Organizational Change, Organization Capital and Economic Growth

JOHN TONER*

The finding of managers and management consultants suggest that there are cases in which improvement in the productive capacity of firms can not be directly attributed to improvements in plant and equipment or to improvements which are vested in individuals. In these cases it seems that the reason for increased capacity derives from organizational changes. Thus, the concept of organizational capital is posited as an explanation for some of the growth in productivity which cannot be explained by additional amounts of other capital and labor inputs.

Investment in organizational capital refers to changes which are vested in the organization of the firm and which are substantially independent of the capabilities of its employees; such changes are expected to result in lasting increases in productivity. This capital formation is brought about by efforts to establish or change the firm's organization, the formal and informal social relationships and patterns of activity within the enterprise. Thus, organizational capital is what an organization has embodied in it in terms of systems, procedures, structure, and interpersonal and intergroup relationships which have been developed in the organization to insure its effectiveness and efficiency. There is no doubt that the theory of organizational behavior has incorporated the basic insight that organizations are more than the sum of the people which participate in them. However, there are important economic consequences of this truth which have not, in general, been recognized by economists. The purpose of this paper is to show how human capital theory can be extended to incorporate the concept of organizational capital and to estimate the contributions of management consultants to economic growth in the U.S. during 1929-1969.

Business Organizations as Assets

Organizational capital is classified in this study as a subcategory of human capital. Alfred Marshall is among the early writers who recognized the importance of business organizations as assets.

1Use of the term, "capital," is useful insofar as it highlights the real alternatives faced by institutional decision-makers with respect to the ways in which the capacity can be increased. However, the authors find no objection to the term "resources" instead of capital.

2This concept of organizational capital was first developed by Tomer (1977, pp. 267-281). Edward Prescott and Michael Vietor (1980) have developed a concept of organizational capital which is substantially different than the one developed here. In their view, organizational capital is 1) information on employees' suitability for particular tasks and information on employees' ability to work as a team with particular fellows and employees and 2) firm-specific human capital vested in individual employees.
2 EASTERN ECONOMIC JOURNAL

Organizational Capital and Economic Growth

X-efficiency in Leibenstein, 1976, pp. 34-44. Obviously, firms initiate organizational change for the purpose of either lowering cost per unit of output or increasing output per unit of input (the other size of the coin); the resulting organization capital formation can be understood to be essentially what Leibenstein refers to as improvements of X-efficiency. It is the view of this article that the use of the concept of organizational capital leads to a more accurate and clear understanding of the economics of organizational change, especially with respect to the influence of organizational change on the rate of economic growth, than is possible with the existing terminology. 10

Organizational Capital Formation and Entrepreneurial Behavior

The organizing activity which produces organizational capital is both innovative and imitative in nature. 8 It is innovative in the Schumpeterian sense of "carrying out new combinations," (Schumpeter, 1934, p. 75). It is imitative in that it requires entrepreneurial behavior to get combinations inaugurated by the first firm subsequently adopted by other firms. With respect to entrepreneurial organi-zational behavior, the distinction between programmed and unprogrammed activity is

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10The word input is used in the conventional sense to exclude consideration of the inputs involved in increasing the capacity of the organization.

11Leibenstein, 1976, p. 24 states that the "...cost reduction (without the aid of innovation or invention) is the primary technology that is essentially a result of improvements in X-efficiency is likely to be an important component of the observed residual in economic growth ...".

12Werner Scharnhorst, 1967, gave early recognition of the importance of the organizing role of the "undertaker" or entrepreneur.

13Schumpeter specifically mentions that entrepreneurial behavior includes "innovations in business organization" (Schumpeter, 1934, p. 133). From the late 1960's to 1970, rich analysis focused on the reasons for the economic superiority of the multinational firm over the unitary firm.

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Likert, 1973. He believes that the use of such an accounting system would lead initially to better management and decision-making and ultimately to greater productive efficiency. This would come with the recognition of how different management actions influence the functioning of the organization and how these, in turn, influence the economic achievements of the enterprise. Likert, in essence, is proposing that the accounting or information systems of business should reflect what social scientists have learned about organizations. His proposal represents a marked departure from present accounting practice even though the "good will" item on some firms' balance sheets may reflect the extra profits they have been realizing as a result of a well functioning organization.

The Value of Organizational Capital

The organization of a firm has value to the extent that it is expected to make an identifiable contribution to the future earnings of the firm, based on an estimation of the value attributable to the organization along with the probability of their realization, one could calculate the value, i.e., present value or capital value, of the organization using an appropriate rate of discount. The mechanics of the present value calculation are not different in this case than in a more typical instance. What is different with respect to organization valuation is how the contribution to business profit comes about. The value of an organization can change either as a result of changes in the ability of the organization to function, i.e., its productivity, or as a result of changes in external factors, such as product demand or price, which influence the firm's profitability. The former factors are more likely to be understood at the level of the firm than are the latter. Deliberate organization changes designed to increase productivity are of particular interest because these may be considered as examples of organizational capital formation or organizational investment.

A number of writers have observed that it is incorrect to assume that because one has acquired the services of tangible capital and contracted for certain amounts of labor at given wage or salary rates that one can automatically expect a certain quantity of output. Different management behavior, especially insofar as it influences such things as the organizational climate and structure, 7 will lead to substantial differences in work motivation and effectiveness, and therefore, to substantial differences in economic performance (Likert, 1964). Harvey Leibenstein states four reasons why given inputs cannot be transformed into predetermined outputs: ... contracts for labor are incomplete; the production function is not completely specified or known; not all inputs are marketed or, if marketed, are not available on equal terms to all buyers; and the effective utilization of an input depends on the degree of motivational pressure, as well as on other motivational factors ... (Leibenstein, 1976, p. 46). This leads Leibenstein to the concept of X-efficiency, which involves four elements: ... individual motivational efficiency; intra-plant motivational efficiency; external motivational efficiency; and non-market input efficiency ... (Leibenstein, 1976, p. 44). It seems likely that the first and second and possibly the fourth elements of the X-efficiency of a firm may be increased when cost reducing organizational change is carried out (see some of the examples of activities which increase

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8 Marshall also states that "capital consists in a great part of knowledge and organization," (Marshall, 1961, p. 138) but there is no further discussion of this. Marshall does, however, recognize clearly many of the leadership and organizing roles of the successful businessmen. (Marshall, 1961, Book IV).

9Simon Kuznets argues for a broad concept of capital (Kuznets, 1965, p. 140) and recognizes explicitly that organizational behavior within the modern non-personal, large scale, capitalistic society is very much apart from the older more personal types of organization and "organization capacity to cooperate that would have been expected of their elders and ancestors, accustomed to entirely different economic relations" (Kuznets, 1965, p. 102).

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"Alfred D. Chandler (1962) has provided a superlative documentation of the change from the unitary or multi-departmental to the multidivisional structure by a sizable number of large U.S. corporations. Other Williamsons (1971, p. 387) believes that this change may constitute the "American capitalism's most important single innovation in the twentieth century." Williamson's (1971) rich analysis focuses on the reasons for the economic superiority of the multidivisional form over the unitary form.
very helpful. According to James March and Herbert Simon, entrepreneurial activity is involved when "...an environmental stimu-
lar may evoke immediately from the organi-
zation a highly complex and organized set of
responses" (March and Simon, 1958, p. 14).

Unprogrammed activity is directed toward
the creation of new programs; this means
organizational change rather than the "steady
state." Thus, it is unprogrammed activity
which is by nature entrepreneurial
organizing, and it is the entrepreneur who is
the source of initiator of new program propo-
sals (March and Simon, 1958, pp. 178-188).

Chester Barnard considers organizing the
activities and interactions of individuals in an
to secure their cooperation to be a very
important, nonroutine function of execu-
tives. He finds that "the process of interac-
tion must be discovered or invented, just as
a physical operation must be discovered or
invented" (Barnard, 1940, p. 60). Moreover,
Barnard states that

"...Technological invention is necessary to the
accomplishment of many ends economically which
can be accomplished if economy is not required, by
other means. On the other hand, some ends which
can only be accomplished by a given technological
process cannot be economically accomplished
without inventions and innovations in organiza-
tional technique (Barnard, 1940, p. 23).

The entrepreneurial organizing activities
referred to above are not adequately dealt
with using the X-efficiency concept. Within
Leibenstein's framework, an increase in X-
efficiency (and thus, productivity) is viewed
as a movement from within the production
possibility frontier towards the surface (Leib-
einstein, 1975, pp. 46-47). In the view expressed here, entrepreneurial organizing
activity leads to increases in the capacity of the
organization; this means a movement outward of the production possibility fron-
tier.2,3

Organizational Capital Formation and
Technical Change

The conception of the technical change
process held by Theodore W. Schultz (he
refers to it as technical change) is most help-
ful for understanding the relationship be-
tween capital formation of all kinds and
economic growth. According to Schultz, tech-
nical change means the process by which the
technical attributes of resources (e.g., land,
labor, etc.) are altered, and such changes are
considered to be capital formation. In
others words, technical change occurs as a result of
investments which are used as resources and alter
the properties of other resources so that their
productive capacities are greater than they
had been previously. In Schultz's view, it is
changes in a very heterogeneous stock of
capital which provide the explanation for all
or most of economic growth (Schultz, 1971,
chapter 2). In Schultz's words,

"...a technique is no more or less than a unit of
capital, and a set of techniques constitutes a
technology is a capital structure, and...technical
development is an alteration of a capital structure
(Schultz, 1971, p. 20).

One can certainly conceive of managerial or organi-
zational changes which would be accurately character-
ized as movements from within the production possibility
frontier to its surface. A firm would be within its frontier
if it had allowed the functioning of its organization to
deteriorate through neglect. Such a firm could then
improve the functioning of its organization without resort
to programmatic change or the use of new organizational
knowledge by merely restoring previous practices,
thereby achieving increased economic performance and
enlarging the frontier.

For a model more consistent with the viewpoint of this
article but based on Leibenstein's general X-
efficiency theory, see Tossen (forthcoming).

Recently a number of these arguments, see
Levin (1966, pp. 13-15),

It follows that unprogrammed changes in
organization are innovative (or initiative) in
nature; they add to the stock of capital (organ-
zational capital), contribute to the technolo-
gical change process, and make economic growth possible.

Measuring Technological Change Due to
Organizational Investment

In the last twenty years or so, there have been numerous attempts to measure various
aspects of the technological change process.

Economists have generally used the concept
of the aggregate production function—even
though there are many who consider this to be
a concept of dubious validity. The aggregate
production function is used below to indicate
the relationships between various inputs
whose growth contributes to the growth of
output and to suggest how the growth of
productivity caused by organizational change
could be measured.

Consider first the kind of production func-
tion used by Solow (1957):

\[ Q = AF(K,L) \]  

where \( Q \) represents output and \( K \) and \( L \) repre-
sent capital and labor inputs in "physical"
units for given periods of time. For a given
state of technology, an increase in output can
be obtained by increasing the inputs; this is
movement along a production function which is
assumed to be linear and homogeneous. If
neutral technological change occurs, this is
represented by a shift of the production func-
tion or a change in the value of \( A \). If (1) is
differentiated totally with respect to time and
divided by \( Q \), the growth form of the equation
is obtained. Thus,

\[ \frac{\Delta Q}{Q} = \frac{\Delta F(K,L) + F(K,L) \Delta K}{Q} \]

in which \( \Delta Q \) indicates the total change in output.
Substituting \( \Delta K \) and \( \Delta L \) for \( \Delta Q \), the
results of Solow (1957) are given by

\[ \frac{\Delta Q}{Q} = \frac{A_F \Delta K + A_K \Delta L}{Q} \]

(3)

In (3), the weights \( \Delta K/L \) and \( \Delta L/Q \) of the input
growth rates are the respective factor shares
assuming that factors are paid their marginal
products. \( \Delta Q/\Delta K L/Q \) and \( \Delta Q/\Delta L Q/L \) are
rate of shift of the production function or the
rate of technological change.

An important modification of the above is the
notion that a portion of technological change
may occur via the embodiment of new
techniques in the inputs. With respect to
capital, Solow (1957) suggested that each
year's additions to the capital stock incorpo-
rate the latest technical knowledge. If the
capital stock data used in the production func-
tion is adjusted to reflect annual increases
in productivity deriving from the
embodiment of new knowledge, it is possible
to estimate this part of the annual growth in
productivity, the rate of embodiment (E). It
follows that the rate of technological change
is composed of two parts, the rate of embodi-
ment and the rate of disembodied technologi-
cal change (D). In symbols,

\[ \frac{\Delta Q}{Q} = E + D \]

(5)

The rate of disembodiment has sometimes been
referred to as the residual or the measure of
ignorance regarding other identi-
ified and unidentified contribu-
tions to technological change.
Among these other factors
generally considered to be included in D are
managerial and organizational changes.5

Schultz's view of technological change
suggests a modification or extension of the
aggregate production function approach
(above) to the measurement of technological change. If capital formation is the essence of how productivity increases take place, this implies a production function which is different than (1), i.e., it implies

$$ Q = f (L, K_1, K_2, K_3, \ldots ) $$

(5)

where $K_1 = K_1, K_2, K_3$ indicates the heterogeneity of the total stock of capital.8 In Griliches words, "changes in output are attributable to changes in quantities and qualities of inputs, and to economies of scale, . . . the production function itself remaining constant (at least over substantial stretches of time) . . . Such an approach does not, of course, remove technical change from the determination of growth; it aspires, if any, to transform what is currently a catch-all residual variable into movements along a more general production function and into identifiable changes in the attributes of inputs." (Griliches, 1963, p. 332). Equation (5) explicitly recognizes improvements in the quality of inputs as types of capital and allows for the identification of new types of capital. Further, it suggests that "the concept of 'embodiment' of technical change should be extended to all inputs rather than just to capital or just to labor" (Griliches, 1963, p. 346). Through the use of this approach and the removal of other errors in the measurement of inputs it is expected that the growth of inputs will explain all or most of the changes in output.17

The main argument of this article, of course, is that one of the K's in the aggregate production function should be organizational capital (0). Thus, both increases in the quantity and quality of organizational capital will cause output to grow. Changes in the quality of inputs such as change of input, or change in the stock of 0 occur when either changes in the organizations or systems of management are changed to incorporate new organizational knowledge or new organizations embodying new knowledge are created. Schlaic asserts that

$$ \ldots \text{new information is of two basic parts: } 1) \text{ which is transformed into new skills, which, when acquired, are forms of human capital, and } 2) \text{ that which is transformed into new materials, which, when achieved, are new forms of nonhuman capital.} $$

(Schlaic, 1971, p. 9)

The implication of the present analysis is that new information has at least one more part; namely, that which is transformed into new organizational capital, a type of human capital.

It may be helpful to be more explicit about the nature of the heterogeneous capital stock, $K_1 = \ldots (K_0, K_1, K_2, \ldots )$ (6)

where $K_0$ is the nonhuman or tangible capital stock adjusted for the improved knowledge embodied in it, and $K_1$ is the portion of the stock of human capital, similarly adjusted, which is invested in individuals (note that $K_0$ itself can be considered a quality adjustment of $K_1$ and $0$, again, is the stock of organizational capital adjusted for the embodiment of new knowledge.18

It should be noted that the intent here is to suggest a more quantitative production function relationship implied by the organizational capital phenomenon, is not to be definitive as to the best specification of the production function relationships. Further investigation of these aspects is obviously warranted especially if empirical work is to be done. Putting the production function in the form indicated by equations (5) and (6) raises some difficult questions. For example, if $K_1$ production function is thought to exhibit constant returns to scale and $K_0$ is with increasing returns, the appropriate relationship is one where $K_0$ is proportionally quantities and not qualitative ones where new knowledge is embodied but double, as in order to do $K_0$ output or can some $K_1$ more than double and some

**EASTERN ECONOMIC JOURNAL**

**ORGANIZATION CAPITAL AND ECONOMIC GROWTH**

Edward Denison has quantified the contribution of a number of important inputs to the rate of growth of output in the U.S. (see Denison, 1962). There are, however, a number of important capital inputs (human and nonhuman) which he does not quantify. As a result, the changes in the capital and labor inputs he accounts for leave unexplained a very sizable portion of the rate of economic growth, i.e., the residual. It would be interesting to see how much of the residual portion of the growth rate would be explained using methods similar to the ones Denison used if one were able to obtain measurements not only of changes in the nonhuman tangible capital stock resulting from its improvements (in its own terms) but also of changes in the organizational capital stock. To illustrate what is involved, the section after the next provides an estimate of the economic growth contribution made by management consultants as a result of their work in client firms.

**Measuring Organizational Capital Formation**

In order to measure the annual contribution of organizational capital formation to economic growth ($G_2$ in the way suggested above, it is necessary to measure the annual growth of the stock of organizational capital.

**Note**: Strictly speaking, it is the services of $K_1$ which should enter the production function not the stock of $K_1$. This implies the need for a data adjustment if inputs are not fully utilized.

**Note**: The application of the approach to the U.S. agricultural sector, see Griliches (1964); B. Griliches and Jorgenson (1967), the approach is applied to the whole U.S. economy.

**Note**: Weighing the growth of inputs by factor shares may provide biased estimate of the contribution of each of these factors to the output growth if a continuous equilibrium exists, introducing a discrepancy between the marginal products of some factors and the rates at which these factors are resourced. Griliches suggests that this type of disparity may exist in the agricultural sector; see Griliches (1963, p. 334). It is conceivable that this could be the case for O-type inputs.
In one sense, measuring the annual investment in $O$ is no different from measuring the annual investment in tangible capital. That is, the measure is simply the real annual cost of these capital goods, i.e., the dollar cost adjusted for price change. The measurement of $\Delta O$, however, is likely to present some special problems only a few of which are touched on here.

From society's standpoint, all costs, which stem from the using up of resources are opportunity costs in the sense that society foregoes what those resources would have been able to produce in their next best use. The job of measurement, however, makes it necessary to view cost from the standpoint of the firm since measurement requires collecting information from the accounts of the firms. Here it is convenient to classify costs as either outlays or opportunity costs. The outlays are, of course, the direct expenditures made by firms to facilitate their unprogrammed organizational change. The opportunity costs, on the other hand, are equal to the value of output not produced because members of the firm are devoting their efforts to the innovative work of creating new “programs.” March and Simon (1958, p. 173) refer to the costs of discovering and developing possible programs of action along with the implementation costs as the “costs of innovation.” The problem for measurement is that “it is seldom possible to make accurate estimates of the costs of innovation, and even in situations where it is possible, such estimates are seldom made.” This, of course, does not mean that it is not possible to make “reasonable” estimates of these costs; it merely means that it won’t be easy.

An Estimate of the Management Consultant Contribution to Economic Growth

In this section, an estimate of the management consultant contribution to the annual rate of growth in the U.S. is made using essentially the same approach as Edward F. Denison (1962, 1974). In estimating the contribution of different sources of economic growth, Denison does not take into account the contributions made by management consultants (or for that matter, managers) to increasing the productivity of the tangible factors employed in businesses. It is not that Denison denies the importance of intangible factors; he simply is not able or does not attempt to measure them. Their contributions are included in the “advance of knowledge” part of the residual, and Denison (1967, p. 280) conjectures that “advances in management knowledge may easily contribute as much or more to measured growth as advances in technological knowledge [per se].”

A study by John Johnston provides support for the view that management consultants make an important contribution to economic growth; he finds that the results of management consulting work in Great Britain has contributed “about one-quarter of the annual productivity increase achieved in recent years” (Johnston, 1963, p. 249). This suggests that the statistical task involves utilizing estimates of management consultant-related capital formation in conjunction with Denison’s methodology to arrive at an estimation of these consultants’ contribution to the annual average percent increase in total product over a certain number of years.

Denison’s Calculations

The essentials of Denison’s methodology can be summed up using an equation which is similar to equation (3) above. This equation states that the annual average percentage increase in total product ($G$) is equal to the annual average percentage change in each factor ($F$) weighted by the average fractional share of these factors in the total national income ($\alpha$) plus the residual annual average percentage increase in total product ($R$) for some specified period of time. If the number of factors are limited to land ($L$), labor ($L$), and capital ($K$) following Denison, the equation is:

$$w_{L}p_{L} + w_{K}p_{K} + w_{C}p_{C} + R = G$$

Thus, to calculate $G_{C}$ in addition to data on $Q$ one needs $\Delta Q/\Delta O$, the marginal product of $O$ assumed to be equal to its rate of return, and $\Delta O$, the net addition to the stock of $O$. If we assume that management is successful in its important ongoing job of examining the quality of the organization, i.e., preventing deprivation of this capital, Denison’s ($\alpha$) is the total cost of creating new organizational capital. Note, however, that the activity involved in examining the productivity of the existing organization is presumed to be a programmed one so its resource cost is not included as part of $\Delta O$. Consistency would subject to significant obscuration as a result of changes external to the firm. If so, then the $\Delta Q/O$ figure would have to be adjusted downward to reflect this.

Therefore, an estimate of the management consultant contribution to the annual rate of growth of land, labor and capital. The use of this equation can be illustrated for the 1929-1969 period (Denison, 1974, p. 127). For this period, $G$ equals 3.33. Other data are as follows:

$G_{L} = 0.8$ $G_{C} = 1.31$ $G_{K} = 0.50$ $R = 1.52$

Labor and capital, respectively, explain 1.31 and 50 percentage points or 39 and 15 percent of the growth rate. The residual accounts for 15.2 percentage points or 46 percent of the growth rate, of which 92 percentage points or 28 percent of the growth rate is attributed to the advance of knowledge.

The Estimation Method

How much of the advance of knowledge can be explained by counting the capital input resulting from management consultant efforts? In order to evaluate this, the Denison equation needs some modification as follows:

$$w_{L}p_{L} + w_{K}p_{K} + w_{C}p_{C} + R = G$$

In this equation, $w_{C}$ stands for the average fractional share of the capital (attributed by management consultant efforts) in the total annual national income, and $P_{C}$ stands for the annual average percentage increase in this kind of capital for a specified period of time. Thus, $w_{C}p_{C}$ is the number of percentage points of the growth rate explained by the growth in the management consultant-related capital input. The addition of $w_{C}p_{C}$ to the Denison equation effectively reduces the size of $\alpha$ which is smaller, since it is in line by a fraction equal to $w_{C}$. However, $w_{C}$ is very small compared to $\alpha$; therefore, the effect of adding $w_{C}p_{C}$ on $p_{C}$ is ignored here. The lack of certain types of data presents an obstacle to making estimates of $P_{C}$ and $w_{C}$; therefore, additional assumptions are necessary. One important obstacle is the lack of knowledge of the stock of management consultant-related capital ($K_{m}$). It is possible, however, as indicated in the next section, to estimate the annual consultant-related capital
formation in privately owned firms \((\Delta TKP_e)\). Since the average capital growth rate, \(P_{K_e}\), is equal to the average of \(\Delta TKP_e/K_{K_e}\) over a specified period of time, knowledge of the denominator for the different years is obviously necessary. To overcome this difficulty, \(P_{K_e}\) is assumed to be equal to the average growth rate of the amount of this capital formation \((\Delta TKP_e/TKP_e)\). In equation form, this assumption is thus:

\[
P_{K_e} = \frac{\Delta TKP_e}{TKP_e} = \frac{\Delta TKP_e}{TKP_e} \tag{11}
\]

where the bar above the symbols indicates that these are annual averages. It is important to note that if 1) the depreciation of this capital is negligible and 2) the growth of this capital formation \((\Delta TKP_e/TKP_e)\) is constant, it can be shown that \(P_{K_e}\) is, in fact, equal to \(\Delta TKP_e/TKP_e\). Although these two conditions are not likely to be totally fulfilled, it does seem that the assumption is not an unreasonable one for the purposes of this crude estimation. \(w_{e}\) is equal to the average income earned by this capital input divided by the average national income. The average of this capital income \((E_{K_e})\) can be obtained by multiplying the amount of \(K_{K_e}\) by the average rate of return (before taxes) on this capital. The amount of \(K_{K_e}\) can be obtained from equation (11) given a knowledge of \(TKP_e\) for this period. That is:

\[
K_{K_e} = \frac{\Delta TKP_e}{TKP_e} P_{K_e} \tag{12}
\]

The rate of return on this kind of capital is unknown, but given the usual mobility of financial resources, it is likely that the \(\bar{r}\) on this capital would tend toward equality with the rate of return on other types of capital with a similar risk factor. Assuming for the moment that this rate of return \((\bar{r})\) is known, then: 

\[
\bar{r} = \frac{\bar{E}_{K_e}}{\bar{K}_{K_e}} \tag{13}
\]

and

\[
S_{K_e} = \frac{\bar{E}_{K_e}}{\bar{K}_{K_e}} \tag{14}
\]

where \(\bar{K}_{K_e}\) is the annual average of the national income.

Using equations (12), (13), and (14), it can be shown that the number of percentage points in the growth of product contributed by management consultant-related capital formation over a period of time is:

\[
G_{K_e} = w_{e} P_{K_e} = \left(\frac{\bar{K}_{K_e}}{\bar{K}_{K_e}}\right) P_{K_e} = \left(\frac{\Delta TKP_e}{TKP_e}\right) P_{K_e} \tag{15}
\]

Thus, equation (15) shows that the use of the assumption to estimate \(P_{K_e}\) biases the use of estimates for \(E_{K_e}\) and \(P_{K_e}\) in calculating \(G_{K_e}\).

The Capital Formation Estimate

To obtain an estimate of \(TKP_e\) for 1929–1969, \(TKP_e\) for 1970 was estimated, and \(TKP_e\) values for earlier years were obtained by assuming that management consultants’ capital forming activity to total activity remained equal to the 1970 proportion. The human capital resulting from consultants’ efforts is of two types, organizational capital and human capital vested in particular individuals (often managers). The data do not permit separate estimates of these two types of human capital formation.

The estimate of \(TKP_{e,1970}\) is based on data generated from interviews conducted in 32 management consulting firms during the first three months of 1971. The interviewees were senior officers in consultant firms, located largely in the New York area and selected using a variety of sampling techniques including stratified sampling. Because large firms were disproportionately included in the sample, the selected firms accounted for 20.6 percent of the estimated $1 trillion of total gross billings of U.S. management consulting firms in 1970.

Essentially, \(TKP_{e,1970}\) is an estimate of the total cost, direct and indirect, of the human capital forming efforts of firms utilizing management consultants. The direct costs are the outlays on consultants, and the indirect costs reflect the forgone output when client personnel work along with consultants. The interviewees’ responses to questions concerning the magnitudes of their capital forming type activities relative to the total and the magnitude of direct costs compared to indirect costs were utilized in the calculations. The \(TKP_{e,1970}\) estimate is $1.354 billion. \(TKP_e\) figures for earlier years were obtained by assuming that the proportion that \(TKP_{e,1970}\) represents of total gross billings in 1970 is the proportion of capital formation to gross billings in earlier years for which billings data were available. Estimates of \(TKP_e\) for intermediate years were obtained using calculated growth rates and the assumption of annual compounding. The resulting estimate of \(TKP_e\) is $468.4 million (current dollars).

The Contribution to Growth Estimate

The estimate of \(\bar{K}_{K_e}\), average national income for 1929–1969, is $273.6 billion (current dollars). If \(r\) is assumed to be 15 percent, \(\bar{r}\) this estimate was made by Philip Shap, Executive Director of the Association of Consulting Management Engineers.

\(\bar{r}\) For more on the estimation procedure and values for the amount of capital formation resulting from the efforts of particular firms, see Toner (1977, pp. 7-14).

\(\bar{r}\) The data for 1929–1939, 1939–1946, and 1965–1969, respectively, were found in the 1929, 1938, and 1973 Supplements to the Survey of Current Business.

TABLE 1  Sensitivity Analysis of Alternative Rates of Return Assumptions on Percent of Residual (Advance of Knowledge) Growth Explained by the Growth of Management Consultant-Related Capital
Input 1929-1969

<table>
<thead>
<tr>
<th>Value of Rate of Return (Percent) of Residual (Advance of Knowledge)</th>
<th>Growth Explained</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>.93</td>
</tr>
<tr>
<td>10</td>
<td>1.86</td>
</tr>
<tr>
<td>15</td>
<td>2.79</td>
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<tr>
<td>20</td>
<td>3.72</td>
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<tr>
<td>25</td>
<td>5.58</td>
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<tr>
<td>30</td>
<td>7.44</td>
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<td>35</td>
<td>9.30</td>
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on tangible net worth for these manufacturing firms was 8.15 percent during 1951-1955. Assuming that these corporations paid taxes which were less than 30 percent but more than 40 percent of total profits, the before tax rate of return on tangible equity capital would be around 15 percent. In the absence of capital market imperfections one would expect the rate of return on the management consultant-related capital expenditure to tend toward equality with these other investments; thus, an $r$ equal to 15 percent would seem to be reasonable.

There are, however, important reasons for believing that this assumed value of $r$ is substantially higher than 15 percent. First, due in part to the highly innovative character of many of the management consultant-related investments, the risk and uncertainty associated with such investments would seem to be substantially greater than the typical manufacturing investment. Second, obstacles to the free flow of information would appear to be greater in relation to these than with respect to the typical investment, and finally, motivational obstacles may be important. Leibenstein alluded to these latter and the rate of return.

It is quite clear that management consulting services are not only profitable to consultants but also highly profitable to many of the firms that employ them. But it is rather surprising that more of these services are not called for. Part of the answer may be that management consultants are not motivated to hire consultants if things appear to be going "in any reasonably satisfactory rate. There are, of course, numerous personal resistances to outside advice. If the motivation is strong enough, e.g., the threat of the failure of the firm, then it is likely that such resistances would be overcome. (Leibenstein, 1966, p. 408)

For such reasons, it is likely that the actual value of $r$ is substantially higher than 15 percent. If, therefore, the influence of management consultants on economic growth might be much greater than estimated earlier. For example, if $r = 40$ percent, the percent of residual (advance of knowledge) growth explained by the growth of the management consultant-related capital input is 7.44 as compared to the 2.79 estimated earlier (see Table 1). Additional research relating to rates of return on such investments would be necessary in order to narrow the range in the estimates of these consultants' contribution to economic growth. Obviously, these calculations are only suggestive of the influence of management consultants on economic growth. However, the estimates do indicate that their role in the economy is an important one. This conclusion is emphasized by noting that the advance of knowledge residual includes all the contributions of research and development as well as advances in organization and management not related to the work of consultants.

**References**


The Traditional and Strategy Formulation Models of Industry Analysis: Implications for Public Policy

JAMES A. DALTON and LOUIS ESPOSITO

I. Introduction

Recent developments in the industrial organization literature suggest a growing dissatisfaction with the traditional structure-conduct-performance (S-C-P) framework of industry analysis. This dissatisfaction is centered not only on the theoretical or conceptual foundations of the paradigm but also in the empirical application of the framework. In addition, whatever analytical “richness” does exist in the traditional framework is generally lost when the framework is used for empirical analysis.

The purpose of this paper is twofold. First, it presents a framework for industry analysis which is broader than the traditional S-C-P framework. This broader “strategy formulation model” represents a synthesis of the theories of organization and strategy in the business literature, and recent developments and extensions of these concepts in the economics literature. Second, it analyzes briefly the differences between the strategy formulation model and the traditional model in terms of their public policy implications.

The paper is organized as follows. Section II presents a brief and simple statement of the traditional S-C-P model, focusing on its key characteristics. Section III discusses the strategy formulation model in detail because the model or approach is less well-known and also because it is a rather broad and complex approach to industry analysis. Section IV presents a comparison of the key features of the traditional model and the strategy formulation model. In section V, the public policy implications of both models are briefly discussed. Section VI presents the summary and conclusions.

II. The Traditional Model

Traditional industrial organization analysis is based on the structure-conduct-performance (S-C-P) paradigm which is rooted in neoclassical microeconomic theory.1 In this paradigm, market performance is determined by market conduct which, in turn, is determined by market structure. Since conduct is not directly or easily observed, primary emphasis is placed on the relationship between structure and performance. Of

1Leibenstein (1979) asserts that the major shortcoming of neoclassical theory is its failure to incorporate the internal structure and operation of firms into the analysis of markets. Since the S-C-P paradigm is based on neoclassical theory, it is a major shortcoming of the S-C-P paradigm as well. For another recent criticism of the neoclassical theory of the firm and an exposition of managerial theories of the firm and their implications for the nature and extent of competition in the market place see Marris and Mueller (1980).

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