

Occasional Working Paper — No. 1, April 2010

Transparent Costing: Has The Emperor Got Clothes?

**Janek Ratnatunga
Erwin Waldmann**

University of South Australia
School of Commerce
Centre for Accounting Governance and Sustainability
University of South Australia
City West Campus
GPO Box 2471
Adelaide, South Australia 5001

ISSN 1838-0409 (Print) 1838-0468 (Online)

Aims and Scope

The Centre for Accounting, Governance and Sustainability is pleased to present Occasional Working Papers written by members prior to their publication in refereed journals. The papers represent the varied current research interests of members. Feedback is welcomed through direct context with the author. Occasional Working Papers assist individual scholars by allowing for publication, dissemination, and discussion of new research in a fast-track mode, prior to later publication in journals or books. Dissemination of the Occasional Working Papers is primarily through the Centre for Accounting, Governance and Sustainability website, downloadable free of charge (see <http://www.unisa.edu.au/cags/publications.asp>).

© 2010 Centre for Accounting, Governance and Sustainability, University of South Australia

This work is copyright. Apart from any use as permitted under the *Copyright Act 1968*, no part may be reproduced by any process without prior written permission from the Director of the Centre for Accounting, Governance and Sustainability. Requests and enquiries concerning reproduction and rights should be addressed to Professor Roger L. Burritt, Director, Centre for Accounting, Governance and Sustainability, School of Commerce, University of South Australia, GPO Box 2471, Adelaide, South Australia, 5001 or emailed to roger.burritt@unisa.edu.au. The intellectual property of each paper remains vested in the authors as listed on the paper.

Published by the Centre for Accounting, Governance and Sustainability, School of Commerce, University of South Australia, GPO Box 2471, Adelaide, South Australia, 500, Director: Professor Roger Burritt

Designer: Amanda Carter

ISSN No: 1838-0409 (print) 1838-0468 (online)

Submissions to Research Administrator, Centre for Accounting, Governance and Sustainability, via email cags@unisa.edu.au

Citation

The following Occasional Working Paper should be cited as:

Ratnatunga, J. and Waldmann, E. (2010), *Transparent Costing: Has The Emperor Got Clothes?*, Centre for Accounting, Governance and Sustainability Occasional Working Papers, No. 1, April, University of South Australia, Adelaide.

Transparent Costing: Has The Emperor Got Clothes?

Janek Ratnatunga¹ and Erwin Waldmann

Abstract

Transparent Costing (TC) is a framework for determining the full indirect costs and thereby the full costs (FC) of *Australian Competitive Grant* (ACG) research projects; with the objective of ensuring the full funding of these projects so that they could be sustained in the long-run, and preventing their cross-subsidisation from other revenue sources. As such, the indirect costs of university research activities needs to be allocated to ACG related projects via a TC exercise. It was found in this study that whilst the objectives of FC appear worthwhile, FC may not prevent the practice of cross subsidisation. Also whilst it was found that TDABC is preferable to ABC in the TC modelling of ‘research only’ departments and institutes; both approaches do not provide accurate information in ‘teaching and research’ departments. In these departments more accurate estimations could be obtained from studying the workload allocation methods and conducting direct interviews of the staff undertaking research on ACG and other externally funded grants.

Keywords: Transparent Costing, Australian Competitive Grants Register (ACGR), Sustainable Research Excellence (SRE), Full Cost of University Research, Time-Driven Activity-Based Costing

Acknowledgements:

We wish to thank Mr. Chris Jolly, Manager Financial Projects of the University of South Australia (UniSA) for his assistance in the authors’ understanding of the TC Methodology as implemented at UniSA, and the permission given to use Figures 4 and 5 which were developed by him. However, views expressed in this paper are purely those of the authors and not of Mr. Chris Jolly or the Finance Unit of UniSA.

¹ Corresponding author: janek.ratnatunga@unisa.edu.au

Transparent Costing: Has The Emperor Got Clothes?

1. Introduction

Transparent Costing (TC) is a framework for determining the indirect costs associated with *Australian Competitive Grants* (ACGs) research. It is a key platform of the *Sustainable Research Excellence* (SRE) program introduced by the Australian Government, and is in addition to the direct funding provided through the *Research Infrastructure Block Grant* (RIBG) scheme. Essentially, TC aims to quantify the indirect costs of ACG research in order to ostensibly get a clearer picture of the potential shortfall in the full cost of research funding provided by the Australian Government.

Information about all of the above programs can be found on the website of the *Department of Innovation, Industry, Science and Research* (DIISR). On this site, it is stated that the dual objectives of the SRE program are to: (1) help address an identified shortfall in the funding available to meet the indirect costs associated with ACG research; and (2) support universities to build and maintain research excellence through the implementation of best practice financial management, performance and reporting frameworks. The first of these objectives reflects a need for additional support to universities to meet the project related infrastructure costs associated with ACG research and enhance the development and support of university research infrastructure more broadly. The second objective, referred to as *Excellence in Research for Australia* (ERA), distinguishes SRE from the RIBG and other research block grant programs, and recognises that achieving research excellence on a sustainable basis is dependent on a university's capacity to strategically manage its resources to meet the costs associated with research activities. It also recognises a need for mechanisms and incentives to support universities to stretch their research performance over time (DIISR, 2010).

From 2013 the SRE will be worth approximately \$300 million annually, spread across the national sector. DIISR guidelines indicate that the SRE is divided into three elements: Base, Threshold 1 and Threshold 2. To access Thresholds 1 and 2, which contain 80% of the funding; universities have to take part in the Excellence in Research for Australia (ERA) initiative and the 2010 trial of TC. All 41 eligible Higher Education Providers have agreed to participate in TC and ERA (DIISR, 2010).

2. The Argument For A Full Research Costing Model

Currently, Australia has a dual support system for funding university research. The two components of this system are competitive grants, such as those awarded by both the Australian Research Council (ARC) and the National Health and Medical Research Council (NHMRC), and block grants such as the Research Infrastructure Block Grants (RIBG) Scheme. This dual funding model promotes diversity in research through flexible financing mechanisms. Research funding is based both on performance-related criteria and on formula-based processes. This is seen as providing a degree of equity and transparency in the allocation of public research funding.

However, there are perceived weaknesses in this dual funding model since universities, funders and government lack the detailed information necessary to calculate and attribute the direct and indirect costs of research. As a consequence, the funding providers have not had an 'in principle' commitment to the systematic funding of the full economic costs of doing research, and hence there is no commitment that the project will sustain in the long-run. Universities in Australia and overseas have long expressed concerns that research grants do not cover administrative, technical and other overheads (AVCC 1996). This means that for research projects to be completed, other means of indirect funding is often required, and if not available, the projects cannot be sustained. The argument put forward by the Australian Government is that sustainable funding arrangements can only be set in place if evidence relating to the quantification of the full (direct and indirect) cost of research in Australian universities is presented. The key to the collection of indirect cost data is the TC project.

The basic argument in favour of moving to a model of full economic costing of university research is that such research should be fully costed and subsequently funded, and not cross subsidised from other sources of revenue (such as international student fees), or from cost savings (such as not recognising in many instances the time expended by the Chief Investigator (CI) on the project)). Other indirect costs that support research activities but are often neglected in the cost models are (i) information and communications technology (ICT) support, (ii) human resources (HR) services; (iii) financial services; (iii) space and office space; and (iv) security and cleaning. These costs are not explicitly covered by competitive research grants or block grants for research.

Another argument put forward for the full costing of research is that chronic under-funding of university research can lead to cost cutting in other areas, such as: (1) deferring (or at worst abandoning) investment in up-to-date research equipment, facilities and other supporting infrastructure; (2) deferring maintenance of both research and teaching facilities- thus making it harder to attract the best staff and students, reducing the efficiency of research activity, and potentially creating safety issues.

Finally, under-funding of research can also have an adverse impact on university staff engaged in research. This includes a lack of employment security, excessive workloads and high level of workplace stress. It is argued that this will severely impact on Australian universities' capacity to attract and retain high level researchers to engage in world class research (Winefield, et. al., 2008).²

The Allen Consulting Group was commissioned by DIISR to identify and evaluate the evidence underlying these issues, and in its report of November, 2008 stated that the benefits of recognising the full cost of university research (including direct and indirect costs of administrative and capital overheads) would ultimately facilitate better research outcomes for the entire community.

In particular, the Allen Report (2008) claimed that understanding the full cost of research enables: (i) better resource allocation; (ii) transparency of any cross-subsidies; (iii) improved asset management; (iv) better understanding by researchers of the costs associated with research activity; (v) integration of financial and academic decision making; (vi) up to date and consistent information for project costing and pricing; (vii) benchmarking on a reasonably consistent basis; and (viii) sustainable performance quality.

Various approaches have been adopted internationally to capture the full costs of research. In the USA, government funding agencies make contributions towards the overhead costs of research grants on the basis of negotiated rates (which vary from university to university). The United Kingdom and some other countries have adopted a full cost accounting approach, with government funding agencies making 'in principle' commitments to meet the full costs of research. Each of the above approaches has advantages and disadvantages. For example, it has been argued that the formula approach can reward those universities with high management costs, at the expense of others whose management structures are leaner (Allen Report, 2008).

3. Models of Indirect Research Cost Allocation

The issue of funding indirect costs associated with competitive research grants was considered by the USA government in 1958; closely followed by the United Kingdom, Canada, New Zealand, Ireland, the Netherlands, Sweden and more recently the European Union (EU). The Allen Report (2008) found some variations between countries as to what can be included in indirect costs. In addition, different terminologies are also in use. The most common way in which indirect costs are expressed is as a percentage of direct costs.

² Research staff issues often erroneously seen as direct cost funding issues, although if a project is abandoned due to the underfunding of indirect costs, then direct costs are eliminated as well. Note however that, in Australia, institutions can spend indirect cost SRE funding on research staff.

The report also shows examples of indirect costs being expressed as a percentage of total (i.e. direct plus indirect) costs or as a percentage of direct payroll costs. The approaches that are used in different countries are detailed in Appendix 1.

The approach used by the United Kingdom is termed *Transparent Approach to Costing (TRAC)*. An ABC approach is used to calculate the full economic costs (fEC) of research projects by providing a basic set of costing tools that enable CIs to record their time in relation to research projects (UK JCPSG, 2000; UK JCPSG, 2001; Clements et al, 2002; UK BERR, 2008).

Costs are reported under three categories; Teaching, Research and Other; and the Teaching and Research categories are further broken down into publicly and non-publicly funded categories. There are three cost types: (1) academic staff; (2) academic services, and (3) infrastructure, and costs are measured on the basis of academic time, square meters of space, and capital costs. Although TRAC was initially an annual retrospective allocation of costs, now payments are based on forecast fEC. The UK experience with TRAC is clearly having an influence within the EU and across Europe; and now more recently in Australia with the introduction of the Transparent Costing (TC) framework.

4. The Transparent Costing Framework

The TC framework is based on two components: (1) An ‘all academic staff’ survey to determine average time spent per full time equivalent (FTE) researcher on ACG research (a two-thirds response rate is needed); and (2) the calculation of a set of allowable indirect costs. The DIISR states that it is working cooperatively with the Higher Education sector in a trial of the 2010 TC framework. The results of this 2010 trial will inform the design of the final TC framework to be adopted under the SRE program and form the basis of allocation under the *Threshold 2* element of SRE in 2011.

The definition of *direct costs* is the same as that used in commercial organisations, i.e. it is an expense that can be traced directly (or identified with) (or attached) to a specific cost object (or cost centre) such as a department, process, product or project. An *indirect cost* cannot be so identified. A more simple definition is that direct costs are expenses that are not shared amongst different cost objects and indirect costs are shared expenses and thus need to be allocated (or shared) amongst different cost objects. The cost object of university research is the ‘research category’ (e.g. such as the Australian Competitive Grants category) and direct costs are those costs directly attributable to such research categories including consumables and researcher salaries (see Table 1).

If a Chief Investigator (CI) works only on a particular project, then his/her salary may be a direct cost and occasionally it is specifically requested for in grants (mostly as teaching relief). However, if a CI works on a number of projects in different research categories (as

well as undertaking teaching and administrative duties) then his/her salary is shared between different cost objects, and is by definition an indirect cost, and is generally not provided for in grants.³ Other indirect costs that institutions incur to support research, but are not attributable to individual research projects are also given in Table 1.

In the trial TC project the indirect costs of competitive research will be calculated as a percentage of the revenues received from competitive grants. Most OECD countries use a ratio to ascertain direct-indirect cost relationships, rather than determining actual direct-indirect costs on a project-by-project basis (Allen Report, 2008). This is the reason that the ultimate objective of the Australian TC exercise is to obtain a ratio for the funding of indirect costs. However, it must be noted that using ratios to allocate shared costs is compatible with traditional cost accounting methodologies, rather than activity based cost (ABC) allocation methodologies.

5. Competing Activity Based Cost Allocation Models

5.1 Activity Based Costing (ABC)

In the past, due to the limited availability of cost data, simplified assumptions about cost behaviour were adopted in developing traditional volume-based cost allocation models (Cooper and Kaplan, 1988). Today, when organisations operate in stable environments, with low variability in outputs, these models still enable a reasonable allocation of indirect costs. However, when the complexities in the business environment increase, these traditional volume-driven costing models are less capable of providing accurate cost information (Cooper, 1987; Drury, 1990).

To address the weaknesses of traditional volume-based cost allocation models the *activity-based costing (ABC)* was developed in late 1980s (Figure 1). The adoption of the ABC model helps organisations to avoid product/service/project cost cross-subsidisation by allocating resource costs through the multiple activities performed at different levels within an organisation (Cooper and Kaplan, 1988; Swenson, 1995; Cohen et al., 2005).

³. Such CI costs should be allocated as an indirect cost. However, in Australia, the DIISR precludes the inclusion of such CI costs as indirect costs, and will not fund it under SRE. As such, these CI costs remain as a large 'black-hole' in the quest towards understanding the FC of research projects.

Table 1: Direct and Indirect Research Costs

Direct costs	
Staff costs	Salaries (and on-costs) of scientific and technical personnel assigned/involved in research projects directly.
General operating costs	Consumables, travel, fieldwork costs, conferences, recruitment and relocation of project specific staff assigned/involved in research projects directly.
Equipment depreciation, usage and rental	For equipment used only for project and costing more than a specified amount, cost of using equipment including maintenance and decommissioning, specialised support staff and pro-rata depreciation. Cost of Leased Equipment used only for project.
Subcontracting	The cost of external services required only for the project.
Travel	Travel costs and subsistence required only for the project
Consumables	Only project specific items.
Certification	Financial and other statements and reports specific to project.
Computing	Only project specific items are direct costs.
Indirect costs	
Support staff costs	Salaries of staff that support researchers, administration Cost of using premises based on depreciated cost or cost of replacement Building depreciation * Renovation and maintenance of research spaces and equipment. Custodial, security, utility, leasing and capital planning costs associated with research spaces and research equipment. Insurance on research spaces.
Facilities & Resources	Technical support for laboratories, offices, animal care and other facilities. Equipment depreciation * Interest expense related to facility construction * Operations and maintenance expenses Acquisition, custodial, security, utility, leasing, and capital planning costs associated with libraries, databases, telecommunications, and information technologies, systems and research tools. Insurance on research equipment and vehicles. Research planning and promotion. Help for researchers to prepare research proposals. Public relations.

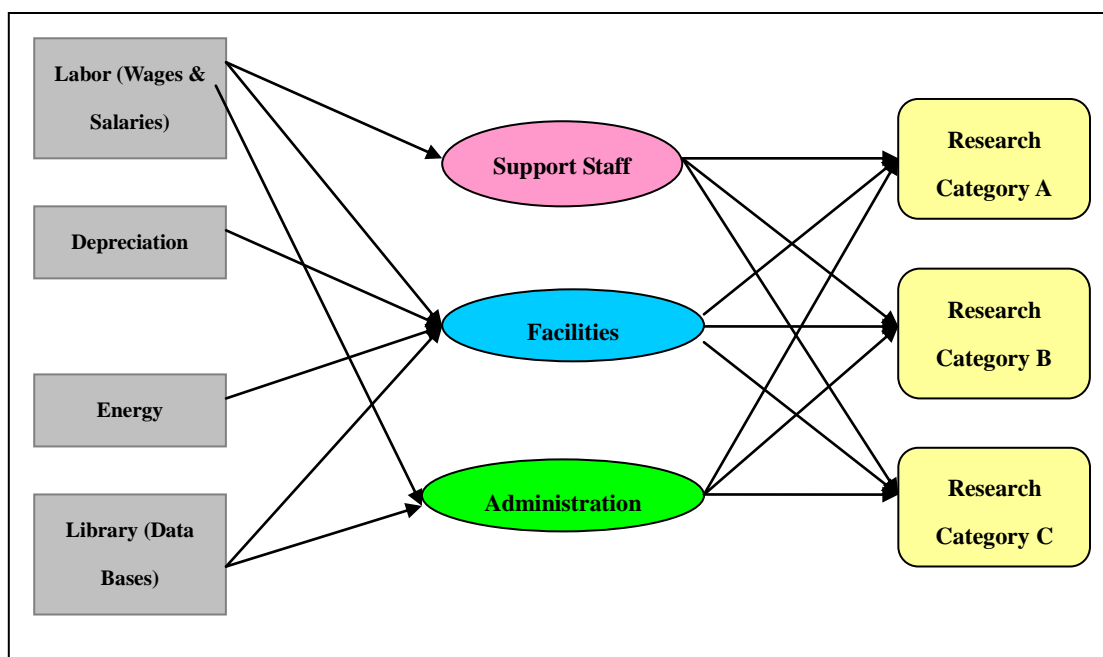
continued

Table 1: Direct and Indirect Research Costs (cont)

Management & Administration	<p>Training of faculty and research personnel.</p> <p>Financial and other administrative services.</p> <p>Acquisition, maintenance and upgrade of information systems to track grant applications, certifications and awards.</p> <p>Human resources and payroll, including the salaries and benefits of employees who support the research enterprise, and who are not already funded through a direct research grant.</p> <p>Purchasing, audit, health and safety costs.</p> <p>General administration and general expenses</p> <p>Departmental administration.</p> <p>Sponsored projects administration.</p> <p>Student services.</p>
Regulatory requirements & accreditation	<p>Creation and support of regulatory bodies.</p> <p>Training of faculty and other research personnel in animal care, ethics review, radiation and biohazards.</p> <p>Costs for international accreditation related to research capacity.</p> <p>Upgrades to facilities and equipment to meet requirements.</p>
Intellectual property	<p>Creating, expanding or sustaining a technology transfer office or similar function.</p> <p>Reports of invention patent applications, licensing, and creation of spin-off companies.</p> <p>Communications and outreach activities undertaken to transfer knowledge through venues not eligible for funding under other federal programs.</p> <p>Marketing of teaching materials, scientific photo libraries, survey instruments, statistical packages, data sets and databases, software and computer models.</p>
Libraries	<p>Journal subscriptions, books and librarian salaries.</p>
<p><i>* Note: The Australian TC 2010 trial does not allow for depreciation or borrowing costs to be included</i></p>	
<p>Source: Compiled from the Allen Report (2008)</p>	

While the ABC model is technically superior to traditional cost allocation models, it has had limited success in replacing these traditional costing models. In addition to criticism in terms of methodology (Anderson, 1995; Malmi, 1997; Gossselin, 1997; Krumwiede, 1998, Gossselin, 2007); there has been criticism from users due to its complexity in implementation. Kaplan (one of the originators of the ABC approach) himself acknowledged this criticism and recommended its abandonment (Kaplan and Anderson, 2007).

Figure 1: ABC Model for Research Categories: Cost Flows



Commonly cited reasons for failures in adopting and implementing the ABC model at the start-up phase included: (i) the long time taken to collect data requiring significant resource commitments; (ii) the need to recognise too many activities and cost drivers in order to deal with organizational complexity, thus requiring high data processing capacities and (iii) the non-recognition of unused capacity in the statements of time. Another problem encountered causing projects to be abandoned was the complexities of maintaining/updating ABC-based cost management systems in large organisations often necessitating repeat interviews in order to allot time to the activities (Kaplan and Anderson, 2004; Pernot et al., 2007).

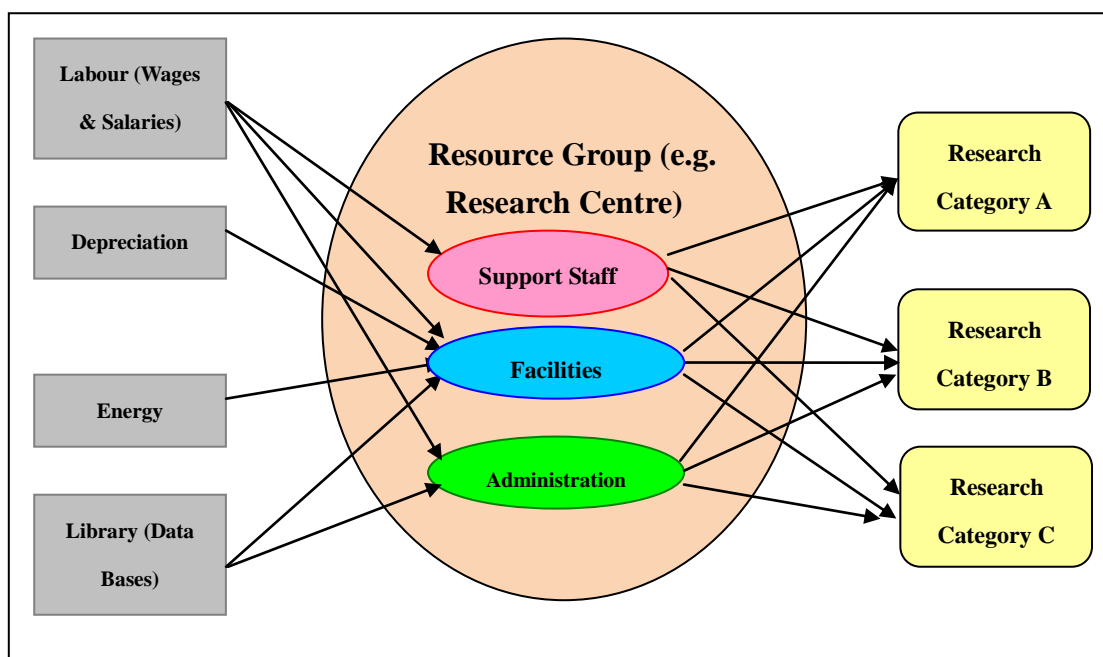
5.2 Time-Driven Activity Based Costing (TDABC)

As the ABC model failed in many projects to provide a cost-effective and sustainable cost management solution (especially due to difficulties in allocating resource costs into activity cost pools), the *Time-Driven Activity-Based Costing (TDABC)* model was developed as a successor to the ABC model. This model was proposed by Kaplan and Anderson in 2004 as a method in its own right, although the first traces of this approach could be found in the Kaplan and Cooper publication of 1998 (Kaplan and Cooper, 1998, p. 292-296).

The TDABC model was designed to address the implementation problems of the ABC model, especially the difficulties in activity analysis and data collection. The TDABC

model is a variant of the ABC model which is specifically designed to simplify the implementation and maintenance of activity-based cost management systems (Kaplan and Anderson, 2004; 2007). The main difference between the two methods is that whilst in the ABC method employees are asked how long they spend on different activities in order to link costs with the activities; in the TDABC method, the time taken to perform these tasks is simply estimated by the cost modellers (using contextual ‘in-situ’ observations, face-to-face interviews and comparative information). The model is designed to address the difficulties faced by management in the implementation of an ABC-based cost management system through the removal of activity pools and the use of quantity-based resource-activity cost drivers. It is based on an equivalence approach which uses duration drivers (standards of working hours) instead of transaction drivers (Everaert and Bruggeman, 2007). The standards can be revised when conditions change. To properly implement the TDABC model, organisations would need to combine standard costing into the ABC methodology.

Figure 2: The TDABC-Based Costing Model: The Resource Groups (Multi-Driver) Variant



Converting an ABC-based costing model to a TDABC-based one should be a relatively simple process. Relationships between resource cost pools, activities and cost objects identified in the ABC-based costing model can be adopted in TDABC-based model via ‘resource groups’ (e.g. support staff, facilities, administration) using multiple time-based drivers to allocate costs to cost objects or using a single time-based driver if there are complexities in the collection of data. Figure 2 illustrates the allocation via a resource group

using multiple-drivers and Figure 3 illustrates the allocation via a resource group using a single time-based driver.

A ‘resource group’ could be an organizational unit, department or research centre that may consist of many different activities. As there are less “resource groups” than activities, the method is claimed to be reduce the complexity of data collection and reduce measurement errors. This is due to the use of time standards. In ABC, complex operations required adding more and more activities into the model. In TDABC, this complexity is accounted for by using ‘equivalent-time’ equations to determine how much of the resource each group consumes. Equivalences are established in a “resource group” by means of a single driver, which is the time needed to perform them. Using these equivalency equations, it is claimed that the model is easy to update; i.e. adding an extra activity (if performed within a resource group), adding variables to explain the time spent, taking into account changes in productivity, etc., and thus no longer present an ongoing maintenance problem. It is not necessary to conduct regular and time consuming surveys just to determine if the distribution of work time between different activities has changed; which simplifies maintenance of the method and enhances sustainability of the costing project. All that is required is that regular surveys are conducted to ensure that these equivalent-time standards remain consistent with the latest practices in the organisation.

At first glance, the TDABC-based model shown in Figure 2 does not look much different from the ABC-based model in Figure 1.⁴ The two models share the same resource cost pools, the same activities and the same cost objects. The difference is merely that the activity-cost pools reside within a ‘resource group’ and some cost drivers are converted to equivalent-time drivers (Kaplan and Anderson, 2004; Barrett, 2005). In Figure 3, however, a single-time based driver is used to allocate all of the diverse activities of a resource group to the cost objects.

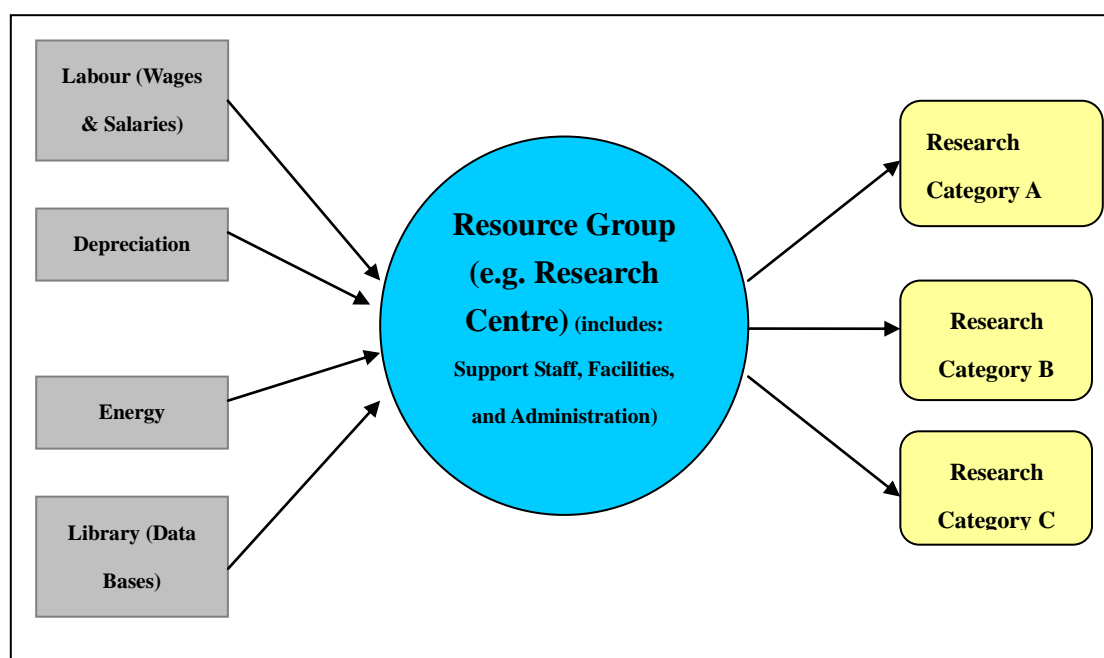
The value of a resource time-activity cost driver is equal to resource costs for a unit of the resource (hours) multiplied by the number of hours for an activity (Kaplan and Anderson, 2004; Everaert and Bruggeman, 2007). The number of resource-activity cost drivers between a resource pool and a cost object depends on each activity’s resources consumption patterns. For instance, in Figure 2, wages and salaries cost is consumed by all of the activities (such as support staff, facilities, administration) whilst energy cost bear no relationship with the support staff activity. Therefore, wages and salaries cost is linked to

⁴ The basic TDABC model is in fact an ABC model that uses time as a cost driver, where the obtaining of structural cost drivers is cumbersome (e.g. standard time to process a research questionnaire rather than the total number of questionnaires; or the standard time to write a research grant rather than the total number on grants).

each cost object through three separate resource time-activity cost drivers, whilst energy cost is only linked via one.

The differences arise when the links to cost objects are through a resource group (consisting of all related activities) using a single time-based driver (and not via separate activity pools) (Figure 3). Here some simplifying equivalent-time assumptions need to be made. For example, with regards to the ‘support staff’ activity, each cost object (i.e. research category) is assumed to consume a similar proportion of support staff capacity/time as the facilities and administration activities. Here the complexity of support staff activities is assumed to be related to the complexity of the research project in a particular category in terms of the whole resource group.

Figure 3: The TDABC-Based Costing Model: The Resource Groups (Single-Driver) Variant



Supporters of the TDABC model suggest that such simplified cost management systems can provide just as accurate cost information, whilst removing the need for performing costly and time-consuming employee surveys to maintain the costing model (Kaplan and Anderson, 2004; Barrett, 2005). According to Kaplan and Anderson (2004), TDABC simplifies the ABC method in two significant areas: (i) the number of activities is reduced and the analysis is made at the level of the departments or of the processes;⁵ and (ii) the need to collect information from different services is limited because of the use of

⁵ Kaplan and Anderson (2004) present a case study where some 1200 activities have been reduced to 200 processes.

standards, where different types of drivers are expressed in terms of only one ‘equivalent-time driver’.

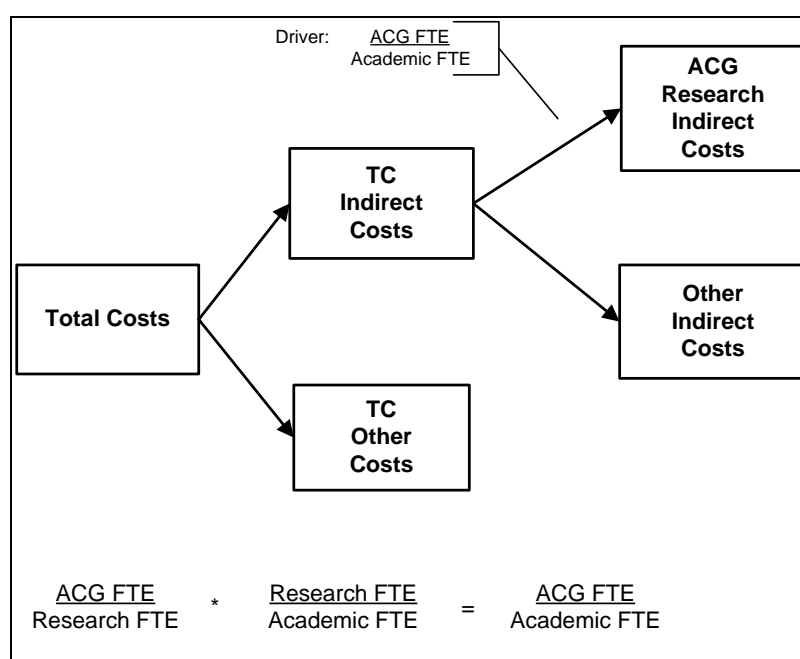
However, detractors of TDABC would claim that as one reduces the number of cost drivers used for allocation, the single-driver TDABC model (Figure 3) would produce results very similar to those obtained via single-driver traditional cost models, and thus over-simplification would produce significant cost distortions.

6. Transparent Costing in Australia: A Case Study

Universities in Australia were given the option of two approaches to determine the cost of indirect costs: (1) the simple (alternative) approach of obtaining known and allowable indirect costs and applying a single driver to separate ARG research and other indirect costs (Figure 4); and (2) the preferred approach of obtaining a more comprehensive picture of indirect costs by undertaking a full TC exercise, and then using a single driver to separate ARG and Non-ARG indirect costs of research activity (Figure 5).

Using manufacturing cost allocation techniques as a comparison, the ‘alternative’ approach (Figure 4) is akin to ‘Traditional’ costing, where the total manufacturing indirect costs are allocated to cost objects using a single (direct-labour hours) cost driver; and the ‘preferred’ approach (Figure 5) is akin to the single-driver TDABC model (Figure 3), where once again the driver was similar to direct-labour hours. In both options, indirect research costs were allocated to cost objects based on the research effort of CIs (direct-labour hours), even though the cause-effect relationship between the two could be very tenuous.

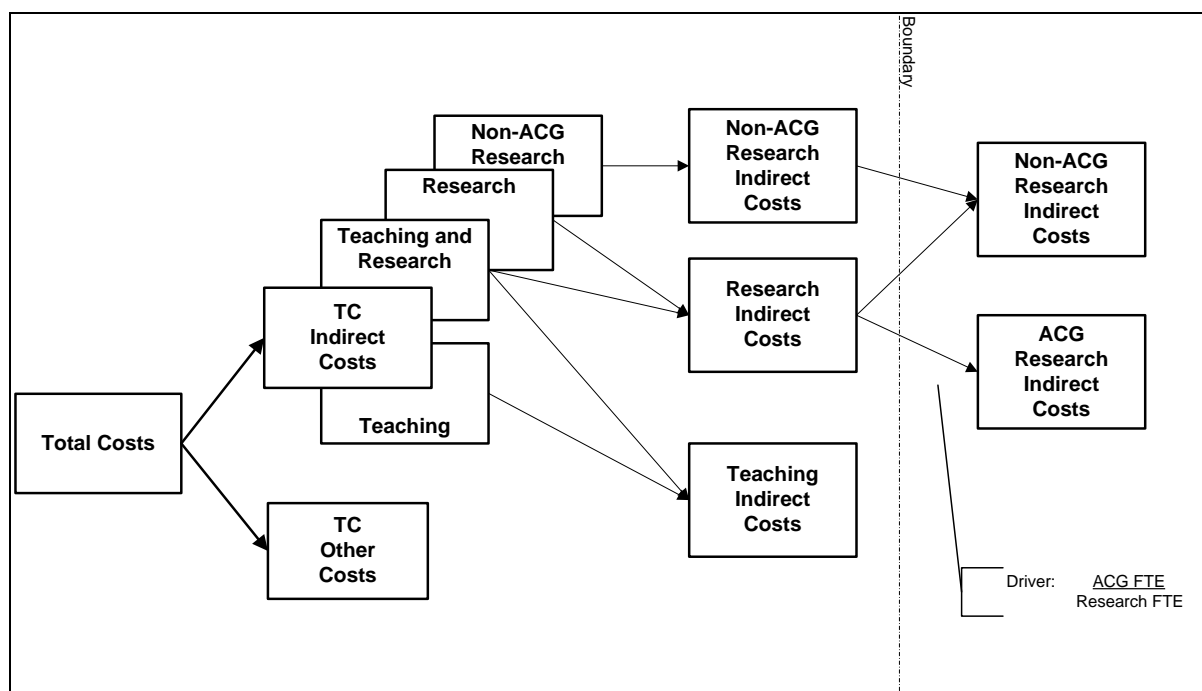
Figure 4: The Alternative TC Model



The University of South Australia (UniSA) has chosen the ‘preferred’ option and undertaken the initial stages of a TC exercise to determine the indirect costs associated with its research activities. The model used is an extension of the ABC models developed in the university for other cost allocation purposes; e.g. the costing of teaching programs, etc.

As one of the most sensitive drivers is the time spent on research activity by academics who are also undertaking teaching, administration and other community activities, UniSA decided to undertake a comprehensive questionnaire survey of its ‘research active’ academic staff.⁶ As such, in the first half of 2010 all such staff were asked to participate in two time-use surveys as part of the TC exercise.⁷ The importance of this survey was made clear to staff; since undertaking TC is a requirement for UniSA to access 80% of the funding available through the Sustainable Research Excellence (SRE) fund.

Figure 5: The Preferred TC Model



The TC survey tool was made available to ‘research active’ academic staff either directly or via the Staff Portal. As those surveyed needed their login details to access the survey or the Staff Portal, non-research active staff had no access to the survey tool. A

⁶ UniSA has a system that automatically generates a list of its research active staff (called ‘Supported Researchers’) for a particular year, based on a minimum level of publications and conference proceedings within a set period of time

⁷ Delegation of entry of the survey data to another staff member, with permission, was possible.

problem that emerged was that the list of 'research active' academic staff was as based on audited publications up to the end of calendar year 2008 (with 2009 still being compiled at survey date); thus new researchers appointed to UniSA in 2009 were left out of the survey. This could bias the data as UniSA had recruited well, in terms of staff with good research potentials in 2009.

It was made clear to all respondents that the survey was not confidential as responses and demographics needed to be traceable. However, they were assured that the response data would only be visible to the survey administrator and would not be used for any other purposes.

Respondents were asked to fill in the hours spent each day in the relevant time use pertaining to a particular cost object (i.e. research category). Time had to be entered in hours and up to two decimal places could be used to represent minutes, e.g. 1 hour 15 minutes was to be entered as 1.25 hours. It was important that the total hours for each day must add to less than 24 hours. If the respondents had JavaScript turned on, the total hours per day and per category would be automatically calculated when entered. An error message would be generated if the total hours per day exceed 24. If JavaScript was off, a 'Display Totals' button was still visible; which enabled totals to be calculated when the button was pressed. If any day had a total greater than 24 hours an error message was be generated and the survey could not be submitted.

Respondents were told that Saturday and Sunday were to be included in the survey to capture any work done outside of Monday-Friday, which is in keeping with research activity patterns of most academic staff. Also identified but not included within the hours across activities was the time spent writing grant applications to the relevant research category. In such cases the respondents were asked to assign the time to the specific grant being applied for; i.e. time spent writing ARC and NHMRC grants would need to be assigned to Australian Competitive Grant (ACG) Research category.

Respondents were also asked to assign time spent discussing research with Higher Degree Research (HDR) students to the relevant research category, i.e. time discussing research with ACG associated HDR students should be assigned to 'ACG research'. Other, non research time spent with HDR students should be assigned to the category 'Training of your own HDR and honours students'. However, academic staff were asked not to include in the survey the time spent on researching towards their own HDR degrees (if they were undertaking such). It was expected that the survey would take approximately 15-30 minutes to complete.

At UniSA, 450 Full-time Equivalent Research Active Academics (termed 'Academic FTE' in Figure 4) were targeted, and there were 366 usable responses (91.5% response rate). Based on such responses, the 'Academic FTE' were separated further into those that

were research active during the sampling period (termed 'Research FTE' in Figures 4 and 5) and then separated still further into those that were research active on ACG projects during the sampling period (termed 'ACG FTE' in Figures 4 and 5).

In the 'Alternative' method (Figure 4), the indirect costs 'allowed' for the TC exercise are then required to be separated into ARG research and other indirect costs by using a driver that is a ratio of 'ACG FTE' to 'Academic FTE'. In the 'Preferred' method (Figure 5) adopted by UniSA, the TC indirect costs are separated into Research and Teaching categories, and then the Research indirect-costs are separated as ARG and Non-ARG indirect costs by using a ratio of 'ACG FTE' to 'Research FTE' as the driver. The key to either method was the accurate collection of research and teaching activity of staff in the sampling period.

However, a number of issues arose in the data collection process. Many research active staff were opposed to the survey technique utilised, considering it to be another imposition by administrators on their limited time, which could be better spent on researching. They also found it difficult to accurately state their research work time, as unlike employees in manufacturing and service organisations, there was no regular pattern to their research activity. It was very possible that in a particular week no research activity was undertaken, and in another week intensive research was conducted. Whilst one could argue that these variations would average out by using two time-use surveys (i.e. two separate weeks), the view was that this was not enough to capture the rich diversity of research practices. Serious questions arose if data collection techniques developed for factory workers and white-collar employees could be used on researchers, especially those that had teaching and administrative responsibilities.

Comments were heard that the survey period was itself problematic as the first was just *before* the start of the academic year, when most academics were concentrating on fine-tuning their teaching programs; and the second survey was just *after* the start of the academic year, when most academics were sorting out student related matters such as timetabling and tutorial assignments. As a result of these concerns, the UniSA survey administrators had to send many reminders for research staff to complete and submit the two survey tools. Heads of Departments were asked for assistance to boost response rates. An ad-hoc telephone survey by one such Head of a large teaching department with a very high number of academics (75) and a large student cohort (3,700), indicated that there was a tendency to over-estimate research time, as this was seen as what was expected of a 'good corporate citizen'. All of the above concerns raise serious questions as to the validity of the data collected.

It must be remembered that the reason for introducing the ABC approach in manufacturing was because the use of 'labour hours' as a rate was much criticized as giving faulty cost allocations resulting in cross-subsidisation. It was argued that the direct labour

hour as a means of sharing indirect charges was no longer in keeping with changing production technology and the value creating process of organisations (Johnson and Kaplan, 1987; Lebas, 1995; Lorino, 1989, Mévellec, 1993). In saying this, the authors were referring to considerably automated industrial activities. Although the problem is not the same when we consider service activities where labour remains an essential resource, these resources usually work to a set work-pattern. Even in highly knowledge-intensive service organisations such as legal firms and accounting practices, the work patterns are more predictable than that of researchers (especially those working in teaching departments that do their research whenever they can ‘fit-it-in’).

Even in organisations with reasonably regular work-patterns, the academic literature indicates that labour times are difficult to measure. For example, Kaplan and Anderson (2003, 2004, 2007) are critical of a common practice whereby employees are asked to estimate the percentage of time spent on their various activities. Often, they claim, the total of these percentages is equal to or greater than 100%, even though in most cases there are some unused capacities. The costs of the drivers are therefore, more often than not, biased. In the UniSA survey tool, by using a 24 hour limit, the idle-capacity issue was totally ignored.

Cardinaels and Labro (2008) show via an experimental analysis⁸ that an evaluation of time in minutes results in considerable overestimation of the time spent and that an estimation in terms of percentages of time appears to be preferable to an evaluation in minutes. The overestimation error may be as high as 35%. The UniSA survey used time, rather than percentage estimations, and this coupled with the perception amongst respondents that they should be undertaking research in any given week to be a good corporate citizen indicates that the overestimation error could be as high as 50%.

Allain and Gervais (2008) show that in service activities⁹, a more or less reliable time estimation is only possible if the ‘customer’ has little influence on output. In such cases idle time which is generally not insignificant (although not always unproductive), tends to be masked. The ‘customer’ for most research work is most often the editor and referees of research journals, and these individuals have a significant influence on output, which again indicates that a time-related survey method would produce highly erroneous results. In the case of some research work, the time spent on computers and other research instruments may help in constructing time spent on research, although Allain and Gervais (2008) found

⁸ The people involved in this experiment performed a series of tasks for which they later gave the estimated time spent. The exact time spent on each task was recorded by computer.

⁹ The test concerned a call centre.

that the use of computers to facilitate self-observation did not aid the recording of the total time spent in a day's work.

It appears that due to all of the above data collection issues in implementing ABC, the TDABC approach of determining the time necessary to perform tasks by means of a direct estimation in minutes or hours would have been preferable. In the case of UniSA, instead of asking research active staff to estimate their research related time, overall estimations based on 'in-situ' observation, face-to-face interviews and comparative information could have been used by the cost-modelling team to obtain 'equivalent time' spent on research within resource groups. After all, TDABC sets out in particular to give greater consideration to the variety and complexity that is found in service organisations (as against those encountered in manufacturing). In fact, all the examples provided in the work of Kaplan and Anderson (2007) on TDABC are based on service activities.

However, Hoozée and Bruggeman (2007) observed that, in the Belgian division of an international company that uses TDABC, the errors in time estimations were 49% due to the incorrect specifications; 30% due to imprecise evaluations of the time spent on certain tasks and 21% due to the lack of updating further to significant process changes. Therefore, one might argue that the 'time-estimations' approach of TDABC is also not relevant in the case of research activities due to the diversity of research practices across a university that precludes obtaining comparative information, and the impracticability of cost-modellers conducting 'in-situ' observations and face-to-face interviews.

7. Discussion and Conclusion

This discussion was focused on three questions (1) will a 'full-costing of research' model meet its stated objectives; (2) if so, is TC able to provide accurate indirect cost information from a cost-benefit viewpoint and (3) are there alternative models to TC?

The stated reasons for a FC model were: (i) that research costs be fully funded by funding organisations so that research projects can be completed and (ii) there is no cross-subsidisation of the under-funded portion of research costs from income generated from other sources (e.g. teaching revenue from international students undertaking coursework programs).

With regards to the first objective, there is inadequate research as to the lack of project completions as a result of inadequate funding, in the area of ACG research. This is because the 'completion' of an ACG research project occurs when the paperwork is submitted on 'how the grant money was spent'; and not on the 'outcome achieved' (such as the publication of a paper). This can be contrasted to Research and Development (R&D) carried out in a business organisation, or R&D pertaining to (say) a Defence contract. Here, a clear end result (a product, process, or innovation) is aimed for. In such cases, if the money

runs out, then the outcome is not delivered. In the case of ‘pure-research’ in universities, as the outcome is so unpredictable, the possibility that a lack of funding could result in a project being abandoned could only be logically deduced.

With regards to the second objective of an FC model, there is overwhelming evidence that significant cross-subsidisation of research does take place. Many teaching departments in Australian universities have appointed ‘research-only’ staff, principally funded from teaching revenues. Even in the case of researchers who also have teaching responsibilities, the ‘buy-out’ of their teaching (as a CI in most ARC grants) is costed as a fraction of their actual costs, often at tutorial rates. However, will funding based on an FC model reduce (let alone eliminate) cross-subsidisation? Ad-hoc discussions with Heads of teaching departments in Australian universities (carried out as part of this study) indicate that the cost-savings obtained (due to increased revenue from Funding bodies) will be utilized to appoint still-more research active staff. Although this behaviour is perhaps in keeping with the Australian Government’s SRE objectives; it will not alleviate the cross-subsidisation problem.¹⁰ Further, as the Australian TC model specifically prohibits depreciation and finance costs being included as indirect costs, the appointment of more research-active staff (via cross-subsidizations provided by teaching revenue collected from full-fee paying students) can alternately lead or lag funding depending on the cycle of student enrollment (e.g. capital facilities need to be put in place prior to commencing direct research and teaching activities).

Even if FC will meet its stated objectives, the question arises as to the applicability of TC to provide accurate information from a cost-benefit viewpoint. The case study above relates to a large teaching department that is also undertaking research. Clearly the complexity of an academic workload that in addition to research includes teaching, administration and community service (often in multiple locations and varied delivery modes such as internal, external and online); and the variability of researching patterns of the academics in such departments; indicates that any attempt to obtain research-related time-measures will be fraught with danger. Whilst TDABC has an advantage over ABC in service organisations, obtaining ‘equivalent-time’ for the research activity of staff in teaching departments will most likely result in highly overstated estimates, and the costs of data collection would far outweigh the benefits (if any).¹¹ However, such estimations would be more relevant in university department and research institutes that are only

¹⁰ Although this discussion focuses on cross-subsidization of direct costs rather than indirect costs (as defined by DIISR and which are the concern of TC), significant indirect costs will also need to be cross-subsidized to ‘support’ the activities of newly appointed research staff.

¹¹ There will be a negative-benefit in obtaining erroneous information.

conducting research. Here, overall estimations based on ‘in-situ’ observations, face-to-face interviews and the study of comparative information could be used for TDABC modelling.

If TC is inappropriate for determining the indirect research costs of teaching departments, are there alternative models that are more reliable? To answer this question we need to consider how the ‘workload’ is distributed in teaching departments. The add-hoc rule is that most Australian University academics need to follow the 40:40:20 rule; i.e. that they will need to spend 40% of their time on teaching activities, 40% on research activities, and 20% on administration and community service, up to a maximum of 1,800 hours per year. Staff are able to obtain a reduction (or increase) of their teaching and administration activity if they commit to an increase (or reduction) of their research activity. In some departments such variations are by negotiation with the Head of Department; in others there are very formal models that link teaching activity to demonstrated research publications output over a set period. In such a teaching department, obtaining the resource costs of workload related research activities for each staff member would be a relatively easy exercise. Also, most often, not more than 10% of academics will be working on projects pertaining to external research grants, and these individuals can be targeted by the Head of Department to obtain accurate annual information as to percentage time spent between research categories. This approach will provide the accurate estimations required to undertake a TDABC modelling exercise in a cost effective manner.

In summary, whilst the objectives of obtaining FC appear worthwhile, the extra revenue generated from Funding bodies may not prevent the practice of cross subsidisation, as the additional revenue can be diverted for the recruitment of additional research active staff to undertake a greater overall level of research activities. This in turn will require still more investment in research infrastructure, and if this is not externally funded, then still more cross-subsidisation will take place. . Further, using TDABC is preferable to ABC in the TC modelling of ‘research only’ departments and institutes; but falls far short of providing accurate information in ‘teaching’ departments (that also undertake research). In the latter type of department, more accurate estimations than those obtained via TC can be obtained from studying the workload allocation methods and conducting direct interviews of the very few staff undertaking ACG and other externally funded grants.

8. References

- Allen Report (2008), Discussion Paper, prepared for the Department of Innovation, Industry, Science and Research, Allen Consulting Group, Canberra.
- Anderson, S.W., (2007), “Managing Costs and Cost Structure throughout the Value Chain: Research on Strategic Cost Management”, In Chapman, C. S., Hopwood, A.G., and Shield, M.D., *Handbook of Management Accounting Research, Vol. 2*, Oxford: Elsevier,

pp. 481-506.

AVCC (1996), 'University research: some issues', Australian Vice-Chancellors' Committee accessed on 25 August 2008 at <http://www.universitiesaustralia.edu.au/documents/publications/policy/statements/urissues.pdf>

Baird, K. M., Harrison, G. L., and Reeve, R. C., (2004), "Adoption of Activity Management Practices: A Note on the Extent of Adoption and the Influence of Organizational and Cultural Factors", *Management Accounting Research*, 15(4), pp. 393-399.

Barrett, R., (2005), "Time-Driven Costing: The Bottom Line on the New ABC", *Business Performance Management*, March, pp. 35-39.

Byrne, S., Stower, E., and Torry, P., (2009), "Is ABC Adoption a Success in Australia?", *Journal of Applied Management Accounting Research*, 7(1), pp. 37-52.

Clements, J, Blackshaw, L. and Breakwell, G., (2002), *Developing a Pricing Strategy in Higher Education Institutions*, Joint Costing and Pricing Steering Group, July 2002.

Cohen, S., Venieris, G., and Kaimenaki, E., (2005), "ABC: Adopters, Supporters, Deniers and Unawares", *Managerial Auditing Journal*, 20(9), pp. 981-1000.

Cooper, R., (1987), "Does Your Company Need a New Cost System?", *Journal of Cost Management*, 1(1), pp. 45-49.

Cooper, R. and Kaplan, R. S., (1988) "Measure Costs Right: Make the Right Decisions", *Harvard Business Review*, 66(9), pp. 96-103.

Cotton, W., Jackson, S., and Brown, R., (2003), "Note on a New Zealand Replication of the Innes et al. UK Activity-Based Costing Survey", *Management Accounting Research*, 14(1), pp. 67-72.

Department of Innovation, Industry, Science and Research (2010), *DIISR Budget Papers 2010*, Commonwealth of Australia, Canberra.

Drury, C., (1990) "Product Costing in the 1990s", *Accountancy*, May 1990, pp. 123-126.

Everaert, P. and Bruggeman, W., (2007), "Time-Driven Activity-Based Costing: Exploring the Underlying Model", *Cost Management*, 21(2), pp. 16-20.

Gosselin, M., (1997), "The Effect of Strategy and Organizational Structure on the Adoption and Implementation of Activity-Based Costing", *Accounting, Organizations and Society*, 22(2), pp. 105-122.

Horngren, C. T., (2004), "Management Accounting: Some Comments", *Journal of Management Accounting Research*, 16, pp. 207-211.

Innes, J., Mitchel, F., and Sinclair, D., (2000), "Activity-Based Costing in the U.K.'s Largest

- Companies: A Comparison of 1994 and 1999 Survey Results”, *Management Accounting Research*, 11(3), pp. 349-362.
- Johnson, H. T. and Kaplan, R. S., (1987), *Relevance Lost: The Rise and Fall of Management Accounting*, Harvard Business School Press, Cambridge, USA
- Kaplan, R. S. and Anderson, S. R., (2004), “Time-Driven Activity-Based Costing”, *Harvard Business Review*, 82(11), pp. 131-138.
- Kaplan, R. S. and Anderson, S. R., (2007), “The Innovation of Time-Driven Activity-Based Costing”, *Cost Management*, 21(2), pp. 5-15.
- Kiani, R. and Sangeladji, M., (2003), “An Empirical Study about the Use of the ABC/ABM Models by Some of the Fortune 500 Largest Industrial Corporations in the USA”, *Journal of American Academy of Business, Cambridge*, 3(1-2), pp. 174-182.
- McNair, C. J., (2007), “Beyond the Boundaries: Future Trends in Cost Management”, *Cost Management*, 21(1), pp. 10-21.
- Pernot, E., Roodhooft, F., and van den Abbeele, A., (2007), “Time-Driven Activity-Based Costing for Inter-library Services: A Case study in a University”, *Journal of Academic Librarianship*, 33(5), pp. 551-560.
- Ratnatunga, J., (1983), *Financial Controls in Marketing: The Accounting-Marketing Interface*, Canberra Series in Administrative Studies Monograph, No. 6, Canberra C.A.E., Canberra, Australia
- Sharma, R., and Ratnatunga, J., (1997) ‘Traditional and Activity Based Costing Systems’, *Accounting Education: An International Journal*, 6 (4), pp. 337-345.
- Sharman, P. A., (2003), “The Case for Management Accounting”, *Strategic Finance*, 85(4), pp. 43-47.
- Sprinkle, G. B., (2003), “Perspectives on Experimental Research in Managerial Accounting”, *Accounting, Organizations and Society*, 28(2-3), pp. 287-318.
- UK BERR (2008), “Frequently asked questions (FAQ) on Full Economic Costing (FEC)”, *UK Department of Business Enterprise and Regulatory Reform* accessed on 25 August 2008 at <http://www.berr.gov.uk/dius/science/science-funding/full-economic-costing/page16406.html>
- UK JCPSG (2000), *Pricing Toolkit for the Higher Education Sector*, UK Joint Costing and Pricing Steering Group, United Kingdom.
- UK JCPSG (2001), *The Use of Indirect Cost Rates in Costing Government Contracts: Technical Guidance*, Joint Costing and Pricing Steering Group, United Kingdom.

Winefield, A. H., Boyd, C. M., Saebel, J. and Pignata, S. (2008), "Update on National University Stress Study", *Australian Universities Review*, 50(1), pp. 20-29.

Appendix 1: Worldwide Indirect Research Cost Funding Methodologies

Country	Formula	Strengths	Weaknesses
The United States of America	Negotiated indirect cost rates capped at 35 % of total costs (or 53.8 % indirect costs as a percentage of direct costs).	Systematic procedure for identifying indirect costs	Some indirect costs not reimbursed
		Predetermined rates give stability for 2-4 years allowing universities to plan	Complexity of administration and accounting procedures
		Institutions have complete responsibility for distributing indirect costs	Pressure on institutions to accept less than their entitlement in order to successfully conclude negotiations
		Institutional rates vary to reflect different cost structures	
Canada	Three stage formula approach currently funding indirect costs to approx. 20% of total costs.	Special federal fund established to pay indirect costs	Indirect costs not fully reimbursed
			Indirect cost reimbursement formula unfair to larger research performing institutions
United Kingdom	Activity-based costing approach termed <i>Transparent Approach to Costing (TRAC)</i> used to calculate full economic costs (FEC). Projects funded 80%-100% of FEC.	TRAC perceived to give more accurate data on indirect costs than other approaches.	TRAC is relatively complex and resource intensive
		Creates awareness amongst academics about the need to accurately capture the full cost of research.	Activity-based costing is open to manipulation and gaming by individual academics.
		Government research funders have increased total investment	

continued

Country	Formula	Strengths	Weaknesses
Ireland	Separate grants to universities for indirect costs using an overhead rate of up to 25-30% on direct costs.	Empowers Vice Presidents responsible for research and leads to better institutional management of research.	Indirect costs not (yet) fully covered.
			Planning and reporting requirements associated with indirect cost recovery involves significant compliance costs.
Sweden	Direct and indirect costs are calculated on the basis of time spent on teaching and/or research. Current Rate about 35% of direct costs.	Recognition of the Teaching vs. Research nexus.	Indirect costs not (yet) fully covered as the average indirect costs for projects were found to be 52% of direct costs (thus the universities were receiving on average 78% of total project costs).
Other European countries	There were three cost models available: the Full cost model (FC); the Full cost with fixed rate model (FCF) where the fixed rate is 20%; and the funding of additional costs (AC). Currently moving to full economic costs (FEC) following the UK model.	EU Framework Program requirements are likely to drive a more uniform European approach to indirect costs	EU Framework Program procedures on indirect costs currently favour universities with full economic cost data, and underfund research projects in those that do not.
			Same issues as UK if ABC approach is used
New Zealand	Simple formula-based approach. The overhead recovery rate is determined by dividing total salary costs by the quantum of externally funded research.	Simplicity.	Only some project funding eligible for indirect costs.
		Full research costs recognised.	Government funding agencies have challenged methodology; and chosen to fund fewer “full-cost” projects.
Source: Compiled from the Allen Report (2008)			

