Overhead Rates: Impact on Research Applications Success

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Abstract: *The purpose of this study was to examine the relationship of overhead rates on research application award success. The pressure to maximize overheads to fund the indirect costs associated with operating a research-intensive university and the perception that higher overhead rates disadvantage research proposals create an unhealthy tension between research administrators and faculty. Statistical analyses of four years of banded overhead rates and publicly available funder award data across seven UK universities identified no significant relationship between overhead rates and success by number or value. The results provide objective evidence to inform discussions and decisions regarding adjusting or waiving overheads. The UK results may generalize to the US to the extent comparisons of overhead practices are similar, though further US-focused research is needed. While the study limitations are acknowledged, the empirical examination of overhead rates contribute to the scientific and applied understanding of the relationship with research grant awards.*

Keywords: *research funding, higher education overheads, indirect costs, grant success*

Introduction

University leaders are increasingly required to make difficult decisions to balance the financial requirements to operate a higher education institution and attract external research grant funding to enhance university reputation, support academic careers, and advance scientific knowledge. One factor, overhead rates, that is perceived to impact that balance has been acknowledged in both popular press and trade publications but primarily in opinion editorials (e.g., Aldhous, 1991; Anderson & Schaefer, 1991; Anonymous, 1991a, 1991b; Ledford, 2014; Pells, 2019). While such articles highlight the perception or concern that higher overhead rates may reduce the research grant awards, no empirical evidence was provided regarding the relationship between overhead and grant success rates. Two quantitative examinations of the relationship (Ehrenberg & Mykula, 1999; Sundberg, 1994), while dated, evidence the historical interest in the issue and reported mixed findings. Thus, the objective of this study was to examine the impact of overhead rates on research application success.

Research Overhead Rates

Research overheads are expenses necessary to support research, which may not be attributed to a specific research project. Overheads include costs to support the research environment, including administrative and facilities costs. The United Kingdom (UK) and the United States (US) approach to determining overhead rates, while different, are actually quite similar in effect.

UK Overhead Rates

Transparent Approach to Costing (TRAC)

TRAC is an activity-based costing methodology, introduced across the UK higher education sector to inform research funding in 2004 as a government accountability requirement and to support institutional management through better understanding of costs within individual institutions (Office for Students [OfS], 2020). TRAC is a process of taking institutional expenditure information from consolidated financial statements, adding a Margin for Sustainability and Investment (MSI) to represent the full 'sustainable' cost of delivery, and then adding cost drivers to allocate costs to specific activities and academic departments. The MSI is based on the average of actual financial performance over the previous three years and forecast performance over the next three years. The main activities to which TRAC allocates costs are: Teaching, Research, Other (such as commercial activities, residences, catering), and Support Activities (costed separately but are attributed to the three core activities).

Full Economic Costing (fEC)

Full Economic Costing (fEC), a development of TRAC, is a government-directed standard costing methodology used across the UK Higher Education sector for producing consistent and transparent research project costs. The underlying principle of fEC is to establish the true cost of a research proposal, and for this to inform the amount requested from funders (the price). The price may be below, equal or above the fEC.

There are three fEC Categories:

1. Directly Incurred Costs: project-specific, (i.e. they arise as a direct consequence of the project taking place), actual, and must be auditable at the project level (e.g. supported by supplier invoices).
2. Directly Allocated Costs: not project-specific (i.e. they are incurred whether or not the project takes place),and are estimated at project level (e.g. Investigator time, Technician time [where not directly incurred]), and Estates costs.
3. Indirect Costs: represent the costs of central and distributed services shared by other activities that are not project-specific.

Figure 1 shows Directly Allocated, Estates and Indirect Cost elements.

Directly Allocated	Estates	Indirect

• Technicians who are not working on specific projects but are providing general support services to laboratories	• Rates & Rent
	• Energy, Water & Sewerage
	• Repairs and Maintenance
	• Depreciation (excluding Residences & Catering)
	• Other Expenditures:
	  • Preventative maintenance
	  • Management team
	  • Customer/Business Services
	  • Projects team
	  • Minor works
	  • Contractors & Consultants
	  • Stock write-off
		• Academic Support (RS in TAS)
		• Other Staff
		• Non-Staff
		• Researchers & Associates
		• Estates Costs (PSG)
		• Library
		• IT
		• Business Development
		• DVC AA
		• DVC R&I
		• Business Support
		• Human Resources
		• Marketing
		• Recruitment and Admissions
		• Registrar
		• VC
		• Planning
		• Procurement
		• Finance
		• University Contingencies
		• FRS17 Pension (Staff Costs)
		• USS Pension Movement
		• Holiday Accrual
		• Restructuring
		• Interest Payable
		• Gain/(Loss) on Assets & Investments

Figure 1. Overhead Costs

Research Overheads

TRAC determines the rates UK Research and Innovation (UKRI) allows universities to charge in order to recover the overheads associated with research activity. UKRI, an umbrella organization that brought together seven research councils[1] in 2018, directs research and innovation funding and is funded through the science budget of the Department for Business, Energy and Industry Strategy. Each HEI's Finance is responsible for calculating and coordinating their TRAC approval.

[1]UK Research Councils include Arts and Humanities Research Council (AHRC), Biotechnology and Biological Sciences Research Council (BBSRC), Economic and Social Research Council (ESRC), Engineering and Physical Sciences Research Council (EPSRC), Innovate UK, Medical Research Council (MRC), and Natural Environment Research Council (NERC). UKRI also monitors National Centre for the Replacement Refinement & Reduction of Animals in Research (NC3Rs) funding activity

Universities applying for research grants from public funders are required to determine the fEC of carrying out the project, regardless if the external funder pays fEC. The aim is to ensure Universities are aware of the true cost of the research and price the work accordingly. Typically, over 80% fEC is expected for competitive commercial projects with industry and 100% fEC for non-competitive research funded by government departments. Research Councils fund at 80% fEC and other funders, such as charities, are often below 80% fEC.

US Overhead Rates

US universities similarly consider infrastructure and operations costs, referred to as facilities and administrative (F&A) costs. F&A costs are calculated based on indirect costs associated with nine facility and administrative cost pools to include buildings, equipment depreciation, utilities, maintenance and library expense, human resources and other central services, as well as research support offices (Office of Management and Budget [OMB], 2014). However, because of the administrative burden associated with costing each research proposal, US universities average the costs by major function, do not adjust for investigator directly allocated costs, and charge a single rate. Large institutions may also employ several rates to reflect the cost at different campuses or without special programs.

While the US Federal Government guidelines drives the F&A calculations and caps administrative costs at the rate of 26%, each university negotiates the facilities portion of their rate with the Division of Financial Advisory Services (DFAS) according to their Cost Accounting Standards (OMB, 2014). As a result, institutional rates vary between institutions, depending on real estate location, construction, and laboratory infrastructure (Cave, 2014). The rate is expressed as a percentage of the direct costs and is negotiated every five years. Policy statements reinforce the rate as appropriate and real for government grants, although agencies can set their own rates for particular programs. In addition, institutions accept a lower indirect cost policy dictated by private and philanthropic funders (National Institutes of Health [NIH], 2019).

A comparison of UK and US overhead procedures and practices highlights differences and similarities between key issues. Examining the governance, calculation methodology and applied rates underscores the procedural differences with establishing and publicizing rates while acknowledging the similarities in practices to include university driven costs and standardized pricing principles. Table 1 summarizes these comparisons of key issues associated with UK and US overheads.

Table 1. Comparison of UK and US Overheads

Key Issues	UK	US
Governance		
• Effective	2004	1966
• Responsible	Office for Students UK Research & Innovation	Dept Health & Human Services Office of Naval Research
• Methodology	TRAC	Nine "Cost Pools"
• Review	Annually	Negotiate 4-5 years
• Visibility	Confidential	Publicly Available
Calculations		
• Terminology	Full Economic Costing (fEC)	Facilities & Administrative (F&A)
• Direct	Cost for conducting Research	Cost for conducting Research
• Overheads	Estates & Indirect Costs Directly Allocated	Indirect Costs
• Limits	None	26% for Administration
• Percentage	% of Project Costs	% of Direct Costs
• Variation	Within HEI Clusters	Across Universities
Rates		
• Government	80% fEC	100% Rate
• Private	> 80% fEC	< 100% Rate
• Philanthropic	< 80% fEC	< 100% Rate

Waiving or Reducing Overheads

In the UK, the methodology for determining the TRAC rates supporting full economic costing is consistent and effectively applies a flat overhead rate to be applied relative to academic time on a project. However, as the factors influencing each university's overhead rates differ, so does this flat rate. As a result, some universities have higher rates than others.

Despite the existence of overhead differences, there is little incentive for a university to waive or reduce the project price by reducing the percent of fEC, as broadly speaking the rates are comparable. Further, grant submission decisions consider the financial contribution required to ensure sufficient funding is available. Universities and Faculties also need to ensure that across their research portfolio of activities, in aggregate, financial recovery targets are achievable and contributions to overheads acceptable.

Moreover, researcher funders are aware of and expect overhead costs and instruct reviewers to focus on the research proposal itself as well as the justification of the resources. When asked to

comment, funders indicated that the project scope or scale is typically the reason a proposal is deemed too expensive. Falk-Krzesinski and Tobin's (2015) comparison of research grant proposal review criteria across US federal agencies substantiated the focus on the research versus the proposal cost. While funders were aware of variation of overheads between universities, reducing prices beyond the percent fEC requirement was acknowledged as not a sustainable practice.

However, principal investigators and senior leaders across the UK protest their institution's overhead rates and request overheads be waived or reduced as the perception that doing so will make research applications more competitive and therefore more likely to be awarded. In universities with relatively higher rates compared to their peer institutions, research offices have reported pressure to coordinate policy to adjust rates to match the TRAC averages, particularly for applications applying to certain funding agencies. Other offices experience requests to waive or reduce overheads, when a project is considered of sufficient strategic interest to 'subsidize' the research. Whether these tactics in massaging the overheads impact application success, though, is not clear.

Impact on Research Grant Awards

Senior HEI leaders, researchers and professional services at United Kingdom Higher Education Institutions (UK HEIs) are interested in the effects of institutional overheads on their grant applications success rates. Preliminary research investigated the relationship of overhead and grant award rates by examining banded overhead rates across multiple UK HEIs and fiscal years with publicly available research funder award data to inform both academic and professional leaders' decisions.

Underlying the request for TRAC, fEC and benchmarking information is the desire to understand the impact of relatively higher overhead rates, if any, on award of research grants. Is there a relationship between overheads and grant award outcomes?

Methods

Participants

A coalition of ten second-tier research-intensive universities representing the 23 TRAC Peer Group B Higher Education Institutions (HEIs) were approached initially by listserv and then follow-up email to participate in the study by providing access to sensitive overhead rates with assurance of confidentiality. Seven of the ten universities provided banded overhead rates from 2013-2018, representing a 70% response rate. The sample of institutions averaged 885 researchers, with 25.6% grant award success rate. The overhead represented the full bands range with average 3.17 with multiple universities reporting different bands across different academic years. Key variable data including the range are shown in Table 2.

Table 2. 2013-2018 HEI Key Variables

Participating HEIs	Min	Max	Average
Universities			
No of Researchers	495	1,150	885
No of Academic Staff	1,115	1,990	1,487
Overhead Bands	1	6	3.7
UKRI Grants[1]			
No Awarded	8	48	29
Value of Awarded	£3.7m	£35.0m	£13.4m
% Success Rate	6%	34%	25.6%
NIHR Grants[2]			
No Awarded[3]	0	3	0.5
£ Awarded	£0	£4m	£477k

Notes.
[1] UK Research Council award per year to include only "Research Grants"
[2] NIHR does not provide the number of applications submitted to calculate % Success Rate
[3] Only 5 of 7 HEIS awarded NIHR Grants between 2014-2018

Measures

Overhead data was collected directly from HEIs and grant award data retrieved from publicly available websites.

Overheads. The annual TRAC Benchmarking analyses reports between 2013-2018 were reviewed with banding data determined by centering the yearly average of awarded projects. The banding then was based on adding or subtracting half the difference between the average and the 1st or 3rd quartile values resulting in six distribution bands, per Table 3. Requesting only banded information provided a means of comparing relative overheads to funder award rates while avoiding confidentiality issues. Each participant shared overhead bands for each of four academic years (AY), as shown in Table 3.

Table 3. Overhead Banding by Academic Year

I +E(Lab)1	2013-2014	2014-2015	2015-2016	2016-2017
Band 1	£48,232	<£50,038	< £52,074	< £55,980
Band 2	£48,233 -£50,798	£50,039 – £53,113	£52,075 - £56.078	£55,981 - £60,499
Band 3	£50,799 -£53,364	£53,114 - £56,189	£56,079 - £60,082	£60,500 - £65,018
Band 4	£53,365 - £54,582	£56,190 - £57,036	£60,083 - £60,628	£65,019 - £68,636
Band 5	£54,583 -£55,799	£57,037 - £57,882	£60,629 - £61,173	£68,637 - £72,254
Band 6	>£55,800	>£57,883	> £61,174	> £72,255

Note.
[1] Indexed rate (£): Indirect + Estates Laboratory TRAC Section D: Research estates charge-out rates per research academic FTE Indirect and Estates: Laboratory ONLY e.g., TRACBenchmarking1617 Group B Average: £65,018 (£52,758 + £12,260)

UKRI Grant Data. UK Research and Innovation (UKRI, 2019) maintains the Gateway to Research (GtR) portal, which the public may access, search and download publicly funded research data. The number of research grant applications submitted and awarded as well as the award value for each responding university was compiled for each research council for five academic years from 2013-2019. The inclusion of AY 2018-2019 accommodates the delay from grant submission to grant award notification. The percent success rate was calculated using the application submission and award data. The number of researchers and academic staff was also collected to examine potential effects of university size.

NIHR Grant Data. The National Institute for Health Research (NIHR, 2019) also hosts a publicly accessible database. The number of research grant applications submitted and awarded as well as the award value for five academic years from 2013-2019 was collected for the seven responding universities.

Analyses

A two-step approach to data analyses included first examining the correlation between overhead bands and number of total research grants awarded, the total value of research grants awarded and the percent success rate for UKRI-only grants to identify the relationship between overhead rates and grant success. NIHR data was not included in the correlation analyses due to the limited and skewed data distribution.

Two tailed T-Tests were employed to identify any significant differences between the lowest and highest overhead rates and award success for UKRI and NIRH grants separately.

In addition, correlation and t-tests were performed to identify potential relationships by UKRI award value and differences accounting for university size.

[2] Research Grants is one of [30] Project Categories and therefore does not include grants such as Centres, Feasibility Studies, Fellowships, Knowledge Transfer, Studentship, or Training Grants among others.

Results

The correlation analyses indicated no significant relationship between overhead rates and the three measures of award success for UKRI grants: number awarded ($r(26) = 0.21$; n.s.), value awarded ($r(26) = 0.05$, n.s), and percent awarded ($r(26) = 0.22$; n.s.). Further, no significant relationship was identified between overheads and within award values (>£100k ($r(26) = 0.18$; n.s); £100k - £500k ($r(26) = 0.20$; n.s.); £500k - £1m ($r(26) = -0.25$; n.s.); £1m - £10m ($r(26) = 0.38$; $\rho = .05$) and <£10m ($r(26) = -0.25$;n.s)).

No differences were found between overhead bands 1-2 and overhead bands 5-6 by the measures of award success for UKRI (number awarded ($t(19) = 0.50$; n.s.); value awarded ($t(19) = 0.06$; n.s.); percent awarded ($t(19) = 0.85$; n.s.) or NIHR grants (number awarded ($t(11) = -0.53$; n.s.) valued awarded ($t(19) = -0.61$; n.s.). Further, no significant differences were founded adjusting for university size (number awarded ($t(19) = -1.67$; n.s.); value awarded ($t(19) = 0.29$; n.s.); percent awarded ($t(19) = -1.67$; n.s.).

Discussion

The impact of overhead rates on grant awards appears to resonate across the research administrator profession. The systematic investigation provides empirical evidence to help inform university senior leaders with their decisions to waive or reduce overhead rates systematically or in response to ad hoc research grant submissions.

While the difference in UK overheads between similarly research-intensive universities is over £240,000 per full time equivalent academic, the range in rates from less than £48,000 to over £72,000 did not correlate with grant success, which ranged between 8 and 48 grants with values between £3.7 and £35 million. Universities with lower overheads did not experience greater number or value of awarded grants or higher percent success rate. Nor did universities with higher overhead rates experience lower grant award success by number, value or percent submitted.

The lack of a significant relationship between overhead rates and grant success was further confirmed when controlling for university size and within funding values. The latter issue was investigated to avoid speculation that the impact of overheads on grant awards may be less (or stronger) at lower, moderate, or higher award values.

To the extent that UK and US share overhead practices and perceptions, the study results inform understanding of both research offices that overhead rates appear to have no significant relationship to the failure or success of grants being awarded. As funders advise, the merit of research proposal may include consideration of the justification of expenses but are not penalized or rewarded for the university's set indirect costs.

Limitations

Several limitations with this study are acknowledge and should be considered when interpreting the findings. First, the results were based on a limited number of collegial universities with similar characteristics in terms of research focus and do not represent the full complement of UK

universities. While an advantage of such a cohort is the reduced influence of extraneous variables, further research is needed across and between the five TRAC Benchmarking Peer Groups and universities with varying degrees of research ambition.

Second, the measures of research grant awards focused on UK research councils and NIHR public funders. Although UKRI is the single largest university funder by both volume and value, these results may not necessarily translate to other funder types, such as industry or charity. Further, the focus on research specific grants excluded many other types of grants which attract overheads. Future research will need to examine a greater range of funders and grant types to ensure generalizability of these findings.

Third, while the data set was sufficient to meet the assumptions of the analyses required of correlations and t-tests, the relatively small sample size combined with the non-normal distribution must be acknowledged. However, the robustness of the statistical techniques provides confidence that there were no significant differences between low and high overhead success rates and that there was no evidence to indicate overheads affected grant awards.

Finally, further research examining factors that influence grant award success may be useful in not only identifying possible covariates but may inform HEIs on how best to focus their limited resources. Possible factors to consider might include time spent developing applications, quantity and quality of internal peer review, access to successful proposals, size of research support office, and cash and in-kind contributions to applications.

Conclusion

Despite these limitations there are several contributions this article may make to research administrators and researchers. To our knowledge, this is the first publication examining overheads relevant to both UK and US audiences. The overhead comparison sheds light on the similarities and differences between nations. Further, the study provides evidence for research offices to guide internal overhead adjustment decisions, including the need for researchers to provide greater justification for waiving or reducing overheads in publicly funding grant applications. The research also highlights the need to further investigate the issue of overheads across HEIs, funders and grant types as well as to examine empirically other factors that may significantly impact grant award.

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