THUTHUKA
RESEARCH PROJECT
BUDGET DATA REPORT
2012/13

Analysis of Data Collected Via the Thuthuka Budget Assist Costing Tool

11 March 2013

Preliminary Information

Prepared By: Dr Claire Botha
Programme Director: Institutional Capacity Planning
Human Institutional Capacity Development
National Research Foundation

Tel: +27 (0) 12 481 4156
Fax: +27 (0) 12 481 4221
Email: claire.botha@nrf.ac.za

Additional data processing by Accountants-On-Site

Prepared for: Dr Romilla Maharaj
Executive Director: Human Institutional Capacity Development
National Research Foundation

Tel: +27 (0) 12 481 4087
Fax: +27 (0) 12 481 4221
Email: romilla@nrf.ac.za

Contents

1   Executive Summary

The Thuthuka Programme is central to the National Research Foundation's (NRF's) human capital development strategy in so far as it relates to advancing the equity and redress agenda within the research sphere. Promoting the redress agenda does not in any way detract from the programme's obligation to facilitate excellence in research. Another key imperative to be observed throughout the funding activity is for the NRF, as a dispenser of public funds, to ensure value for money. Understanding that these objectives are not mutually exclusive, the programme has endeavoured to maintain a fine balance between what can easily be construed as competing interests. This report focuses on the "value for money" imperative and specifically on the credibility of research budgets submitted by applicants in their bid to secure funding.

Credibility is vastly bolstered if the full cost of a research project is known to the funder. The NRF as a facilitator of publicly funded research has an irrefutable interest in knowing the full cost of research projects that it funds. This is underlined by the need to:

- achieve transparency in awarding research grants; and
- ensure value for publicly funded research Rands.

With this in mind, the Thuthuka Research Grant, a grant offered by the NRF, has taken a break from past practices with its latest Call for Proposals. In the past the programme simply required applicants to select the types of support they require from a list of items without the obligation to indicate the full cost involved. This resulted in a *shopping list*, ostensibly void of any real projected costs making it rather difficult to assess the actual return on the public funds invested.

To address this issue the programme introduced a budgeting format which now compels researchers to indicate the full cost related to a research activity as part of their proposals. Key to this was the introduction of the Budget Assist Costing Tool (BACT), a preformatted Excel spreadsheet with functionalities to automatically calculate totals, subtotals and co-funding portions. The BACT was supplied to applicants to help them compile more realistic and comprehensive research project budgets.

Although not compulsory, applicants were encouraged to upload their completed BACT spreadsheets as part of their applications. In total 147 BACT spreadsheets were uploaded and this document provides an analysis of the data gleaned from them. The purpose of the analysis was to detect trends in the costing of research projects and to determine whether the NRF's funding practices were in-line with real world research cost demands.

Mindful of the fact that this was a desktop exercise, this report highlights the following about research costing and the NRF's funding practices as it applies to the Thuthuka programme specifically:

- Human Capacity Development, Research Materials and Supplies and Research Equipment form the core of any research budget;
- Budget movements over the three year period is different for categories with some increasing over time while other decrease over the life cycle of the research project;

- A significant number of researchers do not budget for core cost categories, thereby severely undermining the credibility of their research budgets;
- A sizeable number of researchers still employing *shopping list* budgeting;
- Institutional variances with researchers from some producing better formed budgets than those from other institutions; and
- Some of the support offered by the NRF is completely out of sync with what researchers' project as real world costs.

In addressing the issues listed above in a comprehensive way, this report recommends the following:

- **Full Costing:** That the NRF formally adopts full costing as a standard way of budgeting for research projects across all its programmes and projects;
- **Communication:** That the NRF creates, launched and drives a fully developed communication effort to create awareness about full costing both internally with its own staff and externally with its stakeholder base;
- **Business Intelligence:** That online applications platforms provide for the capturing, processing and presentation of information that could be used at managerial and executive levels to better inform funding strategies;
- **Capacity Building:** That researchers and research offices be trained in full costing to ensure that credible budgets accompany grant applications; and
- **Tooling:** That tools such as the BACT be refined to further facilitate accurate research project costing.

The BACT and this analysis of budget data is the first cut in an iterative process towards effective and efficient research project costing. The areas for improvement have been noted in the report itself and will form part of the work plan as we proceed into the future.

2 Background

2.1 Genesis of the Budget Assist Costing Tool

One of the key objectives of the National Research Foundation (NRF) is to promote and support research through the funding of research projects. Pursuant to this the NRF runs a number of programmes designed as instruments through which researchers can access public funds to finance their projects. One such instrument is the Thuthuka Programme with its emphasis on redressing historical racial and gender imbalances within the research sector.

The Thuthuka Programme places an annual call for applications through which it encourages researchers to apply for project funding. Applications are process in the normal way and reviewers assess each application for scientific merit, achievability and budget credibility. While subject experts assess the scientific merits of an application, the NRF applies a set of funding rules in arriving at a decision whether to award an application. It is at this point that the budget section of the application gains a sharp focus.

Since the inception the Thuthuka Programme, grant administrators noticed the following trends with regards to research financial management after projects have been awarded:

- Some grant holders requesting additional funding over and above the funding initially awarded to their projects;
- Some grant holders not taking up all the funding awarded to their projects; and
- Some grant holders requesting carry-overs on their budgets from one financial year to the next.

The factors listed above are all indicators of research project budgeting deficiencies which can be attributed to:

- inadequate budgeting on the part of the applicant; and/or
- the *shopping list budgeting* format as supplied by the NRF.

With regards to the latter, the NRF supplies a list of budget items that it is prepared to fund with maximum amounts attached to each item. This results in *shopping list budgeting* whereby applicants simply pick items from the presented list and submit that as their budgets. A *shopping list budget* simply represents a list of available items without taking into account the actual cost associated with a project activity. The *shopping list budget* is therefore not a budget in the real sense of the word and can consequently not be used to assess the budget credibility or achievability of a research project.

It thus became apparent to the Thuthuka Programme management that what is required is a budget that approximates future expenditure as closely as possible.

2.2   What is the Budget Assist Costing Tool

The first differentiator to note is that, unlike *shopping list budgeting,* the Budget Assist Costing Tool (BACT) facilitates full costing. In line with the provisions of the Intellectual Property Act, this is a budgeting approach that requires applicants to budget for the full projected cost of their research projects as opposed to just budgeting for what the funder funds. To achieve full costing the BACT identifies all the possible cost drivers related to a research project, categorises them into major and minor cost categories and presents this in an Excel spreadsheet with preformatted drop-down options and formulae calculating totals and subtotals. Besides aiming to provide a realistic, full picture of future research project expenditure, the BACT also aims to achieve objectives as listed below.

2.3   Motivation: Researcher Perspective

Most researchers regard budgeting as an unenviable and time consuming activity. They would much rather spend time on the pursuit of knowledge which is their core business. The availability of a tool that categorises costs, provides preformatted cost items, calculates totals and finally summarises everything greatly eases the costing task. It adds speed to the process whilst at the same time covering all possible cost centres resulting in a fast, comprehensive project budget. Novices to the budgeting task get an instant insight into all the possible cost areas thus reducing the potential for under-budgeting. Experienced researchers will find the automatic calculations useful and can bring to bear their past experience to develop credible budgets.

2.4   Motivation: NRF Perspective

The most important consideration when reviewing a budget is it credibility. This hinges on the motivation provided for each budget item and its projected costs for a particular period. In the past applicants simply applied for the maximum amount for a budget item as offered by the NRF. Not resembling budgeting in any way at all, this practice resulted in a *shopping list* giving not indication of the actual cost of the items involved. The BACT is an attempt to break away from this practice by providing applicants with a tool requiring actual cost to be captured. The benefits are two-fold. Firstly, projecting actual cost approximates future expenditure more accurately and secondly full costing is achieved by providing for more than just funded items. Together these two factors go a long way towards the production of credible research budgets.

3   Report Production

3.1   Objectives

Contrary to analysing the BACT's efficacy as a budgeting tool itself, this exercise is rather an attempt to analyse the budget data provided with the view to gain insight into researchers' costing practices. Specifically, the analysis aims to:

- Identify major and minor cost driver categories;
- Present the average cost budgeted for each major category;

- Consider high-low spread for each budget category;
- Analyse budget data over the medium (3 year) term;
- Compare budgets items against the *NRF shopping list*.

3.2   Approach

The BACT was included as part of the Thuthuka 2012/13 Call for Applications documentation. Although not compulsory, applicants were encouraged to use the BACT in budgeting for their projects. They were also requested to upload completed BACT spreadsheets as part of the online application exercise. It should be noted that the BACT did not replace the online budget section of the application, but that it was meant as an offline tool to be used in preparation for capturing onto the official budget.
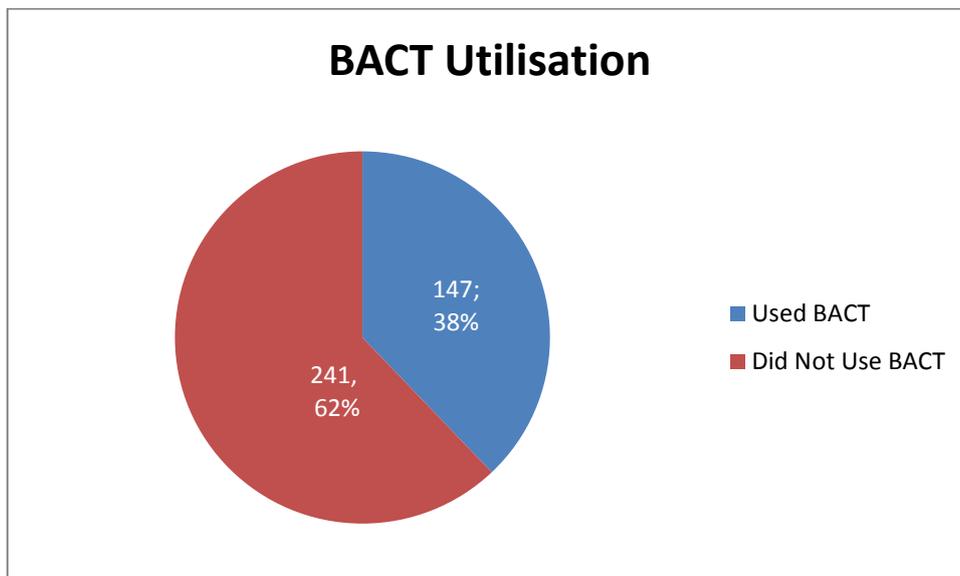
In total the NRF received 388 online applications. Of these 147 submitted completed BACT spreadsheets which represent a 38% return. It is not known how many applicants used the BACT and did not proceed to upload it with their applications. The 147 uploaded BACT spreadsheets were then subjected to a desktop analysis which entailed a consolidation of the individual spreadsheets and an analysis of the aggregated data.

4 Analysis

4.1 Overview

A few cursory observations need to be highlighted right from the start as these have implications for how the data is analysed and interpreted.

- The most concerning observation from this analysis is firstly the fact that certain projects had no budgeted costs for certain line items. It is understood that projects are different in nature and not all expenses are applicable to all projects, but certain expenditure are so general that they are expected to be part of almost any budget. Just looking at year 1, 30 projects (of 147) did not budget for Research materials and supplies, 48 projects (of 147) did not budget for Research equipment, and 41 projects (of 147) did not budget for Human capacity development.
- Large discrepancies were noted between average- and highest costs. Some projects considered different line items more expensive than other line items. This observation concludes that the nature of the projects is very different from each other. The differences make any productive comparisons between projects very difficult. It is recommended that certain projects are rather grouped together, based on their nature, before a comparison is made.
- It is also observed from the "high" analysis that certain expenditure is not increased during the 3 year assessment period. This supports the conclusion that costs are not adjusted for inflation when doing the necessary budgets. Candidates need to take inflation into account when estimating future costs. The same expense might not cost the same over 3 years due to inflationary pressures.

The following conclusions could be drawn from the above:

- The projects are too different in nature to make use of one standard Budget tool. Different versions of the budget tool are needed to accommodate certain projects that are similar in nature.
- The candidates responsible for budgeting have not performed a detailed needs analysis while compiling the budget. More time and planning is needed to identify all needs requiring require financial resources.

4.2 Year-on-Year

Comparing the total expenses from Year 1 to Year 3, a decrease in expenditure is noted from the analysis. The interpretation that could be made from this observation is that research projects became less expensive the longer they continue. This seems to be a reasonable assumption if one takes into consideration that initial setup expenditure is needed at the beginning of a project which will not necessarily be repeated in the years that follow years. The only concern that could be noted is that it is unclear whether the candidates have adjusted their expenditure for the effect of

inflation. Inflation is a global phenomenon that needs to be included in cost calculations that runs over a number of years.

	Year 1	Year 2	Year 3
Lecturer Replacement	954 733.00	954 796.04	1 284 615.42
Research and Technical Assistance	2 740 467.00	2 439 861.50	1 746 861.50
Research Materials and Supplies	8 182 822.83	6 829 531.31	5 701 668.60
External Supervisory Support	320 932.96	247 611.26	182 140.18
Local Conferences	761 278.50	886 203.00	805 680.46
Conferences Abroad	2 000 854.85	2 486 516.29	2 859 101.66
Local Study/Training Visit	506 589.30	483 051.76	360 692.28
International Study/Training Visit	1 313 201.72	976 247.24	788 512.74
Sabbatical	421 353.00	513 288.00	810 354.50
Visiting Scientist or Senior Advisor	979 968.99	1 165 084.82	1 053 323.25
Research Equipment	5 054 050.58	2 645 344.94	1 747 821.03
Domestic Travel	2 137 099.14	1 789 846.36	780 079.42
Human Capacity Development	9 442 000.00	11 026 000.00	8 040 000.00
	34 815 351.87	**32 443 382.51**	**26 160 851.04**
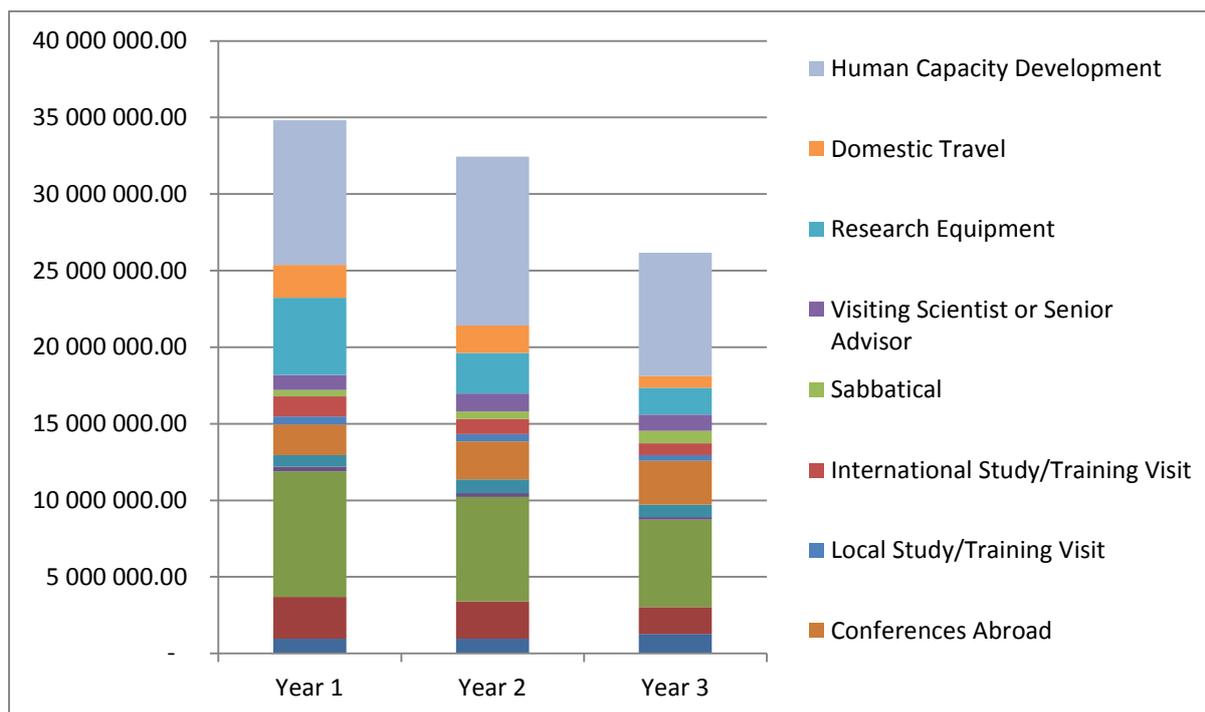
Although the general trend is for costs to decrease over the time of the project some categories buck this trend by increasing towards the end of the project's life cycle. These are project closure costs and typically include items such as Sabbatical Travelling and conferences. Sabbatical travelling can be linked to the writing up activities and conferences with information sharing activities, both occurring towards the end of a project. Start up cost on the other hand is higher at the beginning of

a project and typically include costs such as Research Materials and Supply as well as Research Equipment. (See Annex A).

4.3   Cost Category Ranking

One way of trying to understand research cost is to rank the different cost categories in terms of their relative financial importance in relation to the total projected cost of a research project. From the available data, the following table ranks projected category costs as a percentage of total projected costs. This table clearly ranks Human Capacity Development as the most significant cost driver with External Supervisory Support making up the rear.

Rank	Category	% of Total Projected Cost
1	Human Capacity Development	30.52%
2	Research Materials and Supplies	22.17%
3	Research Equipment	10.11%
4	Conferences Abroad	7.86%
5	Research and Technical Assistance	7.42%
6	Domestic Travel	5.04%
7	Visiting Scientist or Senior Advisor	3.42%
8	Lecturer Replacement	3.42%
9	International Study/Training Visit	3.29%
10	Local Conferences	2.63%
11	Sabbatical	1.87%
12	Local Study/Training Visit	1.45%
13	External Supervisory Support	0.80%

Another, and perhaps a more insightful way of approaching the data is to apply a Must-Have/Nice-to-Have analysis to it. Must-Have cost categories are costs critical to the success of the research project or those costs if not included would result in severe project failure.   Nice-to-Have categories on the other hand are costs that if not incurred will not harm the achievement of the projects research objectives. In between these two we find the Should-Have costs which represent costs that significantly enhance the outputs of the research project, but are not necessary in the project's delivery. Using this framework, the table above can be redrawn as follows.

Rank	Category	% of Total Projected Cost	Priority
1	Human Capacity Development	30.52%	Must-Have
2	Research Materials and Supplies	22.17%	Must-Have
3	Research Equipment	10.11%	Must-Have
5	Research and Technical Assistance	7.42%	Should-Have
6	Domestic Travel	5.04%	Should-Have
8	Lecturer Replacement	3.42%	Should-Have
11	Sabbatical	1.87%	Should-Have
4	Conferences Abroad	7.86%	Nice-to-Have

7	Visiting Scientist or Senior Advisor	3.42%	Nice-to-Have
9	International Study/Training Visit	3.29%	Nice-to-Have
10	Local Conferences	2.63%	Nice-to-Have
12	Local Study/Training Visit	1.45%	Nice-to-Have
13	External Supervisory Support	0.80%	Nice-to-Have

Priory Split
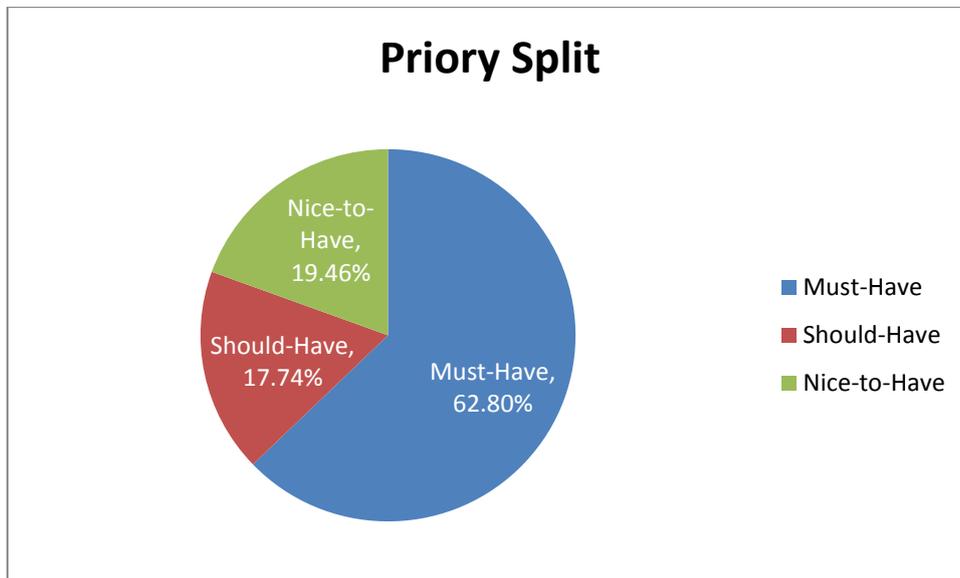
4.4 Must Have Budget Categories

Research Materials and Supplies, Research Equipment and Human Capacity Development are by far the most important categories, demanding on average more than 62% of the resources over the three year period of the project. Year one the projected costs cumulatively represents more than 65% of the projected costs, slightly declining to 63.3% and 62.2% for outer years 2 and 3 respectively. Human Capacity Development, understandably so since research is a labour intensive activity, takes the lion's share as indicated in Annex A.

Average Projected Total 3 Year Cost: Major vs Other Categories

- Major Categories
- Other Categories

37.20%

62.80%
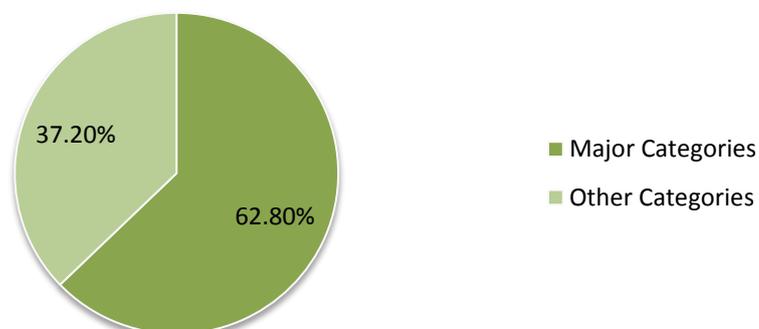
These three categories are the major cost drivers for any research project. Understanding how these costs behave in relation to the scope and nature of a research project is critical in the formulation of credible research budgets. For researchers, under-budgeting in any of these three areas can major implications on the achievability of the project's research objectives. From a reviewer's perspective, a miss-alignment between the projected costs for these categories and the project scope indicates serious deficiencies in the proposed research project plan.

From a funder point of view, funding rules should consider these categories with the view to assist the researcher by catering for these costs as adequately and realistically as possible. For instance, in does not make sense to set an upper limit with amounts that are far below the average projected costs for a particular category. With this in mind and in relation to the Thuthuka Supports, further discussions on the three major categories are presented below.

4.4.1 Research Materials and Supplies

Category description: "Research supplies" are allowed when directly related to technical use on the project (e.g., computer paper, research notebooks, survey forms). General office supplies (e.g., pencils, letterhead paper, memo pads) are not allowable budget items. In no instance should research supplies be requested to replenish an inventory (supplies purchased are to be used with the activity)

Research Materials and Supplies is a function of the number of human resources attached to a research project. This means that the higher the number of resources, the more materials and supplies will increase. The analysis shows that materials and HCD expenditure, on the other hand, are relatively constant (See Annex A).

	High	Low	Average/Upper Limit	% Covered
Projected Cost	877 500.00	1 000.00	168 406.69	
Thuthuka Support			100 000.00	59.3%

The Thuthuka grant allows for R100 000 per annum for this category. This represents 59.3% of the average projected cost. In terms of the co-funding principle the NRF funds 50% of the cost whilst the institution is required to match that with and an equal amount. In this instance the NRF provides for 59.3% of the cost which is well over the 50% co-funding requirement. The Thuthuka Support for this category can therefore be regarded as adequate.

4.4.2   Research Equipment

Category Description: Equipment is defined as any piece of tangible asset with a unit value of R3 000 or more, a life expectancy of more than one year, and which is not consumed in the normal course of operation, unless the sponsor specifies otherwise.

Projected Cost Analysis: Even though research equipment forms a significant part of the expenditure in Year 1, a decrease is observed in Year 2 and 3. This indicates that the researchers understand that equipment is a once off expense and is not likely to be repeated again in the years that follow.

	High	Low	Average/Upper Limit	% Covered
Projected Cost	1 071 814.00	500.00	92 619.77	
Thuthuka Support			50 000.00	53.9%

Thuthuka Support Analysis: The Thuthuka grant allows for R50 000 per annum for this category. This represents 53.9% of the average projected cost. In terms of the co-funding principle the NRF funds 50% of the cost whilst the institution is required to match that with and an equal amount. In this instance the NRF provides for 53.9% of the cost which is well over the 50% co-funding requirement. The Thuthuka Support for this category can therefore be regarded as adequate.

4.4.3   Human Capacity Development

Category Description: Costs related to human resources nominated on the research project.

Due to a shortcoming in the BACT, the analysis used for Research Materials and Supplies and Equipment cannot be applied for this category. The BACT currently does not allow researchers to project for HCD costs. It simply requires researchers to supply the number of resources per class upon which it calculates the total amount offered by the NRF expressed as the stipulated amount per class multiplied by the number of resources required. Differently put, this section of the BACT still uses "*shopping list*" budgeting.

In a future scenario the BACT should provide for the projected cost of human resources by compelling researchers to project the real world cost per resource. The projection should cover student registration fees and tuition which varies between institutions and even faculties.

4.5   Other Categories

4.5.1   Lecturer Replacement

Category Description: Remuneration cost of substitute lecturer who is replacing the staff member during their period of absenteeism, while conducting the research activities.

Projected Cost Analysis: Researchers projected lecturer replacement costs between 2.7% and 4.9% of the total costs, averaging around 3.4%. There is no discernible trend over the three year budget period. Some researchers projected this cost at R4000 per annum which incidentally is equal to the maximum amount that the NRF offers per month for this category. This implies that these researchers did not properly project the real cost associated with replacing a lecturer, nor did they projected for more than one month. It therefore seems that some researchers still lack an understanding of what this cost actually entail. A concerted effort is needed to alert researchers about the items related to the replacement of a lecturer. At an institutional level, research offices should assist researchers in costing adequately for items such as basic salary, medical aid and other allowances which might not be readily apparent to the researcher.

	High	Low	Average/Upper Limit	% Covered
Projected Cost	244 032.00	4000.00	62 630.28	
Thuthuka Support			24 000.00	38.3%

Thuthuka Support Analysis: The NRF funding rule for this category sets the upper limit to R24 000 for this category. This represents 38.3% of the average cost as projected by researchers. After implementing the co-funding principle the researcher would still be 10% short in covering adequately for this category. It is therefore recommended to increase the NRF's offering for lecturer replacement from the current R24000 to R30000 per annum which will result in about 50% of the projected cost.

4.5.2 Research and Technical Assistance

Category Description: Costs associated with bringing in an expert in the field to train the research team and with the procurement of specialised and technical skills not available within the research team. Support for technical assistance (e.g. services of statistician) include: using statistical software packages e.g. SPSS, SAS, R, HLM, to analyse data etc., determine a justifiable sample size.

Projected Cost Analysis: Researchers projected technical assistance to be between 7.9% and 6.7% of total cost, averaging around 7.4%. The current trend suggests that the requirement is higher in the first year (7.9%), decreasing to its lowest point (6.7%) in the third year. Technical experts normally charge at an hourly rate with most charging above R250 per hour. Given this, the lowest projected cost of R900 per annum detected in the data does not seem to be realistic. Researchers should be encouraged to obtain market related hourly rates when projecting costs for consultants.

	High	Low	Average/Upper Limit	% Covered
Projected Cost	360 000.00	900.00	75 295.54	
Thuthuka Support			40 000.00	53.1%

Thuthuka Support Analysis: The NRF rule for this category sets the upper limit at R 40 000 per annum. This represents 53.1% of the R75 295.54 average cost as projected by researchers. Adding the co-funding portion to the R40 000 therefore provides adequate coverage for this cost category.

4.5.3 External Supervisory Support

Category Description: Cost associated with subsistence and travel between the researcher and the supervisor based at another institution.

Projected Cost Analysis: External Supervisory Support makes up less than 1% of the total projected costs in any of the three years as well as on average. Of all the cost categories this one ranks the lowest in term of resource demand, making up on average only 0.8% of the total projected cost. This suggests that researchers do not regard External Supervisory Support as critical in the fulfilment of the research objectives.

	High	Low	Average/Upper Limit	% Covered
Projected Cost	114 765.00	600.00	39 509.71	
Thuthuka Support			20 000.00	50.6%

Thuthuka Support Analysis: The NRF rule for this category sets the upper limit at R 20 000 per annum. This represents 50.6% of the R39 509.71 average cost as projected by researchers. Adding the co-funding portion to the R20 000 therefore provides adequate coverage for this cost category.

4.5.4 Local Conferences

Category Description: Costs related to attending academic conferences locally (in South Africa) which includes items such as conference registration fees, travel, accommodation and subsistence allowances.

Projected Cost Analysis: Local Conferences ranges between 2.2% and 3.1% of total projected cost averaging around 2.6%. The trend seems to be to schedule more local conferences in the outer years of the research project. This is understandable since the first year is mainly used to collect and process research data while researchers use the outer years to share or communicate preliminary findings at conferences.

	High	Low	Average/Upper Limit	% Covered
Projected Cost	201 396.00	450.00	21 331.84	
Thuthuka Support			4 000.00	18.7%

Thuthuka Support Analysis: The NRF rule for this category sets the upper limit at R 4 000 per annum. This represents only 18.7% of the R21 331.84 average cost as projected by researchers. After adding the co-funding portion the researcher would still be 13% short in covering for this cost. It is therefore recommended that support for local conferences be increased to R10 000 per annum.

4.5.5 Conferences Abroad

Category Description: Costs related to attending academic conferences internationally which includes items such as conference registration fees, travel, accommodation and subsistence allowances.

Projected Cost Analysis: International conferences is the fourth highest budget item. Accounting for almost 8% of the total cost it is outranked only by the three major cost categories. International conferences seem to be the highest in the research project's third year.

	High	Low	Average/Upper Limit	% Covered
Projected Cost	192 166.75	3 600.00	60 216.99	
Thuthuka Support			17 000.00	28.2%

Thuthuka Support Analysis: The NRF rule for this category sets the upper limit at R 17 000 per annum. This represents 28.2% of the R60 216.99 as projected by researchers. The support offered by the NRF should be ideally 50% of the projected cost. It is therefore recommended that this support by increased to R30 000 per annum.

4.5.6   Local Study/Training Visit

Category Description: Study visit: Cost incurred when undertaking a study visit to an external institution to access well-developed infrastructure or facilities to accommodate the research to be undertaken. Training Visit: Cost incurred when visiting an external institution to acquire specialised skills, needed for research project and beyond, not available at own institutions.

Projected Cost Analysis: Local Study/Training visits average around 1.4% of the total projected cost.

	High	Low	Average/Upper Limit	% Covered
Projected Cost	114 899.00	3 000.00	33 758.33	
Thuthuka Support			24 000.00	71.1%

Thuthuka Support Analysis: The NRF rule for this category sets the upper limit at R 24 000 per annum. This represents 71.1% of the R33 758.33 as projected by researchers, well over the required 50% support.

4.5.7   International Study/Training Visit

Category Description: Study visit: Cost incurred when undertaking a study visit to an external institution to access well-developed infrastructure or facilities to accommodate the research to be undertaken. Training Visit: Cost incurred when visiting an external institution to acquire specialised skills, needed for research project and beyond, not available at own institutions.

Projected Cost Analysis: International Study/Training visits average around 3.4% of the total projected costs.

	High	Low	Average/Upper Limit	% Covered
Projected Cost	205 500.00	8 000.00	65 488.55	
Thuthuka Support			36 000.00	55%

Thuthuka Support Analysis The NRF rule for this category sets the upper limit at R 36 000 per annum. This represents 55% of the R65 488.55 as projected by researchers, well within the required 50% support.

4.5.8   Sabbatical

Category Description: Costs associated with undertaking a research visit to another institution.

Projected Cost Analysis: Sabbatical cost ranges between 1.2% of total projected cost in year one to 3.1% in year three of the research project. This seems to suggest that researchers tend to schedule sabbatical mainly in year three of their projects.

	High	Low	Average/Upper Limit	% Covered
Projected Cost	333 200.00	5 000.00	64 629.46	
Thuthuka Support			60 000.00	93%

Thuthuka Support Analysis: The NRF rule for this category sets the upper limit at R 60 000 per annum. This represents 93% of the R64 629.46 as projected by researchers, well over the required 50% support.

4.5.9   Visiting Scientist or Senior Advisor

Category Description: Costs associated procuring relevant expertise related to the research project. Can include travel To and From; accommodation during period of visit; per diem / daily stipend (to cover subsistence, travel and communication).

Projected Cost Analysis: Visiting Scientist or Senior Advisor cost averages 3.4% of the total projected cost, peaking at 4% in year three. This suggests that researchers tend to schedule visits towards the end of their research projects.

	High	Low	Average/Upper Limit	% Covered
Projected Cost	323 200.00	14 500.00	84 167.82	
Thuthuka Support			60 000.00	71%

Thuthuka Support Analysis: The NRF rule for this category sets the upper limit at R 60 000 per annum. This represents 71% of the R84 167.82 as projected by researchers, well over the required 50% support.

4.5.10 Domestic Travel

Category Description: Travel allowance granted for domestic travel and incidental costs linked to execution of research activities i.e. costs to and from research sites, e.g. fieldwork and attending research related meetings.

Projected Cost Analysis: Domestic travel cost averages 5% of the total projected cost, peaking at 6.1% in year one. This suggests that researchers tend to schedule domestic travel at the start of their research projects.

	High	Low	Average/Upper Limit	% Covered
Projected Cost	330 500.00	1 650.00	50 074.73	
Thuthuka Support			10 000.00	20%

Thuthuka Support Analysis: The NRF rule for this category sets the upper limit at R 10 000 per annum. This represents 20% of the R50 074.73 as projected by researchers, well below the required 50% support. The recommendation is therefore to increase this support to R25 000 per annum.

5 Towards full costing of research projects

As the requirement for the full costing of research projects gains momentum in South Africa, researchers and funders of research alike are compelled to review their costing and funding practices for alignment with the new paradigm. The NRF as a facilitator of publicly funded research has an irrefutable interest in knowing the full cost of the research projects that it funds. This analysis, as a first step, marks an important milestone towards this end. It presents valuable insights into the behaviour of research project costs and it also reflects on the NRF's funding practices as far as Thuthuka is concerned. It also shows that we still have a long way to go in aligning our processes with grant management best practices internationally.

Although Thuthuka, with the most recent Call for Proposals, has laid a basis for full costing, it is in no way entrenched. For this to happen, the NRF has to formally adopt full costing as a budgeting practice throughout its funding programmes.

Annex A: Compositional Analysis

Financial Category	Year 1	%	Year 2	%	Year 3	%	Total	Average
Lecturer Replacement	954 733.00	2.7%	954 796.04	2.9%	1 284 615.42	4.9%	3 194 144.46	3.4%
Research and Technical Assistance	2 740 467.00	7.9%	2 439 861.50	7.5%	1 746 861.50	6.7%	6 927 190.00	7.4%
Research Materials and Supplies	8 182 822.83	23.5%	6 829 531.31	21.1%	5 701 668.60	21.8%	20 714 022.73	22.2%
External Supervisory Support	320 932.96	0.9%	247 611.26	0.8%	182 140.18	0.7%	750 684.40	0.8%
Local Conferences	761 278.50	2.2%	886 203.00	2.7%	805 680.46	3.1%	2 453 161.96	2.6%
Conferences Abroad	2 000 854.85	5.7%	2 486 516.29	7.7%	2 859 101.66	10.9%	7 346 472.79	7.9%
Local Study/Training Visit	506 589.30	1.5%	483 051.76	1.5%	360 692.28	1.4%	1 350 333.34	1.4%
International Study/Training Visit	1 313 201.72	3.8%	976 247.24	3.0%	788 512.74	3.0%	3 077 961.70	3.3%
Sabbatical	421 353.00	1.2%	513 288.00	1.6%	810 354.50	3.1%	1 744 995.50	1.9%
Visiting Scientist or Senior Advisor	979 968.99	2.8%	1 165 084.82	3.6%	1 053 323.25	4.0%	3 198 377.06	3.4%
Research Equipment	5 054 050.58	14.5%	2 645 344.94	8.2%	1 747 821.03	6.7%	9 447 216.55	10.1%
Domestic Travel	2 137 099.14	6.1%	1 789 846.36	5.5%	780 079.42	3.0%	4 707 024.92	5.0%
Human Capacity Development	9 442 000.00	27.1%	11 026 000.00	34.0%	8 040 000.00	30.7%	28 508 000.00	30.5%
	34 815 351.87	100.0%	32 443 382.51	100.0%	26 160 851.04	100.0%	93 419 585.41	100.0%

Annex B: High/Low and Averages

	YEAR 1			YEAR 2			YEAR 3			TOTAL		
	High	Low	Average	High	Low	Average	High	Low	Average	High	Low	Average
Lecturer Replacement	210 063.00	8 000.00	35 360.48	177 848.04	8 000.00	30 799.87	244 032.00	4 000.00	42 820.51	244 032.00	4 000.00	62 630.28
Research and Technical Assistance	176 500.00	300.00	31 865.90	144 260.00	300.00	29 395.92	120 000.00	300.00	22 395.66	360 000.00	900.00	75 295.54
Research Materials and Supplies	877 500.00	200.00	69 938.66	267 500.00	100.00	62 086.65	340 617.00	250.00	58 180.29	877 500.00	1 000.00	168 406.69
External Supervisory Support	38 255.00	600.00	17 829.61	38 255.00	4 972.00	17 686.52	38 255.00	3 000.00	16 558.20	114 765.00	600.00	39 509.71
Local Conferences	61 960.00	450.00	8 852.08	66 396.00	2 100.00	9 846.70	73 040.00	2 400.00	10 742.41	201 396.00	450.00	21 331.84
Conferences Abroad	68 397.58	6 000.00	26 327.04	76 000.00	6 000.00	29 253.13	145 920.00	3 600.00	32 124.74	192 166.75	3 600.00	60 216.99
Local Study/Training Visit	53 300.00	2 400.00	15 351.19	42 259.96	2 500.00	17 251.85	48 015.00	3 600.00	17 175.82	114 899.00	3 000.00	33 758.33
International Study/Training Visit	126 000.00	8 000.00	42 361.35	82 648.00	10 000.00	39 049.89	106 704.00	17 880.00	46 383.10	205 500.00	8 000.00	65 488.55
Sabbatical	100 000.00	5 000.00	46 817.00	166 600.00	8 750.00	46 662.55	166 600.00	11 450.00	54 023.63	333 200.00	5 000.00	64 629.46
Visiting Scientist or Senior Advisor	137 031.00	10 000.00	39 198.76	120 500.00	4 098.00	37 583.38	142 200.00	3 532.00	50 158.25	323 200.00	14 500.00	84 167.82
Research Equipment	429 000.00	500.00	51 571.94	595 637.00	550.00	48 987.87	243 883.00	600.00	47 238.41	1 071 814.00	500.00	92 619.77
Domestic Travel	219 000.00	660.00	23 484.61	169 800.00	1 260.00	22 656.28	72 300.00	1 000.00	13 929.99	330 500.00	1 650.00	50 074.73
Human Capacity Development	420 000.00	10 000.00	89 075.47	420 000.00	10 000.00	105 009.52	420 000.00	10 000.00	92 413.79	1 260 000.00	20 000.00	256 828.83

	YEAR 1			YEAR 2			YEAR 3			TOTAL		
	High	Low	Average	High	Low	Average	High	Low	Average	High	Low	Average
TOTAL	877 500.00	200.00	18 218.39	595 637.00	100.00	16 977.18	420 000.00	250.00	13 689.61	1 260 000.00	450.00	48 885.18

Annex C: Institutional Composition

Institution	Year 1	Year 1 - %	Year 2	Year 2 - %	Year 3	Year 3 - %
Cape Peninsula University of Technology	1 508 813.00	4.3%	992 740.00	3.1%	1 104 650.00	4.2%
Durban University of Technology	633 300.00	1.8%	796 800.00	2.5%	790 300.00	3.0%
Rhodes University	1 470 595.00	4.2%	1 365 912.00	4.2%	1 042 946.52	4.0%
Stellenbosch University	1 332 438.50	3.8%	1 669 628.00	5.1%	1 216 083.00	4.6%
Tshwane University of Technology	388 770.00	1.1%	426 700.00	1.3%	335 200.00	1.3%
University of Cape Town	4 412 902.21	12.7%	4 591 468.80	14.2%	3 753 779.12	14.3%
University of Fort Hare	145 064.00	0.4%	207 014.00	0.6%	66 800.00	0.3%
University of Limpopo	1 743 084.50	5.0%	1 529 487.50	4.7%	1 226 864.00	4.7%
University of Pretoria	896 340.14	2.6%	1 131 807.52	3.5%	827 448.00	3.2%
University of South Africa	1 737 826.61	5.0%	1 007 204.73	3.1%	773 776.00	3.0%
University of the Free State	827 688.00	2.4%	992 497.00	3.1%	889 075.04	3.4%
University of the Western Cape	867 650.50	2.5%	810 615.00	2.5%	447 790.00	1.7%
University of the Witwatersrand	3 008 506.01	8.6%	2 685 504.17	8.3%	2 450 735.51	9.4%
Vaal university of Technology	84 366.00	0.2%	131 524.00	0.4%	158 580.00	0.6%
North-West University	936 723.00	2.7%	1 047 161.40	3.2%	750 300.00	2.9%
Nelson Mandela Metropolitan University	1 187 368.82	3.4%	1 036 342.00	3.2%	844 592.00	3.2%
CSIR	1 617 375.86	4.6%	1 549 074.62	4.8%	891 162.10	3.4%
University of Johannesburg	1 901 780.42	5.5%	1 701 285.22	5.2%	1 423 392.42	5.4%
Oceanographic Research Institute (SAAMBR)	333 704.00	1.0%	272 627.00	0.8%	252 500.00	1.0%
Nelson Mandela School of medicine	1 172 720.00	3.4%	6 000.00	0.0%	7 600.00	0.0%
Necsa	2 027 128.00	5.8%	2 503 119.00	7.7%	1 620 133.00	6.2%
Walter Sisulu University	1 283 772.00	3.7%	1 236 109.00	3.8%	1 165 626.00	4.5%
Central University of Technology	371 999.99	1.1%	370 059.98	1.1%	360 100.02	1.4%
University of Zululand	384 480.00	1.1%	170 340.00	0.5%	-	0.0%
ARC	108 310.00	0.3%	85 960.00	0.3%	54 960.00	0.2%
University of KwaZulu-Natal	1 394 387.43	4.0%	1 029 115.60	3.2%	781 189.17	3.0%
Council of Geoscience	279 150.00	0.8%	256 165.00	0.8%	172 890.00	0.7%
Mintek	1 355 598.28	3.9%	1 159 646.46	3.6%	790 052.17	3.0%
Tswane university of Techology	667 726.00	1.9%	885 659.00	2.7%	1 329 772.50	5.1%
University of Venda	735 783.60	2.1%	795 815.52	2.5%	632 554.46	2.4%
	34 815 351.87	**100%**	**32 443 382.51**	**100.0%**	**26 160 851.04**	**100%**