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A case for multiple methods in management accounting research

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A case for multiple methods in management accounting research

Abstract

The use of multiple methods in business and accounting research is not a new idea; however, the application of multiple methods is most usually advocated as an approach to the triangulation of research topics and themes on a between-studies basis. In 1997 Brownell and Whittred foreshadowed increased use of multiple methods within single study, management accounting research designs, and yet their prediction appears to have remained unrealised.

The current paper revisits the literature concerning the use of multiple methods in management accounting research, with particular emphasis on within-study approaches. A case for using within-study multiple methods is made and illustrated with a practical example from a recent study of the role of costs in outsourcing decision-making in Australian public sector organisations.

Emergent dimensions of this research study provided a basis to re-evaluate and augment the discussion of the advantages of within-study multiple methods in management accounting research proffered by Birnberg, Shields and Young (1990). Within this extended framework, a number of suggestions concerning the use of within-study multiple research methods are then offered.

Keywords: research methods, management accounting, methodology

1. Introduction

Easterby-Smith, Thorpe and Lowe (1991) advocated the use of multiple methods for business research, while others, such as Wallace (1987), and Caster, Massey and Wright (2000), have highlighted the need for multi-method research in accounting. In a seminal article concerning management accounting, Birnberg, Shields and Young (1990, pp.61-62) concluded that:

since no research method dominates the others on all criteria, multiple research methods should be used to investigate management accounting phenomena. We advocate two variations of the multiple methods approach. The first is to use more than one method to conduct a particular study. The second occurs when individual researchers, each employing different methods, perform a coordinated series of studies on a particular topic.

While the understanding and explication of several areas of management accounting have been advanced by the adoption of between–studies multi-methods, the former approach of within-study multiple methods has received much less exposure in the literature and appears under-utilised and misprised in the practice of management accounting research (Brownell 1995). Despite espousing the need for within-study multiple methods, Birnberg, Shields and Young (1990) do little more than mention the issue, instead concentrating their discussion on the use of multiple methods on a between-studies basis. The current paper attempts to redress this imbalance and to provide a more comprehensive picture of the applications and advantages of within-study multiple methods. To do so is important in providing future directions for management accounting research, particularly given Brownell and Whittred’s (1997, p.14) contention that ‘the use of multiple methods, embedded within a single study design, is also likely to grow as appreciation of the benefits of ‘triangulation’ increases’.

Section 2 of this paper offers a brief review of the literature concerning the use of multiple research methods, clearly distinguishing within-study multiple methods from between-studies multiple methods. Sections 3 and 4 provide an illustration of the use of within-study multiple methods in an actual management accounting research project. Section 3 discusses the reasons why the project was amenable to the use of multiple methods and section 4 details how the methods were applied. The research project chosen as an exemplar investigated how and why costs are used in outsourcing decision-making in Australian public sector organisations (PSOs). Using agency theory, transaction cost economics, and aspects of contingency theory, together with a

critical realist ontology, and both qualitative and quantitative methodology, an *a priori* model of the role of costs in PSOs' outsourcing decision-making was developed, explored, modified, and tested. The phases of the research comprised: critical narrative and content analyses studies of the literature; a case study of a single PSO; a program of convergent depth interviews with managers from fifteen other PSOs; and, a large-scale survey questionnaire administered to managers of further PSOs.

Section 5 of the current paper summarises a number of advantages of using within-study multiple methods drawn from both the literature and the illustrative example. The paper concludes with several suggestions concerning the practicalities of applying within-study multiple methods in accounting research.

2. Multiple methods

It is important to decouple and make clear the distinctions between multiple methods (or multi-methods/mixed methods) applied in a series of largely independent accounting research studies (ie. between-studies) and those used within a single study.

Between-studies multiple methods

The term between-studies multiple methods, as used in this paper, refers to the process of comparing the results and conclusions of a current research study with those of similar prior studies, but which have employed different research methods.

Acknowledging Kaplan's (1986) contention that field methods are most appropriate in researching management accounting phenomena, and Merchant and Simons (1986) cautionary note that the most appropriate method for a management accounting study is a function of the issue being addressed, Birnberg, Shields and Young (1990, p.34) then argued:

since each research method has inherent strengths and weaknesses, multiple methods should be used regardless of which particular management accounting phenomenon is being investigated or which particular theory is being tested.

Birnberg, Shields and Young's (1990) paper is then divided into two sections. The first section applies a number of criteria to evaluate the strengths and weaknesses of three major research methods - field research, laboratory experiments and surveys. The methods are evaluated individually on each criterion and a listing of comparative

advantages of each method produced. The application or advantages of the methods are not discussed on a within-study multi-method basis.

The second section of their paper provides an illustrative example of multiple methods in the context of empirical management accounting research on budget setting. Individual, single method studies in the history of the budget setting research are classified according to methodology, and the studies discussed, highlighting the interplay among research questions, underlying theoretical frameworks and research methods. The authors illustrated that initial studies in budget setting were primarily fieldwork, subsequently giving way to survey research, and later to laboratory experiments, eventually with a return to further field studies, although their temporal classification also seems to demonstrate significant overlap between methods used in different periods. While the authors use the budget setting research to effectively expose the contributions of multiple methods, they do so only on a between-studies basis.

Further, since Birnberg, Shields and Young (1990) adopted a restrictive, predominantly positivist and quantitative oriented interpretation of the meaning of 'empirical' research, they ignored the possibilities of comparing studies derived using alternative ontologies and epistemologies. Thus, the between-studies multi-methods they consider are not radically different.

They concluded that using between-studies multi-methods develops and furthers understanding of management accounting, and can more 'efficiently and effectively advance knowledge' (p.62) and contribute to the literature (p.33) in the discipline.

Within-study multiple methods

In addition to focusing almost exclusively on between-studies multi-methods, Birnberg, Shields and Young (1990, p.33) implied that within-study multi-methods serve the sole purpose of assessing the 'level of method variance in results'.

This notion, and the authors' limited discussion on the point, is consistent with the principles of the multitrait-multimethod matrix, derived from the psychological literature (Campbell and Fiske 1959). The matrix is a means for establishing construct validity based on intercorrelations between potentially like items or characteristics (convergent validity) and those which are supposedly different (discriminant validity).

However, the matrix approach is not necessarily indicative of a multi-method design. It is often used to assess validity of items measured on different scales (Davis

and Cosenza 1988, p.152), or by different people¹, but for which the data have been collected using the same method (eg. a survey questionnaire). Since it is also a statistical technique, it is often incapable of application to multi-methods research incorporating qualitative data.

Rather, within-study multiple/mixed methods can provide for the examination of different aspects of phenomena (complementarity), discovering new or paradoxical perspectives on a research issue (initiation), enhancing the scope or coverage of the research issue (expansion), sequential development and convergence (Greene, Caracelli & Graham 1989), with the principal advantage broadly that of triangulation (Brownell and Whittred 1997). Such triangulation can relate to data, results and findings, in both qualitative and/or quantitative research, and goes beyond merely determining construct validity.

Triangulation

The uses and benefits of triangulation has received limited attention within the management accounting literature (for exception, see Hoque 1995). There are a number of approaches to triangulation, including:

- between methods triangulation (Denzin 1978) – using more than one method in one study (ie. within-study multiple methods in general);
- within method triangulation (Denzin 1978) – using multiple sources of data within one method;
- theory triangulation (Berry, Laughton and Otley 1991) – using multiple theoretical perspectives or frameworks;
- researcher-subject triangulation (Cohen and Manion 1989) – corroborating the researcher’s results or findings with the research subject;
- between studies triangulation (Birnberg, Shields and Young 1990) – as discussed previously in this paper; and
- investigator triangulation (Duffy 1987) – using more than one investigator (also known as researcher convergence).

The first two forms of triangulation are of most interest in the context of within-study multiple methods, although all six forms are relevant.

¹ For examples related to accounting, see Ashton 1977 and Brownell 1995, pp.51-53.

3. Within-study multiple methods – An illustration

The current section provides an illustrative example of a recent management accounting research project which used within-study multi-methods. The project utilised a number of approaches to triangulation reflected in the use of multiple data sources, theoretical pluralism, and multiple qualitative and quantitative methods. Of several multi-method research designs available, the one illustrated applied both a sequential exploratory design and a concurrent triangulation strategy (see Creswell 2002).

Research project outline

A review of salient literature led to the discovery of a lacuna regarding the source and accuracy of claimed cost savings from outsourcing and the lack of research on the use of costs and costing information in the practice of outsourcing decision-making. Bisman (1999, p.5) contended that costing for outsourcing decisions could not be examined without considering ‘the peculiarities and regulatory imperatives affecting public sector organisations’. The major aim of the project, therefore, was to model the interrelationships of multiple contextual and environmental variables in outsourcing decisions in Australian PSOs, and in particular, to map the significance of costs within this framework. This aim was achieved by addressing a number of relevant research questions. The primary research problem was:

How and why are costs and costing information used in making outsourcing decisions in Australian public sector organisations?

Impetus for adopting a within-study multiple methods approach included the nature of the research question and appropriate research paradigm, the theoretical foundations of outsourcing, the methods and methodologies used in prior research on outsourcing, and aspects of outsourcing decision making in practice.

Research questions and paradigms

A fundamental axiom of ‘good’ research championed in most research methods textbooks is that the methods chosen for use in a study should be driven by the research questions (Abernethy *et al.* 1999). The general topic as well as the objective

of a research project may also indicate the advantages of a particular philosophical approach or paradigm for conducting the research (Cavana, Delahaye and Sekaran 2001).

Greve (2001), following Miller and Simmons' (1998) Baudrillardian-based² typology of the meanings of privatisation, suggested that there are four different ways to study outsourcing. Each of these four interpretations are matched below with the research paradigms to which they appear to refer:

- outsourcing is assumed to be a real event (positivism);
- outsourcing should be approached sceptically; involving researchers critically examining claims made about its achievements (critical realism);
- the hidden political reality of outsourcing must be unmasked (critical theory); or,
- outsourcing must be understood in a self-referential way (constructivism).

Since the literature review undertaken for the project had identified a gap concerning the source and veracity of claimed cost savings from outsourcing, critical realism was deemed the most appropriate paradigm within which to conduct the investigation. The paradigm was also suitable for a multi-methods study since it inherently involves triangulation in the form of critical multiplism. The paradigm explicitly 'relies on multiple methods as a way of capturing as much of reality as possible' (Denzin and Lincoln 1998 p.9). Critical realism recognises the validity of both quantitative and qualitative methodologies, retains scientific rigour, and yet acknowledges the value of richness and context, as well as the importance of generalisability (Bisman 2002).

The aims and question set for the outsourcing research, together with the underlying ontological and epistemological paradigm adopted, called for qualitative methodology to explore relationships between variables in outsourcing decision-making, and quantitative methodology to produce more broadly based conclusions to shape or improve outsourcing practice and policy.

Theoretical foundations

Birnberg, Shields and Young (1990, p.34) maintained that 'multiple methods should be used regardless of which particular management accounting phenomenon is being investigated or which particular theory is being tested.'

² The typology is based on the writings of postmodernist philosopher Jean Baudrillard (1994).

Explanations of private sector outsourcing decision-making derive from the precepts of agency theory and transaction cost economics (TCE) (Williamson 1975, 1991), however this extant theoretical literature fails to address the distinctiveness of outsourcing in the PSO context. The research project therefore sought to assess the applicability of both agency theory and TCE to PSOs' outsourcing decisions, as well as aspects of contingency theory which could further assist in explaining the type and use made of management accounting systems and cost information in making these decisions.

For the most part, agency theory and TCE-based research has been conducted within the positivist paradigm (Ryan, Scapens and Theobald 1992), although several commentators have called for more 'realism and balance' (Moran and Ghoshal 1996), and for richer environments in which to apply these theories (for example, see DeJong, Forsythe and Uecker 1985; Wruck and Jensen 1994; Shelanski and Klein 1995).

Thus the outsourcing study featured theory triangulation, by reference to multiple theoretical perspectives, as well as between methods triangulation, including field studies, in order to apply the theories in richer environments. These forms of triangulation provided for a more holistic analysis of data and more capacity for recognition of alternative interpretations of the same data.

Nature and methodologies of existing outsourcing research

Additional input for devising a strategy for answering the primary research question came from examining the methods applied in prior studies of the topic area. Although there is a wealth of research on the amount of cost savings from PSOs' outsourcing activities, there is a dearth of research concerning state and federal levels of government and which is of Australian origin (Hodge 1996).

The methods used in prior research can be divided into two broad categories: case studies,³ and surveys⁴ (particularly popular for doctoral and higher degree research in

³ Examples of the case study approach include; Chandler (1990), MAB (1992), Cook and Morgan (1993), Lyon (1994), Messiter (1994), Aenishanslin, Fernandez and Hall (1995), Cross (1995), DeRose and McLaughlin (1995), Goodwin and Pinch (1995), Willcocks, Fitzgerald and Feeny (1995), De Loeff (1997), Niklasson (1996), Jefferies (1997), Petrillo (1998), and Langfield-Smith, Smith and Stringer (2000).

⁴ Examples of survey and quantitative approaches include; ACC (1998a, 1998b), Domberger, Hensher and Wedde (1993), P-E International (1993), Lee (1994), Botsman (1995), CTC Research Team (1995), Teng, Cheon and Grover (1995), Borchers (1996), Chung (1996), Moore (1996), Lever (1997), Duran (1998), Flannery (1998), Greenwood (1998), and Lee (1998).

the area), and there are several limitations of the approaches that have been previously adopted. Much of the quantitative, survey research lacks research design integrity and fails to report all statistical results (Hodge 1996, p.14). In some stand-alone, large-scale surveys of public sector accounting, privatisation and outsourcing, the authors have concluded that case studies would have provided better data and a richer understanding of both context and variables (see Chandler and Feuille 1991, p.20; Gurd 1993, p.34). Some of the qualitative research is also methodologically weak, with many case studies expressed in the form of descriptive vignettes (for example, see Harrar 1993; Sweet 1994) and which fail to discuss the methods used to collect and analyse data. There also appears to be a scarcity of research utilising archival data (for exceptions, see Ferris 1986; Hirsch 1995; Cooley 1997) and individual or focus group interviews (for exceptions, see Graham and Scarborough 1995; Nesoff 1998; East and Partners Pty Limited 2001).

Few researchers seem to have engaged in both qualitative and quantitative research (for exceptions, see Domberger and Hall 1995; Domberger, Hall and Jeffries 1995; Nam 1995). Nor does it seem that researchers have been keen to reconcile the findings of one branch of studies with the other, or combined both approaches in a single, multi-method study to provide a comprehensive, integrated and triangulated view. Only a few examples of researchers utilising combined methodologies and methods were unearthed.⁵

The apparent lack of use of multiple methods and the general polarisation of the outsourcing research into the qualitative and quantitative provided further justification for adopting a multiple methods approach.

Outsourcing decision-making in practice

There is a paucity of research on management accounting practices in Australian organisations (Langfield-Smith and McBride 1989), and that concerning PSOs is even more meagre. There has also been a failure to address decision-making and ‘political bargaining processes, studies of which would enhance our understanding of systems implementation and use’ in management accounting, and especially so in that which applies to the public sector (Brignall and Modell 2000, p.282).

⁵ Examples of such rare combinations include; cases and interviews (Drew 1995), interviews and survey questionnaire (Useem and Harder 2000), survey questionnaire, document review and interviews (Shiang 1995), and archival study and survey (Hamilton 1997).

As well as these prescriptions for topics of research, there is also an increasingly popular view within the management accounting research community about the means by which to undertake research. The contention is that accounting is a deeply contextual practice that needs to be studied *in* organisations (see Hopwood 1983; Kaplan 1984, 1986, 1993; Covalleski and Aiken 1986; Johnson and Kaplan 1987; Horngren 1989; Scapens 1990; Young 1999). For these reasons the research design featured initial study of a case PSO and qualitative depth interviews of managers of other PSOs, to provide richness, before testing models more broadly through the survey method.

A multi-methods approach was appropriate for addressing the research question; offering the potential to investigate the role of managers' perceptions of costs in outsourcing decision making and the economic and political considerations inherent in public sector outsourcing at all government levels and in all states and territories. The research thus reflected this diversity, drawing on the practices and experiences of public sector organisations and their managers across the board.

Boland and Pondy (1983) suggested that a melding of the natural and the rational are appropriate means for studying accounting in organisations. The blend of qualitative and quantitative methods used also married well with the mix of economic (ie. TCE) and non-economic (ie. contingency theory) theoretical foundations of the research.

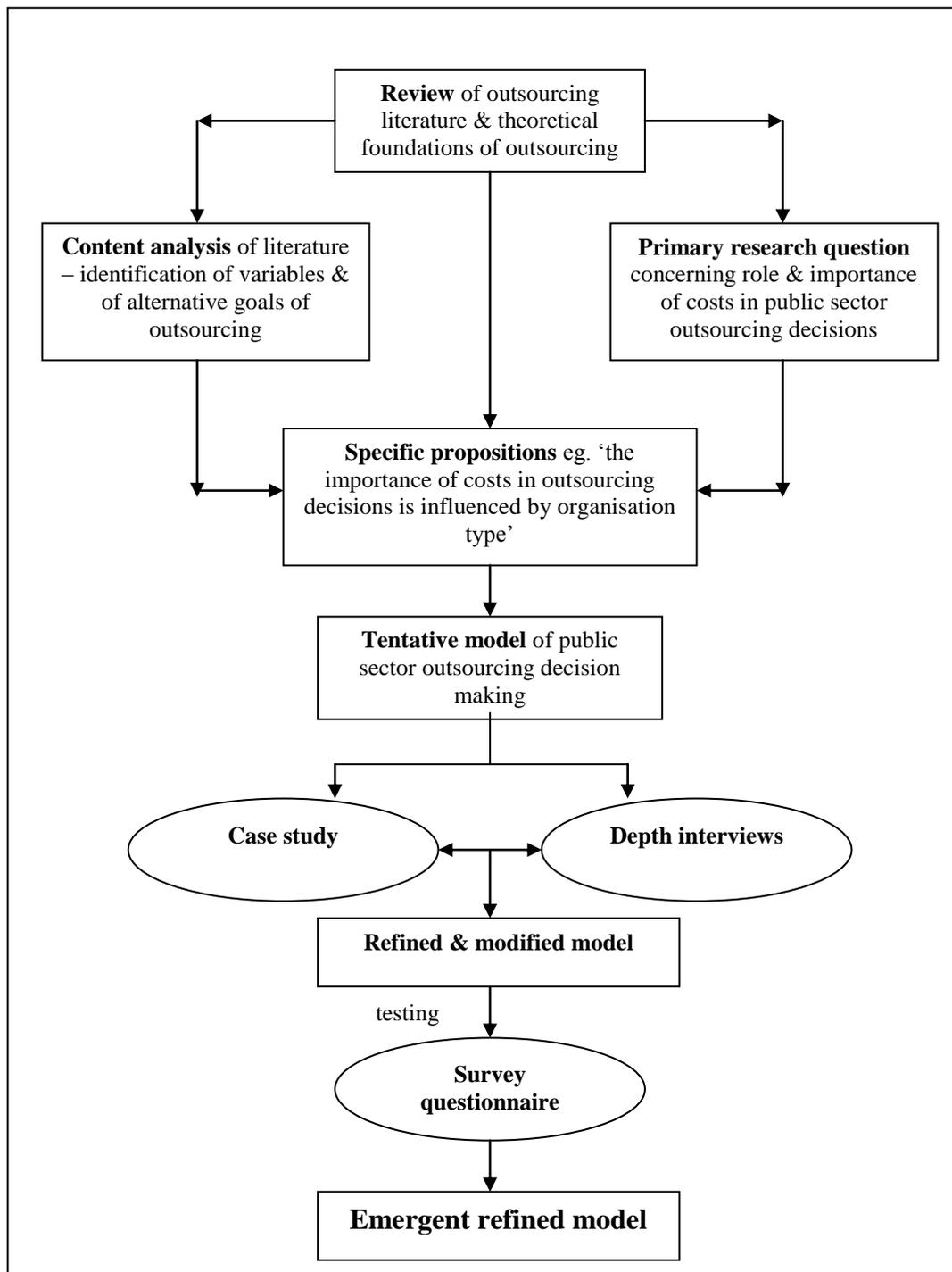
4. Multiple methods applied

In undertaking the research, a series of complementary research methods were applied in a structured sequence, to build, modify and test a model of the role of costs in the outsourcing decision making of PSOs (*Figure 1*). The research design consisted of three major components:

- a case study of a single PSO with thirteen embedded units of analysis;
- a series of individual depth interviews with managers from a fifteen other PSOs; and,
- a large-scale survey questionnaire administered to managers of a still broader range of PSOs ($n = 131$).⁶

⁶ The reported sample size (n) represents the number of useable responses.

Figure 1 Research design



As illustrated in *Figure 1*, the purposes of the literature review and content analysis were to collect and analyse archival data in order to identify variables and build a tentative model of the role and relative importance of costs and costing methods in PSOs' outsourcing decisions. The ensuing case study and interviews provided the means for examining the model in real-world contexts, clarifying the research

propositions developed from the research questions, and allowed for modification of the multi-theoretical model in a recursive fashion. Young (1999 p.81) argued that field research in management accounting serves the 'important role' of 'informing other research methods', and so following these stages in model development, the survey questionnaire was aimed at applying and further revising the model, and testing the validity of particular facets of the underlying agency, TCE and contingency theory perspectives.

The research comprised exploratory and explanatory components, induction and deduction, and qualitative and quantitative methodologies. The approach adopted was one of a generative research strategy (Simon 1990, 1994). The narrative literature review revealed research questions, and combined with the qualitative aspects of the design, yielded research propositions and several testable hypotheses. This generative strategy initially uses less formal techniques (literature reviews, informal interviews, and content analyses) on the target population, in order to capture the nature of crucial research issues. The issues and themes are then developed and tested through formal interviews and/or survey questionnaires.

The research design linked qualitative and quantitative data, moving from less controlled to more controlled methods, and through natural to less natural settings, representing an articulation or triangulation of methods (Fielding and Fielding 1986). This served to lend weight to the data gathered, and is regarded by some researchers as the most appropriate way to conduct a research project among human subjects (Bryman 1988; Denzin 1989). Moving through to quantitative data in this manner also enables a researcher to test and revise impressions and generalisations garnered from qualitative data (Silverman 1985).

The relative merits and shortcomings of each of the main methods used, based on a number of different dimensions, are summarised in *Table 1*.

Table 1 Dimensions of research design components

Dimension of Comparison	Narrative Review of Literature	Content Analysis	Case Study	Individual Face-to-Face Interviews	Individual Phone Interviews	Postal & E-mail Survey
Primary purpose	Exploration	Exploration	Exploration Explanation	Exploration	Exploration	Explanation
Naturalness	High	High	High	Mod	Mod	Low
Cost	Low	Low	High	High	Mod	Low
Data quality:	Mod	Low-mod	High	High	High	Low
Response rate	N/A	N/A	High	High	Mod-high	Low
Respondent motivation	N/A	N/A	High	High	High	Low
Investigator bias	N/A	N/A	Mod-high	Mod	Mod	Low
Immediacy of response	High	High	High	High	High	Low-postal High-email
Evaluation apprehension	N/A	N/A	Mod	High	High	Low
Richness of data	Mod	Mod	High	High	High	Low
Ability to clarify & probe	None	None	High	High	High	Low
Validity:						
Construct	Low-mod	Low-mod	Low-high	Low-high	Low-high	Low-high
Internal	Low	Low	High	Mod	Low-mod	Low-mod
External	High	High	Low-mod	Mod	Mod	Mod-high
Sampling flexibility	High	High	Low-mod	Mod	Mod	High
Study length	Long	Long	Long	Mod	Mod	Short
Ability to use visual aids	N/A	N/A	High	High	None	Low
Anonymity	N/A	N/A	None	None	None	High
Sample parameters	Large	Large	Small	Small	Small	Large
Dependence on respondent's reading & writing abilities	N/A	N/A	Minor	None	None	High
Control of context & question order	N/A	N/A	High	Mod-high	High	None

Based on: Birnberg, Shields and Young (1990), Tull and Hawkins (1990), and Judd, Smith and Kidder (1991).

KEY: Mod = Moderate N/A = Not applicable

Table 1 shows that collectively, the research methods chosen were aimed at maximising reliability and validity. Such use of archival studies, depth interviews and mailed questionnaires is a strategy to ‘attack a research problem with an arsenal of methods that have nonoverlapping weaknesses in addition to their complementary strengths’ (Brewer and Hunter 1989, p.17). The steps taken produced a chain of evidence, formed a backdrop to the relations observed between variables, provided greater assurance that threats to the validity of the analyses had been counteracted, and allowed greater confidence to be placed upon the research results (Judd, Smith and Kidder 1991; Brownell 1995).

Case study multi-methods

The case study alone was a multi-method research exercise. Data were obtained from multiple sources using a number of techniques including oral histories (interviews), observation (as participant), and review of documents.

There were several advantages, particularly in terms of corroborative capacity, of using multiple methods within the case component of the research. The exactitude offered by physical documentation provided a means for overcoming some of the inaccuracies in the recall of interviewees. Similarly, any biases document authors may have had were reduced by interviewing and reinterviewing a range of organisation managers. Personnel were interviewed on individual and group bases, providing within method triangulation.

The document review, which involved a latent form of content analysis, helped in establishing data convergence. Review of key archival materials produced by the organisation was supplemented by examination of public and secondary documents (eg. newspaper reports and external consultancy reports), providing ‘an independent assessment of data obtained from official documents’ (Booth 1995, p.89).

In addition to using multiple data collection and analysis techniques to enhance consistency and search for convergence in the data, managers within the organisation checked the case write-up as a form of respondent validation (ie. researcher-subject triangulation).

Depth interview multi-methods

Given that only a single case organisation was studied, it was necessary to consider a range of other organisations, at different levels of government, of different organisational types and sizes, and in different industries. Thus, the program of depth interviews with managers of other PSOs was designed to develop deeper and broader perspectives on the issues, capture issues which may not have been evident in the case study PSO, refine the nature of key variables, provide for replication, and improve the external validity of the model emerging from the case study.

Using a purposive, maximum variation sampling strategy, fifteen interviews (nine face to face and six via telephone) provided adequate opportunity for competing attitudes and beliefs to become apparent and for identifying common themes. The approach provided both an appropriate level of consensus among interviewees and a high degree of theoretical saturation.

Strengths and weaknesses of the interviews are outlined in *Table 1*. Telephone interviews generally have the same advantages and disadvantages as other interview techniques, with exceptions detailed in the table, and provided for within method triangulation when combined with face to face interviews of other managers in the sample. A potential weakness of the depth interviews was the use of only one informant per organisation. Abernethy *et al.* (1999) have questioned the reliability of data obtained using this strategy, except where interviews are one step in the collection of data, as was the case in the research reported in this paper. As with all interviews, investigator bias and reactivity effects presented possible threats to validity, however, the final stage of the research project, the survey questionnaire, served to mitigate these potential problems.

Survey multi-methods

The purposes of the survey were to address the propositions and test the associated hypotheses, assess the validity and generalisability of the modified theoretical framework that emerged following the case study and depth interviews, and test the underlying agency, TCE and contingency theory perspectives. Results and findings from analysis of survey data were also important for comparison with previous studies of outsourcing in PSOs (between studies triangulation).

Several multi-method attributes featured in the survey questionnaire component of the research. For example, while the conventional method for distributing a large-scale survey questionnaire is via post, as an experimental innovation, a small number of questionnaires were also distributed by e-mail.

Multi-methods were also applied in testing for non-response bias (see Wallace and Mellor 1988), including Oppenheim's (1966) surrogate method, as well as statistical assessment of the representativeness of respondent organisations compared to the overall population.

The questionnaire itself consisted of multiple response modes, including forced-response questions and open-ended questions. Some close-ended questions provided dichotomous response modes and others featured Likert scales. The 7-point scale, commonly used in accounting research, was combined with Likert scales of other point values and with other types of scales in the questionnaire (as in Dunk 1995 and Deegan 1997). Some questions were rated on 3 or 6-point Likert and frequency scales

where piloting had shown respondents could not make discriminations using more finely tuned ratings.

The open-ended questions allowed participants to elaborate on various issues. The use of such questions in mailed survey questionnaires is generally not recommended (de Vaus 1995) because of problems of respondent understanding and inability to clarify question meaning, as well as potential difficulties in interpreting responses. However, as the questionnaire closely followed the established interview protocol, was examined by experts in questionnaire design, and was pilot tested, the level of ambiguity in these questions was minimised.

Brownell (1995, p.38) suggested that the items which comprise a survey instrument should be subjected to four, essentially multi-method analyses of reliability and validity, being:

- reliability tests;
- coding of open-ended questions;
- identification of categories in open-ended questions; and,
- comparison of written and interview versions.

A pilot study was conducted, constituting both a pre-test and a test of reliability. Piloting assisted in improving operational clarity and conceptual and content validity in the final questionnaire.

Several managers interviewed in the qualitative component of the research also took part in the pilot survey providing a fairly robust test of consistency and stability in responses. In essence this was a form of test-retest reliability analysis. These managers also agreed to complete the final questionnaire several months after completing the pilot draft, as a further test-retest measure.

For open-ended questions, two techniques were applied to improve the reliability of coding. The first involved recoding a random sample of responses several weeks after completion of initial coding. Secondly, several participants in the pilot study agreed to discuss the meaning of their responses to open-ended questions with the researcher. This procedure provided both researcher-subject triangulation, as well as a test of reliability in the interpretation and coding of responses.

Several, key close-ended rating scale questions also needed to be assessed in terms of reliability and an item analysis was conducted to assess the factorial validity,

dimensionality, pattern and magnitude of correlations, and internal consistency of these questions. Factor analysis and Cronbach's alpha coefficient were used for testing groups of questions used for measuring particular constructs.

While the external validity of surveys is usually moderate to high, the internal validity is often low (*Table 1*), and so the multi-method approach aided in maximising the validity of the entire research project.

Research outcomes

The principal driver for using the multi-methods approach described in the illustrative study was the nature of the research question. Understanding a complex process such as outsourcing decision making demanded a qualitative investigation to identify and explore the key issues. The issues were then capable of being addressed in other settings and contexts in the search for more broadly based associations and relationships. The use of multi-methods provided a more comprehensive picture of the role of costs in PSO's outsourcing decision-making than could have been achieved from utilising a single research method.

Both the case analysis of a single PSO and the depth interviews with managers from other PSOs yielded high quality data with moderate to high internal validity, recognising the idiographic nature of percipients' experiences. While both techniques provided rich data, neither was likely to produce the broader, externally valid information necessary to aid policymakers and guide PSO managers in making appropriate outsourcing decisions. The sequence of logical steps in the research design culminated with quantitative testing to search for the broad-based, nomothetical applicability of findings that could only be achieved by larger-scale survey research.

The decision to adopt a multi-method approach was revealed to be both important and justified. The research evidenced that choices of accounting methods were strongly implicated in the validity that could be ascribed to reported cost savings. Further, the uses made of cost information in outsourcing decision making in Australian PSOs were significantly different for organisations operating at different levels of government and in different locations, reinforcing the decision to move away from the generally accepted piecemeal type study of the topic area to a more inclusive and holistic investigation.

5. Advantages of within-study multiple methods

Birnberg, Shields and Young (1990, p.52) noted that ‘use of any single method requires compromises’, and ‘research findings could be limited by the weaknesses of a particular method’. Reliability, validity, and generalisability, the corner stones for judging most types of research (Sarantakos 1993; Bordens and Abbott 1999), are improved by employing within-study multiple methods.

Within-study multiple methods, including both quantitative and qualitative methods, can be seen as complementary to providing an elaborated view of issues and phenomena studied and for establishing the validity of findings. Qualitative, naturalistic approaches provide for richness, depth, density and contextual embedding of data. Quantitative approaches allow for assessment of the capacity for broader applicability of observed patterns. Within-study multi-methods research may be initially qualitative and inductive, enabling issues, propositions and models to be developed, clarified and modified, followed by the hypothetico-deductive approach, most commonly used in quantitative management accounting research,⁷ to unearth knowledge concerning broader mechanisms and tendencies.

Using multiple methods can provide the basis for replication on both theoretical and practical levels. Results produced in one stage of the research can be subjected to further scrutiny in successive stages of the research, as well as being compared to theoretical foundations, constituting analytical generalisation.

6. Suggestions for using within-study multiple methods

There are several disadvantages to conducting within-study multi-methods research. The approach is time-consuming and a single case study, survey questionnaire or experiment is more expeditious. Secondly, as Birnberg, Shields and Young (1990) noted, within-study multiple method research requires investigators to possess expertise in applying more than one research method. Thirdly, the depth and breadth of a multi-method study poses significant difficulties for researchers in disseminating and publishing results.

While within-study multi-methods research is time consuming, the defensibility of results and findings, due to improved validities and reliability, is probably a justifiable time/quality trade-off. Further, within-study multi-method research may

⁷ See Chua (1986a, 1986b).

lead to more rapid advancement of knowledge compared to between-studies multi-methods research, as Birnberg, Shields and Young's (1990) forty-year summary of the between-study budget setting research implicitly and probably unintentionally demonstrates, the evolution of that research has been slow.

The problem of investigators not possessing skills in using a variety of research methods yields obvious opportunities for collaborative research efforts. Collaborative research will also enable investigator triangulation, which can reduce researcher bias.

The time taken to complete a multi-methods study may also be justified in terms of multiple publication opportunities, in a wider range of journals. In publishing a multi-methods study in a piecemeal fashion, future steps in the study can be adumbrated in successive publications (for example, see Coad 1999).

More generally though, questions concerning management accounting are often what Yin (1994) describes as complex and 'fuzzy boundary' questions and these questions are perhaps more appropriately answered by adopting a multiple methods approach. The approach may better provide the capacity of research to produce what Pawson and Tilley (1997) described as a family of answers, which embrace multiple contexts and different participants.

For accounting and business doctoral students, multi-methods research is often discouraged, based on arguments that it represents a risky strategy (Perry 1990, 1994; Brownell 1995; Hoque 1995). Nevertheless, since one of the major purposes of doctoral research is to equip students with the requisite skills and expertise in research methods (AVCC 1994) it would seem appropriate to broaden their practical exposure to and experience with multiple methods. This suggestion is probably of particular importance in doctoral and post-doctoral research in management accounting, which has become differentiated and dissipated in recent times (Ryan, Scapens and Theobald 1992, pp.64-65).

The arguments and illustration provided in this paper are aimed at assisting researchers to realise Brownell and Whittred's (1997) prediction of increased use of multiple methods within single study, management accounting research designs. The practical example provided functions to highlight the means for applying within-study multiple methods, as well as yielding an extended framework within which to consider suggestions for applying these types of research designs.

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