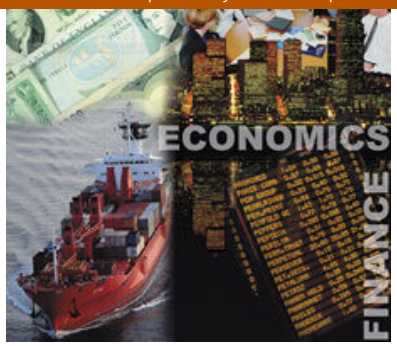

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The industrial relations and budgeting interface: an empirical study

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The industrial relations and budgeting interface: an empirical study

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The industrial relations and budgeting interface: an empirical study

Abstract – While previous contingency accounting studies conceived external environmental factors as affecting budgeting in terms of markets, technology, or task uncertainty, industrial relations environment has been rarely considered as an important influential factor in accounting research. Nonetheless, industrial relations activities - work stoppages, union officials' actions and conflicts between unions – could be expected to play a significant role in an organisation's management control systems and performance. This study sought to search for a contingent relationship between industrial relations and two important elements of an organisation's management control systems - budgetary participation and budget use in performance evaluation. Through a detailed analysis of a sample of 55 Australian coal miners, we examine the moderating role of budgetary participation in the relationship between industrial relations and budget use. The hypothesis in this study postulates managers' use of budgets in performance evaluation being affected by a two-way interaction between industrial relations and budgetary participation. We found that industrial relations environment influences the extent of budget use in performance evaluation, but the magnitudes of this influence depends on levels of managers' participation in setting their organisation's budgets.

Key words: Industrial relations, budgetary participation, budget use, managerial performance, coal mining, Australia.

1. Introduction

Organisations, regardless of size must make strategic choices about industrial relations, human resources, and management control systems (MCSs). It is inevitable that choices made over one of these will affect the others. Using this contingent approach, considerable effort has gone into researching how characteristics of an organisation's MCSs designs such as budgeting within the organisation are affected by organisational circumstances such as size, strategy, structures, and external environmental diversity (Otley, 1980; Langfield-Smith, 1997; Chapman, 1997; Chenhall, 2003; Luft & Shield, 2003).

The bulk of studies conceive external environmental factors as affecting budgeting in terms of markets, technology, or task uncertainty. Industrial relations environment is rarely considered as an important influential factor in accounting research (Amernic, 1985; Ezzamel, *et al*, 2004). Nonetheless, trade union action, industrial conflict, strikes, and the consequent potential for lost production and the uncertainty, which it introduces into the management environment, could be expected to play a

significant role in the day-to-day operations and control systems of many organisations (Berry *et al*., 1985; Hoque & Hopper, 1997; Carmona *et al*, 2003; Ezzamel *et al*, 2004). The purpose of this research is to search for a contingent relationship between industrial relations environment and two important elements of an organisation's MCSs - budgetary participation and budget use. To explore this form of 'alignment' or contingency fit (Gerdin & Greve, 2004; Van de Ven & Drazin, 1985), a parsimonious theoretical framework is developed, as shown in Figure 1. This framework postulates that industrial relations environment (X_1) influences the extent of budget use in performance evaluation (Y), but the magnitudes of this influence depends on levels of managers' participation in setting budgets (X_2).

INSERT FIGURE 1 ABOUT HERE

Our research contributes to contingency theory-based management accounting studies in two ways. First, previous contingency studies provided little knowledge of the budgeting- management-labour relations in an advanced country context.[1] Our study thus extends Hoque and Hopper's (1997) work to an advanced country context. Second, by searching for a 'good fit' or misfit between the industrial relations environment and budget use, our study will also provide additional evidence on the linkage between MCSs designs and environmental uncertainty identified previously (e.g. Brownell 1981, 1982, 1983, 1985; Brownell & McInnes 1986; Brownell & Hirst 1986; Dunk, 1989; Brownell & Dunk, 1991; Mia, 1993.

The study draws from a survey of 55 coal-mining companies in Australia. We chose the mining sector for investigation for its significance for the Australian economy, and the importance of industrial relations to the sector. On average, the mining sector generates A$28 billion (€16 billion or US$20

[1]Studies that examine some aspects of industrial relations and management accounting include: Armstrong (1994), Armstrong *et al*. (1996), Arnold (1998) and Ezzamel *et al*. (2004).

billion) annual turnover and is the single most important source of export revenue. Further, the technology of the industry acts to empower work groups at the expense of management (Barry *et al*., 1998), thus promoting industrial relations to a key role in industry performance.

The paper is organized as follows: The next section provides a background of the various strands to the study: the relationship between industrial relations and budgeting, an overview of industrial relations in the Australian coal industry, the contingency analysis literature, and the relationship between industrial relations, budgeting and managerial performance. The third section outlines the methods used. The results are in section four and the main findings, and questions for further work are in the concluding section.

2. Context and theoretical basis

2.1 Industrial relations and budgeting

The use of accounting, especially cost accounting techniques, to monitor and control labour can be traced back to the sixteenth century (Pollard, 1965; Armstrong, 1987; Edwards & Newell, 1991; Fleischman & Parker, 1991; Carmona *et al*., 2003). In fact, Hopper and Armstrong (1991) argue that accounting controls arose as an attempt to control the labour process; in their view, changes in control systems are made not necessarily to increase efficiency but to intensify the labour process and to redistribute the product of that labour (Armstrong, 1987; Miller & O'Leary, 1993; 1994).

It is surprising then that the relationship between accounting and industrial relations has been rarely studied by either accounting or industrial relations scholars.[2] Despite their obvious importance,

2 The interest of industrial relations scholars in accounting has been mainly in the ways that financial accountants "hide" information, and confuse or mislead trade unions in collective negotiations (e.g. Amernic (1985), Ogden & Bougen (1985), Brown (2000), Owen & Lloyd (1985)). A recent increase in interest in accounting among industrial relations practitioners and scholars has followed where requirements to "bargain in good faith" has imposed duties on employers to disclose financial information relevant to collective bargaining claims.

contemporary studies of the impact of trade unions and industrial relations on accounting control systems are indeed sparse (Arnold, 1998; Ogden, 1997; Panozzo, 1997). As Armstrong (1994) states: "Accounts of post 1980's industrial relations continue to parade the traditional dramatis personae of industrial relations: management trade unionism and State intervention … What is ignored in these scenarios is that industrial relations in large British companies now takes place on a terrain defined by budgetary planning and financial performance monitoring. On the accounting side, studies of trends in British management accounting practice have been equally insular. … In reality, the value of information depends on the ability of management to act on it, and this may well be subject to industrial relations constraints" (p.190).

These observations with respect to advanced countries are borne out by Berry *et al.*'s (1985) study of the British National Coal Board (NCB), Miller & O'Leary's (1994) study of vehicle manufacturing in the US, and Armstrong *et al*'s (1996) major survey of 176 large UK companies. This latter study found that budgeting was an important stimulus to employers seeking labour force flexibility, particularly using part-time female labour, a phenomena of considerable interest in the industrial relations literature (e.g. O'Reilly & Fagan, 1998). They found support for the conventional proposition that budgetary systems were a response to organisation size, diversity and problems of internal co-ordination. However, there was also strong evidence supporting the view that they were used more when labour force resistance was relatively weak, giving managers greater freedom to act on budgetary information.

The work of Hoque and Hopper (1997) addressed the same issues in a developing country context. They examined industrial relations factors impacting upon budgeting in state-owned jute mills in Bangladesh, where the state and politics were often intertwined with problems of their day-to-day operations. Hoque and Hopper found that where trade unions' intervention and activities of workers were perceived as great, then managers saw budgets as having less importance in their organisation; budgeting was demonstrably ineffective for organisational activities.

The argument of such qualitative studies is that the effects of trade unions and labour militancy would lead to managers placing less importance on programmed decision making and control systems such as budgeting within their business units (Flamholtz, 1983). Put into "contingency speak" trade unions are a potential source of uncertainty, and they have influence on day-to-day operations. "Where trade unions are strong … pre-planned budgets may reduce the ability of local managements to reach an accommodation. Where union organisation is weak … a line manager ... may attempt to impose a pay settlement or a change in work practices which will reduce labour costs" (Armstrong, 1994, p. 203).

2.2 Industrial relations in the Australian coal industry

The Australian coal industry has two features that made it suitable for this study: it produces a relatively simple product primarily for export, using either of two technologies (underground or open-cut mining), and industrial relations are always of concern to management, for the industry has high levels of industrial disputation (Barry *et al*., 1998; Bowden, 2000).

Mining - both underground and open-cut - is heavily capital-intensive. The equipment is large and expensive but so is the investment in developing the pit. The depth of the seams in some open-cut operations is such that seven years of excavations of the overburden are required to reach the coal seam. Coal companies are concerned to realize the budgeted return on the initial investments, but the price of the product coal is unpredictable over that sort of time range; in addition to fluctuations in coal prices, which are primarily determined by the Japanese consumers, exchange rate instability further destabilizes earnings.

The industry is also remarkably competitive given the level of capital investment demanded, having a mixture of large firms and some small one-pit operations. Therefore over-investment and thus over-capacity contributes further to the destabilisation of prices. The question of oversupply, and therefore lower prices, has a further effect in that the potentially lower returns on investment make

mining companies more inclined to force through changes to work practices, and to resist rather than to concede union claims.

The profitability of mining varies considerably. Many factors contribute to the mine's performance. The age of the mine, and the geology are extremely important; the first coal taken from a mine is closest to the surface, but as a mine ages the coal seam(s) becomes further and further from the surface. Eventually it runs out or becomes too deep to mine economically. Economies of scale, equipment and location in relation to ports are also crucial factors. In the case of open-cut operations, weather is another key factor; heavy rainfall can flood pits and make mining less efficient or even impossible.

Mine management collect numerous statistics on production and labour usage. They monitor raw labour costs and unit labour costs against budgetary targets. ROI is used as an overall performance indicator, and is able to be used to compare the performance of mine managers, notwithstanding different mine technologies, age of the workings and favourableness of the geology. Our pilot study in the industry confirmed Hopper and Armstrong's (1991) proposition that ROI is used to adjust the number employed in line with fluctuating product markets. Nonetheless, the strength of the unions is such that management's capacity to act is limited by industrial relations constraints. Kerr & Siegel's (1954) observation half a century ago that coal mining is strike prone across countries, including Australia, still holds today. The mining unions have always been ready to call industrial action if they believe that management has overstepped the line of what they regard as reasonable behaviour. These stoppages are partly symbolic, usually lasting only a day or two, but they do stop production and inconvenience management. Their main achievement is to remind management that their powers are limited by the consent of the work force mediated through the union (c.f. Ezzamel *et al*, 2004).

The union culture in underground mining is very similar to its British counterpart, and even uses the same terms (e.g. "lodge" for union branch etc). Moreover this underground tradition extended to the

open-cut operations when they began in the post-World War II period (Barry *et al*., 1998). Both sectors of the industry have always been strike-prone, with tight union organisation, and a notable feature has been the use of national stoppages, which inevitably attract the attention of state and national governments.

The Australian industrial relations system has changed dramatically over the last decade (Hampson & Morgan, 1998). The environment has moved from one where awards made by the Australian Industrial Relations Commission (AIRC),[3] and other statutory instruments, determined worker rights and obligations to one where collective bargaining takes place at the enterprise level. The intention of this shift has been to give managers more scope to negotiate agreements, which they believe would match workplace "needs". On the other hand, it has produced more uncertainty for management. Previously awards of the AIRC acted as national standards, which were enforced by the strong union presence. The more bifurcated workforce, the weaker trade union organisation and the fact that many mines "go it alone" make industrial relations outcomes, in both the short run and long run, contingent upon many previously controllable factors.

Some coal companies warmly welcomed the introduction of this new environment. Beginning in the early 1990s, some coal companies introduced measures to reorganise work through a process of multi-skilling negotiated with industry unions. They also began to change shift rosters. These measures sought to raise productivity and increase flexibility, but came at a high price; offsetting wage increases and the production time lost in training and skill acquisition was not recovered through sufficiently higher levels of productivity.

In the light of the limited successes from this process, some coal companies began aggressive campaigns to de-unionise their mines. In one bitter dispute that ran for more than a year, the owners "retrenched the whole work force and closed the mine, stating its intention of reopening it with new

[3] In the unique case of coal mining there was a separate but parallel body, the Coal Industry Tribunal.

employees hired 'on merit' under 'reconfigured' wages and conditions. The mine was sold "dry of employees to Rio Tinto in 1998, and is now … staffed … with a new work force of non-union employees" (Lee, 2002, p. 171). Penalty rates and rostered days off have also disappeared, and the industry has seen massive redundancies. With more intensive working (Bowden, 2000), productivity per employee has risen. Although, most mines remain strongly unionised, "there have been significant changes in bargaining outcomes with respect to contractors, union preference arrangements and seniority" (Waring & Barry, 2001, pp.234-5). Even in mines where the mining labour force is employed directly, maintenance is often outsourced. Some companies have established their own contracting subsidiaries, which give them certain advantages with respect to employment law - their being "greenfield sites" - but, with the contract price agreed with the mining division of the (same) company, they are more subject to budgetary control. A feature of some operations has been the use of a fly in-fly out labour force where the workers are flown to the mine, work their shift of 12-hour days, sleeping on-site, then fly out as the next crew fly in. This arrangement makes it more difficult for trade unions to organize.

The situation pre-1997 in many respects mirrors the descriptions of Berry *et al* (1985) of the British coal industry in the 1980s, that is strong unions, central control but a good deal of leeway at the mine site which could be used to produce less conflictual industrial relations. Despite the many changes, and the de-unionisation of some mines, the political power of the unions is little diminished. Should they chose to exercise that power via national stoppages, they can seriously affect a key component of Australia's export trade and in the process, substantially affect profitability in the industry. Thus management has gained more control and flexibility, but this still remains severely limited by a powerful union presence in many mines.

2.3 Hoque and Hopper (1997) v the current study

Although this study uses the Hoque and Hopper (1997) four-item instrument to measure the industrial relations environment in the sampled mining organisations, we must note that there are substantial differences in the industrial relations environments between Bangladesh and Australia. Bangladesh has a long history of political instability, which is linked to a turbulent industrial relations climate. Most national political parties have affiliated trade unions in the industrial sectors and the intimacy between trade unions and politicians means that national politics have ramifications for the economy. Workers frequently participate in violent demonstrations, strikes and work stoppages called by the opposition parties.[4] Bangladeshi managers often complain that politicians directly intervene in the affairs of their organisations in contravention of formally agreed plans in order to ameliorate labour crises and to foster their political ends, thereby rendering budget plans meaningless (Hoque & Hopper, 1994 and 1997).

Politics and industrial relations in Australia, however, interact differently. Although most unions affiliate to the Labour Party, the link is not a strong one. The Labour Party does not call strikes, and whether it became involved in disputes would depend on the degree to which the dispute itself had become political. Coal industry strikes become political when they run for more than the usual few days, and the "national interest", which conflates the coal companies' export earnings with the nation's welfare, is cited by government politicians. Whether the government is a Labour or a conservative one, the government reaction tends to be the same. Thus the unions' links to the Labour Party are largely irrelevant and are unlikely to be a concern to managers.

[4] Despite this, official statistics record Bangladesh as having only a handful of work stoppages in any given year (e.g. see International Labour Office, 2001).

2.4 Contingency analysis

A tested proposition in the management accounting literature is that a firm's external environment plays a vital role in organisational operations and performance. This is, in fact, one of the key tenets of contingency theory - that the effectiveness of an organisation's MCSs design requires management's knowledge of the organisation's environment to determine the "fit" or alignment among the different organisational elements (Burns & Stalker, 1961; Lawrence & Lorsch, 1967; Perrow, 1970; Galbraith, 1973; Miles & Snow, 1978; Gerdin & Greve, forthcoming). Empirical evidence from accounting studies within this tradition suggests that MCSs choices made by organisational units depend on the level of environmental uncertainty facing these units (Otley, 1980; Chapman, 1997; Chenhall, 2003). Among previous contingency-based MCSs research, the work of Otley (1978), Hoque and Hopper (1997), Brownell (1982, 1985), Dunk (1989), Brownell and Dunk (1991), Abernethy and Stoelwinder (1991) are perhaps the most relevant for developing our research hypothesis.

It is not surprising to find that organisations seek to remove uncertainty from their environment so that they know how best to transact with it (Cummings & Worley, 1997). This is particularly so when environments are dynamic and complex.[5] Industrial relations environment relating to the activities of trade unions and informal work groups (Dufty & Fels, 1989, Clegg, 1972) is one of many elements of the *task environment*[6] that interacts directly with the organisation and can affect performance or goal achievement (Cummings & Worley, 1997).

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[5]Dynamic environments change abruptly and unpredictably whereas complex environments have many parts or elements that can affect organisations (Cummings & Worley, 1997).

[6]The other elements of the *task environment* are, for example, customers, suppliers, competitors, producers of substitute products or services, financial institutions, etc. These forces are specific to individuals and organisations that directly influence organisational operations or structures (Daft, 1992; Cummings & Worley, 1997). Task environment is not be confused with *task uncertainty*, where the former is an attribute of organisational design, whereby the degree of task variability and task complexity of a job is determined (Brownell & Hirst, 1986; Perrow, 1967; for details, see Tymon *et al*., 1998).

The above analysis of the Australian coal mining industry demonstrates that industrial relations turbulence is of concern to employers in the industry; despite change, much uncertainty remains. Furthermore industrial relations in the Australian coal industry have always been subject to product market considerations (Barry, 1999), which introduce a further element of unpredictability.

Previous studies (e.g. Macintosh & Daft, 1987; Govindarajan, 1984) suggest that accounting control tools such as budgets may not adequately reflect performance in sub units affected by uncertainty, and therefore tend to be used to a lesser extent in sub-units with low levels of operating certainty. Thus, the use of budgeting as a performance evaluation tool (Ahrens and Chapman, 2003) is most effective in situations where uncertainty levels are low or stable (Burns & Stalker, 1961; Woodward, 1965; Thompson, 1967; for more references see Chapman, 1997 and 1998).

Contemporary research, however, challenges this early view of contingency studies. For example, using four case studies from the UK clothing and textiles industry, Chapman (1998) argues that in uncertain conditions effective organisations may employ formal accounting systems with greater employee involvement in such processes.[7] Shields and Shields (1998) argue that if an organisation is going to look at budgetary participation there needs to be a clear reason why participation is being encouraged. Adopting such a view, we expect in the present study that managers are likely to use budgets to a greater extent in a highly uncertain industrial relations environment if they are involved with setting their budgetary goals. Hence, budgetary participation serves an intense formal and informal communication role between organisational members - what is referred to as a *social network* approach (Chapman, 1998).

Examination of the relationship between environmental factors and control systems in the management accounting literature has tended to focus on participative budgeting and the performance evaluation function of budgets (Brownell, 1985; Abernethy & Stoelwinder, 1991). Using theories from the

[7] For a critical commentary on this and relevant issues, see Chenhall (2003).

social psychology of organisations (Likert, 1961; McGregor, 1960; Vroom, 1964), research (e.g. Brownell, 1982) has shown that heavy reliance on budgets in performance evaluation needs to be accompanied by high participation in setting budgets to elicit a favourable effect on performance (for a detailed review, see Shields & Shields, 1998 and Luft and Shields, 2003). Another study by Brownell (1983) that shows, in the absence of participation, a heavy emphasis on budget-based evaluation is felt by managers to be illegitimate. Similarly, participation without subsequent reference to the budget in evaluation is also viewed as being illegitimate. Seen in such a context, we attempt to assess the association between budget use and industrial relations environments with differing levels (high/low) of participation. This research hence proposes the following:

> *Industrial relations environment influences the extent of budget use in performance evaluation, but the magnitudes of this influence depends on levels of managers' participation in setting budgets.*

3. The sample and research method

3.1 The research strategy and sample

To obtain background information about the mining industry and to test the validity and reliability of the survey instrument, we conducted a pilot study in three mining companies in Brisbane, and visited an open-cut mine in New South Wales. Many of the survey questions in this study were adapted from prior research in industrial relations and budgeting (e.g. Hoque & Hopper, 1997; Milani, 1975; Swieringa & Moncur, 1975). In order to refine the design, and focus the content, the survey was pilot tested with industrial relations and accounting scholars and five senior mining executives.

In this study, we focused on a sample of 120 coal-mining companies randomly selected from the *Association of Mining and Exploration Companies* Database (1999)[8]. These companies are either strategic business units or independent miners. To develop a complete mailing list, the names and

[8] This paper is developed from a larger project funded by the *Australian Research Council.*

addresses of business units were identified from this database. As the study is about industrial relations, budgeting and performance, the distribution of questionnaires was restricted to mining heads only. In order to personalise the mailing, we telephoned each company secretary to be sure of the appropriate name of the participant within each business unit. Because of time constraints, in some cases, heads of accounts and finance were nominated by the mining heads to complete the questionnaire.

To support tests of the foregoing hypothesis, a preliminary survey was designed. Given the potential for poor responses that can arise from lengthy and complex surveys, considerable attention was given to refining the visual appearance of the survey. The mail-out survey package included a covering letter explaining the purpose of the research, a copy of the survey, and two postage-paid envelopes – one for returning the survey, and the second to allow respondents to request a copy of the survey results. Each respondent was asked to complete the questionnaire as fully as possible. Further, each participant had the opportunity to reply to an open-ended question regarding the issues identified.

Questionnaires were mailed in early May 2001 with a request for reply by 15 June 2001. A reminder letter was posted four weeks after the initial mail-out. Of the questionnaires distributed, a total of 55 (45.8%) usable questionnaires were returned. Analyses of the early and late respondents' questionnaires (using t-tests) indicated no differences on the basis of size (employment and sales revenues) and type of organisation. Similarly, no differences between respondents and non-respondents were found on the basis of firm size and type of organisation. Table 1 shows the distribution of the sample by firm size (in terms of number of employees and organisational types). On average, the respondents were 40.5 years old, had worked in the mining industry for an average of 7 years, and had held their present position for an average of 4.5 years.

INSERT TABLE 1 HERE

3.2 Statistical tests

We followed a series of statistical tasks before we embarked on our tests of the hypothesis. We used the SPSS12.0 application for all the tests. First, we conducted a detailed examination of the data through a variety of descriptive statistics, the frequency distributions of values for various groups, and tests for normality and homogeneity of variance. Graphical representations of the data through histograms, Stem-and-Leaf Plots and Box plots were also performed as detective work. The Levene Test and the tests of normality (through normal plots, kurtosis and skewness) were conducted to evaluate the assumptions for regression analysis.

We then computed descriptive statistics (means and standard deviations) for each variable. These gave an idea of the generality of responses. Pearson correlation coefficients were calculated for all variables to assess the strength and nature of the associations between them. Factor analysis (via principal components analysis) for all dependent and independent variables was performed in order to justify the computation of a single-item scale, where necessary.

3.3 Variables measurement

3.3.1. Industrial relations

We followed Hoque and Hopper (1997) and measured industrial relations environment using five items. Four items in the measure pertain to industrial relations activities, namely (1) actions of elected trade union officials, (2) internal conflicts among trade unions, (3) strikes and work stoppages, and (4) linkage of trade unions with national political parties. This fourth item was included to retain comparability with the Hoque and Hopper (1997) study, even though, as we noted in section 2.3 its interpretation in Australia would be considerably different from Bangladesh. A fifth item was managers' ratings on the overall industrial relations environment. Managers participating in the survey were asked, on a seven-point Likert-type scale from one (of negligible impact) to seven (extreme impact) to measure their perceptions about the impact and intensity of their organisation's industrial relations environment insofar

as it affected the success or failure of their organisation. Panel A in Table 2 presents the descriptive statistics (means and standard deviations) for the five items of this measure. These show the extent managers perceived each industrial relations factor to affect the functioning of their organisation. Panel B in Table 2 provides correlations for these industrial relations factors. All correlations are positive and a high proportion of them are highly significant. The overall industrial relations variable is significantly and positively associated with all four industrial relations factors. A principal components analysis (PCA) was performed for the four industrial relations factors to decide whether to combine them into an overall factor. The PCA extracted one factor with eigenvalues greater than one, which accounted for 71.53 percent of the total variance. The factor loadings of the measure are presented in Table 2 Panel B. A single scale was constructed for these four items by calculating the arithmetic average of the respondents' scores for each item within the instrument. This summary measure was taken to represent managers' perceptions of the overall industrial relations factor's impact upon the performance of their organisation. The Cronbach alpha coefficient (Cronbach, 1951) of 0.87 indicated that the four items were internally consistent and reliable. Both the overall rating and individual elements are used in testing the hypothesis.

INSERT TABLE 2 HERE

3.3.2. Budgetary participation

To assess budgetary participation, we used the Milani (1975) six-item instrument. This instrument has been used by many accounting studies (e.g., Brownell, 1982; Brownell & Hirst, 1986; Dunk, 1989; Brownell & Dunk, 1991; Mia, 1993). Respondents were asked to indicate the extent to which managers were involved in the following six activities on a seven-point scale, as shown below:

a) Which category below best describes your activity in setting the budget? I am/was involved in setting…(none of the budget = 1 to all of the budget = 7)

b) Which category below best describes the reasoning provided by your superior when budget revisions are made? The reasoning is ... (very arbitrary and/or illogical = 1 to very sound and/or logical = 7)

c) How often do you state your requests, opinions and/or suggestions about the budget to your superior without being asked? (Never = 1 to Very frequently = 7)

d) How much influence do you feel you have on the final budget? (Very low = 1 to Very high = 7)

e) How do you view your contribution to the budget? My contribution is ... (Unimportant = 1 to Very important = 7)

f) How often does your superior seek your requests, opinions, suggestions etc when the budget is being set? (Never = 1 to Very frequently = 7)

Panel A in Table 3 presents the descriptive statistics, and the correlation coefficients and factor matrix are presented in Panel B in Table 3. All of the correlations are positive and a high proportion of them are highly significant. Factor analysis (shown in Panel B2) confirms a single factor for the measure, which is constructed by calculating the arithmetic average of the respondents' scores of each item within the factor. The Cronbach coefficient alpha for this measure was 0.81. Brownell (1983) and Brownell and Dunk (1991) derived Cronbach alpha of 0.86 and 0.88 respectively for the measure.

INSERT TABLE 3 HERE

3.3.3. Budget use

Budget use has been defined in terms of the role of budgets as a means of formal performance evaluation in the work-unit (Abernethy & Stoelwinder, 1991). It was measured using an instrument derived from earlier work by Swieringa and Moncur (1975) and subsequently used by Abernethy and Stoelwinder (1991), Hoque and Hopper (1997), and many other studies of this type (for details, see Shields & Shields, 1998; Chenhall, 2003). Respondents were asked to indicate on a seven-point scale,

ranging from one (not at all) to seven (to a very great extent), the extent to which the following five items relating to the use of budgeting information for performance evaluation describing managerial behaviour:

a) Require submitting explanations concerning budget variances.

b) Investigate items that are "overspent".

c) Hold personally accountable for budget variances.

d) Meeting budget important to superior.

e) Sub-units are evaluated on budget performance.

Panel A in Table 4 presents the descriptive results from the questionnaire appertaining to these five budget use variables. Correlations and factor analysis for the five items are shown in Panel B in Table 4. The results highlight significant and positive correlations. Factor analysis yielded one factor with eigenvalues greater than one that explained 56.1 per cent of the variance. Again, an arithmetic average was computed for use in the analysis. The Cronbach alpha statistics for the measure was 0.78 indicating that its internal reliability is high.

INSERT TABLE 4 HERE

INSERT TABLE 5 HERE

4. Results analysis

Descriptive statistics and correlation coefficients for variables appear in Table 5. To test the hypothesis, the following regression model was run using the SPSS12.0 program:

$$Y = \alpha_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_1 X_2 + e$$

where Y is budget use; X_1 is industrial relations environment; X_2 is budgetary participation; X_1X_2, the interaction term; $\alpha_{0,}$ constant; and e, the error term. Tests of nonlinearity and heteroskedasticity of the data indicated no major problem for regression analysis. The tests consistent with the research hypothesis would be tests of a two-way interaction between participation and industrial relations

environment influencing budget use. Results appear in Table 6 indicate that the direct effect of the industrial relations environment on the use of budgets in performance evaluation is negative, as expected, but not significant (β_2 = -0.038; t = -0.283, p = 0.778). The standardised beta coefficient for the interaction (β_3) between industrial relations environment and budgetary participation is positive and highly significant (β_3 = 0.535; t = 3.974, p = 0.000). The overall regression model for the experimental variables explained 28.1 percent (adjusted R^2) of the variance in the dependent variable, budget use (F = 7.393, p = 0.000). These results support the hypothesis that increased budgetary participation would result in a positive association between a high level of industrial relations uncertainty and increased use of budgets in performance evaluation.

INSERT TABLE 6 HERE

To further explore the above two-way interactive relationship, regression analyses were conducted for the high and low budgetary participation by dichotomising budgetary participation at the median.[9] As demonstrated in Table 7, the interaction between a high level of industrial relations uncertainty and budget use is not significant in conditions of low budgetary participation (t = 0.599, p = 0.555); whereas, the two-way interaction effect of industrial relations uncertainty and budgetary participation on budget use is significant (t = 2.556, p = 0.017). In this case the overall regression model explains 21.4 percent (adjusted R^2) of budget use (F = 6.533, p = 0.017). These results provide further confirmation of the results presented in Table 6 that budgetary participation plays an important moderating role in the relationship between industrial relations uncertainty and budget use. When managers operate with a relatively high level of industrial relations uncertainty, a relatively high level of budget participation may lead to managers' increased use of budgets in performance evaluation.

INSERT TABLE 7 HERE

[9] Analyses were also performed using the dichotomisation of means. While not presented, the results were consistent throughout.

Table 8 reports mean scores for budget use over low and high (dichotomised at the median) levels of industrial relations uncertainty and budgetary participation. The reported cell mean scores for budget use in table 8 are consistent with our expectation, as hypothesised. In this table, notice that a relatively high level of budgetary participation in conditions of a relatively high level of industrial relations uncertainty has the highest mean budget use (mean = 6.09, cell 4). On the other hand, a relatively low level of budgetary participation in conditions of a relatively high level of industrial relations uncertainty also has the lowest mean budget use (mean = 3.62, cell 3).

INSERT TABLE 8 HERE

5. Conclusions

This paper sought to provide empirical evidence on the budgetary participation effect of the association between industrial environment and use of budgets in performance evaluation. Prior contingency-based research in an advanced country context neglected the industrial relations environment as a potential predictor of management control systems (MCS) design. The only contingency-based study research to include the industrial relations environment was conducted in Bangladesh, a developing country (Hoque & Hopper, 1997). Using the results obtained from a survey of 55 coal-mining companies in Australia, we attempted to redress this apparent gap in prior research.

The Australian coal industry was an ideal case study. On the one hand, it is the most strike prone in Australia (Australian Bureau of Statistics *Industrial Disputes, Australia, 2000*: Cat. 6322.0), industrial relations therefore being relatively uncertain as far as management is concerned. On the other hand, employment in the industry had been substantially altered over the decade preceding our study; the evidence from our preliminary work and other sources indicated that financial targets, particularly ROI, had been used to reduce the labour force, increase the use of contractors, and intensify work for those who remained employed. External pressures on mine management to meet

financial targets operated in a manner not dissimilar to that reported by Berry *et al* (1985) in relation to the British NCB. While the environment had changed to one more favourable to management, and where industrial relations may be less of a concern, it remained relatively volatile and hence uncertain.

The analysis provided support for the hypothesis that under conditions of industrial relations uncertainty, managers' participation in setting budgets would result in a high use of budgets in performance evaluation. Thus this study suggests that where industrial relations intervention was perceived as great, then managers saw budgetary participation as having a more important role to play. These results do not support Hoque and Hopper's (1997) results that where industrial relations uncertainty is high, budget participation is low. An explanation can be attributed to the nature of the industrial relations environment in the two nations, as discussed above. But we must also remember, as Armstrong *et al* (1996) have pointed out, that while bud getary targets are "importantly about the control of labour … they tend to be used when managers have gained the freedom to act on the information (p.21). The conditions in the Australian mining industry in the 1990s and into the 2000s was one where national industrial relations legislation was more favourable to managerial prerogative, and the development of enterprise bargaining had further strengthened the hand of management on many mine sites, thus in some mines there was more freedom for management than had hitherto been the case.

There is also a dynamic element involved that is not easily captured in survey results. These relationships between budgeting and industrial relations reinforce each other. Budgeting encourages business unit managers to cut short run labour costs by making more use of non-traditional forms of employment such as contractors, or directly hired workers on short-term or insecure contracts. These employment forms, themselves, undermine trade union organisation because workers employed in this way identify less with the workplace and the union, and, moreover, their short duration in the job or their

irregular appearance on the job site makes it harder for union officials to identify them or contact them. The weaker trade union organisation, in turn, makes it easier to use budgeting as a MCS.

What have we learnt from this study? In this study, managerial participation in budgeting appeared to be a significant factor under conditions of high industrial relations uncertainty. This result is consistent with the organisation theory literature, which finds that under conditions of high environmental uncertainty, more organic forms of organisation would be desirable (Burns & Stalker, 1961; Woodward, 1965).

There is much contingency-based research (Chapman, 1997, 1998; Chenhall, 2003), which finds that financial control tools such as budgets are very ineffective in an uncertain business environment. While we do not debate such a fundamental theory, our results support the recent argument (Shields & Shields, 1998; Chapman, 1998; Chenhall, 2003) that the budget can be an important controlling tool when it is supported by high levels of formal and informal communication among organisational members. The results presented in this paper suggest that organisations tend to increase their use of budgets under conditions of high environmental uncertainty when there are high levels of managers' involvement in setting budgetary goals. In a task uncertainty situation, Galbraith (1973), Van de Ven (1976) and Macintosh & Daft (1987) suggest similar strategies for organisations (see also Abernethy & Stoelwinder, 1991).

The industrial relations environments in Bangladesh and Australia are very different, but the Bangladeshi jute industry and Australian coal mining industry are both key export industries, which are subject to industrial stoppages. We found only moderate levels of industrial relations uncertainty in this Australian study (see Table 2 and Panel A in Appendix), and, as anticipated, the linkage of trade unions with national political parties was of little concern (mean 2.65 out of a possible 7). This contrasts with Hoque and Hopper's (1997) study that found a high level of industrial relations uncertainty with respect

to each of the four industrial relations factors used in the current study (mean scores ranged from 3.80 to 4.23 on a scale of 1-5).

This study's finding that budgetary participation appeared to have significant effects on the relationship between industrial relations environment and high levels of budgets use in performance evaluation in the Australian coal mining industry is an important one. It confirms the view of Armstrong (1994) and other authors that industrial relations affects budgeting and vice versa. While we should note that the impact of industrial relations uncertainty on day-to-day operations appeared to have a relatively less pervasive effect, the findings have also have important implications for managers. Budgeting does not take place in a vacuum, and the context is important.

This study must be seen as an important, but nonetheless small, part of a much bigger picture. Many more issues and contexts need to be researched. While this study and Hoque and Hopper's (1997) work show that industrial relations are important in determining budget behaviour in developing countries and advanced countries in industries with high levels of industry disputation, how important are industrial relations in industries with lower levels of industrial relations activity? And would the results be the same in both a developing country and advanced country context? The issue of participation in budget setting needs to be investigated further too. Exactly who needs to participate in budget setting? Is management participation enough, or is the process more effective if other employees are involved as well? The other big question that arises, and which has not been investigated here, is what is the role of trade unions? Is there a place for union participation in budget setting too, and would that further improve managerial performance? Clearly, there is much to be explored around these important topics.

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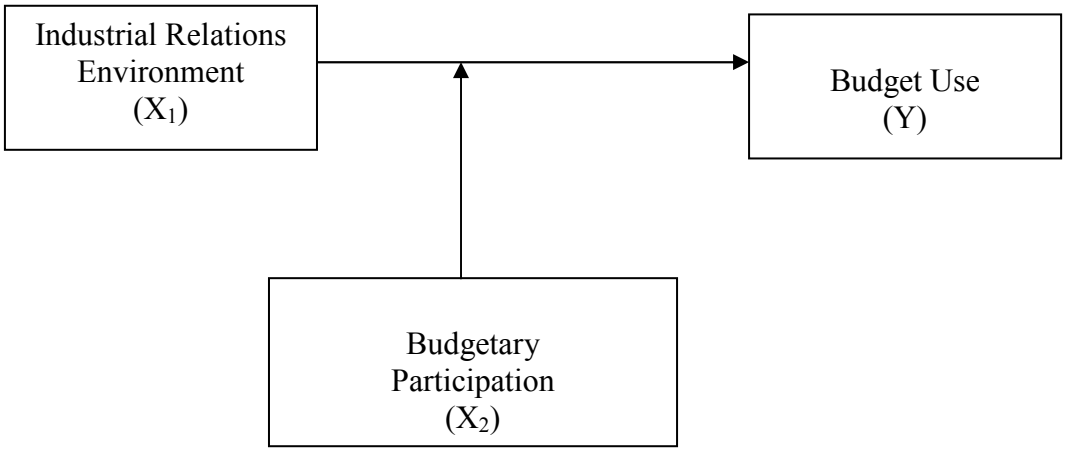

Fig. 1. Framework for the study

Table 1
Profile of the responding firms

Number of employees	Frequency	Percentage
0 – 149	12	21.82
150 – 299	10	18.18
300 – 449	9	16.36
450 – 999	15	27.28
1000 and above	9	16.36
Total	55	100.00
Ownership pattern:		
Privately owned	49	89.09
Government owned	2	3.64
Joint venture	4	7.27
Total	55	100.00

Table 2: Descriptive statistics, correlations and factor analysis of industrial relations activities

Panel A: Descriptive statistics of industrial relations variables (N = 55)

Components	*Theoretical Range*	*Observed Range*	*Mean*	*Standard Deviation*
Actions of trade union officials	1 – 7	1 – 7	4.16	1.82
Strikes/work-stoppages	1- 7	1- 7	4.49	1.98
Internal conflicts among trade unions	1- 7	1- 7	3.91	1.83
Linkage of trade unions with national political parties	1- 7	1- 7	2.65	1.65
Overall industrial relations	1 – 7	1 – 7	4.31	1.71

Note: Scale, 1-7; l, of negligible impact; 7, extreme impact

Panel B: Correlations and factor analysis for industrial relations variables

Variables	*1*	*2*	*3*	*4*	*5*	*Factor Loadings***
1. Actions of trade union officials	1.00					0.89
2. Strikes / work-stoppages	0.60**	1.00				0.87
3. Internal conflicts among trade unions	0.77**	0.69**	1.00			0.86
4. Linkage of trade unions with national political parties	0.49**	0.66**	0.51**	1.00		0.76
5. Overall industrial relations	0.47**	0.50**	0.38**	0.56**	1.00	NA

** $p < 0.01$ (2-tailed)
** Principal components analysis: Percentage of total variance explained = 71.53; N = 55

Table 3: Descriptive statistics, correlations and factor analysis of budgetary participation

Panel A: Descriptive statistics of budget participation related variables (N = 55)

Variables	Theoretical Range	Observed Range	Mean	Standard Deviation
Which category below best describes your activity in setting the budget? I am/was involved in setting…	1 – 7	1 - 7	5.31	1.49
Which category below best describes the reasoning provided by your superior when budget revisions are made. The reasoning is....	1 – 7	2 - 7	5.35	1.17
How often do you state your requests, opinions and/or suggestions about the budget to your superior without being asked?	1 – 7	1 - 7	5.35	1.31
How much influence do you feel you have on the final budget?	1 - 7	1 - 7	4.98	1.55
How do you view your contribution to the budget?	1 - 7	2 - 7	5.64	1.27
How often does your superior seek your requests, opinions, suggestions etc when the budget is being set?	1 - 7	1 -7	5.29	1.49

Note: Scale, 1-7; 1, very low involvement; 7, very high involvement

Panel B: Correlations between budgetary participation variables and Factor Matrix (N = 55)

Variables	1	2	3	4	5	6
1. Which category below best describes your activity in setting the budget? I am/was involved in setting…	1.00					
2. Which category below best describes the reasoning provided by your superior when budget revisions are made. The reasoning is....	.22*	1.00				
3. How often do you state your requests, opinions and/or suggestions about the budget to your superior without being asked?	.31*	22*	1.00			
4. How much influence do you feel you have on the final budget?	.58**	.40**	.44**	1.00		
5. How do you view your contribution to the budget?	.57**	.27*	.42**	.73**	1.00	
6. How often does your superior seek your requests, opinions, suggestions etc when the budget is being set?	.38*	.13	.35**	.54**	.56**	1.00
Factor Loadings	**.73**	**.46**	**.62**	**.88**	**.86**	**.71**

Percentage of variance explained = 52.37

Table 4: Descriptive statistics, correlations and factor analysis of budget use variables

Panel A: Descriptive statistics of budget use (N = 55)

Variables	Theoretical Range	Observed Range	Mean	Standard Deviation
You are required to submit an explanation in writing of the causes of budget variances	1 - 7	1 – 7	4.67	1.74
You are required to investigate items which are 'overspent'	1 - 7	1 – 7	5.07	1.50
You are held personally accountable for budget variances	1 - 7	1 – 7	4.20	1.78
Meeting the budget is important to your superior	1 - 7	1 – 7	5.87	1.07
Sub-units are evaluated on budget performance	1 - 7	1 – 7	4.98	1.66

Note: Scale, 1-7; 1, not at all; 7, to a very great extent.

Panel B: Correlations and factor matrix of budget use variables

Variables	1	2	3	4	5	Factor Loadings
1. You are required to submit an explanation in writing of the causes of budget variances	1.00					0.80
2. You are required to investigate items which are 'overspent'	0.65**	1.00				0.85
3. You are held personally accountable for budget variances	0.36**	0.20	1.00			0.43
4. Meeting the budget is important to your superior	0.37**	0.58**	0.15	1.00		0.75
5. Sub-units are evaluated on budget performance	0.55**	0.60**	0.25*	0.59**	1.00	0.83

** $p < 0.01$; *p <0.10 (2-tailed)

** Principal components analysis: Percentage of total variance explained = 56.05; N = 55

Table 5. Descriptive statistics and correlation matrix

Panel A: Descriptive statistics

Variables	Mean	Standard Deviation	Theoretical Range	Observed Range	No. of Items Used	Reliability Alpha (Cronbach)
Industrial Relations	11.34	5.99	4 – 28	4 - 26	4	0.87
Budgetary Participation	31.98	5.98	6 - 42	6 - 42	6	0.81
Budget Use	24.80	5.71	5 - 35	11 - 35	5	0.78

Panel B: Pearson correlation coefficients

Variables	1	2	3
1. Industrial Relations	1.00		
2. Budgetary Participation	0.37**	1.00	
3. Budget Use	-0.26*	0.38**	1.00

*p <0.10; ** p <0.05 (2-tailed)

Table 6. Regression results (Dependent variable = budget use)

Variables	Coefficient	Standard error	*t*-value	Sig. (*p*-value)
Constant	3.327	0.592	5.621	0.000
Industrial relations (X_1)	-0.032	0.013	0.283	0.778
Budgetary participation (X_2)	0.140	0.135	1.103	0.276
Interaction (X_1 x X_2)	0.535	0.001	3.974	0.000

R^2 = 0.325; Adjusted R^2 = 0.281; $F_{3, 46}$ = 7.393, p = 0.000

Table 7. Additional Analysis: Regression results (Dependent variable = budget use)

Variables	Coefficient	Standard error	*t*-value	Sig. (*p*-value)
Panel A: Low budgetary participation sub-group *Budget use on industrial relations environment*				
Constant	19.873	5.500	3.614	0.001
Industrial relations	0.119	1.260	0.599	0.555
R^2 = 0.014; Adjusted R^2 = -0.025; $F_{1, 25}$ = 0.358, p = 0.555				
Panel B: High budgetary participation sub-group *Budget use on industrial relations environment*				
Constant	19.048	3.038	6.269	0.000
Industrial relations	0.463	0.651	2.556	0.017
R^2 = 0.214; Adjusted R^2 = -0.181; $F_{1, 24}$ = 6.533, p = 0.017				

Table 8. Mean budget use scores across low/high industrial relations activities and low/high budgetary participation

	Low budgetary participation	High budgetary participation
Low industrial relations activities	Cell 1 n = 13 Mean = 5.19 S.D. = 2.18	Cell 2 n = 16 Mean = 5.00 S.D. = 1.28
High industrial relations activities	Cell 3 n = 11 Mean = 3.62 S.D. = 0.94	Cell4 n = 11 Mean = 6.09 S.D. = 1.34