UK Research and Innovation

Pye Tait Consulting

Understanding the full economic costs of doctoral training

Final report

May 2024

Contents

Acknowledgements

We wish to thank the UKRI team for their support and advice throughout this research, with particular thanks to Nelly Wung, Anton Dubenko, Patrick Rigby, Chris Scholtens, Kate Turton, Ewan Nicholas and Christina Turner.

This research would not have been possible without the time and support given by responding higher education providers and we are very grateful for their input to this study.

Executive Summary

Background

UK Research and Innovation (UKRI) is a non-departmental public body established in April 2018 and sponsored by the Department for Science, Innovation and Technology (DSIT). Its creation brought together the seven research councils, Research England, and Innovate UK.

UKRI is the largest single funder of postgraduate research (PGR) in the UK. Around 20% of PGR students in the UK are registered against UKRI training grants. These doctoral training grants offer funds towards student living costs, student tuition fees, research and wider training support, while some councils support management costs for specific programmes.[1] Eligible higher education providers (HEPs) in England may also receive Quality-Related Research (QR) funding from UKRI via Research England for research degree supervision – or equivalent in Scotland, Wales, and Northern Ireland. These represent the two main streams by which UKRI supports doctoral training – the remaining 80% of doctoral students may be funded through a variety of other mechanisms.

All UK HEPs are required annually to report Transparent Approach to Costing (TRAC) data – a method for pricing and costing their teaching, research and other activities. In 2021/22, TRAC data were collected by the OfS on behalf of UKRI, the Scottish Funding Council, the Higher Education Funding Council for Wales and the Department for the Economy (Northern Ireland) and these bodies are co-owners of the data.

UKRI's quantitative analysis of TRAC data from the 2021/22 financial year reveals that – on average at the sector level – HEPs recovered around 46% of the full economic costs of training and supervising PGR.

However, interpreting TRAC data on PGR students is not straightforward, due to the complexity of the TRAC methodology, and the currently unknown extent to which HEPs utilise TRAC guidance when developing bids for funding to determine doctoral training costs.

In Autumn 2023, UKRI published its response to Pye Tait Consulting's analysis of responses to its Call for Input (CFI) on a New Deal for PGR. The New Deal aims to encompass a range of policy and funding measures to support the government's longstanding commitment to research to drive innovation and for the good of society.

In its reaction to the New Deal CFI and in response to the TRAC return data on cost recovery, UKRI committed to explore and understand the full cost of doctoral training.[2]

UKRI therefore commissioned Pye Tait Consulting, an independent research agency, to undertake qualitative research with HEPs to understand influences and considerations in relation to full economic costs and to help develop a fuller understanding of the contemporary costs of doctoral training and their role in the financial performance of HEPs.

[1] For information on what is covered, see UKRI website, Studentships and doctoral training: https://www.ukri.org/apply-for-funding/studentships-and-doctoral-training/get-a-studentship-to-fund-your-doctorate/ Accessed 15 April 2024
[2] UKRI, 2023, New Deal for postgraduate research, response to Call for Input

Research aim and objectives

The overarching aim of this research was to undertake qualitative research with a sample of UK HEPs, to understand the full economic costs of doctoral training from HEPs' point of view. Specific objectives were as follows.

A. Understand how HEPs use funding from various income sources to support PGR and PGR activities.

B. Understand the role of QR funding, QR RDP (Research Degree Programme supervision fund) and equivalent Devolved Administration funds in PGR training and supervision.

C. Understand the different funding sources supporting 'HEP-own' funded PGR training.

D. Requirements for / expectations of match-funding or co-investment for PGR training (e.g. via Doctoral Training Partnerships (DTPs)/Centres for Doctoral Training (CDTs)) across different funders.

E. Identify the key resources required for high-quality PGR training and supervision.

F. Consider what should be counted within the full economic costs for PGR.

G. Consider what level of cost recovery could improve the sustainability of the talent pipeline and modelling the impacts of making any changes to PGR on volume and quality of training opportunities.

H. Understand the influence of UKRI policy (including changes to UKRI policy) and funding on wider PGR support, including cross-subsidy between other income sources and PGR training and the associated incentives and/or barriers for financial and talent pipeline sustainability.

Alongside this, cross-cutting themes were to consider:

- differences in training and supervision costs and approaches across the sector (e.g. in different types of HEP),
- differences in training and supervision costs and broader resource inputs to PGR training, both within and between disciplines/subject areas,
- regional/national differences in financial sustainability and support for PGR, and
- the impact of the current system on Equality, Diversity, and Inclusion (EDI) for PGR.

Methodology

Primary fieldwork comprised a total of 40 qualitative interviews with HEPs in February and March 2024. These were group discussions involving multiple individuals per HEP. Typical job titles of participants include Chief Financial Officer, Director of Doctoral School.

Interviews were conducted with HEPs from all different regions and nations of the UK. There was representation from all TRAC peer groups among interviewed HEPs.

Key findings

The key findings herein are structured to map directly to the core research objectives.

Objective A: Understand how HEPs use funding from various income sources to support PGR and PGR activities.

All interviewed HEPs use a wide range of income sources to fund PGR training and supervision activities. Commonly mentioned sources include income from UKRI councils (via specific training grant investments and block QR funding), co-funding from industry, charity and other organisations, self-funded students, and overseas students' fees. On the latter point, countries mentioned in particular include China, Pakistan, Saudi Arabia, Malaysia, Singapore, Thailand and others in the Middle East region (some HEPs noted that the PGR student market from African countries and also from India is on a downward trajectory). HEPs also subsidise PGR-related costs and studentships using their own funds, and emphasised the importance of international PGR students for the income they bring, which helps to subsidise the costs of home students. Four HEPs did note that, as part of co-funding arrangements, they are obliged to cover the difference between the home and overseas fees themselves.

Where funding from external sources is available, it is typically used to cover direct costs such as supervisor time (the largest component), time for staff such as technicians and tutors, estates and facilities, as well as consumables and travel to conferences among other elements.

Objective B: Understand the role of QR funding, QR RDP and equivalent Devolved Administration funds in PGR training and supervision.

QR funding[3] (or the devolved equivalent) is viewed as a vital part of HEPs' income streams as it makes a significant contribution to PGR training and supervision costs, providing additionality to support wider activities such as postgraduate training schemes, supporting postdoctoral researchers, and supporting sabbaticals. It is typically divided up in one of two ways.

1. Distribution to individual faculties, schools, or departments.
2. Pooling QR funds into a central 'pot' of funding.

HEPs do not generally differentiate between the various QR elements – one of which is the QR Research Degree Programme (QR RDP) supervision fund (its allocation is based on various factors including PGR student numbers)[4] – but instead combine these all into one pot prior to allocation. The flexible nature of QR funding means it can be used to fund any research related activities including but not limited to PGR activities and is used by HEPs to cover a range of PGR costs and activities including funding studentships, supervisor time, training activities, administration, and equipment, and is also on occasion used to support wider activities and investments related to sector reforms.

[3] Further information about QR funding is available here: https://www.ukri.org/publications/explainer-qr-research-funding-and-the-ref/explainer-quality-related-research-funding-and-the-ref/ Accessed 15 April 2024
[4] Further information about QR funding is available at Research England, 2023, How we fund higher education providers

Objective C: Understand the different funding sources supporting 'HEP-own' funded PGR training.

All HEPs noted that they heavily invest resources into their PGR environment as part of their overall strategy and duty to train the next generation. Such resources include staff time (including supervisors, central teams, and support staff) and financial investment in the form of training, facilities, estates, and funding of studentships (i.e. direct costs including stipends, bursaries, supervision, consumables etc.). They also point to the cost-benefit offset and the contribution PGR students make to the research community (e.g. through teaching undergraduates, and research outputs). Internal funds additionally contribute to covering the HEP-side of co-funding or match-funding costs with industry partners, research council funded CDTs, or other funding partners.

Objective D: Requirements for / expectations of match-funding or co-investment for PGR training (e.g. via DTPs/CDTs) across different funders.

Co-funding arrangements form a key part of HEPs' PGR funding model, with interviewees outlining partnerships with a variety of organisations including UKRI (via DTPs/CDTs), industry employers, and charities among others. There is usually no 'typical' funding arrangement, with each having its own unique contract based on the funding partners' specific requirements – this in itself can create an administrative burden as HEPs try to collate sufficient funds for a full studentship from various sources which adds time and complexity to the process of co-funding. Furthermore, while co-funders will arrange a split of the agreed cost between them, HEPs noted that the full costs may not necessarily be reflected in this arrangement, meaning they are obliged to cover additional costs on top of this.

Objective E: Identify the key resources required for high-quality PGR training and supervision.

UKRI's Statement of Expectations for Doctoral Training was published in January 2024 and will affect new training grants whose programmes and students start no earlier than September 2025. The Statement sets out the core principles underpinning the provision of high-quality PGR training and supervision.[5]

Key enablers to realising these expectations mentioned by HEPs include high-quality academic staff, particularly supervisory staff, to be able to lead and mentor students from any background through their doctoral training. Central teams – including wider disciplinary teams, advisors, administration staff, and those supporting students through their PGR training (e.g. via training or other support such as wellbeing) – also play a key role. Such training might encompass generic training, bespoke training, or soft skills training.

HEPs provide support beyond this by establishing opportunities for PGR students to collaborate and network within their research community. They also provide support for PGR students to attend conferences to disseminate their work. Career development teams also play a role in supporting career paths for students, and some HEPs offer opportunities for PGRs to take part in work placements with industrial partners.

Further support is provided by HEPs through the facilities they offer, including shared study spaces, and laboratories and medical facilities and associated equipment and consumables.

[5] UKRI, 2024, Statement of Expectations for Doctoral Training

Objective F: Consider what should be counted within the full economic costs for PGR.

HEPs follow TRAC reporting guidance when completing their annual TRAC return and to allocate costs as direct or indirect costs. Direct costs primarily comprise supervisory time and salaries, consumables and equipment, stipends and bursaries, and estates costs. Indirect costs comprise staff time for administration and central teams, and estates costs for central services (e.g. libraries).

Costs related to STEM (Science, Technology, Engineering, and Mathematics) subjects are generally higher than for arts, humanities and social sciences due to the higher costs related to estates, consumables, and more intensive supervision.

TRAC reporting guidance is used predominantly for the purpose of completing the annual TRAC return i.e. to allocate costs to specific categories. It is generally felt to be clear, although a minority point to some grey areas where clarification would be welcome. For example, some HEPs found it challenging to delineate a specific proportion of some costs to one category when they do not pertain exclusively to one activity, particularly regarding estates costs. Time allocation surveys are used so far as possible to provide an informed response on staff time and cost.

However, HEPs indicated that the annual TRAC return does not fully capture the wider costs of doctoral training and as such does not reflect the full economic costs. Examples of costs associated with doctoral training that are not currently included relate to PGR administration, wider support services (e.g. wellbeing and mental health support), the considerable costs of estates, provider-wide training, and other overheads necessary to ensure the quality of a research degree and student experience. This was reflected in one HEP's response, which would also appear to indicate that HEPs lack an accurate understanding of the precise unit cost per student.

> When we're asking for a fully funded studentship, i.e. the money to run the studentship itself, it's a three-year PhD, so three times the stipend – roughly £60k. Then add three times £5k for fees, which takes it to £75k. If an academic can go out and get £75k for a studentship, you'd be thinking you're getting a lot of money. But that doesn't include consumables, a laptop, anything else. You're talking north of £100k when we cost the studentship, and if we include full economic costs, we're probably closer to £130-£140k. If we're saying £140k and an academic can get £75k, you're at 50% recovery. – TRAC peer group B

Objective G: Consider what level of cost recovery could improve the sustainability of the talent pipeline and modelling the impacts of making any changes to PGR on volume and quality of training opportunities.

The average sector level cost recovery figure of 46% in relation to PGR activities did not surprise most of interviewed HEPs, who pointed to costs not covered by existing funding mechanisms (e.g. estates, wider student support) which HEPs are instead obliged to cover using internal funds. This shortfall is seen irrespective of funder, and HEPs ultimately are required to invest their own resources to cover the associated costs. HEPs related how funding received via grants or co-funding arrangements rarely, if ever, covers the full costs associated with doctoral training, and described a 'patchwork' of funding, using internal funds to make up shortfalls as required.

There was acknowledgement that funding PGR is expensive, however, PGR students are seen as a vital part of the research community for the many intangible benefits they bring. Generally, HEPs who were aware of their own cost recovery felt that cost recovery for more

research intensive HEPs (TRAC peer groups A and B) was higher than the 46% figure, and lower than the 46% for those in other TRAC peer groups, aligning to UKRI's own quantitative research.

That said, HEPs wish to see a substantial increase in cost recovery to boost their financial sustainability, although suggested figures in the region of 80% to 100% were more idealistic than expected. HEPs noted a reliance to some extent on international student fees (both undergraduate and postgraduate) to cross-subsidise PGR activities, and the slight relative decrease in QR funding was also noted to impact financial sustainability.

If circumstances dictated, some HEPs – primarily TRAC peer groups A and B – said they would prioritise investment of resources (and therefore PGR student numbers) into subjects with a track record of research excellence. STEM subjects would likely be prioritised over arts, humanities, and social sciences, to an extent, with the strategic driver being the greater impact on the REF (Research Excellence Framework) score and subsequent QR funding, in addition to STEM subjects requiring greater investment in running costs, e.g. lab space and consumables.

There is appetite to increase overall PGR student numbers, albeit in a financially sustainable manner, and ensuring that students can be offered the service and experience they would expect. Such an increase, it was argued, would boost research excellence and generate wider benefits such as developing future researchers, boosting funding through an increased REF score, thereby increasing QR RDP and cost recovery as well as improving the attraction of PGR. However, HEPs flag concerns around sourcing appropriate candidates, ensuring existing infrastructure can accommodate an increase, and that academics can dedicate sufficient time to additional students.

Further, while international students (both undergraduate and postgraduate) represent a steady income stream for HEPs, there is acknowledgement that overreliance on overseas students from certain markets may leave them at financial risk should that market dry up, meaning that their cost recovery would be negatively impacted.

Objective H: Understand the influence of UKRI policy (including changes to UKRI policy) and funding on wider PGR support, including cross-subsidy between other income sources and PGR training and the associated incentives and/or barriers for financial and talent pipeline sustainability.

Increased funding (from any funding stream, not only from UKRI) would be welcomed to boost financial sustainability to boost current cost recovery levels. HEPs benchmark their fees to UKRI's as a matter of fairness and consistency across the PGR environment, meaning they would feel able to increase their fees if UKRI did so. Moreover, they typically charge the same fees for self-funded and industry-funded students to retain a level playing field and to avoid unintentionally deterring potential PGR students from enrolling. While an increase in UKRI's fee would be welcome, HEPs feel current fees have not taken wider associated costs into consideration – for instance costs relating to PGR administration, wider support services, provider-wide training, and broader estates costs – meaning each student will be a cost to the HEP. They further caveated that overall UKRI-funded studentship numbers should not be impacted if any fee increase is effected.

UKRI's recently updated Statement of Expectations for Doctoral Training is felt to have placed increased expectations and pressures onto HEPs. While HEPs agree with the principles set out within the Statement, they harbour concern that it will be difficult to provide additional services such as increased training and support services (e.g. linked to mental health and wellbeing) that are envisaged, and are concerned about the difficulty of providing

such services without additional funding (noting that Research England and the Office for Students have supported some of these services in the past).

Ideally, most HEPs would like to increase the total number of PGR students, so long as they can continue to offer the expected levels of service and experience to students, as HEPs feel this may be a way of accessing more funding via QR RDP (although were all HEPs to increase PGR student numbers, QR funding would simply be spread more thinly). Increased student numbers could also be supported through increased funding levels and greater investment by HEPs themselves.

When asked what is a reasonable proportion of doctoral training costs for HEPs and UKRI to cover, several feel that UKRI ought to cover 80-100% (with the remainder covered by the provider or via another funding source). It was argued this would assist in being able to meet UKRI's Statement of Expectations, as they would then be able to invest more into PGR students and the quality of their training provision. However, there was also realism that a similar level to grants (i.e. 80%) is unfeasible, and HEPs indicated that a 50/50 split with UKRI is currently the most common approach. HEPs further caveated that any increase should not result in a decrease in the total number of funded studentships as this may be counterproductive in terms of ensuring the research talent pipeline and also noted it may act to deter some potential self-funded students from enrolling.

The complexity of funding and differences in eligibility criteria can perplex HEPs, who would welcome seeing standardisation across UKRI's research councils to make applications consistent across in terms of what costs are (or are not) covered – for example ESPRC grants cover administration costs, unlike NERC or AHRC. Harmonisation would not only be welcomed to streamline HEPs' administrative burden, but including administration costs as eligible costs across all research councils would, it is felt, help to boost cost recovery.

HEPs in TRAC peer groups C, D, E or F feel that being less research intensive and a lesser established reputation can restrict their access to UKRI funding compared to HEPs in TRAC peer groups A and B. They would welcome consideration of opportunities for how their research can be better supported by UKRI, as UKRI funding is viewed as a boon to these HEPs to be able to support their research and provide substantial income.

The expectations or pressures of co- or match-funding – for example to offer resources, facilities, or training as part of the agreement – can act as a deterrent as HEPs feel such a commitment would overstretch them financially (noted by 10 HEPs, nine of which belong in TRAC peer groups A or B). The competitive nature of such bids may force some HEPs to pull out of applications for UKRI match-funding, as HEPs feel they may become too expensive to invest in. On the other hand, nine HEPs noted that co-funding arrangements can help to assist HEPs to fund more students than that might otherwise have done so without the partnership, and free up funds to be used for support elsewhere.

Increased collaboration between HEPs themselves may help to boost financial sustainability by improving access to funding they may not have been able to receive competitively. Moreover, improved access to industry co-funding partnerships could also help in this regard, with HEPs suggesting UKRI should continue to facilitate introductions to suitable partners from industry such that research could be more efficiently directed towards priority economic and societal outcomes. HEPs acknowledged that UKRI's close relationship with government could be invaluable to help drive greater industry investment into research activities, thereby diversifying HEPs' income streams and improving their financial sustainability.

Wider support from UKRI sources was suggested to help ensure equitable access and to cover costs which students (but also sometimes HEPs) themselves are typically obliged to cover currently, thereby boosting cost recovery for HEPs, to:

- enable overseas students to reach the UK to study, to cover costs related to visas, travel to reach the UK, and health surcharge, for those in financial need,

- support part-time students and/or those with caring responsibilities, and those with longer-term health conditions to study at their own pace without financial worries of taking longer to complete, by increasing the funding period for these individuals, and by reviewing the eligibility of PGR students for aspects such as childcare support or parental leave.

1. Introduction

1.1 Background

1.1.1 UKRI as a funder

UK Research and Innovation (UKRI) is a non-departmental public body established in April 2018 and sponsored by the Department for Science, Innovation and Technology (DSIT). Its creation brought together the seven research councils, Research England, and Innovate UK.

UKRI is the largest single funder of postgraduate research (PGR) in the UK. Around 20% of PGR students in the UK are registered against UKRI training grants. The scale and breadth of UKRI's work, and its proximity to government, means it has an important role as a convener to bring together voices from the research and innovation community to encourage and support PGR training. Such investment has a direct impact on peoples' skills and careers, generating new ideas, driving innovation, and with significant impact across almost all economic sectors.

Between 2022 and 2025, UKRI is investing £1.3bn in training grants across its seven research councils. Doctoral training grants offer funds towards student living costs, tuition fees, research and wider training support,[6] while some councils support management costs for specific programmes. Eligible higher education providers (HEPs) in England may also receive Quality-Related Research (QR) funding[7] from UKRI via Research England for research degree supervision – or the equivalent from the Scottish Funding Council, Higher Education Council for Wales, and Department for the Economy – Northern Ireland in each of the UK's devolved nations. These represent the two main streams by which UKRI supports doctoral training – the remaining 80% of doctoral students may be funded through a variety of other mechanisms.

1.1.2 Financial sustainability of the sector

Recent analysis by the Office for Students (OfS) of English HEPs' financial data suggested that the overall aggregate financial position of these registered HEPs is weaker than in recent years, with providers forecasting deterioration in the short- to medium-term financial outlook, with 40% of HEPs forecasting a deficit for 2023/24.[8] Student numbers are forecasted by HEPs to grow in coming years, although this is at odds with a decline in overall student numbers in 2022/23.[9] For many HEPs, projections of financial sustainability are underpinned by actual and forecast income from international students (both undergraduate and postgraduate).

In its latest annual financial sustainability report, based on an Annual Financial Return from 269 HEPs, the OfS highlighted a significant decline in financial performance in light of inflationary pressures, the affordability of estate maintenance and development (including adapting to meet net zero targets), and the apparent reduction in UK and international

[6] For information on what is covered, see UKRI website, Studentships and doctoral training: https://www.ukri.org/apply-for-funding/studentships-and-doctoral-training/get-a-studentship-to-fund-your-doctorate/ Accessed 15 April 2024
[7] Further information about QR funding is available here: https://www.ukri.org/publications/explainer-qr-research-funding-and-the-ref/explainer-quality-related-research-funding-and-the-ref/ Accessed 15 April 2024
[8] OfS, 2024, Financial sustainability of higher education providers in England
[9] Ibid

applications after years of strong growth.[10] On this latter point, while HEPs are forecasting an uplift in fee income received from international students (both undergraduate and postgraduate), the OfS notes that volatility in overseas markets does create an uncertain financial position that requires proactive management.[11] For context, the sector had an aggregate deficit of £1,962m in 2021-22, a substantial rise compared to £202m in the previous year.[12]

While most HEPs expect their financial performance to improve in the medium and longer-term, the OfS states that the environment remains challenging, highlighting such risks as the sustainability of pension schemes, rising cost of living, ongoing investment, and reliance on overseas students (both undergraduate and postgraduate).

1.1.3 TRAC returns

All UK HEPs are required annually to report Transparent Approach to Costing (TRAC) data – a method for pricing and costing their teaching, research and other activities. In 2021/22, TRAC data were collected by the OfS on behalf of UKRI, the Scottish Funding Council, the Higher Education Funding Council for Wales and the Department for the Economy (Northern Ireland) and these bodies are co-owners of the data.

The findings from the TRAC data collection are reported according to five categories.

- Teaching (publicly funded)
- Teaching (non-publicly funded)
- Research
- Other (income-generating)
- Other (non-commercial)

The 'research' element comprises all research activities (but not scholarship or staff development) commissioned or funded by external sponsors, or the HEP's own-funded research activity. Public sponsors include the UKRI councils and government departments. Other sponsors could include UK charities, the EU (European Union), overseas governments, overseas charities and research carried out for commercial or industrial sponsors.

Reporting of costs through the annual TRAC data does not, however, necessarily align with the way that HEPs price up bids for grants. TRAC data (i.e. annual returns) report on the full economic cost by sponsor type, one element of which is 'training and supervision of PGR students'. HEPs are encouraged to report PGR income and costs under the PGR research sponsor type where costs can be readily identified and reallocated, and guidance is provided However, the reallocation of income and costs relating to PGR activity away from the external research sponsor type to the PGR category is not a TRAC requirement.[13] Across 2020/21 and 2021/22, just over three fifths (61%) indicated they had reallocated costs this way.[14] As not all HEPs reallocated costs, this may impact the OfS's analysis to a degree, meaning cost recovery figures generated through the OfS's analysis should be treated with caution.

[10] Ibid
[11] Ibid
[12] OfS, 2023, Annual TRAC 2021-22
[13] TRAC guidance, July 2023 (updated Nov 2023), Version 2.3. See https://www.trac.ac.uk/tracguidance/
[14] UKRI, 2024, Analysis of the cost recovery on PGR funding

TRAC data in relation to PGR

The PGR category in TRAC covers the training and supervision of PGR students including training in research methodology, review of drafts and preparation of thesis, and external examining. These costs include the following.

- Scholarships and bursaries (a direct cost of Research).
- Any other direct costs incurred by the HEP on behalf of PGR students.
- Indirect and estates costs associated with PGR students themselves.
- Time of the supervisors in PGR training and development.
- Indirect and estates costs associated with this supervision time.

The PGR activity category includes all types of PGR student and does not differentiate by their funding source.

UKRI's quantitative analysis of TRAC data from the financial year 2021/22 reveals that – on average at the sector level – HEPs recovered around 46% of the full economic costs of training and supervising PGR.[15]

To put these figures into context by comparing to other sponsor types, 76% of the full economic costs were recovered by HEPs in 2021-22 in relation to 'other government departments' and 57% for 'UK charities'.

However, interpreting TRAC data on PGR students is not straightforward due to the complexity of the TRAC methodology and the currently unknown extent to which HEPs utilise TRAC guidance when developing bids for funding to determine doctoral training costs.

1.1.4 A New Deal commits to understand full economic costs

In Autumn 2023, UKRI published its response to the recommendations made to the sector through Pye Tait Consulting's analysis of responses to the Call for Input (CFI) on a New Deal for PGR. The New Deal aims to encompass a range of policy and funding measures to support the government's longstanding commitment to research to drive innovation and for the good of society.

In its response to the New Deal CFI, UKRI committed to explore and understand the full cost of doctoral training.[16] The 46% cost recovery figured reported by the OfS in relation to PGR includes all types of PGR student (irrespective of their funding source). The complexity of TRAC pricing versus reporting, increasing research costs, and financial pressures for the sector, mean that UKRI is eager to understand the full economic costs of doctoral training, with a view to whether further policy or funding interventions are necessary.

To that end, UKRI has recently been conducting in-house quantitative research of TRAC and HESA data. Alongside this, UKRI wished to undertake complementary qualitative research with UK HEPs to delve further into this area.

UKRI therefore commissioned Pye Tait Consulting, an independent research agency, to undertake qualitative research with HEPs to understand influences and considerations in relation to full economic costs and to help develop a fuller understanding of the contemporary costs of doctoral training and their role in the financial performance of HEPs. The findings will be used by UKRI to inform future policy and funding decisions, with a view

[15] OfS, 2023, Annual TRAC 2021-22
[16] UKRI, 2023, New Deal for postgraduate research, response to Call for Input

to ensuring that UKRI practices support the financial sustainability of the research talent pipeline and to further understanding of the HE sector's role in ensuring financial sustainability.

This research forms part of a wider programme of activity in relation to one of UKRI's strategic objectives, to improve the financial sustainability of research and innovation in organisations across the UK.[17]

1.2 Aim and objectives

The overarching aim of this research was to undertake qualitative research with a sample of UK HEPs, to understand the full economic costs of doctoral training from HEPs' point of view. Specific objectives of the research were as follows.

A. Understand how HEPs use funding from various income sources to support PGR and PGR activities.

B. Understand the role of QR funding, QR RDP (Research Degree Programme supervision fund) and equivalent Devolved Administration funds in PGR training and supervision.

C. Understand the different funding sources supporting 'HEP-own' funded PGR training.

D. Requirements for / expectations of match-funding or co-investment for PGR training (e.g. via Doctoral Training Partnerships (DTPs)/Centres for Doctoral Training (CDTs)) across different funders.

E. Identify the key resources required for high-quality PGR training and supervision.

F. Consider what should be counted within the full economic costs for PGR.

G. Consider what level of cost recovery could improve the sustainability of the talent pipeline and modelling the impacts of making any changes to PGR on volume and quality of training opportunities.

H. Understand the influence of UKRI policy (including changes to UKRI policy) and funding on wider PGR support, including cross-subsidy between other income sources and PGR training and the associated incentives and/or barriers for financial and talent pipeline sustainability.

Alongside this, cross-cutting themes were to consider:

- differences in training and supervision costs and approaches across the sector (e.g. in different types of HEP),
- differences in training and supervision costs and broader resource inputs to PGR training, both within and between disciplines/subject areas,
- regional/national differences in financial sustainability and support for PGR, and
- the impact of the current system on Equality, Diversity, and Inclusion (EDI) for PGR.

[17] UKRI, 2022, UKRI Strategy 2022-2027

1.3 Methodology

The research solely comprised primary fieldwork, a total of 40 qualitative interviews with HEPs across the UK.

A sample of HEPs was developed and agreed between Pye Tait Consulting and UKRI. A total of 56 HEPs were identified, with a spread by TRAC peer group (see box) and geographic location across the UK. HEPs able to claim dispensation from TRAC were excluded from the sample as the research sought to gather views from those HEPs that do not apply dispensation. The sample also comprised a selection of HEPs from the Russell Group, the GW4 Alliance and the N8 Research Partnership.

TRAC peer groups

HEPs are allocated by the OfS to one of six peer groups based on levels of research income,[18] overall total income, having a medical school, or specialism in music or the arts. TRAC peer groups are set for a number of years in order to maintain a stable group for comparison and so are not updated annually.

- **Peer group A**: HEPs with a medical schools and research income of 20% or more of total income
- **Peer group B**: All other HEPs with a research income of 15% or more of total income
- **Peer group C**: HEPs with a research income of between 5-15% of total income
- **Peer group D**: HEPs with a research income less than 5% and total income greater than £150m
- **Peer group E**: HEPs with a research income less than 5% and total income less than or equal to £150m
- **Peer group F**: Specialist music/arts teaching HEPs

HEPs can claim dispensation from TRAC requirements – around one in three HEPs completing TRAC returns do so.

Pye Tait Consulting contacted all 56 HEPs to request participation in the research. In addition, UKRI introduced Pye Tait Consulting to three further HEPs, all of whom are members of the Financial Sustainability of Research Group (FSRG). Of the 59 HEPs contacted, a total of 40 completions were achieved – a response rate of 68%. A breakdown of the profile of respondents is available in section 1.4.

Interviews were held virtually in February and March 2024. These were group discussions involving multiple individuals per HEP. Typical job titles of those participating include Chief Financial Officer, Finance Director, Dean of Postgraduate Research, and Director of Doctoral School.

A topic guide was co-developed between Pye Tait Consulting and UKRI. A copy can be found in the Appendix.

Interview findings were analysed manually. Coding was undertaken to identify key themes in response to each question. This coding allowed identification of frequency of theme at an

[18] Research income is defined as the funding council recurrent research grant plus the total research grants and contracts returned in the 2012-13 HESA Finance Statistics Return.

overall level and to note any patterns in responses between different sub-groups of respondent to draw out any differences or similarities.

Generally speaking, the key findings throughout Chapter 2 are structured from most to least commonly mentioned themes.

In Chapter 3, Pye Tait Consulting has drawn together the main themes arising from this research.

1.3.1 Interpretations and limitations

Readers should be aware that the findings contained in this report are based on interviews with a sample of UK HEPs (40 in total) i.e. not all HEPs participated. The report, in places, quantifies the number of HEPs that put forward a particular point, but this should not be interpreted as a proportion of the sector as a whole, i.e. the views expressed are those of the HEPs participating in this research and not necessarily reflective of all HEPs. In addition, while not every HEP mentioned certain points, that does not necessarily mean that such points are not applicable to those HEPs which did not mention the same point. Furthermore, while some potential suggested actions were put forward by HEPs, readers should bear in mind that it was outside the scope of this research to determine the suitability of such actions for taking forwards.

However, given the detailed, qualitative nature of the research, some key common themes emerge which indicate agreement in experience between participating HEPs.

Some anonymised quotations from participants are included in the report. These extracts are included to provide examples which reflect the most common points being made.

1.4 Respondent profile overview

The spread of responses by UK nation and region is shown in Table 1.

Table 1 Regional spread of responding HEPs

Region/nation	Total interviews
East Midlands	3
East of England	2
London	3
North East	3
North West	4
South East	6
South West	6
West Midlands	3
Yorkshire and the Humber	3
Northern Ireland	1
Scotland	3
Wales	3
Total	**40**

Of the 40 interviewed HEPs, 11 are members of the Russell Group, three are members of the GW4 Alliance, and four are members of the N8 Research Partnership.

The spread of responding HEPs by TRAC peer group is show in Table 2.

Table 2 Profile of responding HEPs by TRAC peer group

TRAC peer group	Total interviews
A	13
B	8
C	6
D	8
E	4
F	1
Total	**40**

1.5 Report structure

The table below maps out how each of the research objectives listed in section 1.2 is covered within the key findings chapter (section 2). Boxes at the start of each sub-section signpost which objectives are covered within that element. The final chapter pulls together the evidence under each research objective.

Research objective	Section	Topics covered
A. Understand how HEPs use funding from various income sources to support PGR and PGR activities.	2.3 2.4.1	Funding sources for PGR training and supervision Allocating costs to TRAC categories
B. Understand the role of QR funding, QR RDP and equivalent Devolved Administration funds in PGR training and supervision.	2.3.1 2.3.2	Funding sources Role of QR funding (or devolved equivalent)
C. Understand the different funding sources supporting 'HEP-own' funded PGR training.	2.3 2.5.1	Funding sources for PGR training and supervision HEPs' strategic approach to investing in PGR
D. Requirements for / expectations of match-funding or co-investment for PGR training (e.g. via Doctoral Training Partnerships (DTPs)/Centres for Doctoral Training (CDTs)) across different funders.	2.3.3 2.5.3	Co-funding arrangements Impact of co-funding on the financial sustainability of PGR
E. Identify the key resources required for high-quality PGR training and supervision.	2.1	Key enablers for high-quality PGR
F. Consider what should be counted within the full economic costs for PGR.	2.2	PGR training and supervision activities included in full economic costs

G. Consider what level of cost recovery could improve the sustainability of the talent pipeline and modelling the impacts of making any changes to PGR on volume and quality of training opportunities.	2.4.2 2.4.3	Views on sector level cots recovery of 46% Cost recovery levels that would help ensure financial sustainability
H. Understand the influence of UKRI policy (including changes to UKRI policy) and funding on wider PGR support, including cross-subsidy between other income sources and PGR training and the associated incentives and/or barriers for financial and talent pipeline sustainability.	2.4.4 2.5.2 2.5.3 2.5.4	Costs that might be covered by UKRI and HEPs Impact of Statement of Expectations Impact of co-funding on the financial sustainability of PGR Support for UKRI and others

2. Key findings

2.1 Key enablers for high-quality PGR

This section provides an overview of UKRI's updated Statement of Expectations for Doctoral Training and discusses the key enablers for high-quality PGR identified by HEPs.

Research objectives covered in this section include:

E. Identify the key resources required for high-quality PGR training and supervision.

2.1.1 UKRI's updated Statement of Expectations

UKRI's Statement of Expectations for Doctoral Training was published in January 2024 and will affect new training grants whose programmes and students start no earlier that September 2025. The Statement sets out the core principles underpinning the provision of high-quality PGR training and supervision.[19] Three core principles underpin the statement, which was developed following UKRI's response to the New Deal Call for Input.

- **Simplification**: Removing complexity to improve understanding and increase efficiency.
- **Flexibility**: Enabling the tailoring of schemes, training programmes, and/or individual studentships to better achieve their aims and ambitions, ensuring students' equitable access to the highest quality skills and knowledge development.
- **Equality, diversity and inclusion (EDI)**: Supporting the progression of a diverse population of students into a range of research and innovation careers by accommodating diverse student needs and career aspirations.

This Statement of Expectations replaces the Statement of Expectations for Postgraduate Training published in September 2016. The new version brings the Statement up to date with developments since 2016, including the following.

- UKRI will model the funding that it provides per student based on at least 3.5-years duration time equivalent, whilst enabling flexibility for the research organisation to set the funding period based on the circumstances of the individual student.
- A new emphasis on flexibility to support students – with the explicit expectation that the thesis or equivalent is submitted within the funded period (and implicitly, that there is no unfunded 'writing up' year) – on student mental health and on EDI-related issues.
- Research organisations will provide more support for skills training, including commercialisation and entrepreneurship, and supervisors should encourage students to access training and development opportunities, including placements.

[19] UKRI, 2024, Statement of Expectations for Doctoral Training

2.1.2 Key enablers

Responding HEPs were asked, based on their knowledge and experience, what the key enablers are to realising the expectations set out in UKRI's 2024 Statement, and the following themes emerged. This provides an understanding of the core components for high-quality PGR and therefore what costs HEPs are obliged to invest in as part of this (covered in more detail in section 2.2).

The subsequent impact of UKRI's updated Statement of Expectations on HEPs' financial sustainability is discussed in section 2.5.2.

High-quality supervision

The importance of high-quality staff – especially staff who supervise doctoral students – was a key enabler emphasised by just under half of HEPs (19 – six TRAC peer group A (out of 13), four B (of eight), three C (of six), four D (of eight), two E (of four)). These academic members of staff need to be experts in their field, possess relevant levels of experience and demonstrate a sufficient degree of commitment to any given doctoral project. Therefore, supervisors' time is also an important variable, as supervisory staff need to dedicate sufficient time to PGR students. Furthermore, the preparedness of supervisors to be able to lead and mentor students from all backgrounds, to develop effective relationships with them, is crucial. Supervision has always been an important element of PGR, although HEPs' interpretation of UKRI's Statement of Expectations is that supervisory staff will have an increasingly important role to play as one of the first ports of call for students with queries of any nature, to be able to signpost to appropriate support.

> The behaviour of the supervisor influences how well the student feels looked after or not. The relationship between the supervisor and the student is the most important thing. Then, for example, is every supervisor equipped to deal with different genders and backgrounds? They need a consistent way to deal with social adaptability. – TRAC peer group B

HEPs discussed how the supervisor-student interaction also needs to be underpinned by transparency in terms of desired expectations, outcomes, assessment points and supportive mechanisms. Whilst supervisors provide support for students, interviewees also highlighted the importance of offering supervisor training to improve their practice, to then boost students' experience. Monitoring, regulation and accountability of supervisor performance also plays a role here.

HEPs noted that, broadly speaking, the nature of doctoral projects differs between disciplines meaning that supervisory input varies. In arts, humanities and social sciences subjects, doctoral students are more typically independent researchers with more hands-off supervision, although supervisors still play an important coordinative role in guiding students on a given project, and to act as a mentor and first port of call for support and onward signposting. In contrast, in STEM (science, technology, engineering and mathematics) subjects, doctoral students need to have much more regular access to facilities and supervisors due to the inherent nature of their research. This difference in approach between disciplines was anticipated to continue in the future.

Central teams

Central teams, comprising disciplinary teams within schools, advisers, staff who help students navigate the PGR journey, and support services also have a key role to play.

Disciplinary teams within schools facilitate core and soft skills training to support students' during their doctoral study and to provide generic skills with applicability beyond academia. Advisers and staff helping students to navigate the PGR journey assess students' needs and direct them towards additional training tailored to individuals, as well as providing careers advice. Support services consist of a wider range of functions including administration (e.g. student registry), HR, library services, disability support, and student wellbeing teams which enhance the whole student experience. Central teams – with requisite skills and training – were highlighted as playing a key strategic role, with HEPs noting the importance of having teams dedicated specifically to student wellbeing and career support in order to provide tailored student support.

Facilities

Around one in three (13) pointed out that facilities are an important enabler (four TRAC peer group A (out of 13), four B (of eight), two C (of six), two D (of eight), one E (of four)). This includes access to equipment, consumables, learning facilities and libraries. This is especially important for STEM subjects as these require laboratories, high-tech equipment and the supporting infrastructure.

Some (eight) made interconnected points about disciplinary differences (four TRAC peer group B (out of eight), two C (of six), one D (of eight), one E (of four)). Whilst STEM subjects typically require laboratory space (some of which is available locally, and others nationally), there is also a need to provide workshop space, studios, and creative facilities for arts subjects, and office space for social sciences.

Fostering a PGR research community

A dozen HEPs (12 – five TRAC peer group A (out of 13), two B (of eight), two C (of six), two D (of eight), one E (of four)) directed attention to the creation of a conducive research environment with the provision of appropriate training for PGR students. Interviewees pointed out how they aim to create a sense of belonging and to foster a research community at departmental level among doctoral students, by surrounding students among the broader research culture and environment. This, it was argued, supports students' socialisation and inclusivity among doctoral students, to enable students to share challenges and experiences, as well as providing an opportunity to collaborate and network. Some HEPs invest into specific spaces within buildings which allows for activities such as research workshops, external training, journal article clubs, and community groups such as buddy systems. There is also support for PGRs (organisationally and financially) to attend conferences to disseminate their research, as well as to undertake research visits to other HEPs or to undertake placements with industry partners.

In terms of training, doctoral students are not only supported by their supervisors, but also require access to wider training and development opportunities at both a departmental and provider-wide level This can include generic skills training, bespoke training, cohort-based training, soft skills training, as well as personal and professional skills training – specific skills training may be delivered at departmental level, while generic or soft skills training may be designed to benefit students across multiple departments. These latter activities in particular may not necessarily be reflected in HEPs' costing of doctoral training.

2.2 PGR training and supervision activities included in full economic costs

This section outlines what PGR-related activities HEPs include when completing their annual TRAC return and in which categories such activities are assigned according to TRAC reporting guidance.

Research objectives covered in this section include:

F. Consider what should be counted within the full economic costs for PGR.

HEPs provided detailed insight on the training and supervision activities they include when calculating the full economic costs of PGR training, and the proportion of costs incurred by them.

Direct costs

Staff time was identified by the majority (26 – eight TRAC peer group A (out of 13), five B (of eight), three C (of six), six D (of eight), three E (of four), one F (of one)) as a directly incurred cost. This mostly relates to supervisors' salaries, but also to salaries of technicians, tutors, and those who would deliver subject-specific training, such as guest lecturers. Alongside this, several (10 – three TRAC peer group A (out of 13), four B (of eight), one C (of six), two D (of eight)) mentioned that such staff costs and time are typically derived from schedules, workload planning, or time allocation surveys (TAS). They explained that these help make this process relatively straightforward, by providing detail on how the models work.

> The main costs are academic staff time which we identify on our time allocation survey. We have a statistical methodology where we ask staff what they're doing on specific days. We select staff, randomly, assign them to days on a random basis. We get a direct measure of the time that people are spending supervising PGRs, so we can allocate that cost to the PGR column. – TRAC peer group B

The cost of estates and facilities was raised by almost half (17 – five TRAC peer group A (out of 13), four B (of eight), two C (of six), four D (of eight), one E (of four), one F (of one)) as a direct cost, for instance the use of laboratories for PGR students. To derive estimated costs attributable to PGR students and their courses, HEPs, for example, outlined how they allocate costs based on planning data received from academic staff, and/or by looking at the time spent by PGR students in a certain facility as a proportion of its total running cost.

Other key direct costs include:

- payments to students, including stipends and bursaries (noted by 11 – two TRAC peer group A (out of 13), two B (of eight), three C (of six), three D (of eight), one E (of four)),
- consumables, materials, and equipment (seven – one TRAC peer group A (out of 13), one C (of six), two D (of eight), two E (of four), one F (of one)), and
- events and travel relating to course activities, such as conferences and research trips (six – four TRAC peer group D (of eight) and two E (of four)).

The majority stated that direct costs are proportionally the largest costs HEPs pay in relation to PGR training and supervision. Typically, direct costs constitute 50% to 70% of HEPs' total

costs in this regard. Of direct costs, 10 HEPs (two TRAC peer group A (out of 13), three B (of eight), one C (of six), three D (of eight), one E (of four)) indicated that staff salaries are the largest component, while nine saying payments including stipends and bursaries are the largest component. Estates often constitute another large proportion of HEPs' costs and indeed were indicated as the largest cost component by two HEPs.

Indirect costs

The most common indirect costs noted by HEPs include:

- administrative and support staff activities of academic departments that are not directly allocated TRAC activities (noted by 11 – three TRAC peer group A (out of 13), one B (of eight), two C (of six), five D (of eight)) – some HEPs use time allocation of workload models to allocate indirect staff costs based on drivers,
- central services, including areas such as professional services, finance, wellbeing support, and student registry offices (nine – two TRAC peer group A (out of 13), four B (of eight), two C (of six), one D (of eight)), and
- estates costs that are not directly allocated TRAC activities, for example the use of libraries and IT spaces (six – two TRAC peer group A (out of 13), one B (of eight), one C (of six), one D (of eight), one F (of one)).

Costs are calculated using methods such as determining the cost of each administrative action on an individual basis for a given activity, or simply using the salary cost.

As with the direct costs that are allocated, HEPs said they aim to follow TRAC guidance to accurately record indirect costs. In their calculation, they allocate costs based on drivers such as PGR student numbers and FTE staff numbers involved in running such services.

> There are also cost drivers to pulling in estate and central overhead costs but we're careful about what gets allocated to PGR. We won't include things related to undergraduate admissions, for example. – TRAC peer group B

Indirect costs are a lower proportion for most HEPs than direct costs. Where they were able to identify proportions, HEPs noted indirect costs typically comprise 30% to 40% of total cost. However, three HEPs (all TRAC peer group A) stated that indirect costs are equal to their direct costs, with indirect costs associated with estates and central team support comprising a large component.

Variation by discipline

Across the board, HEPs noted that the costs of STEM disciplines are higher than those of arts, humanities and social sciences. They pointed to the lab-based element of practical sciences incurring a higher cost in terms of estates and consumables, as well as necessitating a higher allocation of supervisory time – particularly for life sciences and medical sciences. On the contrary, non-lab-based STEM disciplines, for example maths or theoretical physics, were noted to accumulate lower costs resulting from a lack of these elements.

Furthermore, one mentioned that lab-based disciplines incur a higher cost for staff, from training to delivery, while another suspected that its heavy weighting towards STEM disciplines contributes to its cost recovery being so low.

Concurrently, some HEPs discussed the costs related to arts, humanities and social sciences subjects.

- Estates costs constitute a far smaller proportion compared to STEM disciplines (noted by three – one TRAC peer group A (out of 13), one B (of eight), one C (of six)), because the latter necessitate a regular use of labs as opposed to offices. One HEP noted it has a separate social sciences cost banding because of this.

- However, arts and humanities can have significant costs, such as studio space requirements for certain disciplines, and subscriptions to specific databases for business and law (one – TRAC peer group D).

- One feels that arts and humanities may have been 'sidelined' by UKRI as, while these subjects receive less RTSG (Research Training Support Grant) funding than more expensive STEM subjects, they perceive a lack of understanding by UKRI as to what a more valuable experience of doctoral study in such non-STEM disciplines involves. They feel it may be more difficult to understand this as SHAPE (Social Sciences, Humanities and the Arts for People and the Economy) disciplines are more time-oriented on the individual student and focused on placements and travel rather than on consumables (one – TRAC peer group C).

2.3 Funding sources for PGR training and supervision

This section outlines the funding sources that HEPs draw on to fund PGR training and supervision activities. It then details the role of QR funding and outlines co-funding arrangements.

Research objectives covered in this section include:

A. Understand how HEPs use funding from various income sources to support PGR and PGR activities.

B. Understand the role of QR funding, QR RDP and equivalent Devolved Administration funds in PGR training and supervision.

C. Understand the different funding sources supporting 'HEP-own' funded PGR training.

2.3.1 Funding sources

In terms of the income sources used to fund PGR training and supervision activities, interviewed HEPs mentioned a range of different sources, with some able to give approximate indications about the proportionate split. The funding sources listed below are not exhaustive (or limiting) but represent those most commonly discussed. It should be noted that, while not every HEP mentioned each funding source outlined below, that does not mean those HEPs do not draw on such sources.

Section 2.5.3 contains further discussion on the impact of co-funding on the financial sustainability of PGR.

Self-funding students

Around two thirds (28 – 11 TRAC peer group A (out of 13), three B (of eight), six C (of six), five D (of eight), two E (of four), one F (of one)) pointed towards self-funded students, i.e. doctoral students who pay fees themselves. However, it was acknowledged that these fees only cover core costs such as supervision and do not cover wider costs such as equipment, facilities, or wider training and support. Indeed, one HEP noted that the proportion it recovers in relation to self-funded PGR students depends on the ratio of PGR to taught students, and further that cost recovery is also linked to block QR funding, meaning that more research intensive HEPs (TRAC peer groups A and B) will have a higher cost recovery as they receive more QR funding.

Several HEPs possess a sizable number of PGR international students in the self-funding category, whereby overseas students will pay the fee from their own pocket.

However, the self-funded category can be more complex. In some cases, this relates to students who are working and studying alongside their work, or who are studying while being supported by a partner or family. In some HEPs, some students who are counted as self-funded, may in practice also receive sponsorship from another organisation, or be in receipt of some form of scholarship scheme.

The proportion of self-funded students among all PGR students varies by HEP. For some, it is around 30-45%, but for others the numbers are larger e.g. 60%-70%. The proportion of self-funded students also differs by discipline, with humanities and social sciences having a larger proportion of self-funded students compared to STEM subjects.

Industry funding

Funding from industry was mentioned by a similar number of HEPs (26 – eight TRAC peer group A (out of 13), six B (of eight), four C (of six), four D (of eight), three E (of four), one F (of one)), whereby industry bodies or businesses sponsor a project. Given known skills shortages and knowledge gaps in the wider economy, businesses and industry bodies are keen to support doctoral students to help address these gaps and feed the R&D pipeline. This arrangement also allows HEPs to establish valuable partnerships with industry, and is welcomed as a key source of funding. In terms of funding arrangements, industry funding may not necessarily cover student fees, but may instead cover other costs such as access to facilities, with co-funding explicitly mentioned as one of the options of these industry funding arrangements (see section 2.3.3 for more detail). Whilst many HEPs noted industry funding as one of their sources, as a proportion these do not represent a large portion – with estimates ranging from 4% to 30%, but most commonly around 10-12%. Disciplinary variation is visible here too, with STEM subjects more successful in securing industry funding compared to arts, humanities and social sciences.

More detail on co-funding arrangements is in section 2.3.3.

Overseas funding (sponsored)

Half (20) directed attention to overseas funding as a source of income to fund PGR training and supervision activities (nine TRAC peer group A (out of 13), four B (of eight), two C (of six), four D (of eight), one E (of four)). This encompasses European sources of funding (e.g. European Commission, European Structural Funding, and European programmes such as Horizon Europe and Erasmus) as well as from other sources further afield (including private international students). HEPs noted that international students can be sponsored by and receive money for their doctoral projects from their home government – countries mentioned

in particular include China, Pakistan, Saudi Arabia, Malaysia, Singapore, Thailand and others in the Middle East region. Some HEPs noted that the PGR student market from African countries and also from India is on a downward trajectory.

This income covers student fees but not wider costs such as those linked to facilities or estates. However, the fee for international students is higher than for home students, meaning that this increased fee does help to cross-subsidise costs to some extent. Further discussion on this is contained in section 2.5.

In terms of proportions, overseas (sponsored) PGR students were estimated to account for approximately 10% of PGR funding income.

UKRI and the research councils

UKRI and the research councils were explicitly mentioned as a funding source by two in five HEPs (16 – eight TRAC peer group A (out of 13), four B (of eight), two C (of six), two D (of eight)) often alongside Doctoral Training Partnerships (DTPs) and Centres for Doctoral Training (CDTs) or other schemes. UKRI funding mentioned by HEPs is delivered in the forms of doctoral training grants, with some students either fully funded or partially funded by UKRI money (e.g. through industry match-funding). These doctoral training grants offer funds towards student stipends, tuition fees, research and wider training support, while it was noted that some research councils also support management costs for specific programmes.

The proportions of PGR students which are UKRI funded varies significantly. For some HEPs this is between 5% and 20% of all PGR students, while for others (mainly those in TRAC peer groups A and B) it is higher, between 30% and 50%. The proportion of UKRI funded PGR students also differs by discipline, with a greater proportion of UKRI funded PGR students in STEM subjects compared to arts, humanities and social sciences.

More detail on co-funding arrangements is in section 2.3.3.

Charities

One in three (13 – six TRAC peer group A (out of 13), four B (of eight), two C (of six), one E (of four)) mentioned funding from external sponsors and third-party funding for studentships. Similar to industry sponsorship, a charity may be willing to support a doctoral student by covering the fee and stipend to investigate a particular topic or question, regarding this as a cost-effective way to pursue this exploration. Two HEPs also mentioned the QR (Quality-Related Research) charity support fund in this regard.

Disciplinary areas in which charity funding were noted to occur most commonly include biosciences, and medicine and health, and occasionally charities may support arts and humanities too.

As a proportion, charities represent a relatively small income source among PGR students for HEPs, in the range of 6% to 10% on average.

More detail on co-funding arrangements is in section 2.3.3.

Internal HEP funding

A minority (seven – two TRAC peer group A (out of 13), two B (of eight), one C (of six), two D (of eight)) said they fund PGR doctoral students themselves with HEP funding i.e. using

their own, internal resources. One HEP outlined how such funds may come from a budgetary surplus of a given department (e.g. through an underspending or by delaying any investments elsewhere) albeit rarely in contemporary times as budgets of HEPs become tighter. Of course, funding doctoral students with internal resources, is in fact a cost to support students and not a source of income, as pointed out by one interviewee. Where an estimate could be provided, the proportion of PGR students that are funded using the HEP's internal funds ranges from 15% to 35%.

QR funding

QR funding was also mentioned by around one in three (13) HEPs (five TRAC peer group A (out of 13), two B (of eight), two C (of six), two D (of eight), one E (of four), one F (of one)).

The flexible nature of QR funding means that it can be used to fund any research related activities, including but not limited to PGR activities. This recurrent funding from Research England (or devolved equivalent) may be used by HEPs as they choose, and there are five elements of QR allocation, including mainstream QR (based on quality, volume, and relative cost of research in different areas) and QR Research Degree Programme (QR RDP) supervision fund (reflecting, in part, PGR student numbers).

2.3.2 Role of QR funding (or devolved equivalent)

Interviewees discussed how QR funding represents a pot of money that can be used to support specific research-related activities which help to boost the research profile of the HEP. HEPs use QR funding to support doctoral students, although allocation between departments and disciplines varies by HEP.

When asked to explain the role that QR funding (or devolved equivalent) plays in funding PGR training and supervision activities, HEPs explain how this is typically divided up in one of two ways.

1. Distribution to individual faculties, schools, or departments (noted by 19 – eight TRAC peer group A (out of 13), three B (of eight), four C (of six), four D (of eight)).

QR funding (both generally and specifically in relation to PGR) is distributed directly to departments on the basis of various factors, including student numbers (mentioned by two – one TRAC peer group A and one C), the volume of doctoral activity and projects (two – both TRAC peer group A), and the 'demands of the discipline' (one – TRAC peer group A). Two HEPs (one each from TRAC peer groups A and B) allocate QR funding to faculties based on their relative contributions, i.e. 'to faculties that are winning the funding'. One HEP (TRAC peer group D) uses a system whereby faculties are invited to submit proposals and bid for QR funding.

2. Pooling QR funds into a central 'pot' of funding (noted by 14 – two TRAC peer group A (out of 13), four B (of eight), two C (of six), five D (of eight), one E (of four)).

Of this group, a few gave further insight. One HEP (TRAC peer group A) stated that QR funding is treated as one of their 'unrestricted income streams' and is not allocated a specific purpose, so they are unable to see the direct relationship between QR funding and PGR activities. Nonetheless, they noted that this central 'chest' of funding is allocated using a 'resource allocation model', supporting a significant proportion of PGR training and supervision activities.

Another HEP (TRAC peer group B) mentioned that QR funding supports their existing internal funding, with one (TRAC peer group D) explaining that a portion of the central funding is budgeted for specific PGR activities.

Three HEPs (two TRAC peer group D and one C) noted that QR funding is both centrally pooled and allocated to individual faculties.

One HEP (TRAC peer group B) does not track where QR funding is specifically allocated. Another (TRAC peer group E) has been unable to use their QR funding to support any research activity or research degrees, including PGR. They explained that, in the most recent academic year, the uptake of undergraduate students was much lower than expected, resulting in a significantly lower income from undergraduate student fees. As a result, a decision was made to 'absorb' a large proportion of their QR funding and use it to offset this loss in income.

HEPs use QR funding to cover a range of costs and activities. The following activities were mentioned spontaneously by interviewees, however, it is possible other interviewed HEPs also use QR funding for these activities but was not mentioned explicitly.

- Funding doctoral studentships (noted by 13)
- Supervisor salary and/or time (13)
- Training activities, including the development of transferable skills (13)
- Project and research delivery activities (11)
- Administrative and support activities, including staff salary and/or time (10)
- Equipment and facilities (eight)
- Student fees (eight)
- Student stipends (four)
- Pump-priming activities (two)

One HEP (TRAC peer group A) shared that they use a proportion of their QR funding to support their research vision and ambitions, which includes the establishment of a doctoral college. They stated that this has helped to develop and nurture their PGR community and established a positive research culture by providing researchers with the space to 'be creative and discover new things'.

Role of QR Research Degree Provision (RDP) supervision funding

Most HEPs do not particularly differentiate between the different elements of the QR allocation such as the mainstream QR and QR RDP supervision fund, noting that QR funding is typically combined together into a central pot prior to allocation.

A small number were able to identify costs and activities that are specifically covered using QR RDP funding, including studentships (noted by two – TRAC peer groups B and D) and doctoral training (one – TRAC peer group B).

Only seven HEPs (two TRAC peer group A, three B, one D, one E) could offer insight into relative proportions of QR RDP.

- QR RDP is approximately 20% of QR (four)
- QR RDP is 16.5% of QR (one)
- QR RDP is 12.5% of QR (one)
- QR RDP is approximately £10m (one)

Two HEPs (both TRAC peer group D) commented that their QR RDP is a relatively small amount, but did not offer specific values.

Views on QR funding

The intended aim of QR funding is that it supports the conditions for excellent research and enabled HEPs to pursue research interests in line with their strategic vision.

HEPs in TRAC peer groups C and D in particular stressed the positive role that QR income plays, with three describing it as an important or necessary part of their income stream. Of these, one specified that they would struggle to offer training to PGR students without QR income, and another stated that is central to their overall research strategy (for example, by allowing them to support early careers researchers).

One TRAC peer group A HEP also explicitly commented on the importance of QR RDP funding.

> QR RDP funding plays a vital role in the financing of our PGR students and is a significant contributor to affordability of PGR training and supervision. – TRAC peer group A

However, six HEPs (three TRAC peer group A (out of 13), two B (of eight), one D (of eight)) feel that current levels of QR funding are insufficient to cover the full economic costs of PGR training and supervision activities (although that is not the intention of QR funding, as noted above).

> It's a pot of money that is intended to cover the costs of performing certain aspects of research. QR has to cover pretty much all of our own funded research, but it also covers shortfalls on research grants funded by UKRI, and also PGR students. It's just stretched really, really thinly. It doesn't make us up to anywhere near 100% of full economic cost on research. – TRAC peer group B

One HEP (TRAC peer group C) also noted they are not eligible to receive QR income for overseas postgraduate students, which prevents them from being able to fund more studentships.

2.3.3 Co-funding arrangements

In terms of co-funded studentships, HEPs discussed a variety of arrangements, including co-funding with / through the following.

- UKRI (noted by 24).
- Industry partners, namely businesses, companies, enterprises, or organisations (24).
- Collaborative Awards in Science and Engineering (CASE) scheme (four).
- Charities (three).
- European Social Fund (ESF) (two HEPs in Wales mentioned ESF as a previous, rather than ongoing, co-funding partnership).
- Private donations (two).
- Foreign government (one).
- Non-industry, non-governmental bodies (one).

Over half (22) explained that, when co-funding, they implement a variety of funding models and splits. Of these, eight (four TRAC peer group A (out of 13), one B (of eight), one C (of six), one D (of eight), one E (of four)) emphasised that they do not have a ‘typical’ or ‘standard’ model for co-funding, but instead each arrangement has its own contract and unique arrangements.

Co-funding splits are largely based on individual arrangements with funders, agreeing a cost between them, and whether the funder has any specific requirements. For example, when co-funding studentships with UKRI, HEPs tend to implement a 50/50 split on the agreed cost, covering half of the costs themselves – as noted by eight interviewees (five TRAC peer group A (out of 13), three B (of eight)), it is stipulated that UKRI will cover at least 50% of the cost for UKRI-funded students. Four HEPs (of which three are TRAC peer group A and one D) also referred to co-funding through the CASE scheme, which specifies the level of funding required from each funder, including industry partners.

Others noted that the co-funding split is also dependent on the enthusiasm or willingness of the funder, as well as their means. For example, one HEP (TRAC peer group A) acknowledged that there are limits on the amount that small and medium-sized enterprises (SMEs) can realistically contribute.

Two TRAC peer group A HEPs mentioned that the co-funding split is, to an extent, determined at a faculty level, i.e. it is up to individual schools or academics to secure partnerships and to negotiate an appropriate split between funders.

> It will massively vary with individual schools. We delegate responsibility that is down to a more local level. Individual schools may have their own schemes which they think work best for that particular discipline. We will expect an individual academic to go out and find half of the funding to support a student while the school would support the other half, for example. – TRAC peer group A

Almost every HEP (35 of 40) gave at least one example of a co-funding model or split that they use.

- A 50/50 split is most common (noted by 31 – of which 17 specified this was the typical arrangement, and five specified this was a minimum).

- 80/20 split (four), of which one specified this was typical or common.
  - 80% funded by UKRI and 20% funded by industry partners (two).
  - 80% funded by UKRI and 20% funded by HEP (two).
  - 20% funded by industry partners and 80% funded by HEP (one).
  - Minimum of 20% funded by DTP (one).

- 75/25 split (three).
  - 75% funded by co-funders and 25% funded by HEP (one)
  - 75% funded by the provider and 25% funded by co-funders (one).
  - 75% funded by UKRI and 25% funded by HEP (one).

- 33/66 split (three).
  - 66% funded by UKRI and 33% funded by HEP (one).
  - 66% funded by industry partners and 33% funded by HEP(one).
  - 33% funded by UKRI, 33% funded by industry partners, and 33% funded by HEP (one).

- 90/10 split (one).
  - 90% funded by HEP and 10% funded by industry partners (one).

- 70/30 split (one).
  - 70% funded by UKRI and 30% funded by HEP (one).
  - 70% funded by UKRI and 30% funded by industry partners (one).
  - 70% funded by industry partners and 30% funded by HEP (one).

Eight HEPs (one TRAC peer group A (out of 13), two C (of six), three D (of eight), two E (of four)) stated that some of their studentships are fully funded by external funders, of which three clarified this is an ideal, rather than commonplace, scenario.

For some HEPs (10 – three TRAC peer group A (out of 13), two B (of eight), four D (of eight), one E (of four)), co-funding arrangements also include fixed lump sum payments, whereby funders contribute a certain amount towards one or more studentships, either as a one-off or on a rolling / yearly basis. Of these, the majority did not elaborate further, only offering examples of payments that they have previously received from co-funders (for example, one TRAC peer group D HEP received £7,000 per year per student). However, one HEP (TRAC peer group B) specified that the fixed payments from their industry partners are used to cover student stipends.

A handful (four – all TRAC peer group A) also discussed the broader value of co-funding, explaining that partnerships with industry are a strategic move which help the HEP to build capacity in different sectors and areas of research. This in turn leads to flexibility in terms of agreed co-funding splits, as HEPs recognise these benefits and may be more likely to accept a lower contribution from co-funders.

Costs covered under co-funding

In terms of costs covered under co-funding arrangements, HEPs most commonly referred to the student stipend (noted by 27), student fees (22), and consumables, materials, and equipment such as laptops or laboratory equipment (13).

Others also mentioned that funds are used for:

- Training (10), such as cohort development activities, or research methods training.
- An allowance towards travel and conferences (eight).
- Bench fees (six).
- Supervisor time (two).
- Wider HEP support and administrative costs (two).
- Student maintenance (one).

Beyond a monetary contribution, three HEPs (one each from TRAC peer groups A, B, and D) noted how some industry partners also offer access to external facilities (which one HEP describes as ‘cutting edge’) – this is typically only relevant for STEM subjects.

While not explicitly asked of interviewees, a few did add comment that not all costs will be covered under co-funding arrangements and that these additional costs might include those related to PGR administration and wider costs related to estates and other support services, which HEPs are obliged to cover themselves.

Variations by funder

When discussing the costs covered under co-funding arrangements, most interviewees provided a general summary and did not highlight any specific variation by funder, although they did point out that each agreement will have its own unique arrangements, demonstrated by the wide range of co-funded splits and approaches discussed earlier. However, three (one each from TRAC peer groups B, C, and F) explained that the costs covered are dependent on the funder and their expectations, while a further three (one each from TRAC peer groups A, B, and C) offered more specific examples in variation, with several apparent cross-council contradictions that these HEPs were eager to point out.

- AHRC and NERC CDTs do not cover support costs (such as time / costs for administration staff), whereas EPSRC CDTs do.
- Different CDTs and DTPs have their own rules as to what costs are covered.
- UKRI stipulates that funding must be used for specific training.

Variations by discipline

According to HEPs, there is limited variation by discipline in terms of which costs are covered, but there is a difference in the magnitude of the costs covered. Three (one TRAC peer group A, two D) highlighted that, compared to arts and humanities subjects (including social sciences), STEM subjects tend to require expensive, state-of-the-art equipment and so have higher costs for consumables. A further two (one TRAC peer group C, one D) echoed this sentiment, stating that this is reflected in higher bench fees in STEM subjects.

Two HEPs (one TRAC peer group A, one B) also noted that, in comparison to STEM subjects, there are fewer co-funding opportunities for SHAPE disciplines, particularly in terms of industry partnerships.

The subsequent impact of co-funding on HEPs' financial sustainability is discussed in section 2.5.3.

2.4 Cost recovery for PGR training and supervision

This section discusses HEPs' approach to allocating costs to categories when completing their annual TRAC return, their views on the current sector level of cost recovery in relation to PGR training and supervision activities, and what cost recovery level might help them boost their financial sustainability.

Research objectives covered in this section include:

A. Understand how HEPs use funding from various income sources to support PGR and PGR activities.

G. Consider what level of cost recovery could improve the sustainability of the talent pipeline and modelling the impacts of making any changes to PGR on volume and quality of training opportunities.

H. Understand the influence of UKRI policy (including changes to UKRI policy) and funding on wider PGR support, including cross-subsidy between other income sources and PGR training and the associated incentives and/or barriers for financial and talent pipeline sustainability.

2.4.1 Allocating costs to TRAC categories

When completing their annual TRAC return, HEPs account for all costs involved (i.e. all direct and indirect costs discussed in section 2.2), and just over one quarter (11 – five TRAC peer group A (out of 13), three B (of eight), one C (of six), one D (of eight), one E (of four)) directly state as such.

TRAC reporting guidance is generally felt to be clear and is predominantly used for the purpose of completing the annual TRAC return. One HEP also stated that the TRAC guidance is used as a 'sense check' when calculating studentship and PGR costs internally.

Eight HEPs (three TRAC peer group A (out of 13), four B (of eight), one E (of four)), however, pointed out difficulties they had in terms of allocating costs to certain categories necessitated by the TRAC methodology. They find it challenging to delineate a specific proportion of some costs to one category when they do not relate exclusively to one activity, this is particularly the case in relation to estates costs. Two HEPs mentioned that time allocation is used as a driver to provide as much accuracy as possible – nevertheless, this group find that the submission of these costs involves estimation and is prone to a higher margin of error.

Moreover, while HEPs mentioning time allocation models tend to find the allocation of direct staff time straightforward, a small number have encountered difficulties relating to using these for other costs.

- One HEP (TRAC peer group B) has a central budget allocated to support costs for PGR overall, but no system of allocation within it to identify which services are being used and how frequently.

  > Supporting costs would only be added if they're part of a costed research project. That's when they'd get an allocation. There's a central budget that effectively pays for a percentage overall for PGR costs, but there's no system of allocation so that we can identify which services are being used by what, so we can't differentiate. – TRAC peer group B

- Where there is a not very specific activity directed towards PGR training, allocation to PGR becomes difficult (noted by one – TRAC peer group A).

- Where support and administration staff are costed using time allocation and calculated against other drivers, costs are proportionally imprecise and hypothecated (one – TRAC peer group B).

2.4.2 Views on sector level cost recovery of 46%

HEPs were asked about the current sector level cost recovery level reported via TRAC in relation to PGR training and supervision of 46% for PGR training and supervision.

Despite some challenges mentioned in allocating costs to TRAC categories (see 2.4.1), half (20 – nine TRAC peer group A (out of 13), three B (of eight), two C (of six), three D (of eight), three E (of four)) did not find the cost recovery level of 46% surprising. They noted that PGR is expensive to run due to all the costs associated with such degrees. Not all of these costs are covered by funding. On the other hand, a minority (six – one TRAC peer group B (out of eight), three C (of six), one D (of eight), one E (of four)) were surprised at this, generally because their figure is lower than 46% (one quoted theirs as 30%, while others did not give a number, with one citing this as commercially sensitive information).

Overall, most HEPs were aware of their own cost recovery and indicated that their PGR cost recovery was either lower (13 – two TRAC peer group A (out of 13), three B (of eight), two C (of six), five D (of eight), one E (of four)) or broadly in line (12 – four TRAC peer group A (out of 13), three B (of eight), two C (of six), one D (of eight), one E (of four)) with the average. Four (three TRAC peer group A (out of 13), one F (of one)) stated that their PGR cost recovery was higher. Such findings are broadly in line with and corroborate the quantitative

research that UKRI itself has undertaken, which found that TRAC peer group A HEPs have a higher than average cost recovery, and those in D are below average in this regard. (There was little variation by region in this respect, which again confirms findings from UKRI's quantitative research.)

Alongside this, some HEPs outside of TRAC peer group A pointed out that, as they are smaller and less research-intensive HEPs, they do not receive as many awards from research councils which limits their cost recovery, and furthermore smaller HEPs do not have the same level of surplus as larger HEPs to be able to invest in PGR. They perceive that this has an impact on their PGR cost recovery.

> It's not a surprise. We are more like 20-22% but that's consistent with our peer group in TRAC. We're not divergent from our equivalent HEPs on that front. HEPs that get the most funding get to have the biggest cost recovery as they have access to bigger industry and more research council funding. On the other end of the scale, you have to negotiate small level partnerships and you get less back. – TRAC peer group D

However, HEPs indicated that the annual TRAC return does not fully capture the wider costs of doctoral training and as such does not reflect the full economic costs. Examples of costs associated with doctoral training that are not currently included relate to wider support services (e.g. wellbeing and mental health support), the considerable costs of estates (e.g. heat, power, maintenance, upkeep), provider-wide training activities, and other overheads necessary to ensure the quality of a research degree and student experience. One HEP talked through their approach to calculating cost recovery in this regard.

> When we're asking for a fully funded studentship, i.e. the money to run the studentship itself, it's a three-year PhD, so three times the stipend – roughly £60k. Then add three times £5k for fees, which takes it to £75k. If an academic can go out and get £75k for a studentship, you'd be thinking you're getting a lot of money. But that doesn't include consumables, a laptop, anything else. You're talking north of £100k when we cost the studentship, and if we include full economic costs, we're probably closer to £130-£140k. If we're saying £140k and an academic can get £75k, you're at 50% recovery. – TRAC peer group B

Another (TRAC peer group D) discussed their approach to costing up studentships, claiming for direct costs only which includes an allocation of 50 supervisor hours per student per year (pro rata for part-time students), plus the stipend, fees, consumables, and lab costs, as well as costs such as technician time. Meanwhile, one noted that:

> There will be things outside of this that are not costed for, but I've never had to sit down and figure out the precise full economic cost of a studentship. – TRAC peer group B

Drawing this together, this would also appear to indicate that HEPs lack an accurate understanding of the precise unit cost per student.

2.4.3 Cost recovery levels that would help ensure financial sustainability

HEPs were asked what cost recovery level would be required for the research talent pipeline to be financially sustainable.

Just under half (19) were able to propose a percentage cost recovery that would enable financial sustainability, with a general consensus amongst these (14 – six TRAC peer group A (out of 13), four B (of eight), one C (of six), two E (of four), one F (of one)) of an estimate in the region of 80% to 100% (many of which directly stated the latter) – with the remainder funded via another funding source. The sheer costs associated with PGR and the levels of subsidisation needed on a regular basis have led HEPs to believe that a substantial increase in PGR cost recovery is needed for the sustainability of the research talent pipeline – otherwise, they feel that HEPs will not be able to achieve a sustainable growth in PGR student numbers aligned to their aims, or that PGR student numbers may start to decrease. HEPs pointed to costs which are not covered by funding schemes which they are obliged to cover themselves, chiefly the considerable costs of estates, further support, and overheads necessary to ensure the quality of a research degree and student experience. Several HEPs did, however, frame this sentiment in a more idealistic sense, and similarly, some outlined that recovery levels of 80% (suggested as UKRI supports this level of costs for research grants) to 100% (suggested to enable a full cost recovery) are unrealistic to expect or achieve. Indeed, a 50/50 split in funding arrangements with UKRI is cited as the most common approach currently, although not the ideal.

There was widespread acknowledgement that PGR simply is expensive, and that such degrees will always be likely to result in a cost deficit due to its inherent nature and the activities involved. However, HEPs outlined that PGR students are a vital part of their HEP as there are many intangible benefits PGR students bring to the HEP. They bring far more return than students on taught degrees in terms of value and contributions, such as developing areas of knowledge, building external relationships, and the contribution to the brand of their HEP. Further detail on HEPs' strategic drivers to investment is contained in section 2.5.1.

In relation to cost recovery, international PGR students were explicitly discussed by nine HEPs (four TRAC peer group A (out of 13), four B (of eight), one D (of eight)). Mostly, they commented on the impact of and dependency their HEPs tend to have on international students' fees. As a result, some view current immigration policies in the wake of the UK's exit from the EU – such as not being able to bring over family while studying – as a potential threat to their research talent pipeline. However, there was also an acknowledgement that a flat increase in student numbers would also negatively affect sustainability. One TRAC peer group B HEP also noted that funds had deteriorated as international students could no longer be classed as EU citizens and could thus not be charged home fees to bring in more QR funding.

> The impact on international student is very well known. With undergraduate fees being fixed, the income from international PGR students is significant. To protect financial sustainability in terms of PhD training you need to make it worthwhile. It's a bit of a stranglehold – damned if we do increase numbers as that's unstable, but damned if we don't for funding. – TRAC peer group B

In addition, six (two TRAC peer group A (out of 13), two B (of eight), two D (of eight)) discussed the impact of QR funding (or devolved equivalent), noting that this substantially impacts PGR financial sustainability. Some mentioned that QR funding levels has fallen slightly relative to student numbers, partly due to the bigger research footprint in the UK, and also due to not keeping up with inflation.

Opportunities to improve PGR financial sustainability, each identified by one HEP, include:

- closer relationships with industry and third party funders, as there can be deals made which considerably benefit all parties involved,
- DTPs, which was noted to be having a positive impact on income, and
- increasing PGR student fees.

However, on this last point, two HEPs (TRAC peer groups C and E) explicitly pointed out that increasing PGR fees might be counterproductive in terms of the ensuring the research talent pipeline and may act to deter some potential self-funded students from enrolling.

2.4.4 Costs that might be covered by UKRI and HEPs

Additionally, HEPs were asked what they feel would be a reasonable proportion of doctoral training costs for HEPs and UKRI's research councils to cover.

Several (14 – two TRAC peer group A (out of 13), five B (of eight), three C (of six), three E (of four), one F (of one)) indicated that the figure ought to be the same as that provided to research grants (i.e. 80%) or higher. From a broad point of view, they see no reason why the figure ought to be different, as it seems to work well for research. They argued that the academic pipeline is very important to sustain and pointed out that any lower figure would make financial sustainability impossible by its very definition. Indeed, one HEP outlined that, given the focus of both the New Deal for Postgraduate Research and the Statement of Expectations on training and developing skills, HEPs cannot afford to continue subsidising costs that are not covered by the funding they receive. Others (six – two TRAC peer group A (out of 13), two C (of six), one D (of eight), one E (of four)) suggested a number lower than 80% (70% – two, 50% – two, 33% – one, not specified – one) but still feel a need for a considerable increase from current levels, and suggested that costs are covered by alternative means, for example through an increase in QR funding.

On the contrary, there was a degree of recognition from HEPs that an equivalent or higher amount to that provided to research grants may be unfeasible, given doctoral training is not the same as research, as it delves into other areas of education. Furthermore, doing so could negatively impact student numbers, and thus the sustainability of the research talent pipeline, due to alternative financial changes required to make this possible.

> Although it might be entirely reasonable to expect UKRI to meet 80% of full economic costs for training grants, this could only be achieved by (1) reducing requirements for match-funding and (2) increasing funding per PGR FTE student from UKRI. There could be various mechanisms to address either approach, but the net impact of either would be a reduction in PGR volume, unless UKRI were able to increase the value of its doctoral training budget. Hence, the answer to this question becomes not what is reasonable, but what is affordable for UKRI given its ambitions to fund the talent pipeline and its other funding constraints. – TRAC peer group A

In addition, three HEPs (all TRAC peer group D) raised issues relating to perceived inequality.

- Regardless of the costs covered by UKRI, post-92 HEPs do not have the same ability to invest in doctoral training and compete for further UKRI investment – this could be addressed, it was suggested, by increasing relative QR provision.

- HEPs cannot afford to provide the same experience and opportunities that UKRI-funded students receive to non-UKRI funded students (for instance access to training, industry placements, and support for their degree), and hope for more opportunities to decrease this disparity.

A handful (four) also commented on the nature of funding in terms of costs covered, some specifically in relation to CDTs and DTPs. While the directly incurred costs of staff time are covered by funding from research councils, most do not account for indirect costs such as administration and support staff time which constitutes a considerable cost (although the exception is EPSRC which does include administration staff now). Harmonisation across the research councils would not only streamline HEPs' administrative burden, but including administration costs as eligible costs across all research councils would help to boost HEPs' cost recovery.

2.5 Financial sustainability of PGR

This section discusses HEPs' strategic approach to investing in PGR, including how and what they invest, the drivers behind this, and ideal PGR student numbers. It outlines the impact of UKRI's updated Statement of Expectations, and the impact of co-funding of the financial sustainability of PGR, before covering what support might be required from UKRI and others to ensure the sustainability of the research talent pipeline.

Research objectives covered in this section include:

C. Understand the different funding sources supporting 'HEP-own' funded PGR training.

D. Requirements for / expectations of match-funding or co-investment for PGR training (e.g. via DTPs/CDTs) across different funders.

H. Understand the influence of UKRI policy (including changes to UKRI policy) and funding on wider PGR support, including cross-subsidy between other income sources and PGR training and the associated incentives and/or barriers for financial and talent pipeline sustainability.

2.5.1 HEPs' strategic approach to investing in PGR

HEPs' own investment

All HEPs noted that they heavily invest resources into their PGR environment. Almost half (18 – five TRAC peer group A (out of 13), five B (of eight), two C (of six), five D (of eight), one F (of one)) indicated that this investment goes beyond the fee and includes significant funds subsidised using central budgets. Such funds go towards direct training – potentially via DTPs, specific PhD training resources (i.e. bespoke or subject-specific skills training), soft skills development (including provider-wide training covering careers support and professional development), or other cohort training – as well as staff time. Internal funds additionally contribute to covering the HEP-side of co-funding or match-funding costs with industry partners, research council funded CDTs, or other funding partners.

HEPs invest large amounts of their own funds – with some TRAC peer group A HEPs quoting millions – due to a range of strategic drivers. One noted that it strategically invested in PGR via a £7 million uplift to funnel money into areas where it desired to have a stronger

PGR presence to increase sustainability, with the intent that these would become self-sustaining positions via an influx of new students.

Two HEPs (TRAC peer groups A and D) implied that, in strategically collaborating in DTPs and CDTs, they have marginally improved their financial sustainability, given that it reduces the need to compete for funding and some administration team costs are shared.

One TRAC peer group A HEP noted its senior management team had undertaken a modelling exercise to stress-test longer-term scenarios over a 20-year period. When a significant disruptor was added, the one item that all participants noted was that the current approach to and funding model for PGR was unsustainable in the long term. They determined that more would need to be invested from external sources (via industry, partners etc.) to support the 'researchers of the future'. Increasingly critical scrutiny of the current financial approach to PGR by HEPs by their own senior teams is leading a number of HEPs to undertake a review of their strategic approach to this.

HEPs' strategic drivers to funding PGR

The majority expressed a strong desire to fund PGR and offer PhDs as part of their overall strategy, with a few (six – two TRAC peer group A (out of 13), two B (of eight), two D (of eight)) indicating that it is due to a moral obligation. Such obligation arises from the notion that they 'have a responsibility to train the next generation of researchers', as such a pipeline can only originate from HEPs.

Developing the HEP's research environment, to foster innovation and cultivate scientific and societal impact was a commonly noted strategic driver for PGR funding (noted by 17 – four TRAC peer group A (out of 13), five B (of eight), two C (of six), six D (of eight)). PGR is funded to develop excellence in key competitive fields, which are based upon the historic success, competence, and expertise of the HEP.

If funding of PGR were to decrease, HEPs argued that funds would be more heavily focused on developing research in specific key strategic disciplines, which implicitly suggests that HEPs would decrease focus on other subjects such as arts and humanities or social sciences. These HEPs believe that maintaining research excellence and direction is a priority and will allow for greater collaborative opportunity to ultimately encourage the growth of the research talent pipeline.

> We've got a new university strategy which has come out over the last 12 months or so. One of those drivers is to increase research and innovation. We want to increase the number of PhD students because it drives research quality. – TRAC peer group B

As a result of such strategic drivers, some (10 – four TRAC peer group A (out of 13), three B (of eight), three D (of eight)) noted that this may result in prioritising funding (and therefore student numbers) for certain disciplines in which they currently demonstrate research excellence. The preference to support and finance cohorts that directly make an impact and improve institutional excellence would primarily be in STEM subjects with reduced focus on arts and humanities or social sciences disciplines, and this is a preference shared across TRAC peer groups. Six (three TRAC peer groups A (out of 13), three B (of eight)) feel that this difference in funding by discipline is a result of STEM PGR students contributing directly to supervisors' research and papers, conducting impactful research, and contributing to the HEP's REF (Research Excellence Framework) result, and therefore more QR funding. The higher running costs associated with STEM subjects were also put forward as a reason for this strategic decision.

On the other hand, arts, humanities and social sciences tend to be more free-form, and less aligned to supervisor-led projects, meaning such PGR students are more independent and less likely to contribute to the HEP's strategic goals and REF result. One HEP noted that social sciences often require investment in different ways as it may require specialised training that differs to STEM.

However, seven (one TRAC peer group A (out of 13), one B (of eight), one C (of six), one D (of eight), three E (of four)) feel the funding strategy would not be dependent on the discipline, as funds would be centralised and distributed evenly across these.

There was recognition of the contribution that PGR students make to HEPs, with some noting that the teaching, research, papers and other indirect benefits provided are also key drivers to continue to fund PGR.

> One thing that often gets forgotten is they make an important contribution to our teaching. They're an important part of our community. They can be included in grant bids to make these more attractive, so you go for a large strategic grant bid and the HEP supports that by adding one or two studentships. – TRAC peer group B

Ideal PGR student numbers

In terms of ideal student numbers, several (15 – two TRAC peer group A (out of 13), five B (of eight), two C (of six), four D (of eight), one E (of four), one F (of one)) feel they could increase the quantity of PGR students. Some suggested they could take up to 50% more PGR students over the coming years, provided that access to finance supports this uptake, and that they can continue to offer the level of service and experience expected by students. Access to finance may come from a variety of sources such as an increase in the level of funding, an increase in student fees, as well as greater investment by HEPs themselves. Key drivers for this desire to increase student numbers included the following.

- A strategic drive to boost research and excellence (15 – four TRAC peer group A (out of 13), five B (of eight), two C (of six), three D (of eight), one F (of one))
- To make the HEP attractive to both grant funders and prospective students (eight – two TRAC peer group A (out of 13), two B (of eight), one C (of six), two D (of eight), one E (of four)).
- Build the next generation of researchers and train qualified people (five – two TRAC peer group A (out of 13), one B (of eight), one D (of eight), one F (of one)).
- To boost diversity within the research environment (four – one TRAC peer group C (of six), two D (of eight), one F (of one)).
- To result in an increase in QR funding (three – one TRAC peer group A (out of 13), two D (of eight)) – although were all HEPs to increase PGR student numbers, QR funding would simply be spread more thinly.

It was further argued that PGR students generate wider benefits for HEPs and PhD funding is crucial to sustain the research talent pipeline. Moreover, cost recovery cannot be tackled in a way that is a detriment to student numbers as this would undermine the UK's ambitions to become a scientific powerhouse. Therefore, cutting PGR student numbers is not the route to solving this problem. Further, increasing student numbers may result in economies of scale (i.e. decreased cost per student).

In contrast, one TRAC peer group A HEP suggested that its PGR numbers may decrease, anticipating that PGR numbers are too expensive to subsidise, and that international students' (both undergraduate and postgraduate) recruitment fees do not cover the costs. Three also harboured concerns that, whilst they are eager to increase PGR student numbers, there may be issues in sourcing suitable candidates, given that the pool of eligible graduating candidates would not be increasing alongside this. Limited staff time was also pointed to as a factor for not being able to support an increase in student numbers.

Some interviewees also emphasised the importance of international PGR students and the income they bring, which helps to subsidise costs of home students, although concern was noted that over-reliance on certain markets could expose an HEP to financial risk should that market dry up, and the subsequent negative impact on cost recovery.

> When you stand back and look at the funding of research, none of it is fully funded or costed. Someone has to overpay – it's overseas students. This reliance on overseas students especially from China is causing an issue. – TRAC peer group A

Strategic concerns

Notably, several (nine – four TRAC peer group A (out of 13), one C (of six), three D (of eight), two E (of eight)) raised concern that an underinvestment from external sources ultimately is making (or will make) financing overhead and indirect costs more challenging – for example, the reduced access to some EU funding in the wake of EU Exit was mentioned. Four HEPs (three TRAC A peer group (out of 13), one B (of eight)) also feel significant effort is needed to allocate available resources – funding as well as staff time – to meet their desired training and PGR support goals, with one stating that its goal is to be a reputable, research intensive world leader in its core fields.

2.5.2 Impact of Statement of Expectations

Against this backdrop, HEPs feel there is increasing expectation now, in light of UKRI's updated Statement of Expectations, that they provide broader support services. Such services are discussed in section 2.1 (with examples including mental health and wellbeing support, disability support, etc.) and seen as encompassing a wide range such as administrative support, student support services, and career support among other factors. Interviewees also pointed out that there is an increasing focus on student wellbeing and mental health (e.g. emotional support) as well as physical wellbeing too. HEPs aim to support a wide range of students, as part of their EDI commitments. There was also an acknowledgement by HEPs that some of the support services across HEPs are shared across undergraduates and PGR students (however there is no specific mention of the cost implications stemming from this).

In terms of provision of these key enablers, cost can act as a barrier, as noted by around a third of HEPs (13 – six TRAC peer group A (out of 13), two B (of eight), three D (of eight), two E (of four)). One reason is the impact the general financial downturn is having on HEPs which is imposing financial constraints on their spending. Here, some anticipated that student numbers will decrease in the short-term, while others are currently going through internal cost reviews and are becoming more aware of the importance of cashflow and their being subject to increasing financial scrutiny.

Academic staff workload and associated costs are another factor. HEPs noted that absorbing more PGR students increases staff workload and time dedicated to supervision, leading to higher staff costs over time.

The costs of facilities and materials for STEM subjects (such as laboratories) as well as workplace and laptop provision in comparison to other disciplines (such as arts, humanities and social sciences) are another dimension. One HEP suggested there is no level playing field in terms of funding, meaning that 'poorer' HEPs will struggle to afford or offer training that will meet UKRI's expectations.

UKRI's updated Statement of Expectations raises the bar further in terms of offering high-quality PGR training and supervision. HEPs pointed out that the delivery of these expectations will entail substantial investment into staff and resources, with associated costs, meaning that additional services not previously provided (such as mental health and wellbeing, and disability support) may be difficult to provide without extra funding. It was acknowledged this support is important to boost the student experience, but funding levels have not changed to enable HEPs to deliver these.

2.5.3 Impact of co-funding on the financial sustainability of PGR

In terms of how co-funding (both with UKRI and with other funders) impacts HEPs' financial sustainability of PGR training and supervision, broadly speaking, HEPs have one of two perspectives: either that co-funding has a positive impact and strengthens financial sustainability, or that it can have a negative impact, particularly in terms of the strain it places on internal resources – generally a positive view is more common. To note, some HEPs put forward arguments for both, while two HEPs (one TRAC peer group A, one B) feel that co-funding has no impact.

Amongst those who feel that co-funding has a positive impact, there was a strong sentiment that co-funding allows HEPs to fund more studentships than they could do otherwise. Of these (nine – two TRAC peer group A (out of 13), two B (of eight), one C (of six), two D (of eight), two E (of four)), one emphasised that co-funding enables them to fund twice as many PGR students (in cases where the split is 50/50), and another stated that it frees up funds that can then be used to support students in other areas.

> We can improve recruitment because of co-funding. We've been able to grow our PGR cohorts, so from an experience perspective, there are more PGR peers to learn from – there are more people attending events and more people you can listen to and learn from. – TRAC peer group D

There was also emphasis on the link between co-funding and research development. Nine (three TRAC peer group A (out of 13), one B (of eight), one C (of six), three D (of eight), one E (of four)) HEPs feel that co-funding allows them to expand their research, and can, for example, facilitate a knowledge exchange with industry partners. Of these, three highlighted that co-funding doctoral studentships can have a positive impact in the long run, as students' contributions to research projects feed into REF and therefore boost QR income.

A similar proportion (nine – three TRAC peer group A (out of 13), one B (of eight), three C (of six), one D (of eight), one E (of four)) discussed the broader benefits of co-funding, such as building relationships with industry partners or expanding networks. For example, for one HEP, co-funding led to the opportunity to complete private consulting work:

> It's not just about the PhD students in question. If we've a relationship with an organisation, then there may be spin out to R&D consultancy, e.g.

> we've had 17 [co-funded] students but done projects worth millions of pounds with [the co-funder]. – TRAC peer group D

A couple of HEPs (two – one TRAC peer group C, one E) explained that co-funding through CDTs and DTPs helps to boost their reputation and thus draw in more students.

It was also noted that, while co-funding from industry partners may not directly result in a full recovery of costs, there are strategic benefits to forming such partnerships. Investment by industry into PGR can ultimately generate income streams for both the HEP and industry, for instance through IP development, spin-outs, and other projects.

For those who feel co-funding can have a negative impact on financial sustainability, the key sentiment was the burden associated with co-funding, both financial and administrative. Three HEPs (one TRAC peer group A, two C) highlighted that there is a large financial cost associated with CDTs and DTPs, for instance having to pay to be part of a DTP, as well as fees per student more generally, with one stating that the money they put in might be 'better spent on funding our own studentships'. A couple (two – one TRAC peer group A, one D) explained that it can take a long time to find and develop relationships with partners, and a further two (one TRAC peer group A, one B) stated that the co-funding process puts a strain on internal resources as they seek to gather sufficient funds from various sources to fund one studentship, which adds complexity and time to the co-funding process. Two (both TRAC peer group A) specifically highlighted the administrative burden, with one explaining that it can be difficult to 'pull together the disparate strands so that you can fund a full studentship'.

Four HEPs (one TRAC peer group A (out of 13), two C (of six), one E (of four)) also brought attention to their concerns surrounding overseas postgraduate students, discussing how co-funders can sometimes only be willing to pay overseas students' fees at the set home rates (c. £4.5k), as opposed to the overseas rates (c. £16k); this means that they often have to fund the difference between the two rates themselves. One HEP feels it would be 'much more equitable if these costs could be charged to UKRI grants'. Another expressed more general concerns around the decreasing numbers of overseas PGR students, stating that they rely on such students to bring in additional income, and that a deficit would put a strain on maintaining their co-funding commitments.

2.5.4 Support from UKRI and others

HEPs were asked, given UKRI's role as an influential funder, what UKRI could do to ensure the sustainability of the future research talent pipeline, and – additionally – what could be done to boost PGR cost recovery, either by UKRI or other stakeholders.

Level of funding

The level of funding was of particular note to just over half (22 – eight TRAC peer group A (out of 13), seven B (of eight), two C (of six), three D (of eight), one E (of four), one F (of one)), with most believing that, to improve the sustainability of the research talent pipeline for PGR activities, more funding – from UKRI sources or other streams – would be required. There was agreement between these HEPs that their current funding streams do not fully account for overhead, managerial, or administration costs that are incurred over the PhD lifetime, and that increased funding is therefore necessary to work ensure the financial sustainability of PGR. Similar comments were also made regarding boosting cost recovery,

as six (one TRAC peer group A (out of 13), two B (of eight), two C (of six), one E (of four)) communicated a desire for greater direct funding from UKRI.

A few (five – two TRAC peer group A (out of 13), two B (of eight), one D (of eight)) suggested consideration of increasing student fees for UKRI-funded candidates which would help to cover some overhead costs and improve overall cost recovery. They stated that HEPs benchmark their home fees to UKRI's fee levels for consistency and equality across the funding environment, indicating they would increase their fee were UKRI to do so, and feel that UKRI has kept fees low without taking into consideration wider associated costs. Moreover, HEPs typically charge the same fees for self-funded and industry-funded students to retain a level playing field. Any fee increase is suggested with caution, as such an increase may act to deter new PGR students, and increasing fees without increasing overall budget would result in fewer studentships, as well as potentially affecting equitable access. The general view is therefore that more funding is required and, while HEPs do not specify precisely what action UKRI could or should take, work is ongoing by HEPs to tackle this issue.

Awareness of PGR costs and funding expectations

Several (10 – five TRAC peer group A (out of 13), one B (of eight), one C (of six), one D (of eight), two E (of four)) suggested that improving funders' understanding of the costs and related shortfalls that are involved with PGR has the potential to improve the sustainability of the research talent pipeline. An improvement in understanding could cover: 1) cultivating an awareness of all the associated costs – namely 'overheads', such as administration costs, wider support costs (e.g. related to mental health and wellbeing), estates costs, etc., 2) addressing misconceptions and communicating elements of PGR that are often not fully funded, and 3) the real differences across disciplines (e.g. costly infrastructure for STEM subjects, administration and support costs etc.). This will help to improve strategies relating to cost recovery as funders may be more aware of the intricacies and nuances of PGR and associated costs.

The expectations or pressures of co-funding or match-funding arrangements with UKRI can act as a deterrent in some cases (10 HEPs – six TRAC peer group A (out of 13), three B (of eight), one D (of eight)). HEPs explained how there are significant expectations for HEPs to offer more resources, facilities, and skill sets in order to win UKRI match-funding. The competitive nature of such bids may force some HEPs to pull out of applications, as they may become too expensive to invest in. Clear communication from UKRI about the specific expectations of match-funding would help HEPs navigate this bidding environment.

> In the past I would say that there's been a perception amongst our academic community that we have to put in significant match funding on those applications for DTPs in order to be successful. Being really clear that the application will be judged on its own merits and that there's no expectation of HEP investment might be really helpful. – TRAC peer group A

Access to different funding streams

The complexity of the funding landscape with multiple funding sources and/or funders may also pose a barrier to PGR sustainability. Several HEPs (12 – four TRAC peer group A (out of 13), two B (of eight), two C (of six), three D (of eight), one E (of four)) feel that if UKRI were to simplify its eligibility criteria to ensure standardisation across the research councils (i.e., ensuring that each council has the same requirements for funding, and that the same

costs are covered), maintaining its dialogue with HEPs, then together these would make application processes easier and greatly help in winning funding to support future talent pipelines.

> Getting the individual councils to be more streamlined or common in their approach would be good. Last year UKRI made some noise that they were going to use the collective talents to fund and streamline all that stuff, but the councils are still going to do what they want to do individually. – TRAC peer group B

Ten HEPs (two TRAC peer group B (out of eight), one C (of six), five D (of eight), two E (of four)) indicated that it is difficult to gain UKRI funding or have access to opportunities such as DTPs or CDTs. Whilst they acknowledged that these are likely to help them expand their talent pipeline and to provide finances to boost cost recovery, these HEPs were conscious that TRAC peer group A and B HEPs are better placed to be successful in DTP/CDT bids and can therefore input greater internal investment to PGR. Some feel that UKRI funding is awarded in a greater proportion to Russell Group HEPs, with less recognition to research capabilities in smaller, less prestigious HEPs, and would welcome UKRI funding being opened up and diversified to ensure more HEPs can benefit.

One TRAC peer group E HEP feels it is more difficult to acquire the partnerships with other, larger, HEPs needed for such DTP or CDT programmes, as larger HEPs tend to preferentially partner with similarly sized and research intensive HEPs – 'there isn't any space in the partnerships for a small neighbour'. Another from TRAC peer group D stated that as a result of being unable to regularly access industry and research council funding, they must negotiate smaller level partnerships where less cost is recovered. One TRAC peer group B HEP feels that post-1992 HEPs do not have the same weight in certain disciplines to compete for UKRI investment compared to more 'prestigious' HEPs, and that a block grant approach with more QR funding could help improve their financial health.

> UKRI is very fixated on research intensive HEPs. There is a limited understanding of how things are set up in less research intensive HEPs. There needs to be more listening to the variety across the sector and understanding it practically. We're not all research intensive, but that doesn't mean we're not deserving of research support. – TRAC peer group E

Communication and collaborations

Several (10 – five TRAC peer group A (out of 13), one B (of eight), one C (of six), one D (of eight), two E (of four)) suggested a partnership approach with UKRI would be beneficial, stating that if it were possible to understand and directly align to UKRI's strategic goals and funding ideals, it would be easier to apply for and obtain funding to then boost financial sustainability. Such a partnership model, it was suggested, would allow for communication between HEPs and research councils to establish what UKRI's longer term strategic aims are, such that funding and PGR research could be more efficiently directed towards priority economic and societal outcomes.

Increased collaboration between HEPs themselves may also help to boost financial sustainability. Three (one TRAC peer group C, one D, one E) noted that collaboration across establishments when bidding for UKRI funding (such as DTPs/CDTs) could improve the sustainability of the talent pipeline. This collaboration would improve access to finance that such HEPs may not otherwise have been competitive enough to receive independently. One TRAC peer group C HEP commented that they appreciate being able to collaborate with a

range of other HEPs (through a DTP), as it allows them to gather examples of best practice for the PGR environment.

Seven (five TRAC peer group A (out of 13), one B (of eight), one C (of six)) suggested there could be improved access to industry, either by greater industry engagement facilitated by HEPs themselves, or via UKRI's facilitation. Diversifying income sources and obtaining more industry partners would be beneficial to improve cost recovery related to PGR activities – such as training and facility usage – and would also contribute to student opportunities and development.

> We're thinking about how we increase our engagement with industry partners and their contribution to research activity. It's thinking about the diversity of the income sources that are available to us to support it and how we leverage other external income beyond UKRI income. – TRAC peer group A

Ensuring equitable access

Diversifying the population of candidates eligible for PGR funding was raised in relation to improving access to PGR for students. Seven HEPs (two TRAC peer group A (out of 13), two C (of four), two D (of eight), one F (of one)) noted that direct investment from UKRI should be made to help support the talent pipeline and to increase overall financial sustainability. This support was suggested in relation to students who may have caring responsibilities, have a disability, or be neurodivergent researchers, and who may require a longer time to complete a PhD than the 'standard' 3.5-years period. This could, it was suggested, involve UKRI engaging with underrepresented groups to promote PhDs and communicate that the research environment is accommodating to their needs, including elements such as support for childcare and longer-term health conditions.

Some (five – two TRAC peer group A (out of 13), one B (of eight), one C (of six), one F (of one)) indicated that there could be more financial support for international PGR students, particularly for those struggling with costs associated with travel or other non-specified international fees. For example, such support was suggested to include assistance with visas issues and health surcharges.

As part of increasing this talent pipeline sustainability, six (two TRAC group A (out of 13), one B (of eight), one C (of six), two D (of eight)) suggested that student stipends could be increased to attract potential PGR students and to compete with graduate salaries in industry. This increase was put forward with caveats, including that overall funded studentship numbers do not decrease, and that project costs do not rise to accommodate an increase in stipends.

> Try to get more people from the UK applying to do PhDs – that means increasing the stipend to attract people in and compete with job offers out of degrees. Without an ongoing enthusiasm, things stutter to a halt. Keeping momentum is key is making PGR attractive to individuals. – TRAC peer group B

Further incentives were additionally noted by three HEPs (one TRAC peer groups B, one E, one F) – such as funding for training and international travel for conferences or research – which they feel like would encourage retention, and boost cost recovery as well as pipeline sustainability.

Four HEPs (one TRAC peer group C (of six), one D (of eight), one E (of four), one F (of one)) additionally feel that to boost cost recovery, more could be done via internal strategies

– with some input from UKRI in terms of additional support or sharing best practice – to support student retention and encourage post-PhD activity and employment, including managing expectations of the PhD environment and ensuring continued student satisfaction throughout.

3. Conclusions

This chapter draws together the core themes emerging from the interviews with the 40 interviewed HEPs to outline the issues that are most prevalent among HEPs in relation to cost recovery and the financial sustainability of PGR training and supervision. Concluding remarks herein are mapped to the original research objectives.

Objective A: Understand how HEPs use funding from various income sources to support PGR and PGR activities.

All HEPs use a variety of income sources to fund PGR-related activities. Such sources include income from industry, charity and third sector funders through co-funding arrangements, UKRI and the research councils, international students, self-funded students, and QR funding (or devolved equivalent).

Funding from external sources is typically used for direct costs such a supervisor time (the largest component) as well as consumables and travel to conferences among other elements.

Objective B: Understand the role of QR funding, QR RDP and equivalent Devolved Administration funds in PGR training and supervision.

QR funding (or the equivalent in devolved nations) is viewed as a vitally important mechanism for HEPs to support PGR training and supervision. Generally, QR funding is combined into one pot and then distributed as HEPs see fit, being used to support research – including, but not limited to – a wide range of PGR-related activities. Examples include funding doctoral studentships, supervisor salary and/or time, training activities including the development of transferable skills, project and research delivery activities, and administrative and support activities including staff salary and/or time.

Objective C: Understand the different funding sources supporting 'HEP-own' funded PGR training.

HEPs invest their own resources heavily to make up funding shortfalls. Investment not only includes the student fee but also includes significant funds subsidised using central budgets. Such funds go towards direct training – potentially via DTPs, specific PhD training resources, soft skills development, or other cohort training – or staff time. Internal funds additionally contribute to covering the HEP-side of co-funding or match-funding costs with industry partners, research council funded CDTs, or other funding partners.

Objective D: Requirements for / expectations of match-funding or co-investment for PGR training (e.g. via DTPs/CDTs) across different funders.

Funding partnerships are a key part of HEPs' PGR funding models. The nature and extent of funding agreements and splits varies on a case-by-case basis and there is no 'typical' arrangement, resulting in a not insignificant administrative burden for HEPs where there is a requirement to collate funding for a full studentship from multiple sources.

Objective E: Identify the key resources required for high-quality PGR training and supervision.

Key enablers for high-quality PGR include high-quality supervision, facilities, support from central teams, and support to foster an inclusive and thriving PGR community. Generally, these aspects are felt to have remained constant over recent years as key enablers.

Costs related to STEM disciplines are typically higher than for SHAPE subjects due to higher costs associated with estates, facilities and consumables.

Objective F: Consider what should be counted within the full economic costs for PGR.

Costs are divided into direct and indirect costs (aligning to TRAC reporting guidance for HEPs' annual return). Direct costs comprise:

- staff time for supervisors, technicians, tutors, and subject-specific training,
- estates and facilities (e.g. laboratory use),
- payments to students (e.g. stipends),
- consumables and equipment, and
- travel to PGR-related events and activities.

Indirect costs comprise:

- staff time for administration and support staff,
- staff time for those in central services (e.g. professional services, finance, wellbeing), and
- estates costs not directly related to PGR (e.g. libraries).

Generally, TRAC reporting guidance is felt to be clear, and is used predominantly for the purposes of the annual TRAC return, although HEPs point to some grey areas, such as delineating proportions of costs that do not relate specifically to one activity.

However, HEPs indicated that the annual TRAC return does not fully capture the wider costs of doctoral training and as such does not reflect the full economic costs. Examples of costs associated with doctoral training that are not currently included relate to wider support services (e.g. wellbeing and mental health support), the considerable costs of estates, provider-wide training, and other overheads necessary to ensure the quality of a research degree and student experience.

Objective G: Consider what level of cost recovery could improve the sustainability of the talent pipeline and modelling the impacts of making any changes to PGR on volume and quality of training opportunities.

There was acknowledgement and consensus, that, by its nature, PGR is expensive with an imbalance between costs and income, and HEPs are obliged to invest heavily to make up the shortfall. There is therefore a desire to increase the financial sustainability of PGR, although HEPs are realistic that getting close to a full return on investment (i.e. 100% cost recovery) is unlikely. Cost recovery is, though, higher than average for TRAC peer group A and B HEPs – corroborating UKRI's own quantitative research.

In terms of priorities, HEPs were broadly in agreement that – if their hand were forced – their strategic focus would be on areas of current research excellence. Further, such areas would likely be more focused on STEM subjects rather than arts, humanities and social sciences,

as the former disciplines are viewed to have the biggest impact on an HEP's REF score (and thereby impacting QR funding received).

There is appetite to increase PGR student numbers, albeit in a sustainable manner. International students can play a key role in HEPs' funding streams, with overseas students' fees at both undergraduate and postgraduate level being used to partly subsidise PGR-related shortfalls. There was acknowledgement, however, that too great a reliance on overseas markets may leave HEPs at risk of financial deficit should the market disappear.

Objective H: Understand the influence of UKRI policy (including changes to UKRI policy) and funding on wider PGR support, including cross-subsidy between other income sources and PGR training and the associated incentives and/or barriers for financial and talent pipeline sustainability.

UKRI's recently updated Statement of Expectations for Doctoral Training was felt to have placed increased expectations and pressures onto HEPs. Increased training and support services from HEPs are envisaged, but HEPs are concerned about the difficulty of providing such services without additional funding.

Interviewees also pointed to a disparity between the research councils in terms of what is or is not funded (for example, EPSRC CDTs covering some administration costs unlike AHRC or NERC). While supervisory time is the core component of PGR costs, other components such as estates and central team costs (e.g. to provide training and support services) are also significant overheads which are not fully recognised through UKRI's funding mechanisms.

Concern was also raised over a perceived lack of support for various elements besides core components like supervisor time, which would help to secure the future research talent pipeline. Wider support was suggested to enable overseas students to reach the UK from their home country to begin studying and who would otherwise be unable to afford this, to support part-time students and/or those with caring responsibilities, and to enable those with longer-term health conditions to study at their own pace without financial worries of taking longer to complete – this would aid HEPs' cost recovery for those offering such support.

Co-funding arrangements (both with UKRI and/or with other partners) are generally viewed positively, allowing HEPs to fund more students than they would otherwise be able to, and to help build relationships with partners which brings in itself potential impact and synergies.

Appendix: Topic guide

Introduction and context

UK Research and Innovation (UKRI) is the largest single funder of postgraduate research (PGR) in the UK. Around 20% of PGR students in the UK are registered against UKRI training grants.

These doctoral training grants offer funds towards student stipends, student fees, research and wider training support, while some councils support management costs for specific programmes. Eligible HEPs may also receive Quality-Related Research (QR) funding for research degree supervision – or equivalent in Scotland, Wales, and Northern Ireland.

All UK HEPs in receipt of grant funding from the UK funding bodies are required to implement the Transparent Approach to Costing (TRAC) and provide annual TRAC returns to their respective funding bodies.

TRAC data is shared with UKRI and other stakeholders across England, Scotland, Wales and Northern Ireland to inform funding policy. UKRI's analysis reveals that – on average at the sector level – HEPs recovered around 46% of the full economic costs of training and supervising PGR.

However, interpreting TRAC data on postgraduate research students is not straightforward, due to the complexity of the TRAC methodology as well as other factors.

Therefore, UKRI has commissioned Pye Tait Consulting, an independent research agency, to undertake qualitative research with HEPs to understand influences and considerations in relation to full economic costs and to help develop a fuller understanding of the contemporary costs of doctoral training.

The findings will be used by UKRI to inform future policy and funding decisions, with a view to ensuring that UKRI practices support the financial sustainability of the research talent pipeline.

Our conversation today should last around 45 minutes and will cover topics such as key sources of PGR funding, co-funding and match-funding, and full economic costs and cost recovery, along with UKRI's role in this.

Reassurances

Your views will be treated confidentially by Pye Tait Consulting and reported anonymously to UKRI, in line with the Data Protection Act 2018, and the Market Research Society Code of Conduct. We also abide by the GDPR in terms of how we use your Personal Data and our Participant Privacy Notice is available online [interviewer to share link with interviewee if requested].

Please note, by proceeding with this interview, you consent to participating in this research.

Further, please note that we plan to record this interview using the Teams/Zoom [interviewer to delete as appropriate] recording function. This is purely for our own use to ensure we have accurate notes, and the recording will be automatically deleted. I am going to start recording now – if you do not consent, please say [interviewer to record if consent granted, if no consent granted, proceed but without recording].

Interview details (to be pre-filled)

TRAC peer group (A-F)	
Region/nation	

PGR resources and funding sources

1. UKRI's Statement of Expectations for Doctoral Training, published in January 2024, sets out the core principles underpinning the provision of high-quality PGR training and supervision. Based on your knowledge and experience, what would you say are the key enablers to realising those expectations?

Prompt: staffing, equipment, facilities, training opportunities, ensuring student wellbeing, supervision quality, organisational collaboration, partnerships with industry and other stakeholders, placements, equitable access

Probe: are there additional needs specific to certain disciplines[20], e.g., access to clinical environments or international facilities? To what extent is cost a barrier to preventing the provision of key PGR resources (if at all)?

2. Please could you explain what income sources you use to fund PGR training and supervision activities?

Prompt: UKRI research councils, other government departments, industry, charity/third sector, overseas/EU funding, self-funding (probe: what does 'self-funding' mean for HEPs?)

3. What is the approximate split or proportion of PGR income received from these different sources? To what extent does this vary by discipline, and why?

4. Please could you explain the role of QR (Quality-Related Research) funding – or equivalent – and the role that plays in funding PGR training and supervision activities?

Prompt: What costs and activities is QR or equivalent funding used to cover in relation to doctoral training? E.g., supervision, equipment, facilities, stipends, fees.

Probe: What proportion of this funding is from the QR Research Degree Provision[21] (RDP) supervision fund (or equivalent)?

[20] Note to interviewer: 'disciplines' in scope of this research are those funded by UKRI, namely arts and humanities, biotechnology and biological sciences, engineering and physical sciences, economic and social research, medical research, natural environment, science and technology.
[21] QR funding can be spent towards HEP's own priorities, as long as funded activities are related to research and knowledge exchange. The QR RDP reflects postgraduate research student numbers in departments that attract mainstream QR funding, the relative costs of the subjects.

Full economic costs and cost recovery

5. What PGR training and supervision activities do you include or not include when calculating the full economic costs of PGR training?

Prompt: direct costs (staff costs, equipment, facilities), support costs (e.g. IT, technician), indirect costs (e.g. central costs, HEP support services)

6. What is the approximate split or proportion of PGR costs between these activities? To what extent does this vary by discipline, and why?

7. Where studentships are co-funded, what is the typical co-funding split agreed between funders and why?

Prompt: could reference Centres for Doctoral Training (CDTs), Doctoral Training Partnerships (DTPs), consortia, partnerships with industry or third sector organisations, expectations of co-funding, dis/incentives of UKRI policy that aid or hinder financial sustainability

8. What costs are covered under these co-funding arrangements? Does this vary by funder or by discipline? What impact (if any) does co-funding have on the financial sustainability of PGR training and supervision activities?

9. As noted at the start of our call, the current sector level cost recovery reported via TRAC in relation to PGR training and supervision is 46 per cent. (For comparison, cost recovery for research funded by charities is 57 per cent and by the research councils is 70 per cent). Does this level (46 per cent) surprise you, or differ substantially in your HEP? In your view, what level of cost recovery would be required for the research talent pipeline to be financially sustainable? Why?

Prompt: what are the potential opportunities and threats to PGR financial sustainability?

10. In your view, what do you think is a reasonable proportion of doctoral training costs for HEPs and UKRI's research councils to cover? To what extent does this happen already?

Prompt: UKRI supports, for example, 80 per cent of the full economic costs of research grants – what should the equivalent be for training grants, and why?

11. To what extent does your HEP choose to invest its own resources in training PGR students, including those who are not supported by UKRI or other funders? Why is that – what are the strategic drivers behind this? Does this vary by discipline?

Probes:

- understand how PGR fits into broader strategic aims and priorities
- understand ideal student numbers
- what would be prioritised if PGR funding levels increased or decreased

12. Given UKRI's role as an influential funder, what could UKRI do to help ensure the sustainability of the research talent pipeline?

Prompt: (remembering that UKRI is not a regulator) what does UKRI do more or less well in relation to this subject? Could UKRI do anything more or different?

13. What else could be done to boost PGR cost recovery (either by UKRI or other stakeholders)?

Final thoughts

14. Do you have any final comments you would like to add relating to funding for PGR training and supervision, or in relation to cost recovery and financial sustainability, and UKRI's role in this?

Thank and close.

A report prepared by:

Pye Tait Consulting
Registered in England, Company No: 04001365, VAT No: 755 8312 14
Postal address: Royal House, 110 Station Parade, Harrogate, North Yorkshire, HG1 1EP
Tel: 01423 509 433
Registered office address: 5 Merus Court, Meridian Business Park, Leicester, LE19 1RJ

email (enquiries related to this report): n.charleton@pyetait.com
email (general enquiries): info@pyetait.com
website: www.pyetait.com

Pye Tait Consulting is part of the EMB-Group.

Pye Tait Consulting is a member of: