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ALFRED P. SLOAN SCHOOL OF MANAGEMENT

CORPORATE MANAGEMENT OF PRODUCTIVITY ;
- AN INTERNATIONAL COMPARISON

by

J. Morris McInnes

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I INTRODUCTION

This paper reports the results of a study of the corporate management of productivity. The purpose of the study was to begin to formulate answers to the following general questions: At a corporate level, how do managements view productivity; are they concerned about it; if so, what is causing the concern; and what approaches are being taken to the management of productivity?

The primary focus of the study was major US industrial firms. However, to provide a richer basis for interpreting corporate responses to productivity, data from US firms was compared with data from similar firms in Britain and Japan.

The results indicate a considerable degree of concern about productivity among corporate managements in all three countries, but the acuteness of the concern is more pronounced in Britain and Japan than in the United States. Attitudes and formal managerial approaches are more similar between US and UK managements than between either of these and Japanese managements. One notable difference between the US and UK responses is the single-minded degree to which the UK managements define productivity in labor-efficiency terms; US managements are more diffuse in their interpretation. The Japanese managements project a functionally-balanced, systemic viewpoint, and appear strongly committed to seeking solutions to productivity problems in a long-term framework. In short, to the Japanese managements productivity seems simply to be a perspective from which to appraise overall corporate strategy.

The paper is organized as follows. The next section discusses

productivity as a managerial issue within the broad context of the on-going national debate on the matter. Section III describes the research design. Section IV presents the data and its analysis, along with some interpretive comments. Finally, Section V, while noting the limitations of the study, discusses some of the implications of the patterns of corporate responses indicated by the empirical findings.

II PRODUCTIVITY AS A MANAGERIAL ISSUE

Staats [1980] is one of many authors who have recently highlighted productivity as a significant problem confronting the nation. While the US economy is still the most productive in the world, relative to major trading partners, and especially to Japan (Staats, p. 61), US productivity has been continually losing ground during the past twenty years. Judged from the standpoint of US competitiveness in the world, and in the light of the demands being placed on the economy - stemming from domestic social goals, international commitments, and prevailing expectations about levels of consumption - lagging productivity growth does seem to pose a formidable problem to the United States.

Several authors have offered structural analyses at the macro level to attempt to explain the slow-down in US productivity growth. Malkiel's [1979] is particularly succinct. Both Staats and Malkiel advocate greater coordination between public policy and the private business sector in devising and implementing solutions.

If the preceding prescription is to have any substance, it is important to know how the matter is perceived by corporate managements. Arguably, indeed, the most important focus from which to build a systematic understanding of the problem is at the level of the firm. It is, after all,

here that the main decisions are shaped, the results of which ultimately reflect in national statistics. While attention to productivity as a managerial problem has been widespread, the literature is fragmentary and, to a large extent, anecdotal.

Difficult problems surround the measurement of productivity at the macro level (Dogramaci [1981], Fabricant [1981]). But at least the definition of the term is fairly unequivocal, expressing the ratio of the value of net output to labor input. This is not the case at the level of the firm. Ball [1968] proposes the adoption of a definition, similar to the one used at a national level, for use by managements at the level of the firm. Beattie [1970] strenuously rejects this, arguing that capital productivity is the ultimate, and only proper concern of private-sector management. Craig and Harris [1973] propose, and demonstrate empirically, a total-factor approach to productivity measurement. Their proposal is interesting, but it lacks any concern for identifying the underlying variables which may cause changes in productivity, a necessary input to its management. The work emanating from the American Productivity Center (e.g, Ruch [1981]) attempts to formulate the measurement of productivity in a framework that allows some interpretation of underlying causes of changes. Harvey and Morris [1981] present by far the most sophisticated approach in the managerial literature for constructing explanations of firm-level changes in productivity. They demonstrate their method through an analysis of the movements in productivity of 21 firms in the UK machine tool industry between 1973 and 1977.

Turning to managerial prescriptions for improving productivity, there are two somewhat disparate emphases in the literature. The predominant one, in terms of the volume of writing, addresses the matter from the standpoint of eliciting incremental improvements within the broad configuration of a

firm's current production systems. This approach primarily focusses on human beings as workers and operational problem solvers. Hinrichs [1978], for example, presents some excellent case studies demonstrating the improvements which can be attained by more effective use of human resources in work situations. However worthwhile, this approach is essentially partial in its orientation. Other authors (e.g., Thurow [1980]) stress the role of fixed capital formation in the improvement of productivity. It seems clear that significant, as opposed to incremental, gains in productivity must rely to some extent on capital investment. But the application of relatively greater amounts of financial capital, without attendant progress in the technical quality of assets, is ultimately self-defeating as a path to sustained productivity growth. This suggests that the overall product and process technology used by a firm is the key aspect affecting its productivity. A few authors (e.g., Starr [1981], Gold [1979], [1981]) propose a broad, total-system approach to the management of productivity. This begins from the precept that productivity is an outcome of the total design of an organization, its technologies, and its operating policies. It does not displace the on-going, tactical efforts to achieve productivity improvements. But it does suggest a re-direction of these within a comprehensive planning and control process initiating from the corporate level.

All of this work is normative, however, and does not address the prior empirical question of how corporate managements themselves view productivity, and whether they attempt to deal with it as a strategic issue. Gallese [1980], in a journalistic article examining the relationship between productivity and employment, observes that US manufacturing business has for the past several years been substituting labor for capital. He goes on to point out that this has not been consciously directed by corporate

managements, but has occurred in a delegated and haphazard manner. Judson [1982], on the basis of a survey of top-level executives in US industrial companies, reinforces Gallese's impression, concluding that productivity is not a matter which has been addressed seriously and purposively by senior corporate executives.

The current study was undertaken to extend the systematic empirical investigation of corporate management of productivity. It took as its principal focus the treatment of productivity in the corporate planning and control process, essentially seeking answers to the questions enumerated in the first paragraph of the paper.

III RESEARCH DESIGN

A questionnaire survey was used for data collection. The general topics covered were: (1) degree of concern about productivity, and identification of the reasons for any increased concern during recent years; (2) productivity goals, and perceptions of the degree of conflict between these and goals in other performance areas; (3) formal managerial mechanisms used in planning for and controlling productivity; (4) managerial attitudes and beliefs about productivity, and about sources of, and hindrances to, its improvement; (5), descriptive company statistics, including information about past and expected growth rates in sales and earnings.

Most questions asked respondents to convey their answers on a scale of one to seven, the ends of each scale being anchored by descriptive statements. A few questions asked for a "yes-no" response.

The questionnaire was designed to require no more than 20 minutes to complete. It was pre-tested using a sample drawn from the participants in an executive course being run at the Sloan School of Management. Early in

1982, it was sent to the "Chief Planning Executive" at the corporate headquarters of each company in the research sample. This executive role was chosen because of the emphasis on the linkage between productivity and the planning and monitoring of resources at the corporate level. It was sent to the 300 largest (measured by sales revenue) industrial companies in the United States, and to the 100 largest companies in each of Britain and Japan. In total, therefore, 500 companies were surveyed.

Japan was chosen as a basis for comparison because of the rate of productivity growth which that country has achieved in the last two decades. This growth has been attributed, at least in part, to the strength of Japanese corporate management (e.g., Lee and Schwendiman [1982], Gold [1979], Chapter 16). Britain was chosen for the opposite reason. At the turn of the century Britain's was the most productive economy in the world, but since then it has steadily declined in the international ranking. It was considered of interest to observe how corporate managements in Britain have responded to the prolonged problem of slow productivity growth.

The questionnaire used common American managerial language. This was not considered likely to introduce bias to the responses, since British and American managerial language is very similar, and fluency in English among senior Japanese executives is commonplace.

Previous research (McInnes [1982]) revealed very different responses from industrial firms and firms in major service categories (e.g., transportation, retailing) among US managements. Therefore, responses from non-industrial firms in the UK and Japanese samples were excluded from the present study. Two UK and three Japanese responses were discarded for this reason.

The final sample comprised 96 US companies, 25 UK companies and 25 Japanese companies (32%, 25% and 25% respectively of the companies surveyed).

Mean values and standard deviations were calculated for each question for each of the three national samples. A two-tailed "difference-of-means" test (T-test) was used to identify significant differences for responses between the samples, and between variables within each sample. Further investigation within each sample was undertaken using correlation and regression.

IV DATA ANALYSIS

This section is organized into six parts. The first describes the characteristics of the companies contained in each of the national samples. The next presents the responses concerning the degree of urgency attributed to productivity as a corporate issue. The third deals with the managerial interpretation of productivity, and the sources of and hindrances to its improvement. The fourth addresses the extent of conflict between productivity goals and goals in other areas. The fifth analyses formal approaches to the management of productivity. And the final part offers a summary of the overall patterns observed in each sample, and compares and contrasts these across the samples.

4.1 - Description of the Companies

Table 1 presents the descriptive statistics for the companies in each sample and the comparative statistics between the samples.

Compared with the US companies, the UK companies report significantly lower growth of sales and earnings during the decade of the 1970's, while the Japanese companies report significantly higher sales growth but similar earnings growth. This is consistent with the aggregate economic performance of the three countries. The higher past growth rate of sales than earnings

among the Japanese companies suggests they have been pursuing market-building strategies.

There are no significant differences among the three samples regarding expected changes in growth rates of sales and earnings; none is significantly different from "about the same." And yet there is an interesting pattern within each sample. The US companies project an optimistic view of the future: 45% of the companies expect to accelerate their rate of earnings growth, and the number of companies placing themselves in the high growth category changes from 44 in the past to 57 in the future (an increase of 30%). The UK companies are even more optimistic: 48% expect to accelerate their rate of earnings growth, and the number changes from four to ten companies placing themselves in the high growth category (an increase of 150%). This is to be accomplished with no expected acceleration in the growth of real output. By contrast, the Japanese companies are significantly less sanguine about the future: 32% expect to accelerate their rate of earnings growth, and the number of companies placing themselves in the high growth category actually decreases from eleven to nine (an 18% decrease).

The other differences are the significantly higher rate of technical change perceived by the Japanese compared to the US companies, and the significantly higher degree of unionization of the Japanese compared to both the US and the UK companies. In the US and UK samples, the degree of unionization is significantly and negatively correlated with the rate of past earnings growth (US: $r = -.424$, $p < .01$; UK: $r = -.357$, $p < .10$); but in the Japanese sample these variables are exactly uncorrelated ($r = 0$).

4.2 - Degree of Concern about Productivity

Table 2 presents the data concerning the degree of urgency attributed to

productivity improvement.

In all three countries improvement of productivity is perceived to be a pressing issue; but the British and the Japanese both place a higher priority on the matter than do the Americans. The Japanese sense of urgency has emerged more recently than in either the United States or Britain.

In all three countries, the concern does not seem primarily to have been evoked directly by measured trends in productivity itself. Rather, circumstances external to the firm have induced managerial responses directed to the productivity of the firm's operations. In the US, it is largely a response to escalating factor costs, with no significant differences identified among specific factor inputs. In Britain, the single most important factor causing concern is escalating labor costs. In Japan, the single most important factor is increasing domestic competition; conceivably, as growth in international markets has diminished, Japanese firms are giving greater attention to their positions within their home market.

In both Britain and Japan concern for capital costs is significantly less salient than in the United States.

Shortages of critical skills is not viewed as a particularly important aspect in any of the countries. However, in the United States this factor is positively correlated with technical dynamism ($r = .185$, $p < .10$). This suggests some degree of inefficiency in the labor market. Even though unemployment is high, technically dynamic firms are apparently experiencing shortages of people with specialized skills.

An interesting contrast between the American and Japanese managements emerges in the pattern of the relationships between concern for productivity and firm performance. There is no significant association in the UK data. But in the US sample, concern for productivity is negatively correlated with

the past rate of earnings growth ($r = -.266$, $p < .01$) and positively with the expected change in the future rate of growth of earnings ($r = .256$, $p = .01$). This reiterates the optimistic posture projected by US managements, referred to previously. In the Japanese sample the pattern is exactly the opposite. Concern is positively correlated ($r = .326$) with past rate of growth of earnings, and negatively with expected change in growth rate of earnings ($r = -.455$, $p < .05$). The significant difference between the US and Japanese firms accorded to declining profit levels as a factor causing concern for productivity (Table 2) is consistent with this observation. The Japanese concern appears to arise from an anticipated decline in the rate of earnings growth, whereas in the US the concern is a reaction to past earnings performance. Perhaps reflecting the recency of this emerging concern in Japan, managements have not yet had time to assure themselves that they can effectively solve the anticipated problems through enhanced productivity; US managements, on the other hand, appear on balance to be confident that productivity gains will provide more rapid earnings growth in the future.

4.3 - Managerial Attitudes and Beliefs about Productivity

As discussed in the second section, there is considerable unresolved debate in the literature surrounding an appropriate concept of productivity at the firm level, and in addition an appropriate focus for approaching the management of productivity. This was explored in the questionnaire. Respondents were asked to indicate on a scale, ranging from "strong agreement" to "strong disagreement," their perceptions of the prevailing opinion within their managements about thirteen statements relating to productivity, and to sources of and obstacles to its improvement. The responses are presented in Table 3. The same information is re-cast in

Table 4; here the responses are rank-ordered for each country, and categorized on the basis of the strength of agreement or disagreement.

From Table 4 a managerial construction of productivity can be made, drawing on the points of relative consensus across the samples. Productivity is viewed principally in terms of the internal conduct of the organization's work, is most closely identified with the production function, and is measured in terms of efficiency. It is perceived as having little to do, however, with getting people to work harder. And there is agreement that it has to be viewed systemically, including consideration of customers and suppliers, and in the light of available technologies. It cannot be addressed satisfactorily within a short-time horizon. And top management leadership is seen as being important in establishing the attitudes which are conducive to fostering productivity in the organization.

Capital investment appears not to be regarded as an especially key element in enhancing productivity. And in all three countries a greater role for government is rejected, most emphatically in the United Kingdom.

The Japanese managements put significantly greater emphasis on research and innovation as the key source of continued productivity gains. And, whereas the American and British managements agree that union pressures frequently impede efforts to improve productivity, this is strongly rejected by the Japanese managements. Curiously enough, the American managements disagree that marketing has a role to play in improving productivity, a view which seems somewhat at odds with their agreement to the need to adopt a total-environment perspective.

4.4 - Productivity Goals and Goal Conflict

The responses to questions about productivity goals, and the degree of goal conflict perceived between productivity goals and goals on other

performance dimensions, are presented in Table 5.

British and Japanese firms are significantly more likely than American firms to have strategic goals which explicitly and directly address productivity improvement. Among the US companies, the existence of corporate productivity goals is positively associated with the degree of concern about productivity ($r = .398, p < .01$).

In all three samples, the perceived conflict expressed with regard to current earnings and cash flow goals is so highly correlated as to suggest that the two are perceived as being virtually indistinguishable (US: $r = .740$; UK: $r = .608$; Japan: $r = .898$). This does not seem to support the view that timing of recognizing expenses under accrual accounting militates against long-term investment for productivity improvement (Rappaport [1979]). On the other hand, current concerns about liquidity may simply be causing a convergence of short-term earnings and cash-flow considerations.

The degree of conflict perceived between productivity goals and financial goals (current earnings and cash flow) is effectively the same across all three countries. This does not support the contention that the structure of the financial markets in both Britain (Samuels, Groves and Goddard [1975]) and the United States (Hayes and Abernathy [1980]) places companies in these countries at a disadvantage in the matter of investing for long-term improvements in performance. Indeed, even though not reaching a notable level of significance, the Japanese in fact express greater conflict between productivity and financial goals than do the Americans.

Overall, a low degree of goal conflict is expressed in all three countries. One notable exception is in the United Kingdom, where productivity goals are perceived as being in considerable conflict with employee stability goals. Perhaps in this instance employee stability goals arise from sources outside the managerial organization, for example from

legislation or from union pressures. The degree of goal conflict on this dimension in the UK data is positively correlated with the degree of unionization ($r = .240$), indicating some support for this suggestion.

4.5 - Formal Management Approaches to Productivity

Table 6 presents the responses on formal managerial mechanisms for planning and controlling productivity performance.

The questions were cast in the fairly standard paradigm of management control, namely goal formation, strategies and plans for goal attainment, and accountability and rewards to reinforce goal-directed behavior (Lorange and Scott Morton [1974]). These are examined primarily in the context of the degree of centralization.

In all three countries, the same pattern is observed with regard to planning. There is successively greater delegation in moving from goal definition to goal quantification and, finally, to the establishment of strategies and plans for goal attainment. Overall, the Japanese adopt a more centralized approach than either the Americans or the British.

The degree of centralization has a different pattern across the samples in relation to technical dynamism. The centralization measure was first regressed on business diversity to remove the effects of this variable. Then, technical dynamism was correlated with the standardized residuals from the preceding regression. In the US, technical dynamism and centralization are negatively correlated ($r = -.204$, $p < .05$); but in both the UK and Japan they are positively correlated (UK: $r = .637$, $p < .01$; Japan: $r = .305$, ns). This indicates that in American companies greater delegation is chosen as a corporate control strategy in response to greater technical dynamism, whereas in the UK and Japan greater centralization is chosen.

In all three countries a large number of operational measures of

productivity are used, these being tailored to the characteristics of each of the various activities in the organization.

Striking differences emerge in the managerial review process between the Japanese companies on the one hand, and the British and American companies on the other. The Japanese are significantly more likely to hold managers explicitly and tightly accountable for the attainment of productivity improvements. Further, they are more likely ($p < .10$) to make some portion of compensation contingent on attained performance.

The final item concerns whether a corporate executive has been designated as having a specific responsibility for company-wide productivity. This appears to be becoming commonplace among American companies. Further investigation of the role indicates that it usually carries little by way of executive powers, but is principally concerned with information transfer, both from external sources to managers in the company and across structural boundaries within the organization.

4.6 - Summary of Observed Patterns

Concern for productivity is emerging as an issue among American corporate managements. However, at this juncture, the concern is less than in the United Kingdom or in Japan. And the managerial response to the issue appears to be reactive (especially compared with the Japanese), and has not as yet crystallized into clear patterns.

In the United Kingdom, corporate managements are expressing a strong determination to accelerate the rate of growth of earnings. In fact they are by far the most optimistic in this regard, and particularly so when considered in relation to their past performance. Since growth in real output is not expected to accelerate, and since - given the expression of concern for intensifying competition - there can be little room for

significant real increases in output prices, this acceleration in the rate of earnings growth will have to be achieved from productivity gains. There is little ambiguity about how this is to be achieved; labor efficiency is the target, and central direction of technical change is the means. While the UK managements are expressing no animosity towards workers per se, unions are clearly viewed as being in conflict with this managerial intent.

The Japanese present a very different posture from either the American or the British managements. Firstly, there is no suggestion of conflict between unions and management. Secondly, the concern for productivity seems to be a proactive response to anticipated future difficulties rather than a reaction to problems with past performance. Thirdly, research and innovation are seen as the key to providing solutions to the anticipated problems. Overall, the Japanese project a powerful managerial prescription. This is based on providing appropriate functional differentiation in the organization around the requisite skill specializations. These are balanced and integrated in a long-range planning framework, conducted in a relatively centralized manner. Finally, a goal-directed discipline is established in the organization by means of tight and explicit managerial accountability for performance, along with some degree of rewards contingent on results achieved.

V CONCLUDING COMMENTS

Questionnaire research on large samples of companies has obvious limitations. It can only gather aggregate impressions about a phenomenon; it cannot delve deeply into complexities. Moreover, it carries the danger that personal opinions, rather than corporate managerial practices, are being measured. In the present study, considerable care was taken to

minimize this problem, through the choice of the samples, ensuring interpretability of the questions, and building into the questionnaire numerous consistency checks; in addition, follow-up conversations with a sample of respondents was used as a post-completion test of the accuracy of interpretation of data. Then there is the question of whether survey data can be considered to have been drawn from a normally-distributed population, and is interval in nature. The findings reported in the paper are based on parametric tests, at least in part because the output of these is more readily assimilated in the presentation of the results. In fact, all the main conclusions were subjected to non-parametric testing; the essence of the findings does not change, although the statistical confidence attributed to specific results would obviously diminish to a small extent.

The overall findings of the research, even recognizing the foregoing qualifications, present a provocative and challenging picture. Particularly compared with the proactive, strategic response to productivity exhibited by the Japanese, American managements seem tentative in their approach. The conclusions of the study are less bleak than those arrived at by Judson [1982]; but they are nonetheless somewhat disquieting.

Firstly, even if less pronounced, the conflict which is so apparent in the British responses - managerial conflict with organized labor, and a negative attitude towards government's role in the matter - is mirrored in the US responses. These observations do not provide a basis for great optimism that cooperative efforts, as advocated by the authors referenced earlier in the paper, are likely to meet with any rapid success.

And secondly, there is a sense that strategic direction is lacking in the US response to lagging productivity growth. The general thrust of corporate strategic planning which has been promulgated in the United States during the decade of the 1970's has recently come under severe attack

[e.g., Keichel [1982]). This has emphasized two themes: a product-market analysis, accompanied by portfolio balancing of selected strategies (e.g., Abell and Hammond [1979]); and a financial-market analysis connecting product-market portfolios, through the capital-asset pricing model, to aggregate economic valuations of strategies (e.g., Salter and Weinhold [1979]). It is not that these approaches are essentially wrong; they are simply incomplete. At best, they pay passing attention to the intervening logic linking product-market and financial-market opportunities through an organization's production capabilities. By and large, they assume away the problem of sustaining an organization's core technologies, essentially subsuming the complex heart of the managerial matter within the rubric of the "experience curve." A few authors (e.g. Skinner [1969], Starr [1973]) have for some time been warning of the dangers of slighting production in the corporate strategic planning process.

In point of fact, the reliance on product-market and financial-market frameworks for analysing corporate strategy is simply a symptom of a more fundamental trend in US corporate management, namely a structural change based on increasing delegation of operational responsibility, accompanied by profit-oriented control strategies (Hayes and Abernathy [1980]). This has created an organizational centrifugal force; a force which is inimical to the required concentration of expertise and resources to cope with the systemic problems of managing organizational adaptation to radical technological changes. The contrast between the US tendency to choose greater delegation as a response to technical dynamism, and the Japanese and British tendencies to adopt greater centralization, is perhaps the most thought-provoking result in the research.

The dominant challenge facing managements in the 1980's is surely the ability to come to grips with emerging technologies (Kantrow [1980]),

technologies which have the potential to cause radical re-design of work systems and the relationships between organizations and the external parties with which they conduct business. As pointed out by Moore and Moore [1981], this is only in relatively small part a technical issue. More importantly, it demands fundamental attention to the management of human resources, in the context of the behavioral and political dimensions of the dynamics of organizational change.

TABLE 1: DESCRIPTIVE STATISTICS OF THE SAMPLES

	MEAN SCORES (STD. DEVIATIONS)			COMPARATIVE STATISTICS ²		
	AMERICAN COMPANIES (N=96)	BRITISH COMPANIES ¹ (N=25)	JAPANESE COMPANIES ¹ (N=25)	US/UK	US/JAP.	UK/JAP.
PAST SALES GROWTH	1.6(0.6)	*2.0(0.6)	*1.2(0.4)	3.235 0.0029 (96/23)	4.170 0.0001 (96/24)	5.691 0.0000 (23/24)
PAST EARNINGS GROWTH Scores: 1 - g > 10% 2 - 0% ≤ g ≤ 10% 3 - g < 0%	1.6(0.6)	*2.0(0.6)	1.6(0.6)	3.079 0.0043 (96/23)	ns (96/23)	2.278 0.0278 (23/23)
EXPECTED SALES GROWTH	1.9(0.7)	2.0(0.7)	2.1(0.9)	ns (96/23)	ns (96/24)	ns (23/24)
EXPECTED EARNINGS GROWTH Scores: 1 - g (expected) > (past) 2 - g (expected) = g (past) 3 - g (expected) < g (past)	1.7(0.8)	1.7(0.8)	2.1(0.9)	ns (95/23)	ns (95/23)	ns (23/23)
TECHNICAL DYNAMISM Scores: 1 - Very dynamic 7 - Stable	4.5(1.9)	4.4(1.7)	*3.5(2.2)	ns (96/24)	2.052 0.0481 (96/25)	ns (24/25)
BUSINESS DIVERSITY Scores: 1 - Conglomerate 7 - Single business	3.2(1.9)	3.3(2.2)	3.9(2.2)	ns (96/24)	ns (96/25)	ns (24/25)
DEGREE OF UNIONIZATION Scores: 1 - All employees unionized 7 - No employees unionized	3.7(1.6)	3.1(1.4)	*1.5(1.0)	ns (96/24)	8.590 0.0000 (96/25)	0.0000 (24/25)

Notes: (1) In the British and Japanese columns, mean scores which differ significantly ($p < .05$) from US mean scores are denoted by an asterisk.

(2) T-statistic; probability of difference occurring by chance ('ns' - not significant at $p < .05$); and sample sizes for each comparison.

TABLE 2: PRODUCTIVITY AS A MANAGERIAL ISSUE

	MEAN SCORES (STD. DEVIATIONS)			COMPARATIVE STATISTICS ²		
	AMERICAN COMPANIES (N=96)	BRITISH COMPANIES ¹ (N=25)	JAPANESE COMPANIES ¹ (N=25)	US/UK	US/JAP.	UK/JAP.
DEGREE OF CONCERN Score: 1 - top priority 7 - no particular priority	2.6(1.5)	*1.6(0.8)	*2.1(1.0)	4.603 0.0000 (96/25)	2.052 0.0449 (96/25)	ns (25/25)
RECENT INCREASE IN CONCERN Score: 1 - Definitely 7 - No	2.1(1.3)	1.9(1.0)	*1.6(0.6)	ns (96/25)	2.582 0.0116 (96/25)	ns (25/25)
FACTORS CAUSING INCREASED CONCERN: Score: 1 - Strong factor 7 - Not a factor						
Escalating costs of: labor	2.2(1.1)	1.9(1.3)	2.3(1.4)	ns (86/23)	ns (86/25)	ns (23/25)
capital	2.2(1.3)	*3.4(1.8)	*3.3(1.2)	2.977 0.0059 (85/23)	4.058 0.0002 (85/24)	ns (23/24)
energy	2.4(1.4)	*4.0(1.7)	2.4(1.3)	4.131 0.0003 (83/23)	ns (83/25)	3.574 0.0009 (23/25)
materials	2.6(1.3)	*4.6(1.4)	2.2(1.0)	6.206 0.0000 (85/23)	ns (85/25)	6.736 0.0000 (23/25)
Shortage of critical skills	4.2(1.7)	4.9(1.5)	4.6(1.6)	ns (86/23)	ns (86/25)	ns (23/25)
Maturing markets; slackening demand	2.8(1.6)	2.8(1.7)	2.4(1.4)	ns (85/23)	ns (85/25)	ns (23/25)
Increasing domestic competition	3.1(1.3)	3.2(1.8)	*1.9(1.0)	ns (85/22)	4.545 0.0000 (85/25)	2.872 0.0072 (22/25)
Increasing foreign competition	3.2(1.9)	2.8(1.7)	3.6(1.3)	ns (85/23)	ns (85/25)	ns (23/25)
Stabilizing technologies	3.9(1.6)	4.6(2.0)	3.8(1.3)	ns (84/23)	ns (84/24)	ns (23/24)
Declining profit levels	2.9(1.5)	2.6(1.6)	*2.3(1.2)	ns (86/23)	2.115 0.0399 (86/25)	ns (23/25)
Declining productivity growth	3.3(1.6)	3.9(1.9)	3.5(1.5)	ns (85/23)	ns (85/25)	ns (23/25)

Notes: (1) In the British and Japanese columns, mean scores which differ significantly ($p < .05$) from US mean scores are denoted by an asterisk.
(2) T-statistic; probability of difference occurring by chance ('ns' - not significant at $p < .05$); and sample sizes for each comparison.

TABLE 3: MANAGERIAL ATTITUDES ABOUT PRODUCTIVITY

	MEAN SCORES (STD. DEVIATIONS)			COMPARATIVE STATISTICS ²		
	AMERICAN COMPANIES (N=96)	BRITISH COMPANIES ¹ (N=25)	JAPANESE COMPANIES ¹ (N=25)	US/UK	US/JAP.	UK/JAP.
Score: 1 - Strong agreement 7 - Strong disagreement						
Productivity is primarily a matter of internal methods and efficiencies	3.1(1.4)	*2.5(1.0)	2.8(1.1)	2.393 0.0206 (96/25)	ns (96/24)	ns (25/24)
Better production management is the key to improving productivity	3.3(1.3)	3.1(0.9)	*2.2(1.0)	ns (96/24)	4.646 0.0000 (96/25)	3.580 0.0008 (24/25)
Improving productivity is largely a matter of getting people to work harder	5.3(1.3)	4.7(1.4)	5.4(1.7)	ns (96/25)	ns (96/25)	ns (25/25)
Productivity gains come from attitudes which must start right from top mgt.	2.5(1.4)	*2.0(0.9)	3.1(2.0)	2.287 0.0259 (96/25)	ns (96.25)	2.666 0.0118 (25/25)
Improved marketing is the key to enhanced productivity	4.8(1.2)	*4.1(1.4)	*3.7(1.4)	2.335 0.0258 (95/25)	3.571 0.0011 (95/25)	ns (25/25)
Productivity gains come largely from capital investment	3.3(1.2)	3.5(1.1)	3.7(1.5)	ns (96/25)	ns (96/25)	ns (25/25)
Productivity is a short-range issue, best dealt with through high performance targets	5.4(1.3)	5.0(1.6)	5.1(1.5)	ns (96/25)	ns (96/25)	ns (25/25)
Research and innovation are the key sources of continued productivity gains	3.2(1.4)	*4.2(1.3)	*2.2(0.9)	3.203 0.0027 (96/25)	4.506 0.0000 (96/25)	6.222 0.0000 (25/25)
Productivity gains involve the whole environment, including suppliers, customers and technologies	2.6(1.3)	2.9(1.2)	2.3(1.0)	ns (96/25)	ns (96/25)	ns (96/25)
Productivity gains result from careful long-term planning	3.2(1.3)	3.4(1.4)	*2.4(1.0)	ns (96/25)	3.398 0.0014 (96/25)	2.848 0.0068 (25/25)
The government must take greater responsibility for the nation's productivity	5.2(1.6)	5.3(1.4)	4.7(1.5)	ns (96/25)	ns (96/25)	ns (25/25)
Union pressures frequently impede efforts to improve productivity	3.1(1.5)	2.6(1.4)	*5.9(1.2)	ns (94/24)	9.883 0.0000 (94/25)	8.623 0.0000 (24/25)
The work ethic has greatly diminished, resulting in lagging productivity growth	4.0(1.4)	3.8(1.5)	*5.2(1.8)	ns (96/25)	3.093 0.0042 (96/25)	2.963 0.0048 (25/25)

Notes: (1) In the British and Japanese columns, mean scores differ significantly ($p < .05$) from US mean scores are denoted by an asterisk.

(2) T-statistic; probability of difference occurring by chance ('ns' - not significant at $p < .05$); and sample sizes for each comparison.

TABLE 4: RANKINGS OF ATTITUDES/BELIEFS ABOUT PRODUCTIVITY¹

STRENGTH OF FEELING	AMERICAN MANAGERIES	BRITISH MANAGERIES	JAPANESE MANAGERIES
STRONG AGREEMENT (Mean score < 3.0)	(1) Top management leadership (2) Whole environment	(1) Top management leadership (2) Internal efficiency (3) Union impediments	(1) R&D/innovation (2) Production (3) Whole environment (4) Long-term planning (5) Internal efficiency
AGREEMENT (Between 3.0 and 4.0)	(2) Internal efficiency (4) Union impediments (5) Long-term planning (6) R&D/innovation (7) Capital investment (8) Production	(4) Whole environment (5) Production (6) Long-term planning (7) Capital investment	(6) Top management leadership
NEUTRAL (Mean score not significantly different from 4.0)	(9) Diminished work ethic	(8) Diminished work ethic (9) Marketing (10) R&D/innovation	(7) Marketing (8) Capital investment
DISAGREEMENT (Between 4.0 and 5.0)	(10) Marketing	(11) People working harder	(9) Government responsibility (11) Short-range issue
STRONG DISAGREEMENT (Mean score > 5.0)	(11) Government responsibility (12) People working harder (13) Short-range issue	(12) Short-range issue (13) Government responsibility	(11) People working harder (12) Diminished work ethic (13) Union impediments

Note: (1) Ties between mean scores are resolved by reference to the standard deviations. An equal mean score with a lower standard deviation is ranked above one with a higher standard deviation.

TABLE 5: STRATEGIC GOALS AND GOAL CONFLICT

	MEAN SCORES (STD. DEVIATIONS)			COMPARATIVE STATISTICS ²		
	AMERICAN COMPANIES (N=96)	BRITISH COMPANIES ¹ (N=25)	JAPANESE COMPANIES ¹ (N=25)	US/UK	US/JAP.	UK/JAP.
EXPLICIT PRODUCTIVITY GOALS EXPRESSED AT CORPORATE LEVEL Scores: 1 - Yes 2 - No	1.3(0.5)	*1.1(0.3)	*1.1(0.3)	2.120 0.0394 (96/24)	2.120 0.0394 (96/24)	ns (24/24)
DEGREE OF CONFLICT BETWEEN PRODUCTIVITY GOALS AND OTHER GOALS: Scores: 1 - Considerable conflict 7 - No conflict						
Market Share Goals	5.6(1.6)	5.2(1.7)	5.2(2.1)	ns (72/22)	ns (72/24)	ns (22/24)
Current Earnings Goals	5.1(1.9)	4.6(1.6)	4.7(2.1)	ns (72/22)	ns (72/24)	ns (22/24)
Cash Flow/Financial Goals	4.9(1.7)	4.5(1.6)	4.6(2.1)	ns (72/22)	ns (72/24)	ns (22/24)
Employee Stability Goals	4.8(1.7)	*3.0(1.7)	5.3(1.7)	4.080 0.0003 (71/22)	ns (71/24)	4.502 0.0000 (22/24)
Technical Innovation Goals	5.7(1.5)	5.0(1.9)	5.6(1.6)	ns (71/22)	ns (71/24)	ns (22/24)

- Notes: (1) In the British and Japanese columns, mean scores which differ significantly ($p < .05$) from US mean scores are denoted by an asterisk.
 (2) T-statistic; probability of difference occurring by chance ('ns' - not significant at $p < .05$); and sample sizes for each comparison.

TABLE 6: FORMAL MANAGEMENT OF PRODUCTIVITY

	MEAN SCORES (STD. DEVIATIONS)			COMPARATIVE STATISTICS ²		
	AMERICAN COMPANIES (N=96)	BRITISH COMPANIES ¹ (N=25)	JAPANESE COMPANIES ¹ (N=25)	US/UK	US/JAP.	UK/JAP.
CENTRALIZATION: <u>Score:</u> 1 - Strong central direction 7 - Delegated						
Overall management of productivity	4.4(1.6)	4.6(1.4)	4.0(1.4)	ns (96/25)	ns (96/25)	ns (25/25)
Goal definition	3.7(2.0)	3.7(1.8)	3.7(1.6)	ns (71/22)	ns (71/24)	ns (22/24)
Goal quantification	4.7(1.8)	4.9(1.9)	4.0(1.7)	ns (71/22)	ns (71/23)	ns (22/23)
Plans for goal attainment	5.2(1.5)	5.3(1.4)	5.0(1.4)	ns (94/24)	ns (94/25)	ns (24/25)
PRODUCTIVITY MEASURES <u>Score:</u> 1 - No productivity measure 4 - A large number of measures	3.4(0.9)	3.2(0.8)	3.2(0.8)	ns (96/24)	ns (96/24)	ns (24/24)
ACCOUNTABILITY FOR PERFORMANCE <u>Score:</u> 1 - Tight, explicit accountability 7 - No explicit accountability	4.4(1.6)	3.8(1.6)	*2.8(1.4)	ns (96/25)	5.049 0.0000 (96/25)	2.379 0.0215 (25/25)
CONTINGENT REWARDS <u>Score:</u> 1 - Explicit incentives 7 - No explicit incentives	4.9(1.7)	5.5(1.7)	4.2(1.8)	ns (96/25)	ns (96/25)	2.570 0.0134 (25/25)
CORPORATE PRODUCTIVITY EXECUTIVE <u>Score:</u> 1 - Yes 2 - No	1.7(0.5)	*1.9(0.3)	1.6(0.5)	2.599 0.0121 (96/25)	ns (96/25)	2.028 0.0489 (25/25)

Notes: (1) In the British and Japanese columns, mean scores which differ significantly ($p < .05$) from US mean scores are denoted by an asterisk.

(2) T-statistic; probability of difference occurring by chance ('ns' - not significant at $p < .05$); and sample sizes for each comparison.

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