen as appropriate for the objectives and intentions of FIC. However, there were also calls for additional clarity and specificity in several areas that would aid programme idea and proposal development. This included the importance attached to multi-disciplinary/Council activity, the BEIS/UKRI international goals and priorities that programmes should align with, the rationale for the choice of priority countries, and the likely scale of programmes that will be funded. The additionality criteria and guidance could also be improved to focus more on complementarity and added value with respect to existing initiatives.

Recommendation 8: Once the future structure and strategic focus of the Fund is decided, we recommend that the **UKRI FIC Team looks again at the choice and wording of criteria** used in any bidding templates or panel assessment guidance that will be used, to ensure that these remain fit for purpose and to address some of the uncertainty around current wording that has been highlighted through the current evaluation. UKRI's International Strategy (currently in development) may help address the current lack of clarity around the relevant government/UKRI priorities to align with.

For monitoring and evaluation

Based on the experiences of implementing this phase of the evaluation, we also provide a series of recommendations for future monitoring and evaluation activity.

Recommendation 9: The Technopolis evaluation team considers options for increasing response rates from business participants in future survey iterations (given the small overall population).

On the first point, we recommend allowing more time for the surveys to be live (from four to six weeks) and increasing the number of reminders sent. We also note that the response rate among unsuccessful applicants was almost as high as for successful applicants (21% versus 22%), which is highly unusual (one would expect higher response rates for the latter). The unsuccessful applicants survey was sent directly by UKRI (given restrictions on access to personal data for this group). An invitation to participate in the survey from the FIC team seems

to have prompted a good response, and we will discuss the possibility of implementing a similar approach for successful applicants in the next rounds of the study.

On the second point, even though we achieved a good distribution of responses among businesses (they represent 12% of respondents and 17% of the successful applicant population), the final sample is 29 responses, which means some of the indicators are based on numbers, rather than percentages. In order to improve response rates we suggest targeting businesses separately, using a different introduction to create the right incentives, and consider making this survey shorter (although that may mean collecting less information from them).

Note that as programmes progress the survey populations will expand, which may mean that a sample of 15%–20% delivers enough data to produce more robust indicators.

Recommendation 10: UKRI and the Technopolis evaluation team considers reallocating some of the resources for future phases of the evaluation to expand the number of case studies being developed (from 5 to 7), as these have proved to be a very useful source of insights and evidence.

The additional two cases would cover other funders in some of the priority countries not currently being addressed, focusing on examples where there were less well-established relationships prior to FIC and/or whether there has been limited R&I collaboration activity historically (as indicated by Gateway to Research data on past grants).

During the current phase of the evaluation, the case studies have proved useful in demonstrating in more depth particular examples of the findings emerging from elsewhere. Covering additional countries would expand this knowledge base and provide additional insight. The resources required for the development of these extra case studies (8 days in total for each of the next two phases) would be found within the existing budget for the study through efficiency savings and the re-targeting of already planned interviews to cover case study countries.

Recommendation 11: UKRI ensures that any future applicants are notified that by applying they are agreeing to their details being used and shared for the purposes of evaluation. We understand that this issue has been raised within UKRI, but that it is unlikely to be resolved within the lifetime of the current evaluation.

Recommendation 12: UKRI (evaluation team) considers reviewing with Councils the recording of participation of international partners in grants with GtR, as the data seems to have some gaps. GtR constitutes the best source of information to conduct historical analysis of UKRI funding (and, in this case, of international collaboration funding). Making sure that the data reliably captures this information would help to improve the robustness of this type of exercise, not only for FIC, but for any programme looking to support international collaboration. This could also help to provide evidence for a future Business Case.

Recommendation 13: UKRI (FIC team) maintains current programme monitoring activities, as these appear to be well developed, appropriate and effective. The feedback from FIC programme leads that narrative templates should be updated less frequently has already been addressed by a move from quarterly to six-monthly reporting. This is appropriate, given that FIC programmes are now well-established and we would suggest that this is good practice that should be replicated for other funds in future.

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