The role of budgets in organizations facing strategic change: an exploratory study

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Abstract

Recent attention in the general management literature has focused on mechanisms and processes used by organizations to respond and adapt to changes in their operating environment. There is, however, very little broad-based empirical research examining the role that management accounting control systems can play in shaping organizational change. Much of the empirical research to date has focused on the role of accounting as a diagnostic tool for assessing and rewarding managerial performance despite the recognition that accounting can serve as a dialogue, learning and idea creation machine (Burchell et al., 1980. Accounting Organisations and Society 5, 5–27). The purpose of this study is to explore how accounting can serve this alternative role. We use (Simons, R. 1990.) Accounting Organisations and Society 15, 127–143. interactive/diagnostic classification of management control systems to capture how accounting can be used as a learning machine in the formulation and implementation of strategic change. A theoretical model is developed to examine the relationship between strategic change, style of budget use and performance. It is argued that an interactive style of budget use can mitigate the disruptive performance effects of the strategic change process. The data, collected from Chief Executive Officers in 63 public hospitals, provide results that are consistent with our expectations. © 1999 Elsevier Science Ltd.. All rights reserved.

1. Introduction

The ability of the management to anticipate and respond to opportunities and pressures for change is critical for organizational survival. While research in the management literature is now focusing on the mechanisms and processes that facilitate strategic adaptation to changing environmental conditions, there has been very little research examining the role of management accounting control systems (MACS) in organizations undergoing strategic change. A number of researchers (Hopwood, 1987; Dent, 1990; Argyris, 1990; Hedberg & Jonsson, 1978) have provided strong theoretical support for the idea that MACS can serve an active role in shaping organizational change. There is, however, little broad-based empirical research examining how these systems are used in organizations facing strategic change, and with what consequence (Shields, 1997). Much of the empirical research studying the links between MACS and strategy has been limited to identifying variations in control system design in firms facing different strategic priorities (Simons,
1987; Govindarajan, 1988; Govindarajan & Gupta, 1985). Moreover, the results of this research have been inconclusive or in some cases, contradictory (for example, compare Miller & Friesen, 1982; Simons, 1987; Kaplan, 1990; Govindarajan, 1988).

Simons (1990) offers one possible explanation for the apparent inconsistencies in the literature. He argues that prior research has been preoccupied with studying the extent to which differing strategic priorities influence the importance of MACS in their traditional role of performance evaluation, or what he refers to as their “diagnostic” role (Simons, 1990, 1991). Much of the same preoccupation with budgetary controls as purely monitoring devices also characterizes the agency literature in management accounting. By contrast, few studies have examined how the role of accounting might change dependent on the strategic setting (Chapman, 1997). It is entirely possible that the reliance on accounting forms of control will not necessarily diminish in importance in different strategic circumstances, but that their role or use will be different. In particular, what is ignored by much of the research is the potential for MACS to be used much more actively as a tool for formulating and implementing changes in strategic direction, or what Simons (1994) refers to as the “interactive” use of MACS. The question of how organizations use MACS to facilitate and support the strategic change process is largely unexplored (Shields, 1997).

The purpose of this paper is to explore how top management in organizations undergoing strategic re-orientation use MACS. We develop a model which examines whether the effect of the strategic change process on the firm is performance governed by the extent to which top management use budgeting interactively, as opposed to diagnosis- nistically. The following section develops the theoretical model used to study the relationship between strategic change, style of budget use and performance, concluding with a testable hypothesis. Subsequent sections describe the empirical study and present the results. The results are discussed, and the limitations and directions for further research are presented in the final two sections.

2. Theoretical framework

2.1. Definition of constructs

2.1.1. Strategic change

The management literature has tended to treat strategic change synonymously with organizational change and has provided many diverse definitions and theories of organizational change. One of the dominant themes of this literature has been the adaptation-versus-inertia debate – that is, can, and do, organizations adapt to changing environmental conditions? (Astley & Van de Ven, 1983; Singh et al., 1986). A second stream of research has been more concerned with the content and process of strategic change. The content of strategic change refers to the goals, scope and/or competitive priorities determined by top management; process refers to the organization’s approach to managing strategy formation and implementation (Ginsberg, 1988). While some researchers have focused on the distinction between ‘frame-breaking’ change and emerging change (see: Tushman & Romanelli, 1985; Mintzberg & Waters, 1985; Miller & Friesen, 1984; Hinings & Greenwood, 1988), current research is concerned with issues relating to how change occurs, who initiates it, what constrains it, and the mechanisms used to facilitate it (Kelly & Amburgey, 1991; Wiersema & Bantel, 1992; Greiner & Bhambri, 1989). This study follows this latter line of enquiry.

In the study, we follow the suggestion of Ginsberg (1988) and others (Wiersema & Bantel, 1992; Kelly & Amburgey, 1991), and define strategic change in the way in which strategy, itself, has been defined in the literature. We adopt Miles & Snow’s (1978) definition of strategy. Miles & Snow (1978) characterize a firm’s product market stance as a continuum with “defenders” (a strategic stance focusing on maintaining market leadership in a limited and relatively stable range of products and services) at one end and “prospectors” (firms whose strategy involves frequent changes and quick responses to new market opportunities) at the other. Following Shortell et al. (1990) strategic change is defined as the extent to which a firm is moving along the defender/prospector con-
For example, an organization might be moving from a strategic position which focuses on a limited set of services to a more market-oriented stance, where strategic priorities focus on the development of services to meet market needs. Thus, strategic change can range from no change at all to a relatively high level of strategic change.

2.1.2. Style of budget use

Budgets are a major feature of most MACS and are used by management as a means of coordinating and communicating strategic priorities and, in conjunction with reward systems, are often used to facilitate lower-level managers’ commitment to these priorities. With a few exceptions, the vast majority of prior research in management accounting has implicitly or explicitly assumed that budgets serve what Simons (1990) refers to as a diagnostic role, and what Burchell et al. (1980) earlier described as an “answer machine” role. In this role, budgets serve the traditional purpose of evaluating performance and attributing responsibility for outcomes to particular organizational functions or members. However, budgets can also be used as a dialogue, learning and idea creation machine (Burchell et al., 1980). Simons classified this alternative role of accounting as “interactive”. A defining feature of interactive use of budgets is the continual exchange between top management and lower levels of management, as well as interactions within various levels of management but across functions. This interaction involves not only participation between subordinates and superiors in the budget setting process, but also an ongoing dialogue between organizational members as to why budget variances occur, how the system or behaviours can be adapted and even whether any action should be taken in response to these variances. In this setting, the budgeting system becomes a “database” which facilitates organizational learning. Interactive use occurs when top management “uses the planning and control procedures to actively monitor and intervene in ongoing decision activities of subordinates. Since this intervention provides an opportunity for top management to debate and challenge underlying data, assumptions and action plans, interactive management controls demand regular attention from operating subordinates at all levels of the company.” (Simons, 1990, p. 136)

We adopt Simons’ classification of budget system use, and examine the extent to which the style of budget use moderates the relationship between strategic change and performance. Our expectations are developed in the following section.

2.2. The model

In this study, we wish to explore whether the interactive use of budgets enables the organization to cope better with the change process – that is, will the contemporaneous relationship between strategic change and performance be enhanced when budgets are used interactively? The model developed here treats budget use as a variable that influences the relationship between strategic change and performance. We expect the relationship between strategic change and performance to be more positive when budgets are used interactively compared to a situation when they are used diagnostically. This expectation stems from the effect of strategic change on the decision context. The change process creates a context where decision making by top management becomes increasingly complex and unpredictable as new opportunities alter strategic objectives, or change the priorities placed on those objectives. In this situation top management is often redefining goals and objectives. This can create a level of uncertainty or ambiguity for subordinates as to the priorities or preferences on which to focus their attention. In addition, the technological and production changes associated with changes in product mix, or with new product development, require that new routines be learnt. These conditions impose additional demands on the organization’s information processing capabilities (Galbraith,
For strategic change to result in improved organizational outcomes in this decision context, it will be necessary to respond to these information demands by altering structural arrangements within the organization. Information processing capabilities are increased by creating “flatter”, more organic structures and/or by using integrative liaison devices such as task forces, teams, and inter-functional committees. These devices are designed to break down functional barriers in order to make the organization more responsive, increase its problem-solving capabilities and encourage more informal lateral and vertical communications (Abernethy & Lillis, 1995; Mintzberg, 1983). An important feature of these devices is their ability to cut across conventional, functional lines of responsibility, as well as through hierarchical levels of authority.

These structural arrangements, however, are at odds with budgetary controls which, in their diagnostic use, depend on being designed to reflect faithfully the traditional responsibility structure of the organization (Abernethy & Lillis, 1995). To manage effectively when the organization is undergoing change, top management requires information that is more prospective in nature. They also require an information exchange process that is interactive and dynamic. The interactive dimension becomes particularly important. Designing a system which encourages increased interaction between top management and subordinates facilitates increased information flows (Galbraith, 1977). As Simons (1991) shows, interactive use of budgeting provides a vehicle for the top management to reveal their values and preferences to organization members. It enables the interchange of information concerning the opportunities, threats, strengths and weaknesses that exist as the organization reorients itself in the market. Interactive use of budgeting provides a means of debating how to respond to changes in environmental and operating conditions. Budgets can serve as a “catalyst for debate” and thus help participants reach a compromise rather than providing the “answer” (Macintosh, 1994). Budget variance information, for example, can be used as a means of learning more about the possible alternatives and their consequences. In this way budgets play a pro-active role in facilitating the effective implementation of strategic change (Shields, 1997).

The interactive use of budgets, with its focus on dialogue, communication and learning, between top management and subordinates as well as among managers at the same level, is consistent with the operation of cross-functional liaison groups. Indeed, it can be seen, itself, as an integrative liaison device that breaks down the functional and hierarchical barriers that inhibit information flows. To persist with diagnostic use when firms are undergoing change is likely to have an adverse effect on the relationship between strategic change and performance. Diagnostic use undercuts the commitment of organizational members to these cross-functional liaison groups, because the budgeting system will reinforce the existing functional lines of authority and responsibility precisely at the time when these functional barriers should be lowered. It is thus expected that the relationship between strategic change and performance will be enhanced when budgets are used interactively.

However, interactive budget use is not costless as it requires more extensive involvement of top management in the budget process as well as increased interaction among other organizational members. Interactive use of budgets is, therefore, only likely to enhance performance when strategic change is relatively high. That is, the benefits of interactive use will outweigh the costs in that situation. Diagnostic use, on the other hand, is likely to be more effective in situations where change is either minor or non-existent. In this setting there is little ambiguity concerning organizational priorities, and the nature of the work is relatively stable, with established, well-understood routines for performing tasks. It becomes feasible to factor strategic priorities into specific objectives and to communicate those objectives downwards in the organization in the form of financial targets (Bruns & Waterhouse, 1975). Budgets are effective for monitoring and controlling behaviour in this situation. Top management can use budget reports as a diagnostic tool to assess if outcomes are in accordance with intended plans and reward behaviour accordingly. The major strength of financial controls, such as budgets, lies in its ability...
to monitor reliably organizational processes which are in a steady state. For example, the use of standard costing systems and variance analysis depends critically on the stability of those processes and activities. Standard costs require a clear view of input/output relations which cannot be had where organizational activities are undergoing change, or where the nature of tasks is highly uncertain (Hirst, 1983).

In summary, we argue that the contemporaneous relationship between the level of strategic change under way and organizational performance will be enhanced when budgets are used interactively. In contrast, where an organization is undergoing little or no strategic change, we expect diagnostic use of budgeting to continue to show performance-enhancing effects. Fig. 1 illustrates our expectations.

To conclude, we expect that strategic change will bear a more positive relation with performance when budgets are used interactively. Our expectations can be stated formally as follows:

The relation between strategic change and performance will be moderated by the extent to which budgets are used interactively.

3. Estimation procedures and data

To test our proposition, the following equation was fitted to the data, a description of which follows

\[ Y = \beta_0 + \beta_1 X + \beta_2 Z + \beta_3 XZ + \varepsilon, \]  \tag{1}

where \( Y \) is the performance, \( X \) the strategic change (high scores represent substantial change), \( Z \) the style of budget use (high scores represent interactive use).

Support for our expectation requires that the estimate of \( \beta_3 \) is found to be significantly different from zero. We also expect that \( \beta_3 \) will be positive. This can be seen by considering the partial relation of Eq. (1) with respect to strategic change (\( X \)) given by

\[ \frac{\partial Y}{\partial X} = \beta_1 + \beta_3 Z. \] \tag{2}

If \( \beta_3 > 0 \), strategic change (\( X \)) will have a progressively more positive effect on performance (\( Y \)) as the interactive use of budgeting (\( Z \)) increases. This is our prediction. In addition to the significance of \( \beta_3 \), confidence in the support of our proposition will be based on examination of the overall explanatory power of Eq. (1), and on a test of the increment in explanatory power obtained by the model which includes the interaction term, over a model which excludes it.

The data to which Eq. (1) was fitted were obtained from an empirical study conducted in the hospital sector in Australia. The focus on a single industry enables industry effects to be controlled, but more importantly, the choice of the hospital sector, given the rapid change being experienced in parts of the industry (Shortell et al., 1990), provides some assurance of overcoming any prospect of range restriction in the strategic change variable. The unit of analysis was the individual hospital, and data were gathered by the administration of a written questionnaire to the Chief Executive Officers (CEO) of large Australian public hospitals identified in the Hospital and Health Services Year Book (1994). This source provided the name of the CEO, and other relevant statistical data that assisted in diagnosing any bias associated with non-response. The sample of hospitals selected for the study was relatively homogeneous. They were all general hospitals involved in similar teaching, research and patient care activities. Only hospitals that were relatively large were included in the sample (i.e. greater than 200 beds). Hospitals received their funds primarily
from government sources and were accountable to the state funding authority. There was also uniformity in the type of governance structures which existed in the hospitals at the time of the study. To assess if there were any differences in hospitals from different Australian states, the means on each of the variables of interest were compared across states. There were no significant differences.

The questionnaire was distributed and returned by mail and the process yielded 63 (75%) complete, useable sets of responses. In addition, data on performance, the dependent variable in the study, were also sought from both the financial director and medical director of each hospital, permitting an assessment of convergent validity of the performance measure. Matched data on performance from all three respondents were obtained from 29 hospitals. These procedures required that respondents be identifiable so as to achieve the matching described above, but also permitted a targeted follow-up of non-respondents and a more thorough set of procedures to diagnose possible non-response bias.

Several tests for possible non-response bias were undertaken. First, tests of differences in several of the published biographic variables between respondents and non-respondents, and between early (initial) and late (follow-up) respondents were undertaken. Second, a comparison of means on all measured variables was undertaken, comparing the early and late respondents. None of these tests produced significant differences, suggesting the absence of any obvious non-response bias.

The data indicated that CEOs had been in their current position for an average of 3.73 years and employed by the hospital for an average of 6.86 years. Hospitals had, on average, 385 inpatient beds with operating expenditure of approximately $A67 million ($US 52 million). Appendix A identifies the number of hospitals in each state as well as their relative size (represented in terms of number of inpatient beds and operating expenditure).

3.1. Measurement of variables

Given the exploratory nature of this study it was necessary to develop measurement instru-

ments. These measures were based in part on prior research, but were supplemented using pilot testing methods including semi-structured interviews with eight CEOs in the field. These procedures were undertaken to ensure that the variables of interest in this study were relevant to this industry, and that the questions used to measure each variable were unambiguous and captured the constructs of interest. A copy of the measures used in the analysis is included in Appendix C. The measurement of each variable is discussed in turn.

3.1.1. Strategic change

Strategic change is a complex construct which incorporates multiple dimensions. It is thus particularly difficult to operationalize. There are no studies in the accounting literature which have attempted to measure strategic change. There has, however, been some attempt to capture strategic change in the general management literature. Given the exploratory nature of the study, it was considered appropriate to use a method that had been validated in the research literature. For this reason we employed the approach adopted by Shortell et al. (1990) to capture strategic change. Shortell et al. (1990) adopt a dimension of strategic change that is particularly relevant to the hospital industry. The competitive environment in the hospital sector in recent years has prompted CEOs to be much more pro-active in assessing market requirements. The most obvious manifestation of a strategic reorientation would thus be in the shifts in product/market stance. The instrument selected attempts to capture the extent to which the organization is changing its product market stance using the Miles & Snow (1978) strategic typology.

The instrument required CEOs to indicate their perception of the hospital’s strategic position two

2 Demographics relating to these eight hospital sites are included in Appendix A.
3 While the Miles and Snow instrument has been in the literature for a number of years, a recent test of its theoretical robustness provides strong support for its continued use (Doty et al., 1993). The typology continues to be used by numerous researchers and in a variety of industries (Abernethy & Guthrie, 1994; Shortell et al., 1990; Simons, 1987). It has also been subject to considerable psychometric assessment (Snow & Hrebinia, 1980; Hambrick, 1983; Shortell & Zajac, 1990).
years ago. The scale was a seven-point scale, anchored at one end by a description of a defender-type organization, and, at the other end, by a prospector-type organization. Respondents were then asked to rate their current strategic position. Recall that the focal construct is the extent, or level, of change, as opposed to its direction and thus it is immaterial whether firms are moving from a defender stance towards a prospector stance or vice versa. For this reason, strategic change was measured as the absolute value of the differences between the two ratings. The results section of the paper includes a description of supplementary tests undertaken to confirm the importance of the extent of change and the irrelevance of the direction of change.

In order to provide some additional support for the use of this particular measure of strategic change, considerable attention in the pilot phase of the project was devoted to assessing the validity of the measure. Interview data from the CEOs provided important evidence that this dimension of strategic change was important to hospitals. It was also evident that the CEOs were able to reliably record their perceptions of strategic change. Those interviewed appeared to have no difficulty assessing the degree of change currently being undertaken in their respective organizations. In one public hospital, for example, managed for 99 years by the Sisters of Charity, the CEO had been in the position for two years and was charged with the responsibility of repositioning the hospital strategically. The new CEO was quite clear in his direction – he was positioning the hospital to be market-oriented. Prior to his arrival, the hospital could easily be described as having a defender-type strategy. The CEO had identified market demands and indicated the service changes being introduced to meet these demands.

... we've added the lithotripsy service which is a major service, ... expanded our medical imaging with MRI, the second major hospital to do so, ... expanding in our community programs, mainstreaming psychiatric services, expanding our drug and alcohol services, set up a neuroscience department ... these are some of the things ... we are looking at other things.

Similarly, at another hospital, the CEO had adopted a pro-active stance by assessing market demands and responding by introducing new services and programs to meet these demands.

... the liver transplant has been added ... palliative care has been added – a new program ... specialist geriatric service ... brain damage unit. There will be others ... probably half a dozen.

Another hospital considered itself to be a prospector, but was undergoing little strategic change – its strategy was to maintain its position through expansion of existing programs rather than development of new programs.

... we've been concentrating more on expansion of services as a result of those waiting list monies ... if the state budget is approved we are getting somebody to expand bone marrow transplant.

The interview data suggest that respondents had little difficulty in either positioning where the hospital was now, or two years earlier. The descriptive statistics, presented in Table 1, indicate sufficient variability in the measurement of this construct.

3.1.2. Style of budget use

In this study, the CEO is the key agent of strategic change and thus we argue that the relevant theoretical construct for the style of budget use is that style, or role for budgets, intended by the CEO. This role is best defined in reference to the CEO’s perception of their specific overt behaviours when interacting with occupants of other positions, i.e. what is often term the “enacted” role (Deutsch & Krauss, 1965). While role theory distinguishes “enacted role” from “received role”, it emphasizes that the differences between the two roles
have theoretical substance rather than merely reflecting an error in measurement of one or the other. Indeed role theory supports the idea that it is the behaviour of the role occupant most directly influenced by the particular context that is relevant. In our case, we are interested in how CEOs respond to strategic change and predict that the effective implementation of strategic change prescribes a particular role for the CEO in the management of the change process. It is thus the CEOs’ perceptions of their overt behaviours or their intended role that is important here. For this reason, we sourced the assessment of style of budget use from the CEO.

It was necessary to develop an instrument to capture interactive budget use. Based on Simons’ (1990, 1991) description of interactive use we developed four items. We asked respondents to indicate the extent to which they agreed with four statements relating to their budget behaviours. Each item was presented as a seven-point scale, with anchors of “strongly agree” and “strongly disagree”. As this measure had not been used previously in a questionnaire form, steps were taken to provide support for its psychometric properties. Factor analysis indicated that the four item measure was unidimensional, and the Cronbach alpha reliability coefficient (0.59) was within the limits considered to be acceptable (Nunnally, 1978). Support for the measure was also provided by assessing its convergent validity with an alternative measure of the construct, presented in a later section of the questionnaire. With the latter measure, respondents were provided with two descriptions of budget use based directly on Simons’ (1990, 1991) definitions. One of these captured an interactive style of use, the other a diagnostic style. Respondents were asked to choose which of the two alternative descriptions of budget use better represented their style of use of budgeting. We deliberately chose an alternative measure which was quite different in format (forced choice) from the four-item Likert type scale to be consistent with the principle of maximally-dissimilar forms of ratings, urged in the literature on convergent validation. The point-biserial correlation between the multi-item measure and the dichotomous measure was 0.41 \((p < 0.001)\) providing reasonably strong support for the convergent validity of the four-item measure used in the study. The availability of reliability data for the four-item measure led to its choice for use in the hypothesis test, and the final measure was constructed via a summation of the four items. Scores were coded such that a high score represented interactive budget use.

### 3.1.3. Hospital performance

Performance is measured using CEOs’ self-ratings. There has been some concern in the literature as to the objectivity of self-ratings. However, the focus on a public sector industry precluded using either profitability or stock return as a proxy for performance. It was also not possible to use published hospital output or other measures of hospital performance as the funding of hospitals in Australia is a state responsibility and publicly available data are not comparable across states. Moreover, within states there are substantial variations in the completeness of data, and data which do exist are not contemporaneous across hospitals. By contrast, data supplied by CEOs are

<table>
<thead>
<tr>
<th>Variables</th>
<th>Theoretical range</th>
<th>Actual range</th>
<th>Mean (sd)</th>
<th>Correlations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strategic change</td>
<td>Interactive budget use</td>
<td></td>
<td>Strategic change</td>
</tr>
<tr>
<td>1. Strategic change</td>
<td>0/6</td>
<td>0/6</td>
<td>1.27(1.07)</td>
<td></td>
</tr>
<tr>
<td>2. Interactive budget use</td>
<td>4–28</td>
<td>14–28</td>
<td>21.87(1.40)</td>
<td>0.30(0.02)</td>
</tr>
<tr>
<td>3. Performance</td>
<td>1–7</td>
<td>3–7</td>
<td>5.83(0.85)</td>
<td>−0.02(ns)</td>
</tr>
</tbody>
</table>

*a Pearson correlations (2-tailed test) were computed.*
consistent in terms of the performance dimensions assessed are contemporaneous and, are subject to in-built controls against the threat of leniency bias. Common-rater bias is also unlikely to be a concern given that the coefficient of interest is that relating to the interaction term rather than the main effect coefficients.

To capture the multi-dimensional nature of hospital performance, an instrument was purpose-developed and based on data collected during site visits undertaken during the pilot study. According to the CEOs interviewed, six dimensions were considered important to the overall performance of hospitals and these items were included in the measurement instrument, along with an overall measure of hospital performance. The instrument required CEOs to indicate their hospital’s current performance, relative to other hospitals of similar size and function, on a seven-point Likert-type scale, anchored at the poles by “below average” and “above average”. Following Govindarajan (1984) and others (Govindarajan & Gupta, 1985; Abernethy & Stoelwinder, 1991) we capture performance as a relative rather than an absolute measure. This overcomes some of the measurement difficulties associated with a cross-sectional sample where organizational effectiveness may be affected by other factors (Govindarajan, 1984). For example, in the hospital industry, highly specialized hospitals are likely to be more costly than those providing less intense services. Having CEOs compare themselves relative to others performing similar services and of similar size indirectly controls for the effect of such factors.

The individual items of performance identified by CEOs as important to overall performance were not expected to represent a unidimensional scale, and factor analysis confirmed this. The items were, therefore, not summed for use in the analysis. Rather, the analysis was performed using the overall rating of performance. However, to ensure the overall rating captured the multi-dimensional nature of performance, we assessed the proportion of its variance that was accounted for by the six performance dimensions using a multiple regression of the overall rating on the six dimensions. This produced a multiple correlation of 0.66 (\( F_{6.57} = 7.07, p < 0.001 \)). We also assessed the convergent validity of the self-rating measures of performance by correlating these with the ratings obtained from both the financial director and the medical director of the same hospital. While not as high as expected, the results indicated some convergence between the CEOs’ and the financial directors’ ratings \( (r = 0.31, p = 0.01) \), and the CEOs’ and the medical directors’ ratings \( (r = 0.23, p = 0.01) \).

4. Results

Prior to fitting Eq. (1) to the data, the independent variables were centred to overcome any potential problems associated with multicollinearity in models with multiplicative terms (Cohen, 1988).\(^5\) The results are in Table 2, and show that \( \beta_3 \) is both positive and significant \( (t = 3.42, p = 0.001) \) with a significant amount of variance in the dependent variable \( (R^2 = 0.18, F_{3.59} = 4.26, p < 0.001) \) explained by the model. In addition, the inclusion of the interaction term in the regression adds significantly to the explanatory power of the model, compared to a model (not presented here) which excludes it \( (F_{2.60} = 11.66, p < 0.001) \). These results support our expectation that budget use moderates the relationship between strategic change and performance.\(^6\) As indicated

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\(^5\) Centring involved subtracting the mean value of the two independent variables from the original score. The VIF (or tolerance) values and the condition index values indicated that centring overcame any potential difficulties with multicollinearity. The VIF value for the strategic change variable changed from 55.82 to 1.35 after centring; the condition index value changed from 2.75 to 1.48. The VIF value for the budget use variable changed from 2.39 to 1.11 and the condition index changed from 14.61 to 1.35. The VIF value for the interaction variable changed from 61.98 to 1.24 and the condition index changed from 37.96 to 1.86.

\(^6\) To overcome the possibility of an omitted variable bias due to size of hospital, two further regression models were assessed. One model included “number of inpatient beds” and the second model included “operating expenditure”. Both of these variables are proxies for size. The results are presented in Appendix B. Size of hospital does not appear to have a significant effect on the dependent variable, nor does it have any substantive effect on the size or significance of the interaction coefficient. The amount of variance explained by the model also remains relatively constant.
in Table 2 the relation between strategic change and performance is more positive when the style of budget use is interactive compared to when it is diagnostic. To provide added confirmation of this result, we computed the Pearson correlation between strategic change and performance for the sub-sample scoring below the median on the style of budget use (i.e. diagnostic use), and for the sub-sample scoring above it (i.e. interactive use). Respectively, these correlations were 0.32 \((p < 0.10)\) and 0.16 (ns). More important than whether either of these correlations differs from zero is the question of whether they differ from each other. This latter test, using Fisher’s \(r\) to \(z\) transformation (see, for example, Winkler & Hays, 1975), showed a significant difference between the two \((p < 0.05)\).

We also sought confirmation of this last result using non-parametric procedures that place fewer demands on the data. The Spearman rank correlation between strategic change and performance was −0.32 \((p < 0.10)\) and 0.16 (ns). More important than whether either of these correlations differs from zero is the question of whether they differ from each other. This latter test, using Fisher’s \(r\) to \(z\) transformation (see, for example, Winkler & Hays, 1975), showed a significant difference between the two \((p < 0.05)\).

To add some intuitive appeal to these results we assessed the relationship using a two-way ANOVA. Strategic change was split at the median to create two groups (low strategic change and high strategic change). The continuous measure of interactive budget use was also split at the median to create two groups. This enabled us to assess the relationship as illustrated in Fig. 1. The mean scores for performance (presented in Table 3) indicate that performance is highest when interactive use and strategic change are appropriately matched. That is, performance is highest in Cell 1 where strategic change is low and budget use is diagnostic and in Cell 4 where strategic change is high and budget use is interactive. Performance is lowest in Cells 2 and 3 where there is a mismatch. The results of the ANOVA provide support that these differences are due to the interaction between strategic change and budget use. The two-way interaction term is highly significant \((F = 10.50, p = 0.002)\).

As mentioned earlier, we performed some additional analyses to test the validity of several of the model’s assumptions. Recall that in developing the hypothesis we argued that it was the extent of strategic change that was important in determining the degree to which top management use bud-

### Table 2
Results of regressing hospital performance on strategic change, budget use and their interaction \((n = 63)\)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Standardized beta coefficient ([t\text{-value, sig level}])</th>
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<tbody>
<tr>
<td>Constant</td>
<td>5.73 ([7.78, p &lt; 0.001])</td>
</tr>
<tr>
<td>Strategic change</td>
<td>−0.27 ([-1.93, p &lt; 0.058])</td>
</tr>
<tr>
<td>Budget use</td>
<td>0.18 ([1.44, \text{ns}])</td>
</tr>
<tr>
<td>Interaction term (strategic change × budget use)</td>
<td>0.45 ([3.42, p &lt; 0.001])</td>
</tr>
<tr>
<td>(R^2)</td>
<td>0.18</td>
</tr>
<tr>
<td>Adj (R^2)</td>
<td>0.14</td>
</tr>
<tr>
<td>(F) Value</td>
<td>4.26</td>
</tr>
<tr>
<td>Signif (F)</td>
<td>0.001</td>
</tr>
</tbody>
</table>

### Table 3
ANOVA Results

<table>
<thead>
<tr>
<th>Relationship between strategic change, style of budget use and performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Style of budget use</td>
</tr>
<tr>
<td>Strategic: Low “Match” (Performance highest)</td>
</tr>
<tr>
<td>Change: High “Mismatch” (Performance lowest)</td>
</tr>
</tbody>
</table>

7 We did not choose to use this method of analysis to test the hypothesis as the variables were measured using continuous data and thus a regression model was considered to be the more appropriate analytical model.
gets interactively, rather than the direction of the change process. To test this assumption, we extracted from our data seven organizations that were changing from a prospector stance towards a defender stance. Examination of the descriptive data presented in Table 4 is instructive as it clearly shows that the magnitude of change is positively related to the extent of interactive budget use. Note that the score for strategic change represents the extent to which the organization has moved from a prospector stance towards a defender stance. While confidence in any statistical inference is limited because of the small sample size, the rank correlation between the scores for “strategic change” and “interactive budget use” in this subset is 0.88 ($p < 0.001$), and a median test (Mann-Whitney) shows no difference in the scores for interactive budget use between this group of seven and the balance of the sample (56). Finally, the coefficient estimates generated from fitting Eq. (1) are unchanged by the deletion of these seven cases from the database.

### Table 4
Descriptive statistics for the sub-sample of hospitals changing from a prospector stance towards a defender stance ($n = 7$)

<table>
<thead>
<tr>
<th>Case</th>
<th>Strategic change score</th>
<th>Interactive budget use score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6</td>
<td>26</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>26</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>25</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>23</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>19</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>19</td>
</tr>
</tbody>
</table>

### 5. Discussion

This paper provides the results of an exploratory study designed to improve our understanding of how accounting can be used to facilitate strategic change. Simons’ (1990, 1991) interactive/diagnostic typology was used to examine the role of budgeting when firms undergo strategic change. It was predicted that performance would be enhanced if budgeting is used interactively when organizations undergo strategic redirection. These relationships were analyzed using data from 63 hospitals and the evidence supported expectations. The findings are consistent both with Simons’ (1990, 1991) descriptions of the way in which control systems are used in firms to manage strategic uncertainties, and with interpretive accounts of organizational change (e.g., Dent, 1987). As noted by Dent (1990, p. 20), these interpretive accounts have tended to be “speculative” as they have generally been undertaken in one organization and, therefore, provide only “a minimal basis for distinguishing actualities from potential”. The evidence provided in this study adds to this empirical base and furthers our understanding of the relationship between accounting and organizational change.

In addition, the study adds to our knowledge of the accounting/strategy link and provides some empirical evidence that is useful in understanding the apparent conflict that has emerged from studies examining this link. The evidence supports Simons’ (1990) assertion that the effective implementation of strategic priorities does not necessarily influence the importance of accounting controls, but rather, influences the manner in which these controls are used. The data suggest that where top management use budgeting in an interactive mode, this better serves the needs for the learning and adaptation required when strategic change is underway.

### 6. Limitations and directions for future research

As with all exploratory research, numerous directions for future research emerge from this study. One logical extension of the study would be to develop a more complex model that incorporated the two antecedent conditions identified by Burchell et al. (1980) as influencing an organization’s decision-making context – namely, clarity of objectives and knowledge of the means/end relationship. This refinement would enable an assessment of the relative impact of strategic change on these two conditions. The model could then more directly test how accounting information can be used in this decision context.
to facilitate the effective implementation of strategic change.

The model examined here was also confined to examining top management’s style of budget use. As Simons (1990, 1991) research indicates, senior managers select different controls to be used interactively, depending on the nature of the strategic uncertainties faced. It is entirely plausible, in certain situations, that alternative non-accounting forms of control may serve an important role where strategic change is occurring. Further research could assess the relative effectiveness of accounting and other non-accounting controls in facilitating organizational change. The results here might also be sensitive to the managerial level selected for analysis. As operational budgets are used extensively by middle level management, it would be fruitful to identify the conditions that influence their alternative uses of budgeting.

Replicating the study in the corporate sector could also extend this research. While limiting the study to one industry enables indirect control over potentially confounding industry effects, further research is required in other industries to assess the generalizability of the model. A replication of this study in the corporate sector would identify whether the hypothesized relationships hold in different industries. If the results obtained do not support the framework developed here, there is an opportunity for uncovering potentially important variables which will further enhance our understanding of the role of accounting in the management of strategic change.

The implications of this study are influenced by the method selected to study the research question. As with all cross-sectional research designs, the results presented here do not permit an assessment of the cause and effect relationships among the variables of interest. All that can be said is that the results are consistent with the theoretical position taken in the paper. Cross-sectional methods also do not enable the dynamics of organization change to be explored. Considerable research opportunities exist to extend this study using longitudinal field research methods. One particularly fruitful area for further study would be to assess the factors which influence strategic change, and how this in turn influences control system design.

Several methodological improvements are also possible, particularly with respect to measurement. All the constructs used in this study required development of measurement instruments. While considerable care was taken in the development and assessment of the psychometric properties of the instruments, further testing of these measures by other research studies is urged. It might also be possible to measure these constructs using other data sources. For example, prior research has attempted to measure strategic change using industry handbooks and other published data (see Goodstein & Boeker, 1991). This approach was not possible in this study as there were no comparable data for Australian hospitals that were sufficiently complete or reliable for the period in question. It should also be noted that the study only operationalized one dimension of strategic change. Strategic change is a complex construct and further attention could be directed towards developing a measure that captures its multidimensional nature.

Despite the potential difficulties with the measurement instruments, the study does attempt to devise “new measurement instruments which address the various roles which accounting might play in organizational control” (Chapman, 1997, p. 203). The concerns over measurement difficulties in this study are also somewhat mitigated by the theoretically consistent results obtained. However, this is a post hoc rationalization, and further work is obviously required to validate these instruments. Hopefully, this study provides an impetus for researchers to address these issues and to move beyond existing models of control, and begin to systematically explore the different roles served by accounting in the management of change. As is evident, important issues remain to be addressed.

Acknowledgements

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Appendix A: Sample demographics

<table>
<thead>
<tr>
<th>State</th>
<th>No. of hospitals</th>
<th>No. of beds mean (sd)</th>
<th>Operating expenditure ('000) mean (sd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT (1)</td>
<td>624 (-)</td>
<td>120000 (-)</td>
<td></td>
</tr>
<tr>
<td>NSW (26)</td>
<td>354 (181)</td>
<td>62146 (54320)</td>
<td></td>
</tr>
<tr>
<td>Victoria (17)</td>
<td>383 (156)</td>
<td>66987 (47998)</td>
<td></td>
</tr>
<tr>
<td>Queensland (10)</td>
<td>351 (154)</td>
<td>39652 (9587)</td>
<td></td>
</tr>
<tr>
<td>South Australia (10)</td>
<td>570 (366)</td>
<td>112086 (66733)</td>
<td></td>
</tr>
<tr>
<td>Tasmania (2)</td>
<td>448 (100)</td>
<td>73467 (32196)</td>
<td></td>
</tr>
<tr>
<td><strong>Pilot Study (Victoria)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospital A</td>
<td>469</td>
<td>110000</td>
<td></td>
</tr>
<tr>
<td>Hospital B</td>
<td>309</td>
<td>55264</td>
<td></td>
</tr>
<tr>
<td>Hospital C</td>
<td>312</td>
<td>49691</td>
<td></td>
</tr>
<tr>
<td>Hospital D</td>
<td>354</td>
<td>92000</td>
<td></td>
</tr>
<tr>
<td>Hospital E</td>
<td>861</td>
<td>151512</td>
<td></td>
</tr>
<tr>
<td>Hospital F</td>
<td>488</td>
<td>113638</td>
<td></td>
</tr>
<tr>
<td>Hospital G</td>
<td>521</td>
<td>127570</td>
<td></td>
</tr>
<tr>
<td>Hospital H</td>
<td>453</td>
<td>71210</td>
<td></td>
</tr>
</tbody>
</table>

Appendix B: Assessment of the impact of “size” on regression results

Two regression models incorporating “beds” (Eq. (1)) and “operating expenditure” (Eq. (2)) into original regression model(i.e. ) \( (n = 63) \).

<table>
<thead>
<tr>
<th>Variable included in model</th>
<th>Eq. (1)</th>
<th>Eq. (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
<td>Standardized beta coefficient</td>
<td></td>
</tr>
<tr>
<td>[r-value, sig level]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Standardized beta coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>[r-value, sig level]</td>
<td></td>
</tr>
</tbody>
</table>

Appendix C: Measurement of variables

C.1. Strategic change

The following two descriptions of hospitals were given to respondents. They were asked to circle on a seven-point Likert type scale where they would place their hospital two years ago, and where they would place the hospital now. A (1) represented a Hospital A-type hospital and a (7) represented a Hospital B-type hospital.

“Hospital A offers a relatively stable set of services and tends to focus on a particular segment (i.e. geographical region) of the population and offers a more limited range of services/programs that other hospitals of similar size and function. Generally Hospital A is not at the forefront of new services or market developments in health care. Developments in services/programs tend to concentrate on current areas of operation. It believes that doing the best job possible in its existing range of services/programs and refining existing services/programs are of utmost importance.”

“Hospital B makes relatively frequent changes in, and additions to, its set of services/
programs and tends to offer a wider range of medical services compared to other hospitals of similar size and function. Hospital B responds rapidly to early signals of market needs or opportunities and it consistently attempts to be at the forefront of new service/program developments. Other hospitals often follow Hospital B in the development of these services/programs. This type of hospital may not maintain its strength in all of the areas it enters.”

6.2. Interactive budget use

Respondents were asked the extent to which they agreed or disagreed with the following statements.

1. I often use budgeting information as a means of questioning and debating the ongoing decisions and actions of department/clinical managers.
2. The budget process is continuous – it demands regular and frequent attention from managers at all levels.
3. There is a lot of interaction between top management and department/unit managers in the budget process.
4. I use the budget process to discuss with my peers and subordinates changes occurring in the hospital.

6.3. Interactive/diagnostic classification of budget use

Respondents were asked to check which one of the following alternative uses of budgeting better represented their involvement in, and use of, budgeting.

The information generated by the budgeting system is an important and recurring agenda addressed by the highest level of management. The budgeting process demands frequent and regular attention from managers at all levels of the organization and the information provided by the system is interpreted and discussed in face-to-face meetings with subordinates and peers. The budget process relies on the continual challenge and debate of underlying data, assumptions and action plans (description of interactive use)

or

The budgeting system is a process aimed at achieving predetermined outcomes and the information produced by the system is used primarily to inform top managers if actions or outcomes are not in accordance with plans. Staff specialists (i.e. finance departments) play a pivotal role in preparing and interpreting the information produced by the system. Data are reported through formal reporting procedures and top managers tend to be involved in the process infrequently and on an exceptions basis (description of diagnostic use)

6.4. Hospital performance

Respondents were asked to rate on the following criteria their performance relative to other hospitals of similar size and function on a seven-point anchored Likert-type scale ranging from one (below average) to 7 (above average).

1. Comparative costs with other hospitals.
2. Ability to win resources.
3. Reputation of medical programs.
4. Undergraduate and graduate medical/health professional teaching.
5. Research.
6. Quality of care.

The global measure asked the respondent to rate the hospital’s overall performance relative to other hospitals of similar size and function on the same seven-point scale.

References


Hospital and Health Services Year Book, Australia, 1994.


