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ACCOUNTING PARADIGMS AND SHORT-TERM
DECISIONS: A PRELIMINARY STUDY

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by

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ACCOUNTING PARADIGMS AND SHORT-TERM DECISIONS: A PRELIMINARY STUDY

As more companies decentralize their organizational structures, they tend to fix on profit centers as the primary unit of managerial responsibility. This development necessitates, in turn, greater dependence on short-term financial measurements like return on investment (ROI) for evaluating the performance of individual managers and management groups.

Harvard Business Review, July-August 1981.

Abernethy & Hayes in this quote from their paper entitled "Managing Our Way to Economic Decline," charge that the growing reliance on profit centers in particular financial control and in general is stifling American business's ability to compete effectively internationally. The charge, if sustained, is a serious one since it is leading in their estimation to a decline in the overall economic well-being of business and ultimately of the entire body politic.

Three things need to be established before this charge can be fully made. First, there must be a definition of financial control i.e., is it only profit centers or is it a broader malady that is affecting American business? Second, there is a need for a theoretical framework within which the effects of a financial control system on managerial decision making can be predicted and the cause and effect relationships traced. Third, one needs some empirical evidence that financial control systems are indeed composed of the short-term measures described by Abernethy & Hayes. This article provides some preliminary evidence on this third point. It also offers a definition of financial control systems that I have found useful in our empirical work, and finally a sketch of Cyert & March's behavioral theory of the firm within which I attempt to interpret the empirical findings.

The paper attempts three things. First, it provides some support for Abernethy & Hayes claims that American businesses have become enmeshed in

short-term quantifiable measures. Second, it argues that if American businesses are to be encouraged to take longer term decisions, it is imperative that we develop the concept of strategic control systems. And finally, the paper suggests that we have relied too much on a rational model of planning and control and that more insight into the financial control process might come from the use of a learning model of the firm.

The paper is broken into three sections. The first lays out the initial motivation for an empirical study conducted at the Sloan School of Management, MIT, by Dr. J. M. McInnes and the author and provides some of the preliminary empirical results. The second section compares the rational model of decision-making in the firm with a more behavioral model. The third section seeks to interpret the empirical findings in the light of the theory developed in the middle section.

SOME EMPIRICAL EVIDENCE

Financial Control: Financial control systems are ubiquitous. The term itself is freely used. It comes as somewhat of a surprise therefore to the would-be researcher in the area that no widely-accepted definition of the term exists and that empirical evidence on such systems is very sparse.

Van Breda and McInnes sought to remedy this situation by an in-depth study of a number of American businesses. Van Breda (1980) offered the following definition as a basis for this research:

- A financial control system is a set of related dollar-denominated variables used in interactions between individuals to
- 1) measure the performance of individuals singly or in aggregate
 - 2) signal the results of efforts by individuals to others
 - 3) determine, partially or wholly, rewards for performance.

In other words, a financial control system is a means of communication, a means of evaluation, and a means of motivating.

The definition is broad and intentionally so. The system can include variables drawn from the accounting system but also from other financial frameworks such as present value analysis. It could also include market data such as the firm's share price. One of the major research questions at issue was which subset of the universe of possible variables did management choose? Our hypothesis was that this choice would reflect the particular situation of the firm -- in other words, we had a contingency model of the financial control system in mind.

Central to the definition was the adjective "related." Webster's first definition of a system is a set or arrangement of things so related or connected as to form a unity or organic whole. By definition then, if a financial control system is to constitute a system then the variables which compose it must be related or connected.

A related set of variables may also be defined as a symbolic model. The financial control system is in this sense a model of the organization with exogenous variables being treated as parameters to the model. The nature of the model, or models, in use in an organization, or equivalently, the set of perceived relationships between variables, especially financial control variables, constituted an important area of our research. We return to this point later where we argue that the financial control system is a powerful and pervasive model of the firm which shapes managerial decision-making critically.

The Sample: The decision was made to research the issue of financial control systems within the context of publicly-quoted, widely-held companies. The reason for this was to attempt to exclude from consideration companies which might be pursuing idiosyncratic financial policies stemming from the specific utility of a dominant ownership coalition, rather than from policies which might be attributed to an interpretation of the financial markets in a

more general and impersonal sense. Time and financial exigencies further constrained the population to companies on the North East corridor. Given the diversity of companies in this area this was not perceived as a restriction on generality.

The choice of companies was restricted further to enterprises with a single, or dominant, product or production technology, on the grounds that the senior management of such enterprises would be likely to be familiar with the business characteristics of operations and so could exercise a relatively unrestricted choice of emphasis in information sets between financial and non-financial. The intent was to control for diversity of operations therefore. This had the effect of controlling the population in respect to size of enterprise since there is some evidence to indicate that size and diversity are relatively collinear.

Within this population a judgmental sample was drawn rather than a random sample. Chou (1975) lends support to this approach for pilot studies. The reason it was deemed appropriate here was that it enabled us to design a sample that gave contrast in terms of the explanatory variables of interest. These variables were themselves selected from a longer list on the basis of a priori theorizing as being of especial interest to current research into financial control systems. By making a judgmental sample it was possible in part to control for excluded explanatory variables.

Despite these justifications for the sampling technique employed the results and conclusions reached in this paper should be regarded as merely suggestive. The structure, size, and distribution of the survey should be borne in mind when reading the results and conclusions. Any attempt to make the survey statistically valid would be misleading considering the small sample size.

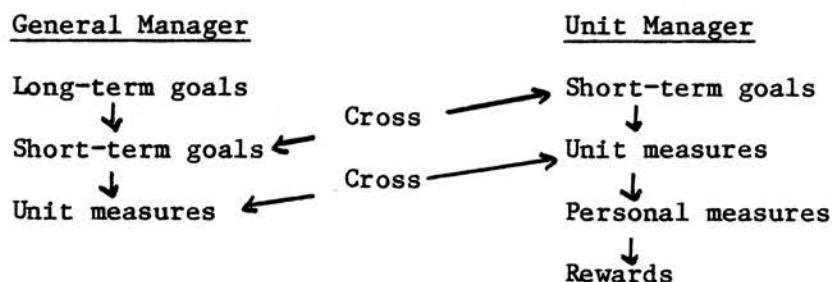
Initial contact with firms was made by letter, a copy of which is attached as Exhibit I. A follow-up telephone call was made within two weeks of mailing. It was necessary to follow this up in turn with a brief interview with the firm's contact person to explain more fully our intended research design. The intent of this prior interview was to attempt to ensure that we met those members of the firm most useful to us. Firms on their own tended to structure interviews around the designers of control systems only, where we wanted to talk to users as well. Damage to the integrity of the research was limited since only the initial contact person was involved in these discussions.

The Questionnaire: An early decision in the research design phase was that relatively in-depth, on-site interviews should be conducted. The research tool that emerged was a set of questionnaires consisting of a mix of closed and open-ended questions.

These questions were not without their problems. Broad, open-ended questions are potentially excellent vehicles for drawing non-directed and non-influenced answers. They are also useful devices for testing recall and gauging thereby importance of a topic to a subject. Another advantage is their ability to elicit broad and subtle suggestions, comments, and arguments on and around the topic being explored. On the other hand, an open-ended questionnaire can yield unsatisfactory results simply because of the great leeway they offer the subject. If the response is to be of value, the interviewer has to exert subtle, but very careful control in order to enforce some uniformity in the way the subject responds. As a result of these comments a blend of both closed and open-ended questions was attempted. No obvious questioning bias emerged during the course of the research so that we were fairly convinced of the reliability of the instrument.

Of particular interest to this paper were our questions on the goals and measures used by managers in our study. Copies of the relevant questions appear in Exhibit II. These questions were put to a wide variety of managers -- the general manager, the controller, the planner, the marketing manager, the production manager. Our obvious hypothesis in doing this was that goals and related measures would vary across functional areas in the firm.

The essential issue being researched at this point was how the firm's goals related to the reward and incentive system. To this end a series of questions were asked. The way these relate to one another may best be seen in diagrammatic form:



A distinction was drawn therefore between the measures used to evaluate the performance of the unit itself and of the manager himself. Cross checks were built into the research by questioning the manager and his supervisor.

Our intent was to draw out of management their long-term strategies and goals and then to see how these translated into short-term goals and tactics. Our expectations were that these would be mostly qualitative and nonfinancial -- especially the statements of long-term goals. We were then interested in how these goals were translated into measures. We expected these in turn to be quantitative and a mixture of financial and nonfinancial. Within the set of financial measures we expected to find a blend of accounting-based and non-accounting variables.

Hypotheses and Results: Stated otherwise our hypotheses were fundamentally two. First, we expected the control system as a whole to vary by functional area. More specifically, we expected the marketing manager to be measured on different variables from the production manager and each to have a different goal set. Second, we expected the financial control system, defined here as the set of dollar-denominated variables used for control, to reflect the strategies of the firm as mediated by the short-term goal statements. As a subsidiary hypothesis we expected the financial control system to consist of a mixture of accounting and non-accounting variables. More specifically, we expected the variables to be a blend of financial and managerial accounting variables.

An example of what we expected to find ran as follows. A firm might have stated as one of its long-term goals its intent to become the dominant firm in its industry. This could have translated into a desired market share of a certain percentage. This would have certain implications for the near term such as a desired growth in sales for the coming year and an investment program in the manufacturing area. Each of these could have had certain measures -- a target sales figure for this year for instance and a three year growth figure for example. Other performance measures might have included the relative performance of competitors.

Our findings were dishearteningly negative both from a research point of view and, bearing Abernethy and Hayes' comments in mind, from a larger societal point of view. Exhibit III lays out the short and long-term goals mentioned by managers of petrochemical firms. A glance at the statements of long-term goals of these managers reveals an alarmingly high preponderance of financial measures -- more than 50 percent of the goals mentioned are nothing more than accounting variables. Market share is mentioned by three of the

four firms but the reason for desiring market share is missing. Market share per se is after all more in the nature of a tactic than a goal. Most noticeable here is the complete absence of what has been termed superordinate goals. It should be noted that the order in which these goals appear does not give any indication of their importance. We did attempt to get managers to rank-order their goals but failed in the attempt. Managers found it extraordinarily to prioritize their goals and most answered that all were equally important.

The short-term goals are even more noticeably oriented to short-term operations and more especially to accounting variables. Two firms did mention personnel development but in the interviews these followed after items such as revenue, expenses, or profit as a goal. It is also noteworthy how small a difference there was between the statements of short-term and long-term goals. The overlap is almost complete.

The measures mentioned by the managers appear in Exhibit IV. These are virtually entirely short-term in nature. It is also noteworthy that with one possible exception, namely pound-volume output in firm three, every measure mentioned is financial in nature. More specifically, the measures are all accounting based.

A detailed analysis of these measures was done by functional area to test our hypothesis that the measures would vary across the firm. Our hypothesis was confirmed but in an obvious manner only. Sales departments tended to stress revenue measures and production departments stressed cost measures, and so on. In other words, once one knows the organizational structure of the firm one can predict with almost complete certainty the control structure -- or at least the financial measures that will be in place across the firm.

To sum up then, we expected to find a preponderance of broad and qualitative long-term goals. Instead we found that even long-term goals tended to be stated in very financial terms. There was a complete absence of superordinate goals for instance. We expected to find short-term goals to be a derivative of long-term statements. Instead, we find them to be virtually the same. We expected to find a fairly broad range of measures in place in firms. Instead we found them to be almost entirely accounting in nature. We did find that measures varied across the firm but this corresponded almost exactly with the organizational structure -- we found no manufacturing departments that were evaluated on the basis of profit for instance.

ORGANIZATIONAL LEARNING

The Rational View: Accounting is typically defined as an information system that supports the decision-making of shareholders, managers, and others. One way to conceptualize this role is to think of a typical decision matrix. The manager, say, has a range of actions open to him. A number of states of nature are feasible and may be predicted with a certain set of prior probabilities. Each combination of state and action leads to a possible outcome. The manager has to select that action that over the range of possible outcomes yields the most desirable vector. A typical decision rule is to maximize expected profit.

When information enters in such a world, the manager is assumed to revise his set of prior probabilities. Most commonly this revision process is presumed to follow Bayes Rule and to lead to a set of posterior probabilities. Should the combination of the posterior probabilities and actions lead to a changed action and, by implication, to a more valuable set of outcomes the information is said to have value.

This model is essentially rational. Typically, it is accompanied by statements about the goals of the firm and how accounting assists managers to allocate resources in accordance with these goals. Often too, there is at least the implicit assumption that managers know all the relevant actions open to them, that they are aware of all the possible states of nature, that they understand the transformation process that generates outcomes, and that they continually and actively search out new information and alternatives.

The Behavioral View: A potentially more useful model of the managerial process is presented in the work of Cyert & March (1963) in their behavioral theory of the firm. Following the earlier work of Simon (1947), they argue that there are cognitive limits that constrain decision makers. Simon called this "bounded rationality" to distinguish it from the notion of "comprehensive rationality" assumed in the economic literature. Allison (1971) described the notion of bounded rationality in these terms:

The physical and psychological limits of man's capacity as alternative generator, information processor, and problem solver constrain the decision making processes of individuals and organizations. Because of these bounds, intendedly rational action requires simplified models that extract the main features of a problem without capturing all its complexity.

Importantly, therefore, one sees the need for a model of the firm as a result of our inability to comprehend the world in all its complexity.

Restated, two things follow immediately from the assertion that managers are bounded rationally. First, there is a need to simplify the world by the construction of a model of reality. Ackoff & Sasieni (1968) defined a model in these terms:

Models are representations of reality. If they were as complex and difficult to control as reality, there would be no advantage in their use. Fortunately, we can usually construct models that are much simpler than reality and still be able to use them to predict and explain phenomena with a high degree of accuracy. The reason is that although a very large number of variables may be required to

predict a phenomenon with perfect accuracy, a small number of variables usually account for most of it. The trick, of course, is to find the right variables and the correct relationship between them.

The issue would seem to be whether management has indeed turned the trick and found the right set of variables and correctly established the relationships between them. Abernethy & Hayes seem to be suggesting otherwise.

Second, there is no a priori guarantee that consensus will exist on the choice of a particular model. On the contrary, one can predict with virtual certainty that considerable diversity will exist in beliefs as to the most appropriate model. On the other hand, Duncan & Weiss (1979) argue that if managers are to be able to communicate among themselves it is vital that they have an agreed upon model. If necessary such a consensual model must be imposed on members of an organization to forestall anarchy.

Such a consensual model begins to take on the characteristics of a paradigm. This has been defined as a set of beliefs that govern one's perception. This would appear to be one step up from a simple model to what one might call a meta-model. Paradigms are not merely tools used in decision making but actual shapers of perceptions and thoughts that govern the decision process.

The Learning Process: Such a view is important to our understanding of the learning process within organizations. Duncan & Weiss define organizational learning

as the process within the organization by which knowledge about action-outcome relationships and the effect of the environment on these relationships is developed.

Though they do not state it as such, organizational learning can be posited to take place in the rational mode through the process of Bayesian revision of prior probabilities. This is a gradual process that leads to priors being refined step by step over time as new information emerges.

Paradigmatic learning is more closely related to the techniques of classical statistical testing. Information is rejected as essentially worthless unless it reaches a certain level of significance when one's initial hypothesis is summarily rejected. In other words, paradigms do not seem to be gradually refined. Rather they are ultimately overwhelmed by a body of anomalies. Such a view of learning as a discrete process strengthens the assertion that paradigms are an extremely powerful shaper of perceptions and ultimately of decisions.

Returning to the Cyert & March behavioral theory of the firm, their second contention is that the search for new information is generated by problems. In other words, search is not a continual process but a discrete process again motivated by a problem -- defined, as we have argued, by the paradigm within which the decision maker is operating. The rational model, on the other hand, posits continual search which considerably reduces the power of the accepted paradigm since it does not or is not seen to govern the search process.

A further aspect of the behavioral theory that would seem pertinent to a theory of learning in the firm is the notion of satisficing i.e., in choosing between alternative courses of action managers are assumed to pick an alternative that seems "good enough" rather than one that is optimal in a more global sense. To the extent that a short-run response is perceived as "satisfactory" there may be a diminished need for long-run solutions.

Three more aspects of the learning process round out our understanding of how an organizational paradigm affects managerial decision making. First, organizational learning involves adaptation which may be defined as a modification over time of goals. Second, organizational learning also entails a

change in the attention rules. Given the need to simplify reality organizations attend to only some parts of their environment. Ideally these correspond to the critical variables that Ackoff & Sasieni refer to. Third, organizations modify their search rules as they learn more about their environments.

ACCOUNTING MODELS

The Paradigm: At this point we may return to our discussion of our findings and relate them to the view of organizational learning described briefly above. As stated above, accounting is often described simply as an information system which is supportive of, but not necessarily in control of, the decision process. However, once we begin to view the organization in terms of a behavioral theory of the firm and more particularly in the light of organizational learning theory then it becomes plain that accounting potentially plays a far more important role. In brief, our contention is that accounting forms the paradigm within which the firm operates.

Our grounds for this contention are several. First, it needs no proof that accounting is the most widely used model in virtually every organization but especially in profit-oriented businesses. Other models exist of course but this one is found in every business and pervades almost every aspect of it.

Second, it is an obvious but seldom explored fact that accountants do not present raw data to management. Revenue, for example, is defined by fairly precise rules and cannot be earned, in general, until goods or services are delivered. In many firms this leads to a scramble at the end of the month to get goods out of the door even though managers know that the sale has been "won" and that delivery is merely a deterministic follow-up. This last minute

rush puts a strain on production, disrupts the production process, and is costly in an opportunity cost sense. Yet managers continue to do it because of the way accounts define the revenue earning process.

Restating this last, accounting acts as a classical paradigm defined as a set of beliefs that govern management's perceptions. It is not merely an information system in this context but a shaper of the decision process itself. In the example quoted it affected the production process but examples could be multiplied of how numerous decisions are affected because of the way accountants interpret the raw data of economic events.

A third reason for our belief that accounting acts as a paradigm or meta-model lies in our empirical findings. As stated earlier, virtually all the goals and measures used in the firms we have interviewed relate relatively directly to the accounting system. We hypothesized that we would find goals, long-term goals especially, that would be qualitative in nature. Instead we found that even long-term statements tended to be put in accounting format. We hypothesized that the measures themselves, the critical variables in the model, would be a mixture of financial control variables defined in the broad sense of the earlier definition and some quantitative variables that were not financial in nature. Instead we found that almost all measures were accounting based in the narrowest sense of accounting. In short, it seems clear that accounting dominates the thinking of managers of American corporations.

That this should be so is not terribly surprising. If we allow that a priori there are a wide variety of models available in an organization and follow Duncan & Weiss in their assertion that a common, consensual model is necessary for communication then one might expect to find managers turning to the one model that is closest at hand. Furthermore, if one allows for satisfying then one has grounds for believing that managers will accept this model

on grounds that it is "good enough." The question that Abernethy & Hayes raise is whether it is good enough any longer.

Some Implications: There is no question that the potential influence of the accounting paradigm is tremendous. If one reexamines the three aspects of organizational learning one notes that accounting affects all three. First, our findings indicate that accounting determines to a certain degree the actual goals of the firm. In other words, the adaptation of goals is presumably taking place within the accounting paradigm. Service, for instance, might be a better goal and profit a concomitant, but as long as we are in the accounting paradigm profit will be the preeminent goal of businesses.

Second, accounting defines the variances which define in turn the search rules of the organization. A problem is defined in terms of accounting variables and does not exist except as it shows up as a variance. Third, accounting defines the attention rules of the organization. Opportunity costs, for example, are not revealed by the accounting system and as such little attention is paid to them potentially.

The implications of all this tend to support Abernethy & Hayes' contentions. One should qualify this by saying that it is not financial control as defined in this paper that is a problem but how financial control is defined in practice that is at fault. Nonetheless, there does seem to be pervasive evidence that many American corporations tend to stress short-term accounting-based variables in their control systems. If one places this against a model of the firm that is behavioral in origin and involves organizational learning then it becomes apparent how the accounting paradigm might be generating the problems to which they refer.

The solution is not easy. Paradigms are not easily shrugged off. High rates of inflation, however, do seem to be creating a number of anomalies that

might lead to improved paradigms. Increasing competition from the Japanese also seems to be leading managers to reflect on current practices. Academia too will have to play a role in defining the shape of what we earlier termed a strategic control system might look like and how managers might use it in pursuit of better decisions.

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EXHIBIT I

Text of Letter Sent to Candidate Firms

Dear

I am writing to invite your company's participation in a research program into financial control systems that we are conducting at the Sloan School of Management.

We plan to visit approximately twenty companies during January and early February. We envisage that the necessary data could be collected during a 1-day visit to your firm by one or two members of our research team. We would like to emphasize that we are not looking for data which is likely to be regarded as sensitive in any sense.

The subject of our research is the design and use of financial control systems. A lot has been written about this; however, in the final analysis it tells us very little about the practice of financial control and the design of financial planning and reporting systems as this relates to the characteristics of different industries and to the position of a company within its industry.

The field research that we plan will cover four or five companies drawn from each of four industries. In the course of the visit, our researchers would wish to interview several managers in the organization -- managers within the accounting and control activity itself, and managers in functional and general line management positions. In addition to interviews, we are developing a questionnaire to support the collection of research data. We would also find it useful to have copies of procedures documentation, if these exist and where they can be made available.

As we stressed earlier, the information we are looking for is unlikely to be regarded as sensitive. Moreover, all information provided to us in the course of the research will be treated in strict confidence. Any quantitative data will be coded to disguise its source. Research results themselves will be presented in summary form in such a way as to preserve the confidentiality of company-specific data.

As output from the research, we expect to achieve a greater degree of understanding of the development and use of financial information in the planning and control process in profit-directed organizations. We hope that we will be able, as a result of the research, to offer more definitive guidelines concerning the important considerations in evaluating and designing financial planning and reporting systems. While it is never clear in advance what benefits a company will gain from participating in a research program of this kind, it is common in my experience for them to find it worthwhile simply in terms of stimulating their thinking about the particular subject of the research. Research results will be made available to you of course, and you may wish to discuss these with us in terms of your approach to financial control.

EXHIBIT I (contd)

We would like to be able to have commitments from companies concerning their willingness to participate, prior to Christmas. Therefore I plan to follow up this letter in the near future with a telephone call to you, to respond to questions which you may have and get your reactions to the proposal.

With best regards,

Yours sincerely,

EXHIBIT II

General Manager

1. a. What are the long term goals of the firm?
 - b. Please rank these in order of importance. Could you weight these in approximate percentages?
 - c. Which ones have specific targets?
2. a. What are the firm's current year goals?
 - b. Please rank them in order of importance. Could you weight these in approximate percentages?
 - c. Which ones have specific targets?
 - d. Which long term goals do these relate to?
3. a. What measures are used to assess the performance of the units in your organization?
 - b. Please rank them in order of importance.
 - c. Please relate these measures to your long term and current year goals. If not related to any goals why was that particular measure chosen?

Unit Manager

1. a. What are your unit's goals for the current year?
 - b. Please rank them in order of importance.
 - c. Which goals have specific targets?
 - d. To which company goals do these relate?
2. Are the measures used in assessing the performance of your unit the same as the measures used in assessing your personal performance? If not, please explain.
3. a. What are the measures used in assessing your personal performance?
 - b. What is the relation of these measures with the long term goals and short term goals of the company?
 - c. Which of these measures have specific targets?
 - d. Which of these measures are made an explicit part of the consideration of your merit increases? promotion? bonuses?

EXHIBIT III

GOALS OF PETROCHEMICAL FIRMS

<u>FIRM</u>	<u>LONG TERM</u>	<u>SHORT TERM</u>
C1	ROA, profit, ROS Sales revenue Market share	ROA, profit Sales volume, margins Market share Manufacturing performance Personnel development Fieldstock requirements
C2	Profitability, ROA Cash flow; Revenue, sales volume Production volume Customer portfolio Market share, market position	Profit, ROA Cash flow, capital expenses Revenue, sales volume, plant yield Production volume, manufacturing costs Customer portfolio Market share
C3	Cash flow, profit Pound-volume output Pound-volume input ROA Plant efficiency Market share, quality Major customer portfolio	Cash flow Pound-volume output Fieldstock requirements ROA, Margins Manufacturing performance Market share Personnel development
C4	Cash flow, profit Capital investment ROI Revenue Manufacturing costs Business direction	Cash flow, profit Capital investment ROI Revenue, operating yield Manufacturing costs

EXHIBIT IV

MEASURES - PETROCHEMICAL FIRMS

FIRM

- C1: Volume/price, general expenses, profit, sales volume, ROA
- C2: ROA, profit, capital expenditures, production volume
- C3: Unit cost, volume effect, utility cost, profit and loss, net profit, cash flow, pound-volume output
- C4: Pretax profit, return on sales, return on investment, revenue, cash flow

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