WORKING PAPER
ALFRED P. SLOAN SCHOOL OF MANAGEMENT

PARTICIPATION AND MANAGERIAL PERFORMANCE

Morris McInnes* and Ram T. S. Ramakrishnan**

January 1987

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
50 MEMORIAL DRIVE
CAMBRIDGE, MASSACHUSETTS 02139
PARTICIPATION AND MANAGERIAL PERFORMANCE

Morris McInnes* and Ram T. S. Ramakrishnan**

January 1987

*College of Management
UMass-Boston
Boston, MA 02125
(617) 929-7830

**Graduate School of Business
Columbia University
New York, NY 10027
(212) 280-3489
ABSTRACT

The results are reported of a study testing participation's relationship to managerial performance among 415 senior operating managers in 13 large companies. A theoretical model is first proposed, in which participation affects performance by increasing role, task, and goal clarity, and the usefulness of operating monitoring, and then by increasing managerial confidence and motivation; the enhancement of these information and attitude variables is proposed in turn to increase performance. The empirical relationship between participation and performance is found to be positive, and explained by the intervening variables included in the model; the information and attitude effects each provide approximately equal amounts of explanation. Participation's association with budget slack is examined. Greater participation increases both the expectation and the frequency of attaining budget; however, this does not appear to entail greater budget slack, since participation is not significantly associated with the effort required to be sure of making budget or with the level of effort expended on the managerial task. Finally, four moderating conditions are hypothesized and tested. While participation's relationship to performance is consistently positive, it is more pronounced for managers of lower ability, when greater information asymmetry exists between managers and their superiors, and for managers whose responsibility centers face greater environmental uncertainty; it is less pronounced when formal rewards are strongly contingent on attaining budget.
PARTICIPATION AND MANAGERIAL PERFORMANCE

Participation's effects on decision making and task performance have received a lot of research attention over the years, in the literatures of both organizational behavior and management accounting. Several frameworks have been proposed in the management accounting literature, some of which focus directly on participation's relationship with performance [Becker and Green, 1962; Brownell, 1982a; Brownell and McInnes, 1986], while others consider it as an aspect within the framework [Hanson, 1966; Dunbar, 1971; Ronen and Livingstone, 1975; Chenhall et al., 1981, pp. 195-213]. All suggest, albeit with various reservations, that participation is likely to affect performance favorably, as do the authors of exploratory surveys of budgetary control practices in business organizations [Argyris, 1952; Sord and Welsch, 1958; Miller, 1966].

Experimental and empirical results, however, are mixed. In the organizational behavior literature of goal setting, dealing in the main with the performance of relatively routine tasks, the evidence is inconclusive [Locke and Schweiger, 1979; and Locke et al., 1981]. Neither has the matter been entirely resolved for the managerial task, although the weight of empirical evidence tends in this case toward the positive relationship predicted in the literature. While Milani [1975] and Kenis [1979] report only weak positive associations between participation and performance, their subjects are first-line supervisors. Searfoss and Monczka [1973] demonstrate an increasing importance of budgetary control, and stronger positive effects of participation, as the management level increases. Consistent with this, Merchant [1981] shows that participation and performance are significantly related among the managers in his sample who are from large companies in which importance is placed on budgetary control; and Brownell [1982b] shows that heavy reliance on budgets in performance evaluation, accompanied by a high level of participation in setting budgets, is associated with high performance.
Brownell and McInnes [1986] contend there is no theoretical reason to expect participation to have a direct effect on performance. They propose that the relationship is mediated by motivation as an intervening variable. But their empirical results do not support this. While they find a strong positive relationship between participation in budgeting and managerial performance, little of it is accounted for by motivation, principally because the correlation between participation and motivation, even though positive, is insignificant. As a possible explanation of this, they hypothesize that budget slack may increase with participation in setting budgets, thus impairing the intrinsic motivation attributed to working toward and attaining budgets. They advocate further examination, both to obtain a better understanding of participation's effects on motivation, and to identify the impact of other variables which may mediate the participation-performance relationship.

This paper builds on and extends the work of Brownell and McInnes [1986] (hereafter BM). A fuller structural model of the relationship between participation and performance is developed from the literature. The model proposes that participation's first effect is informative, increasing role, task and goal clarity, and enhancing the instrumentality of operating monitoring; then, participation and being better informed are postulated to reinforce positive attitudes, namely managers' confidence in their abilities to meet the demands of the task, and their motivation to perform well. In turn, these information and attitude effects are postulated to enhance managerial performance.

As in BM's work, an expectancy model is used to measure motivation. This allows an examination of participation's relationship with motivation through its effects on the elements, the various expectancies and valences, contained in the model. Thus, the BM results pertaining to participation's effects on motivation are able to be further tested in the present research; moreover, the budget-slack hypothesis inferred from their results is directly examined.
Finally, four variables are proposed as being likely to moderate the intervening effects, thereby affecting the strength of the participation-performance relationship. These are managerial ability, information asymmetry, the strength of the budget-reward contingency, and environmental uncertainty.

The results are reported of an empirical study testing these various propositions. Participation is found to be positively related to managerial performance, and, consistent with the structural model, all but an insignificant portion of the relationship is explained by the intervening variables. The hypothesis of greater budget slack is not supported; participation is found in this study to be associated with enhanced intrinsic motivation, and to have a positive correlation with effort, which, even though insignificant, is not the sign which would be expected in the presence of greater budget slack. And the strength of the participation-performance relationship is found to vary with the four moderating conditions; however, the direction of the moderation, and the underlying mechanisms, are not in all four cases as predicted.

The next section deals with the development of the model and the derivation of the hypotheses tested in the empirical study. This is followed by sections describing, in turn, the research and the results. A final section discusses the study's limitations, its implications for theory and practice, and avenues for further research enquiry.

MODEL DEVELOPMENT

First, the structural model mediating participation's effect on performance is proposed. Then the question of budget slack is addressed. Finally, moderating conditions, and their effects on the strength of the participation-performance relationship, are considered.

The Intervening-Variables Model

Becker and Green [1962] were among the first explicitly to relate participation's effect on performance to intervening variables. They suggested
two types of mechanism, one resulting from the communication which accompanies participation, and the other, psychological in nature, affecting attitudes. Both are examined here, referring to the first as the "information effect" and to the second as the "attitude effect". Within the latter, two variables, visualized as being independent of one another, are considered: these are (1) managerial confidence, and (2) motivation to work hard and imaginatively at the managerial task.

**Information Effect:** Latham and Saari's [1979a] work suggests that a clearer understanding of task requirements emerges from participative, compared with imposed, goal setting; and Kenis [1979] finds greater goal clarity is associated with participative budgeting. Rizzo et al. [1970, p.151] contend that "If an employee does not know what he has authority to decide, what he is expected to accomplish, and how he will be judged, he will hesitate to make decisions and will have to rely on a trial and error approach in meeting the expectations of his superior." They are suggesting, in other words, that greater role, task and goal clarity, and clarity about evaluative criteria, will increase managerial effectiveness. Maher and Piersoll [1970], Carrol and Tosi [1970] and Kenis [1979] report empirical results consistent with this contention.

Participation, by clarifying goal-paths, may also enhance the effectiveness of operating monitoring in helping managers to track performance, signalling situations requiring their attention, and directing, focussing, and sustaining their effort to perform well. Ijiri [1965] highlights the importance to managers of identifying goal indicators to provide, in advance of feedback from the management accounting system, timely and reliable evidence about progress toward the budget. Erez [1977], from an experimental study using students as subjects, concludes that goal-directed feedback reinforces clear goals in producing high performance. His conclusions have been confirmed by subsequent empirical studies (Latham et al. [1978]; Komaki et al. [1978]; Nemeroff and Cosentino [1979]).
In sum, it is hypothesized that participation leads to greater role, task, and goal clarity, and to an enhancement of the usefulness to managers of operating monitoring ($H_1[a]-[d]$); and these effects are in turn hypothesized to increase managerial performance ($H_2[a]-[d]$).

Confidence: Mento et al. [1980] demonstrate the importance of confidence, the belief on the part of workers that their abilities are sufficient for the task, to enhanced performance. Conceivably, the supportiveness (Latham and Saari [1979b]) inherent in participation may bolster confidence. Further, the information effect may enhance confidence. A better-informed manager is likely to be more confident, since doubts about the degree of delegated authority, what is expected, and how it can be achieved, which can undermine purposeful managerial action, will be better resolved (Rizzo et al. [1970]).

Hence, it is hypothesized that managerial confidence is increased by participation and by being better informed ($H_3[a],[b]$), and that greater confidence enhances managerial performance ($H_4$).

Motivation: Several studies demonstrate a positive relationship between participation and motivation (Hofstede [1967]; Searfoss and Monczka [1973]; Searfoss [1976]; Kenis [1979]; Merchant [1981]; Tiller [1983]).

BM also find a positive, but in their case insignificant, relationship between participation and motivation. They are the only ones, in this particular research context, to have applied expectancy theory to the measurement of motivation. They used a form of expectancy model first proposed by House [1971], and introduced to the accounting literature by Ronen and Livingstone [1975]. In the discussion of their findings they note some conceptual flaws in the expectancy model which could affect the motivation scores, and hence the overall correlation between participation and motivation. However, the form of the model would not affect the relationships observed between participation and the elements comprising the model. BM find two apparently offsetting effects: first, the expectancies in the model are
enhanced by participation, thus increasing motivation; but secondly, the valences, especially the intrinsic valences, are diminished, thus decreasing motivation.

In this study, correcting the conceptual flaws in the House/Ronen and Livingstone (H/RL) expectancy formulation, the following model is used to measure motivation:

\[
M = \sum_{i=1}^{n} [(P_H P_{HAi} + (1-P_H)P_{HF1})U_1(W) + (P_H P_{HAi} - P_M P_{MAi})U_1(B)], i=1...n
\]

Where:
M is the motivation to work hard and imaginatively at the managerial task.

\[P_H, P_M\] are the probabilities respectively of attaining budget with high and with minimal effort.

\[P_{HAi}, P_{HF1}, P_{MAi}\] are the probabilities respectively of obtaining an incremental amount of reward i under the following conditions: high effort/budget attained; high effort/budget failed; and minimal effort/budget attained.

\[U_1(W), U_1(B)\] are the utilities of an incremental amount of reward i when obtained respectively from having worked hard and imaginatively at the managerial task, and from having attained budget.

This model is a special case of subjective expected utility (EU) theory. The action space is restricted to two choices, to work hard and imaginatively or to work simply at the level necessary to meet the organization's minimum requirements. Task outcome is restricted to two states, attaining or failing budget. Motivation is then measured by the incremental expected utility over the utility, valued as zero in the model, expected from working at the minimal level and failing budget. No distinction is made in the form of the model between intrinsic rewards, rewards which are self-mediated, and extrinsic rewards, rewards which are mediated by some external party such as the manager's boss, peers, or others with whom the manager works.

The EU model reduces to the H/RL model in the following circumstances: extrinsic rewards can be obtained only from attaining budget, and not directly from working hard and imaginatively at the managerial task; intrinsic rewards
can be distinguished from extrinsic rewards, are obtained with certainty, and affect motivation as single average values rather than additively; and there is no likelihood of attaining budget with the minimal level of effort.

The expectancies in the model which refer to obtaining organizational rewards and to attaining budget should, as found by BM, be positively correlated with participation. With regard to the first of these, Becker and Green [1962] postulate that the downward communication which is facilitated by participation will clarify and reinforce formal-reward contingencies. In the model, then, participation, through the information effect, should enhance the differences between $P_{H}$'s and $P_{M}$'s and between $P_{A}$'s and $P_{F}$'s ($H_5[a],[b]$), particularly where these moderate formal organizational rewards, for example increments of pay and bonus, and increased prospects of promotion. And with regard to the second, the reciprocal communication accompanying participation should enhance the expectancy, $P_{H}$, that high effort will lead to budget attainment ($H_5[c]$). This could result from clarification of path-goal relationships [House, 1971], or from less demanding budgets because of a moderation of the organization's beliefs about the feasible rate of performance improvement over time [Hanson, 1966].

Participation's behavioral, as opposed to these cognitive, effects on motivation are less clearcut. These will be reflected in the valences, or expected utilities, in the model. If the budget-slack hypothesis holds, the valences of the intrinsic rewards are likely, as found by BM, to be negatively related to participation. If, on the other hand, participation is felt by managers to enrich their task, as suggested by many behavioral theorists (e.g., Argyris [1952], Becker and Green [1962], Ronen and Livingstone [1975]), then a positive relationship between participation and the intrinsic valences is likely, as observed for instance by Merchant [1981], to result. This is an important issue which requires further testing for its resolution. For the time being, no prediction is made of the direction of the relationship between participation and the valences in the expectancy model. Hence, because of
the predicted positive relationship between participation and the expectancies in the model, the overall relationship between participation and motivation is hypothesized to be positive (H₆).

Based on Mitchell's [1979] comprehensive review of the literature on the relationship between motivation and performance, in which he concludes that most studies demonstrate a positive effect, and on the strong positive finding in BM's study, motivation is hypothesized to be positively related to managerial performance (H₇).

Completeness of the Model: From a careful examination of the literature, no other variable, beyond the ones already considered and included in the structural model, seems likely to play a mediating role in participation's effect on performance. Hence, the relationship observed between participation and managerial performance is hypothesized to be fully accounted for by the intervening variables in the model (H₈).

Budget Slack

BM base their budget-slack hypothesis on a pattern in their data. They find participation in budget-setting is associated with a greater expectancy of receiving formal rewards from attaining budget; following Schiff and Lewin [1970], they argue this could lead managers to believe easier budgets serve their immediate self-interest. Moreover, consistent with easier budgets, participation is found to be associated with an increased expectancy of attaining budget. Finally, diminished intrinsic motivation deriving from the budget is found to be associated with greater participation, suggesting less challenging, and perhaps easier, budgets.

Other researchers have also presented findings consistent with budget slack [Lowe and Shaw, 1968; Onsi, 1973; Collins 1978]. However, as in the case of BM's study, none has measured budget slack directly, and so the presence of budget slack, and the conditions giving rise to an increase in it, are only inferences.
The level of performance and budget difficulty may vary from organization to organization, and even from situation to situation. For instance, participation in budget-setting could result in budgets which are both easier, and yet, because of the accompanying communication, contain superior operating strategies, and therefore higher levels of operating performance, than would be the case without participation. Moreover, an enhancement of the budget-reward contingency, and of the probability of attaining budget, could both be consistent with economically-efficient control strategies. Predictability can have overriding importance for some organizations, justifying the sacrifice of potential performance at the individual level with a view to increasing operating coordination, and hence performance, at the total-system level (Stedry [1960], Dunbar [1971]). And managers, if risk-averse, would presumably be willing to trade a lower mean level of compensation for a higher expectancy of attaining, and therefore a lower risk of failing, budget (Demski and Feltham [1976]).

A slack budget is defined here simply to be one which demands less effort than would be considered "normal". Since the normal level of effort may be situationally peculiar, effort has to be related to prevailing norms. This is done in the present study by measuring effort incremental to the amount necessary solely to meet the organization's minimum requirements. The effort, above this minimum level, required to be sure of making budget is used as a proxy for budget slack. Budget slack is then examined in relation to several aspects of participation, to the level of effort expended, to expected and actual performance versus budget, and to managerial performance.

Moderating Variables

Brownell [1982a], proposing reasons which might explain the conflicting evidence about participation's relationship to performance, suggested moderating effects from various individual, interpersonal, and contextual variables. Earlier, for instance, he (Brownell [1981]) demonstrates the
moderating effect of the personality trait "locus-of-control". "Internals" on this trait believe they exercise a high degree of influence on events, whereas "externals" believe that luck plays a dominant part in human affairs. High internals, compared with high externals, exhibit greater job satisfaction and performance under participative conditions, and vice-versa. Similarly, Merchant [1981] shows that participation has a stronger effect on performance in conditions of decentralization where an administrative, rather than an interpersonal, control style is used.

In the present study four moderating conditions are tested: managerial ability, an individual variable; information asymmetry, an inter-personal variable; the strength of the budget-reward contingency, a control system variable; and environmental uncertainty, a contextual variable. Each is postulated to moderate the strength of the participation-performance relationship by its effect on the intervening variables, as is now discussed.

Managerial Ability: Latham and Yukl [1975] find that participative goal setting has a more favorable effect on performance for workers with relatively less education. Analogously, participation could be used in organizations as a developmental tool, thereby having a stronger effect for managers who are uncertain about their abilities. Participation could result in a transferrence from superior to subordinate of knowledge and skills, thus enhancing the subordinate's ability; however, in the present context its principal effect is predicted to be one of bolstering confidence and motivation, and through these managerial performance (H9[a]).

Information Asymmetry: Communication has greater potential value to budgeted managers the greater the information asymmetry between them and their superiors (Christensen [1982]; Penno [1984]). Hence, participation's effect on performance, because of the greater incentive value of the communication it facilitates, is hypothesized to be more positive under conditions of greater information asymmetry (H9[b]).
Budget-reward Contingency: It was noted earlier that for participation to have a discernible effect on performance, budgets must be important (Merchant [1981]); moreover, it was noted that participation particularly enhances performance when accompanied by an evaluative style which stresses the budget (Brownell [1982b]). Making formal rewards highly contingent on attaining budget is one way to underscore the importance of both budgetary control and, of course, attaining the budget. Hence, the participation-performance relationship is hypothesized to be more positive under conditions of higher budget-reward contingency (H9[c]).

Environmental Uncertainty: The importance of downward communication, which is hypothesized to facilitate the information effect, is likely to increase as the operating environment changes more rapidly and with less predictability (Galbraith [1974]). Hence, the participation-performance relationship is hypothesized to be more positive the greater the environmental uncertainty faced by a manager's responsibility center (H9[d]).

THE RESEARCH

In this section the research is described, beginning with how the data were collected, proceeding to how each of the variables was operationalized and measured, and finally addressing briefly the methods of analysis used to test the hypotheses.

Data Collection

A questionnaire was used to gather the data. It was pre-tested for clarity of expression and for the time needed for its completion using a sample of 20 managers of the same level of seniority and from similar companies as the intended research sample. The average time taken in pre-testing to complete the questionnaire was 30 minutes.

Most of the questions asked for a response on a seven-point scale, with both ends of the scale anchored by verbal descriptions. In the case of some
questions, respondents were asked to answer by indicating a number selected from a scale descriptively anchored at the end points and at salient intervening points. In a few cases, respondents were asked to give a "yes-no" answer, or a brief verbal response.

Thirteen large companies were included in the study. Initial contact was with the chief executive, either the chairman or the president, and the research was subsequently administered with the aid of a senior member of corporate management.

Companies were asked to select a representative sample of about 50 of their senior operating managers, carrying functional responsibility at a level just below general management. The questionnaire was distributed to the sample, accompanied by a cover letter signed by the corporate executive who was coordinating the research in each company. A pre-addressed envelope was included for returning completed questionnaires directly to the researchers. Anonymity of response was guaranteed, with a view to reducing bias which might arise if respondents were to believe their answers could be inspected by corporate management. Thus, returns could be identified by company, but not by individual respondent.

Measurement of Variables

The measurement of variables is described, following the order of their introduction in the theoretical development.

Participation: The participation measure developed by Milani [1975] was used to gauge the degree of involvement and influence in budget-setting. This is a six-item, Likert-type scale, each item calling for a response from one to seven. The scale is designed for an additive construction of the overall score, and has previously been demonstrated to comprise a single factor [Brownell, 1982b]. The Spearman-Brown (SB) reliability measure (see Nunnally [1978, p.211]) computed for its use in this study was 0.69. Respondents were also asked to assess the extent of their participation in evaluating the performance of their responsibility centers, and the degree to which they
felt they could influence the level of performance goals set for their responsibility centers, and the tradeoff between goal-difficulty and the level of incentives tied to goal attainment.

Managerial Performance: Because of the anonymity of response used in the data collection, it was necessary to rely solely on a self-rating approach to measuring managerial performance. As argued by Thornton [1980], a self-rating is actually the most relevant measure of performance in studies, such as this one, which are exploring cognitive and attitudinal effects in the organization. These effects mediate managerial behavior which, in conjunction with the operating environment, produces objective performance. It would be preferable in assessing the reliability and validity of self-ratings of the quality of the managerial behavior to be able to compare them with objective performance, or with ratings from some other source. Nevertheless, with regard at least to the latter, managers, in common with practitioners in other professional fields (e.g., university teaching [Blackburn and Clark, 1975; Doyle and Chrichton, 1978; ETS, 1981]), appear to be quite reliable in rating their own performance, as judged by the correlations between self-ratings and other rating sources, such as superiors, peers or subordinates. It is true that some researchers claim self-ratings suffer from a leniency bias (e.g., Heneman [1974]). Be that as it may, research, such as the present study, using correlational methods of analysis will not be adversely affected, provided bias, even if it does exist, is not systematic with any of the other variables in the study.

The self-rating method developed by Mahoney et al. [1963, 1965], with a minor modification, was used in the study. Ratings, assessed on a nine-point scale, were asked for each of nine sub-dimensions of managerial performance, as follows: planning, investigating, coordinating, evaluating, supervising, staffing, responding to unexpected events, negotiating, and representing. In
addition, an overall rating of managerial performance was asked for. Since different positions require different mixes of managerial input, this latter rating should not be expected to be a simple average of the ratings on the nine performance sub-dimensions. Mahoney et al. [1963, pp.106-107] propose that the sub-dimensions should be independent, and explain at least 55 percent of the overall rating, the remainder being explained by job-specific factors. The Pindyck and Rubinfeld [1976] procedure was applied to test the independence of the nine sub-dimensions (see BM [p.592] for a description of this procedure). Of the 36 pairwise comparisons, only two violate the Pindyck-Rubinfeld criterion, demonstrating that the nine sub-dimensions are indeed fairly independent. A regression of the overall performance rating on the nine sub-dimensions was run; 69 percent of the variance in the overall rating is explained by the nine sub-dimensions. Finally, respondents were asked, elsewhere in the questionnaire, to assess how well their performance has recently been rated by their superiors. The overall self-rating of managerial performance correlates significantly ($r=0.331, p<0.01$) with the assessment of the superior rating. These tests, in the absence of an independent check, provide a measure of confidence in the validity and reliability of the self-ratings.

A measure of budget performance was also elicited, by asking respondents to assess their recent experience with regard to variances against budget for their responsibility centers.

The Information Effect: Seven questions, each assessed on a scale anchored at one end by "precise" and at the other end by "very vague", were used to measure respondents' understanding of aspects of their jobs. Two related to role clarity, one referring to delegated powers and the other to the relationship of the manager's decision-making authority to the task of the responsibility
The responses to these two questions are significantly correlated ($r=0.423$, $p<0.01$), and an average is used as a measure of role clarity. Three related to task clarity, one referring to the mission of the responsibility center in relation to the overall company mission, and two referring to the reciprocal coordination of the work of the responsibility center with other organizational units. The responses to these three questions are significantly intercorrelated ($r_{12}=0.600$, $r_{13}=0.422$, $r_{23}=0.593$; SB measure = 0.78), and an average is used as a measure of task clarity. And two related to goal clarity. These referred to circumstances in which all goals could not be simultaneously attained, and asked for an assessment of the degree of understanding of organizational priorities, first among dimensions of current performance, and then between current performance and longer-term development goals. The responses to these two questions are significantly correlated ($r=0.699$, $p<0.01$), and an average is used as a measure of goal clarity.

Respondents were also asked to assess the value to them of formal and informal monitoring in carrying out their managerial tasks. The responses to these questions are not correlated; further analysis shows that the amount of participation allowed a manager in the design of formal monitoring systems is positively correlated with the value attributed to formal monitoring ($r=0.466$, $p<0.01$), and negatively with the value attributed to informal monitoring ($r=-0.075$). This suggests that managers invest a relatively fixed amount of effort into developing monitoring, and if they are not permitted to influence the formal system to meet their needs they will develop informal, or personal, systems. Thus, informal and formal monitoring are alternatives, and the value attributed to monitoring is additive of the two. Therefore, the sum of the two responses is used in the analysis.

**Attitude Variables:** To measure managerial confidence, reference was first made to job-related knowledge and skills, and respondents were asked to assess their degree of confidence in these for meeting the demands posed by their managerial tasks.
All the variables in the EU expectancy model were assessed, and a motivation score for each respondent was calculated. Seventeen rewarding outcomes, shown in Table 2, were used. A principal issue in pre-testing the questionnaire was to ensure that the sample of managers perceived the list to contain all the relevant rewards they experience from their managerial work. Respondents were twice asked to express their preference for an increment of each reward, relative to increments of all the other rewards, using a scale anchored at one end by "extremely desirable," through "indifferent" to, at the other end, "extremely undesirable." The first time they were asked to express their preference if the increment of reward were to be obtained as a result of working hard and imaginatively \(U_i(W)\), and the second time if it were to be obtained as a result of attaining budget \(U_i(B)\). They were also asked to assess the probability of receiving an increment of each reward in each of four circumstances, as follows: having worked hard and imaginatively, and having attained budget \(P_{H1A1}\); having worked hard and imaginatively, but having failed budget \(P_{H1F1}\); having worked with minimal effort, but nevertheless having attained budget \(P_{M1A1}\); and having worked with minimal effort and having failed budget \(P_{M1F1}\). Finally, measures were elicited of the probability of attaining budget with high \(P_H\), and with minimal \(P_M\), effort.

Two direct assessments of motivation were also asked for, one relating to the strength of desire to "meet or beat budget" (budget motivation), and the other to the strength of desire to "ensure your unit's highest possible performance" (performance motivation). The purpose of these direct assessments was to provide a check on the scores produced by the EU model. The EU scores correlate positively with budget motivation \((r=0.198, p<0.01)\), and with performance motivation \((r=0.328, p<0.10)\); these results provide a measure of confidence in the validity and reliability of the EU measure of motivation.
Budget Slack: Respondents were asked to provide an assessment of the effort necessary to "be sure of attaining budget"; the idea here was to elicit an effort measure, holding constant the probability of budget-attainment. Then respondents were asked to assume a high level of effort, thus holding effort constant, and to assess the conditions under which they could expect to attain their budgets. The scale for this last question was anchored at one end by "only when operating conditions are extremely favorable" and at the other end by "even when operating conditions are extremely unfavorable."

Effort was measured by first referring to a minimal level, sufficient simply to meet the least expectations of the organization. Respondents were asked to rate their effort incremental to this minimal level, first in terms of hours spent and then in terms of intensity during working hours. The two responses are significantly correlated (r=0.454, p<0.01), and a single measure was constructed by multiplying the two, hours times intensity, together.

Moderating Variables: Two questions were designed to assess managerial ability, one referring to job knowledge and the other to job-related skills. Respondents were asked to assess the extent to which they possess all the knowledge and skills necessary for their jobs. The two responses are significantly correlated (r=0.660, p<0.01), and their average is used as a measure of managerial ability.

Information asymmetry was assessed using two direct questions, one asking respondents how accurately in advance they are able to estimate the potential performance of their responsibility centers, and the other how accurately in advance their superiors are able to make the same estimate. The difference between the two responses is used as a measure of information asymmetry.

The strength of the budget-reward contingency was assessed using some of the data which were gathered to estimate the EU motivation model. The probabilities of receiving increased pay, bonus, and an enhanced prospect of
promotion were assessed in each of two circumstances: having worked hard and imaginatively, but having failed to make budget; and having worked at the minimal level of effort, but having nonetheless attained budget. The differences between the latter and the former probabilities are taken as measures of the strength of the budget-reward contingency. The responses across the three elements of formal reward are significantly intercorrelated ($r_{12}=0.707$, $r_{13}=0.648$, $r_{23}=0.537$; BM measure = 0.84), and an average of the three is used as a measure of the budget-reward contingency in the analysis.

Environmental uncertainty was assessed using six questions selected from the questionnaire Khandwalla [1972] used to study the effect of the operating environment on the use of financial controls. Four asked for assessments of the volatility and predictability of input costs and output prices. And two asked about the dynamism and predictability of factors in the environment other than costs and prices, such as "technical and legislative factors, policy changes emanating from elsewhere in the organization, and competitor actions." The six responses are significantly intercorrelated, and an average value is used in the analysis as a single measure of environmental uncertainty.  

Analysis

The analysis is conducted using a single pooled sample of all 415 respondents. Later, the main result of the study, the positive relationship between participation and managerial performance, is shown to hold within each company as well as across the 13 companies. This provides justification for treating the respondents as a single sample.

Most of the individual hypotheses are tested using simple correlation. However, the structure and completeness of the intervening-variables model are examined using path analysis. A fairly full explanation of path analysis is provided by BM [pp.593-594], and therefore only a brief description is presented here. The reader is referred to the model as presented in Table 4. The model is non-recursive, and so the path coefficient $p_{ij}$ is the direct
effect of variable $j$ on variable $i$. It is simply the standardized slope when $i$
is regressed on $j$, with all other variables in the model controlled for. It
can also be obtained using the correlation coefficients, $r_{ij}$, which are shown
in Table 3 for the variables included in the model. The following set of
simultaneous equations has to be solved:

$$r_{ij} = p_{ij} + \sum_{k} p_{ik} r_{kj}$$

To illustrate, an explanation of the observed relationship between
participation and managerial performance ($r_{51}$, equal to 0.233) was derived
from the following calculation:

$$r_{51} = p_{51} + (p_{52}p_{21} + p_{53}p_{31} + p_{54}p_{41})$$
$$+ (p_{54}p_{43}p_{31} + p_{54}p_{42}p_{21} + p_{53}p_{32}p_{21})$$
$$+ (p_{54}p_{43}p_{32}p_{21})$$

The direct path coefficient linking participation and managerial performance,
$p_{51}$, is found from this to be 0.060. Thus, 75 percent of the correlation,
r$_{51}$, is explained by the model (i.e., [1-(0.060/0.233)]*100), and an
insignificant portion is left unexplained. By dividing through by $r_{51}$, the
portions of the overall relationship accounted for by the various paths in the
model are obtained. The total explanatory power of a particular variable, say
$k$, in participation's relationship to managerial performance is obtained by
summing the terms in the preceding equation which contain $p_{ki}$.

The effects of the moderating variables are estimated from the following
regression equation:

$$Y = a_1 + a_2X + a_3Z + a_4XZ$$

Where:

- $Y$ is managerial performance
- $X$ is participation in the managerial process
- $Z$ is a binary variable, assigned a value 1(0) for a high(low) value of
  the moderating variable
- $XZ$ is the interaction between participation and the moderating variable.
The moderating effect is measured by the coefficient $a_4$, and a $t$-test is used to assess its significance.

RESULTS

Completed questionnaires were received from 415 managers, a response rate of 69 percent. Respondents had an average of 16 years with their companies, and a total of ten years in their present jobs and jobs similar in content and responsibility to their present jobs.

The Intervening Variables

The correlation coefficients between participation, the elements of the information effect, the elements of the attitude effect, and managerial performance are shown in Table 1. All eight coefficients between the two participation measures and the four elements of the information effect are positive and significant (consistent with $H_1[a]-[d]$); similarly, all four coefficients between the elements of the information effect and managerial performance are positive and significant (consistent with $H_2[a]-[d]$). All four coefficients between the two participation measures and the two elements of the attitude effect are positive and significant (consistent with $H_3[a]$ and $H_6$); and the two coefficients between confidence and motivation, and managerial performance, are positive and significant (consistent with $H_4$ and $H_7$). Finally, all eight coefficients between the four elements of the information effect and the two elements of the attitude effect are positive, and seven are significant (consistent with $H_3[b]$, and with the proposition that cognitive mechanisms enhance motivation).

Participation's Effects on Motivation

The relationships between participation and the elements of the EU model of motivation are shown in Table 2. Consistent with $H_5[a]$ and $[b]$, the expectancies of receiving incremental amounts of formal rewards as a result of working hard and attaining budget are significantly associated with participation. Indeed, all 17 of the correlations between participation and
the Pw's are positive, and 14 are significant; 13 of the correlations between participation and the Pb's are positive, nine of these are significant, and none of those which are negative is significant. These results suggest that participation enhances reward expectancies in a general way, and not simply for the expectancies which moderate formal organizational rewards. Moreover (not reported in Table 2), consistent with H5[c], the association between participation and the expectancy of attaining budget with high effort (Pb) is positive and significant (r=0.247, p<0.01).

The work-related utilities (U(W)'s) are essentially unaffected by participation. Although not shown in Table 2, their mean levels are significantly higher, and their standard deviations considerably smaller, than the budget-related utilities (U(B)'s), suggesting that work provides greater, and more uniform, satisfaction than the budgets which are part of the management control system.

The budget-related utilities are in general positively associated with participation. The only two correlations which are negative are not significant. Of the 15 which are positive, nine are significant. These results contrast with BM's finding of a negative relationship between participation and the intrinsic valences.

The Structural Model

The analysis of the structural model linking participation and managerial performance is set out in Tables 3 and 4. A difficulty in using and interpreting the output of path analysis is that it rapidly becomes unwieldy as the number of variables included in the model increases. Hence, the number of variables should be reduced to the point where the insight obtained from the model is balanced against the interpretive difficulty. The variables in Table 1 are reduced by aggregating first the two participation variables, and then the four information-effect variables. This is done simply by averaging
them. The reduced set of variables, and their correlation coefficients, are shown in Table 3.

The model, and the results of the path analysis, are given in Table 4. The figures on the arcs of the model are the path coefficients, calculated in the way explained earlier. The tabular data present the total explanatory power of each variable in the model, broken down into (1) the direct effect of the variable, (2) its effect jointly with each of the other variables, and (3) its effect jointly in conjunction with both other variables. The joint effects are attributed in the first instance to each of the three intervening variables. This results in double, and triple, counting of the compound effects, which has to be backed out in the calculation of the total amount of explanation provided by the model.

The path coefficient of the arc linking participation and performance is 0.060, which is insignificant. This is consistent with Hg. The information effect is the single largest explanator, accounting directly for 27 percent of participation's positive relationship with performance; jointly through its positive effects on the attitude variables it accounts for another 15 percent, for a total of 42 percent. The two attitudes, confidence and motivation, are independent of one another, as demonstrated by the insignificant path coefficient on the arc in the model linking them. Each accounts for about the same portion of the participation-performance relationship (25 and 23 percent respectively), and together they account for approximately 48 percent of the relationship, similar to the amount explained by the information effect.

**Budget Slack**

It has already been found that more participation enhances the reward expectancies attributed to attaining budget, providing a motive for managers to prefer easier budgets, and boosts the likelihood of budgets' being attained, consistent with easier budgets. On the other hand, participation increases the budget-derived valences, which is not consistent with greater budget slack. The matter is now examined more closely, using the data in Table 5.
Budget slack is measured by the amount of effort necessary to be sure of attaining budget. It is negatively correlated with effort, which is in turn positively correlated with managerial performance. Since these correlations are in the expected directions, they provide a degree of confidence in the validity and reliability of the measures being used in the analysis.

Two aspects of budget-setting, which are especially germane to the question of budget slack, are extracted from the overall process, namely the degree of influence managers feel they exercise over the level of goal—difficulty in the budget, and over the trade-off between accepting more difficult goals in return for a higher level of reward if budget is attained. These are, as would be expected, significantly correlated with participation in budget-setting. Budget slack is not significantly associated with participation in budget-setting, or with the degree of influence exercised over the level of goal difficulty; nor are either of these participation measures significantly related to effort. Hence, it does not appear that participation leads to greater budget slack. On the other hand, the positive correlation between greater influence on the budget—difficulty/contingent-reward trade-off and budget slack suggests managers can be induced, by the promise of higher rewards, to accept budgets which are expected to require greater than normal effort.

Participation in budget-setting, and greater influence on the level of budget difficulty, are both positively correlated with the degree of adversity of conditions which can be encountered during the operating period while still being sure of attaining budget. Thus, participative budgets should be more likely to be attained, which is borne out by the relationship with budget performance; that is to say, there is less incidence of variances against budget as the level of participation in budget-setting increases. The motive underlying this appears quite clearly to be one of risk reduction rather than avoidance of hard work.
Moderating Variables

The investigation of the effects of the moderating variables is presented in Tables 6 and 7.3

In Table 6 the t-statistics testing the significance of the coefficients from each of the regressions of managerial performance on participation \( (a_2) \), each of the moderating variables \( (a_3) \), and the interaction between each of the moderating variables and participation \( (a_4) \) are shown. Participation is positively related to managerial performance under all four moderating conditions (first column). The only moderating condition which has any direct relationship with managerial performance is managerial ability (second column); as would be expected, lower ability accompanies lower performance. All four moderating conditions significantly influence the strength of the participation-performance relationship (third column): the relationship is stronger with lower managerial ability, higher information asymmetry between managers and their superiors, and higher environmental uncertainty (consistent with \( H_9[a] \), \( H_9[b] \), and \( H_9[d] \) respectively); and it is weaker with a greater degree of budget-reward contingency (contradicting \( H_9[c] \)).

These effects are explored further by means of the results shown in Table 7. Here, the moderating variables' interactions with the intervening variables are analyzed. The same method as before is applied, but instead of using performance as the independent variable in the regression, each of the three intervening variables is used in turn with each of the four moderating variables. Hence, twelve regressions were run; however, only the t-statistics for the interaction terms are reported.

In the case of lower managerial ability, participation increases managerial confidence and motivation, resulting in participation's greater effect on performance. This is consistent with the reasoning behind the hypothesis. In the case of information asymmetry, a positive relationship
is observed with the information effect and negative, even though insignificant, relationships with confidence and motivation. Thus, while information asymmetry's moderating effect is in the direction hypothesized, the underlying mechanism seems not to be through the incentive effect on which the hypothesis was based. High budget-reward contingency has a negative, albeit insignificant, relationship with all three intervening variables; these combine to give the negative moderating effect on the participation-performance relationship. At first sight this is puzzling, somewhat at odds with the previous results on which the hypothesis was based. Nevertheless, a high budget-reward contingency is not precisely the same as either budgetary control being important, or an evaluative style which focuses on the budget. Indeed, it goes a major step further, placing the operating managers at risk in respect to attaining budget. In these circumstances, managers may feel defensive, and thus not open to communication, and also dominated by the budget, diminishing the challenges of the managerial task in a broader, and more motivating, sense. Finally, in the case of environmental uncertainty, participation's effect on all three intervening variables is positive; hence, all three contribute to uncertainty's moderating effect on the participation-performance relationship, not simply, as was hypothesized, the information effect.

Testing for a Company Effect

An important question concerns the generalizability of the results, that is to say, whether they hold in each of the thirteen companies as well as across the companies. A mean-adjusted procedure was used to test this, applying it to a main result of the study, namely the positive relationship between participation and managerial performance. The participation and managerial performance scores for the respondents were adjusted by subtracting from them their mean values for their respective companies. This procedure effectively normalizes the origin of the sets of observations across the companies, removing any company-specific effect which might exist in the
The correlation coefficients between participation and performance are statistically indistinguishable for the two sets of data, the adjusted ($r=0.252$), and the unadjusted ($r=0.233$). Thus, one of the study's main results holds within, as well as across, companies, giving some confidence in the generalizability of the findings, and also providing justification for using a single pooled sample in the analysis.

**SUMMARY AND CONCLUDING DISCUSSION**

The study's limitations should be borne in mind when evaluating its findings. There may, for instance, be bias arising in the selection of samples of managers in each company, and from the self-selection exercised by managers in choosing whether to respond to the questionnaire. And, despite careful pretesting and the use of a large number of consistency checks across the data, respondents may not have interpreted the questions in precisely the manner intended. Nor may the findings be generalizable beyond the sample of the study. Since the sample is taken from 13 major companies, and one of the main result is shown to hold within as well as across companies, it may be reasonable to suppose that the findings are representative of large U.S. corporate organizations. But they certainly cannot be assumed to extend to small, or to non-corporate, organizations, or to other managerial levels in large corporate organizations. Finally, causality, direction of influence, and sequencing of relationships among variables are all inferred in the study from underlying theory. Since the data are cross-sectional, they cannot confirm the causalities proposed in the model.

Despite these qualifications, the study contributes to knowledge about management control systems in several ways. It synthesizes and extends many previous findings and propositions about participation's relationship to performance in a managerial context, consolidating them in one study. Further, following the start made by BM, an intervening-variables model of the relationship is derived and tested, and, following Brownell [1982a], the idea
of moderating variables is demonstrated and theoretically integrated with the
intervening-variables model. Much of the previous empirical work in this area
has suffered because it has not been carefully related to underlying theory.

The study's findings support the positive nature of participation in the
managerial process. However, the need to view participation more broadly than
simply in budget-setting is clear from the data. Participation in budgeting
and in performance evaluation reinforce one another, but the stronger effect on
managerial performance appears to arise from participation in performance
evaluation. An important part of participation's positive effect on managerial
performance stems from the increased understanding by managers of the tasks
assigned to them and how these relate to the overall mission of the
organization, of their roles in accomplishing these tasks, and of the
organization's goals and priorities among goal dimensions; it also enables
managers to derive greater value from operating monitoring. Of equal
importance, participation, and being better informed, enhance managerial
confidence and motivation, in turn enhancing performance. Confidence and
motivation are independent of one another, each contributing equally to the
participation-performance relationship. Much attention has been given to
motivation's role in mediating participation's effect on performance, whereas
confidence has previously received little attention.

Participation reinforces the salience in the organization of budgets, so
that variances from budget are less frequent, thus increasing the predict-
ability of performance in the organization. The mechanisms underlying this do
not appear to entail greater budget slack, but rather the setting of budgets
which, assuming high effort, are more likely to be attained when the
uncontrollable events affecting performance are taken into account. The
managers in the sample do not appear to be averse to effort, which is not
really surprising since they are all senior managers pursuing successful
careers with major companies. Thus, the assumption of high effort when budgets

-27-
are being set is probably a reasonable one, and will contribute to the efficiency of the management control system by allowing the focus during the choice of goal levels to be on managers' risk preferences. This is not to say that the assumption of high effort is taken entirely on faith. The extent to which formal rewards are tied directly to effort is evidence that the management control system monitors effort as well as results against budget.

Within the expectancy model which is used to measure motivation, participation appears to enhance the expectancies of rewards contingent on both hard work and attaining budget. It also appears to enhance the expectancy that hard work will lead to attaining budget. These results are consistent with the findings of previous research. In this study, a strong effect of participation is an enhancement of the utilities, or valences, attributed to the rewards which are contingent on attaining budget. This suggests that participation enhances goal congruence, increasing managers' awareness of the importance of the budget to the organization, hence causing them to attribute greater value to rewards which stem from budget attainment.

The last result is in conflict with the findings of the BM study. The managers in the present study may be more senior than those in the BM study, and they may come from larger companies in which budgetary control is considered to be more important. Both of these would influence the role of budgetary control in the managerial process, and the reaction of managers to participation. At any rate, it is clear that the responses elicited by participation are quite sensitive to contextual variables, a matter which designers of management control systems must bear in mind. While in the present study participation's effect on managerial performance is consistently positive, the strength of the relationship is shown to be significantly influenced by personal and inter-personal attributes, by control-system variables, and by characteristics of the operating environment.
A number of interesting avenues for further research suggest themselves from the study. One concerns the causalities which have been assumed here. To explore these empirically would require a longitudinal field study, with considerable control over the conditions being examined. Another concerns the extent to which the findings can be generalized, for example to other managerial levels and to other, such as non-corporate, types of organization.
Footnotes

1. The intercorrelations are as follows:

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost volatility</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost predictability</td>
<td>0.7663</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price volatility</td>
<td>0.3663</td>
<td>0.3563</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price predictability</td>
<td>0.2943</td>
<td>0.3483</td>
<td>0.7523</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-price dynamism</td>
<td>0.2003</td>
<td>0.2033</td>
<td>0.073</td>
<td>0.065</td>
<td></td>
</tr>
<tr>
<td>Non-price predictability</td>
<td>0.1793</td>
<td>0.2123</td>
<td>0.069</td>
<td>0.1202</td>
<td>0.4453</td>
</tr>
</tbody>
</table>

2: p<0.05; 3: p<0.01; SB measure = 0.72.

2. It is not the case, however, that enhanced budgetary performance arises solely from setting budgets which are more likely to be attained regardless of the environmental stringency encountered during the operating period. After controlling for this, participation and budgetary performance are still positively correlated (r = 0.232, p<0.01). Other variables, such as the strength of motivation to attain the budget, are enhanced by participation, and these in turn enhance budgetary performance.

3. Two other moderating conditions were tested, but because of the lack of any strong findings the results are not reported in the body of the paper. These are (1) functional area of the managerial task, and (2) the mean prevailing level of participation itself. The findings are briefly described here.

Hayes [1977] proposed that a management control system should reflect different characteristics of the managerial functions. Following this suggestion, the strength of the relationship between participation and performance was compared across manufacturing, marketing, research and development, and administrative support functions. Only one finding, of quite weak significance, emerged, namely that participation's effect is less pronounced, relative to the other functions, in manufacturing (t = -1.53, p<0.10).

Conceivably participation has diminishing returns to performance. To test this, two sub-samples were created by splitting the whole sample at the median value of participation. The slopes of the regressions relating participation to performance in the lower and higher-participation sub-samples are, respectively, 0.213 (p<0.01) and 0.113 (p<0.10). These are consistent with the proposition of participation's diminishing benefit, but the difference between the two slopes is not particularly significant.
<table>
<thead>
<tr>
<th>Participation in:</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
<th>(8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Budget-setting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2) Performance evaluation</td>
<td>.319\textsuperscript{3}</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information Effect:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3) Role clarity</td>
<td>.257\textsuperscript{3}</td>
<td>.356\textsuperscript{3}</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(4) Task clarity</td>
<td>.093\textsuperscript{1}</td>
<td>.308\textsuperscript{3}</td>
<td>.504\textsuperscript{3}</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(5) Goal clarity</td>
<td>.185\textsuperscript{3}</td>
<td>.330\textsuperscript{3}</td>
<td>.484\textsuperscript{3}</td>
<td>.435\textsuperscript{3}</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(6) Utility of monitoring</td>
<td>.314\textsuperscript{3}</td>
<td>.168\textsuperscript{3}</td>
<td>.176\textsuperscript{3}</td>
<td>.195\textsuperscript{3}</td>
<td>.245\textsuperscript{3}</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude Effect:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(7) Confidence</td>
<td>.176\textsuperscript{3}</td>
<td>.228\textsuperscript{3}</td>
<td>.353\textsuperscript{3}</td>
<td>.360\textsuperscript{3}</td>
<td>.179\textsuperscript{3}</td>
<td>.083</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(8) Motivation</td>
<td>.252\textsuperscript{3}</td>
<td>.244\textsuperscript{3}</td>
<td>.224\textsuperscript{3}</td>
<td>.228\textsuperscript{3}</td>
<td>.155\textsuperscript{3}</td>
<td>.180\textsuperscript{3}</td>
<td>.174\textsuperscript{3}</td>
<td></td>
</tr>
<tr>
<td>Performance:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(9) Managerial performance</td>
<td>.127\textsuperscript{2}</td>
<td>.246\textsuperscript{3}</td>
<td>.291\textsuperscript{3}</td>
<td>.220\textsuperscript{3}</td>
<td>.284\textsuperscript{3}</td>
<td>.105\textsuperscript{1}</td>
<td>.306\textsuperscript{3}</td>
<td>.272\textsuperscript{3}</td>
</tr>
</tbody>
</table>

1: \(p<0.10\); 2: \(p<0.05\); 3: \(p<0.01\)
Table 2
Correlations Between Participation and the Elements of the EU Model of Motivation

<table>
<thead>
<tr>
<th>Elements of reward:</th>
<th>Utilities</th>
<th>Probabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$U_i(W)$</td>
<td>$U_i(B)$</td>
</tr>
<tr>
<td>1) Higher pay and benefits in current position</td>
<td>.053</td>
<td>.195$^3$</td>
</tr>
<tr>
<td>2) Less stressful and tiring pace of work</td>
<td>-.077</td>
<td>-.028</td>
</tr>
<tr>
<td>3) Greater feelings of accomplishment</td>
<td>.005</td>
<td>.162$^3$</td>
</tr>
<tr>
<td>4) Higher level of respect from boss</td>
<td>.038</td>
<td>.188$^3$</td>
</tr>
<tr>
<td>5) Increased prospect of promotion</td>
<td>.099$^1$</td>
<td>.180$^3$</td>
</tr>
<tr>
<td>6) More frequent special award or recognition</td>
<td>.025</td>
<td>.169$^3$</td>
</tr>
<tr>
<td>7) Greater opportunity to set self high standards</td>
<td>.005</td>
<td>.186$^3$</td>
</tr>
<tr>
<td>8) Higher Bonus</td>
<td>.026</td>
<td>.215$^3$</td>
</tr>
<tr>
<td>9) Greater respect from others with whom you work</td>
<td>-.098$^1$</td>
<td>.129$^2$</td>
</tr>
<tr>
<td>10) Greater opportunity for personal development</td>
<td>-.026</td>
<td>.122$^2$</td>
</tr>
<tr>
<td>11) Stronger feelings of job security</td>
<td>-.052</td>
<td>.049</td>
</tr>
<tr>
<td>12) Greater opportunity for independent action</td>
<td>-.058</td>
<td>.045</td>
</tr>
<tr>
<td>13) Increased frequency of receiving compliments</td>
<td>-.068</td>
<td>.051</td>
</tr>
<tr>
<td>14) Greater opportunity to set example for others</td>
<td>-.057</td>
<td>.073</td>
</tr>
<tr>
<td>15) Able to make more friends at work</td>
<td>-.056</td>
<td>-.002</td>
</tr>
<tr>
<td>16) Greater opportunity to help others develop</td>
<td>-.020</td>
<td>.084</td>
</tr>
<tr>
<td>17) Time at work seeming to pass more rapidly</td>
<td>-.020</td>
<td>.087</td>
</tr>
</tbody>
</table>

Averages: $-.031, .149^3, .150^3, .125^2$

Notes:
$U_i(W)$ and $U_i(B)$ are the utilities of an incremental amount of reward i (i=1...17) if obtained, respectively, from working hard and imaginatively or from attaining budget.

$P_{Wi}$ is the increase in subjective probability that high, compared with minimal, effort will result in obtaining an incremental amount of reward i (i=1...17); measured as $[P_{HF} - P_{MF}]_i$.  

$P_{Bi}$ is the increase in subjective probability that attaining, compared with not attaining, budget will result in obtaining an incremental amount of reward i (i=1...17); measured as $0.5[(P_{HA} - P_{HF}) + (P_{MA} - P_{MF})]_i$. 

1: $p < 0.10$; 2: $p < 0.05$; 3: $p < 0.01$
<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Participation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2) Information effect</td>
<td></td>
<td>.4453</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3) Managerial confidence</td>
<td></td>
<td>.2503</td>
<td>.2813</td>
<td></td>
</tr>
<tr>
<td>(4) Motivation</td>
<td></td>
<td>.3113</td>
<td>.2783</td>
<td>.1743</td>
</tr>
<tr>
<td>(5) Managerial performance</td>
<td>.2333</td>
<td>.2793</td>
<td>.3063</td>
<td>.2723</td>
</tr>
</tbody>
</table>

3: p<0.01
Table 4

A Structural Model Linking Participation and Managerial Performance Through the Information Effect, Managerial Confidence and Motivation

Analysis of the Effects in the Model

<table>
<thead>
<tr>
<th>Effect</th>
<th>Amount Explained</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information effect: directly</td>
<td>27.0%</td>
</tr>
<tr>
<td>jointly with confidence</td>
<td>9.0%</td>
</tr>
<tr>
<td>jointly with motivation</td>
<td>5.3%</td>
</tr>
<tr>
<td>with confidence/motivation</td>
<td>0.5%</td>
</tr>
<tr>
<td>Managerial confidence:</td>
<td></td>
</tr>
<tr>
<td>directly</td>
<td>14.8%</td>
</tr>
<tr>
<td>jointly with information</td>
<td>9.0%</td>
</tr>
<tr>
<td>jointly with motivation</td>
<td>0.9%</td>
</tr>
<tr>
<td>with information/motivation</td>
<td>0.5%</td>
</tr>
<tr>
<td>Motivation:</td>
<td></td>
</tr>
<tr>
<td>directly</td>
<td>16.7%</td>
</tr>
<tr>
<td>jointly with information</td>
<td>5.3%</td>
</tr>
<tr>
<td>jointly with confidence</td>
<td>0.9%</td>
</tr>
<tr>
<td>with information/confidence</td>
<td>0.5%</td>
</tr>
<tr>
<td>Elimination of multiple counting</td>
<td>16.2%</td>
</tr>
<tr>
<td>Amount of relationship explained by the model</td>
<td>74.2%</td>
</tr>
<tr>
<td>Unexplained</td>
<td>25.8%</td>
</tr>
</tbody>
</table>

-34-
<table>
<thead>
<tr>
<th>Variable</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation in budget-setting</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Influence on budget difficulty</td>
<td>0.377</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Influence on budget difficulty/reward trade-off</td>
<td>0.187</td>
<td>0.134</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Budget slack</td>
<td>0.070</td>
<td>0.077</td>
<td>-0.168</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stringecy, (still sure of making budget)</td>
<td>0.212</td>
<td>0.262</td>
<td>0.015</td>
<td>0.353</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effort</td>
<td>0.051</td>
<td>0.059</td>
<td>0.051</td>
<td>-0.211</td>
<td>-0.065</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance versus budget</td>
<td>0.285</td>
<td>0.167</td>
<td>0.072</td>
<td>-0.004</td>
<td>0.277</td>
<td>0.005</td>
<td></td>
</tr>
<tr>
<td>Managerial performance</td>
<td>0.127</td>
<td>0.117</td>
<td>0.054</td>
<td>-0.058</td>
<td>0.040</td>
<td>0.252</td>
<td>0.162</td>
</tr>
</tbody>
</table>

2: p<0.05; 3: p<0.01.
Table 6

The Effects of the Four Moderating Variables on the Participation-performance Relationship

<table>
<thead>
<tr>
<th>Moderating Variable</th>
<th>T-statistics of the coefficients for:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Participation</td>
<td>Moderating Variable</td>
</tr>
<tr>
<td>Lower Managerial Ability</td>
<td>2.71&lt;sup&gt;3&lt;/sup&gt;</td>
<td>-5.73&lt;sup&gt;3&lt;/sup&gt;</td>
</tr>
<tr>
<td>Higher Information Asymmetry</td>
<td>2.88&lt;sup&gt;3&lt;/sup&gt;</td>
<td>-1.09</td>
</tr>
<tr>
<td>Higher Budget-reward Contingency</td>
<td>4.01&lt;sup&gt;3&lt;/sup&gt;</td>
<td>0.82</td>
</tr>
<tr>
<td>Higher Environmental Uncertainty</td>
<td>2.18&lt;sup&gt;2&lt;/sup&gt;</td>
<td>0.92</td>
</tr>
</tbody>
</table>

1: p<0.10; 2: p<0.05; 3: p<0.01

Table 7

The Effects of the Four Moderating Variables on the Relationships Between Participation and the Three Intervening Variables

<table>
<thead>
<tr>
<th>Moderating Variable</th>
<th>T-statistics of the coefficients of the interaction term for:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Information Effect</td>
<td>Managerial Confidence</td>
</tr>
<tr>
<td>Lower Managerial Ability</td>
<td>0.66</td>
<td>1.72&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Higher Information Asymmetry</td>
<td>1.37</td>
<td>-0.34</td>
</tr>
<tr>
<td>Higher Budget-reward Contingency</td>
<td>-0.85</td>
<td>-1.14</td>
</tr>
<tr>
<td>Higher Environmental Uncertainty</td>
<td>2.23&lt;sup&gt;2&lt;/sup&gt;</td>
<td>1.37&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

1: p<0.10; 2: p<0.05; 3: p<0.01
REFERENCES

Argyris, C., The Impact of Budgets on People (The School of Business and Public Administration, Cornell University, 1952).


Hofstede, G. H., The Game of Budget Control(Van Gorcum, 1967).


Ijiri, Y., Management Goals and Accounting for Control(Rand McNally, 1965).


Stedry, A. C., Budget Control and Cost Behavior (Prentice-Hall 1960).

