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THE SHORT-TERM OUTLOOK OF TOP MANAGEMENT AND DECLINING R&D EXPENDITURES

Shauna Cohen

I. INTRODUCTION

America appears to have lost its competitive edge in many world markets. For example, the U.S. auto and steel industries which were formerly leaders in world markets are now facing stiffer competition from both European and Japanese firms. In 1960, foreign producers claimed a negligible share of the U.S. car market. However, by 1979 this figure jumped to over 30% (Business Week, June 30, 1980, p. 60). In 1950, the U.S. produced almost 47% of the world’s steel; by 1980, this figure had dropped to only 14.1% (American Iron and Steel Institute, 1981).

The penetration of foreign producers into domestic markets has become an increasingly disturbing issue to U.S. corporations. Many observers feel this may be due in part to the U.S. businessmen’s low priority in investing funds in research and development (R&D) for future innovations.

This paper examines the relationship between R&D and productivity. It discusses the reasons why top executives in the U.S. may have adopted a short-run business mentality and how this may have led to declining R&D expenditures. It then describes the consequences of this attitude and its resulting practices upon U.S. industry.

II. RESEARCH AND DEVELOPMENT AND PRODUCTIVITY

The objectives of R&D are to improve existing products and methods and to create new ones. Innovation provides the essential technological edge which facilitates success in world markets. The significance of these developments is often underestimated because they rapidly become a part of our daily routine. For ex-
ample, the television, jet travel and digital computer industries were nonexistent in 1945; but by 1965 they contributed more than 13 billion dollars to the Gross National Product (GNP) and employed an estimated 900,000 workers (U.S. Department of Commerce, 1971).

R&D directly increases both the depth and breadth of technological knowledge. Economists estimate that 50–80% of the real dollar growth in U.S. GNP is attributable to productivity gains, nearly all of which flow from new technology. There is rarely disagreement among experts over the significance of R&D as a prime mover of the U.S. economy (National Academy of Sciences, 1971, p. 357).

Recently, expenditures on R&D have been rising significantly in many developed economies. For example, R&D expenditures as a percentage of GNP by West Germany have risen from 1.8% in 1967 to 2.2% in 1978. Similarly, Japanese expenditures have risen from 1.3% of GNP in 1967 to 1.9% in 1978. Expenditures in the U.S., however, have dropped from a 1967 peak of 2.9% to slightly above 2.2% in 1978 (U.S. Department of Commerce, Bureau of the Census, 1980). U.S. spending on R&D, in constant 1972 dollars, reached a peak of $29.8 billion in 1968 and then hovered between $29 billion and $27 billion through 1976. Expenditures in 1979 were only $31.2 billion, which was only a 5% increase over the 1968 figure (Business Week, June 30, 1980, p. 60).

Many claim that too much of the R&D budget in the typical U.S. firm is devoted to complying with government regulations. In the chemical industry, for example, research managers estimate that regulations account for 10% to 15% of R&D budgets (Business Week, July 7, 1980, p. 48). Also, the R&D budget may in fact often be an overestimate of effective expenditures. The percentage spent on basic research has declined in recent years, while the amount spent on improving existing products has increased. Another method of further slashing the R&D budget is to use the funds for other purposes and to charge the R&D department for the cost.

Rates of productivity growth in the U.S. have also been declining over the past few decades. Between 1948 and 1968, output per manhour increased at an annual rate of 3.2%. Between 1968 and 1973, however, this rate declined to 1.9% and during the next six years dropped to a mere 0.7%. The lower rate of growth in productivity is due in large part to the high employment growth of the service industries where productivity gains are difficult to achieve. However, in manufacturing activities productivity growth has also fallen sharply. For example, between 1963 and 1973 output per manhour grew at an annual rate of 2.9% but between 1973 and 1979 this rate had declined to 1.6% (Business Week, June 30, 1980, p. 65).

In the minds of many observers, this decline in U.S. productivity growth can be closely linked to the decline in R&D. One survey on the subject, undertaken in the summer of 1978 and again in fall 1980, examined the attitudes of both workers and business managers with respect to the reasons underlying the slowdown in productivity. Excessive government regulation, inadequate capital investment, poor worker attitudes and the general business climate were cited as primary reasons. Inadequate R&D spending, while only rated as the ninth most
important factor in the 1978 survey, rose to fifth place by 1980. It was mentioned by 79% of the 1980 respondents as a major influence on the productivity level. Studies by prominent economists such as John Kendrick and Edward Denison have lent further support to the importance of sufficient R&D spending. According to these studies, low R&D spending might account for as much as 10% of the recent productivity decline (U.S. Subcommittee on Science and Technology, 1981, Rahn, p. 670).

If productivity is indeed the crucial factor underlying U.S. economic growth and if R&D is a major cause of productivity growth, why is it then that R&D spending has hit such low levels in recent years? Most traditional explanations of the R&D slowdown blame the ills of inflation, high interest rates, and uncertainty concerning the economy and unemployment. Recently, however, a new school of thought has emerged which focuses more intensely upon changes in managerial attitudes and practices. According to this new thinking, management has shifted away from viewing the business entity as a long-term entrepreneurial undertaking toward one which has set its sights on maximizing short-run profits. Successful firms are those who make a long-term commitment to compete in world markets by continuously offering superior products and using technologically superior methods of production (Hayes & Abernathy, 1980, p. 68). Many experts have claimed that U.S. business executives seem to have discarded this principle, however, and have instead limited their efforts to short-run considerations. For example, Douglas White, Senior Vice President of the American Productivity Center in Houston, Texas, has stated:

I think one of our greatest problems is, and it’s probably one of our greatest strengths, that we expect quick fixes. . . . We suddenly somehow feel that we can fix things overnight, and as a result, I think our view is so short term. That’s true of the way we evaluate our business corporations, that’s true of the way Wall Street analyzes performance. . . . I’m alarmed at this situation and I think we need to take a longer view and culturally that’s going to be difficult for us to do. [U.S. Subcommittee on Science and Technology, 1981, p. 297]

Other critics of the current practices of U.S. management have voiced similar concerns:

By their preference for servicing existing markets rather than creating new ones and by their devotion to short-term returns and “management by the numbers,” many [U.S. businessmen] have effectively forsaken long-term technological superiority as a competitive weapon, . . . maximum short-term financial returns have become the overriding criteria for many companies. [Hayes & Abernathy, 1980, p. 70]
If the decline in R&D expenditures is indeed the result of an increasing short-run orientation of U.S. management, it is important to detect the factors which may have led to the emergence of this mentality. In the discussion which follows, we shall analyze several factors which might explain how and why this attitude developed.

III. REASONS FOR THE DEVELOPMENT OF THE SHORT-RUN MENTALITY OF EXECUTIVES

One possible factor involves the changing sociological and economic conditions of the post-World War II era. Executives of the 1950s and 1960s grew up in a world of affluence. Many believed that society would always prosper and that demand would continue to grow. Business was running smoothly, profits were on the upswing and management was content. If a product was successful, a firm needed only to expand production at the right times and in the right places to meet demand and to increase earnings (Business Week, June 30, 1980, p. 70).

In the minds of many, one legacy of this period of rapid economic growth was a decline in the competitive spirit of U.S. business managers. Since the formulas in use at the time were conducive to high profit levels, it became increasingly difficult for these firms to undertake extensive long-range planning. The fact that the decade of the 1950s was itself a period of high R&D spending might, at first, seem difficult to explain; but it should be noted that during this period there were generally sufficient funds available for a firm to funnel into many different business activities, including R&D. As profit levels began to decline in the late 1960s and 1970s, however, sufficient funds were no longer available to continue supporting all business activities at their previously high levels. In other words, during the relatively prosperous fifties, few managers had believed that the period of increasing profits would one day come to an end—hence the lack of emphasis on strategies for the future.

Many of today's top executives were trained in and indeed became quite successful by subscribing to these principles. What seemed to work in the 1960s, however, was not always successful in the late 1970s. Among other things, the U.S. population was no longer growing as quickly as before, and the demand for goods and services in general was not increasing at its former rate. The bottom line, of course, is that management did not respond quickly enough to meet a changing environment.

Another possible reason for management's obsession with the short-term may lie in the increase in the number of chief executive officers (CEOs) with financial or legal backgrounds. Forty-five percent of executives in the top U.S. firms today have received their training in either the financial or legal areas, as compared with only 18% with engineering training and 13% with training in technical research. By way of contrast, 52% of all Japanese manufacturing firms are headed by CEOs with engineering backgrounds (U.S. Subcommittee on Science and Technology, J. Arai, p. 256).
As more and more CEOs with financial expertise have assumed top corporate positions in the U.S., they have naturally brought with them a stronger emphasis on financial reporting. The principle of managing businesses by implementing product and technological changes has tended to give way to a more intense focus on earnings reports and on financial methods. It has been said that the typical executive today is more likely to resemble a banker managing a portfolio of investments whose interest may lie more in buying and selling firms than in developing new products or new production methods (Business Week, June 30, 1980, p. 78).

Three decades ago, most CEOs advanced from within the corporation's ranks. Most began at the bottom and held several positions in different areas of the firm before rising to the position of CEO. This manner of progression usually provided valuable “hands on” experience in the CEO's understanding of the firm's technology, marketing, sales and production techniques. When these executives finally reached the top, this experience enabled them to make intelligent production decisions based on an intimate technical knowledge of the firm and the industry. Nowadays, however, firms are increasingly likely to choose their CEOs from outside their own ranks and, in many instances, even from outside their own industries. As we have stated previously, it is often difficult for a manager with technical training to appreciate the importance of technical R&D and various capital investment proposals.

Some observers have placed part of the blame for the emergence of the short-term orientation of U.S. management upon the educational institutions where most of today's CEOs were trained. As William Abernathy has noted:

"Schools followed the financial merger wave and the legal wave which began in industry. I think that it is true that we have not provided enough balance in the curriculum in terms of business aspects like production, workforce, and other behavioral subjects. We may have offered too much ... finance and emphasized financial control too much. [Business Week, June 30, 1980, p. 71]"

Yet another explanation for the change in management attitudes may lie in the changing structure of the typical U.S. firm. During the 1950s and 1960s as the U.S. economy experienced rapid economic growth, so also did the typical business corporation. Since many individual executives found themselves increasingly unable to effectively manage their growing organizations, decentralization often seemed to be the ideal solution. Profit centers were thus formed within many firms, whose major purpose was to maximize both the earnings of the individual centers and those of its managers. Underlying this behavior was a type of “invisible hand” thinking—the belief that if each profit center did what was best for itself, the best interests of the organization would also be served. Only later did the flaw in this logic become apparent when allocations essential for R&D or equipment were not
made. In some cases the individual manager tried to avoid these expenditures so that his or her unit would appear to be more profitable in the short run. This increasingly accepted mentality of maximizing short-run gain is considered by many to be one of the major causes of the failure of American businessmen to replace aging plants and equipment with new, technologically superior ones.

To cite just one example of the deleterious effects of this short-term mentality, let us take the case of the steel industry. The average U.S. steel plant is currently twenty years old, which is twice the average age of plants in West Germany and in Japan. Moreover, between 1966 and 1976, capital investment per year as a percentage of GNP in West Germany was more than 20% greater than that in the U.S., while in Japan the percentage of GNP devoted to capital investment was nearly twice that of the U.S. (Day & Pascarella, 1980, p. 50).

The sheer size of many U.S. organizations may be partially to blame for the development of the short-run managerial attitudes. The education and training received by many executives often emphasized the building of mammoth business empires. Too often, the size of the firm became a major criterion by which to measure the individual executive’s degree of success. As a consequence, top management often strove to enlarge their enterprises. The subsequent increase in the size of the typical firm, however, often widened the gap between the various levels of management. In many firms, top management has become further and further removed from their employees. In the absence of better criteria with which to judge employee performance, more importance is placed upon short-term quantitative measures. While such a system often provides a uniform and readily identifiable set of performance criteria throughout the organization, it cannot provide an objective measure for functions such as R&D, entrepreneurial talents and long range planning. None of these functions easily lend themselves to statistical evaluation. For example, it is difficult, if not impossible, to accurately quantify the ingenuity of an executive or to determine the worthiness of an expenditure for an R&D project which may have initially seemed plausible, but which did not ultimately succeed. The exclusive reliance, however, on quantification as the method for evaluating the productivity of managers and the profitability of specific projects can be harmful to the firm in two basic ways. First, in times of economic recession, a manager may be hit hard by events beyond his or her control. Current conditions may preclude the manager from attaining company goals, and an evaluation based solely on “results” may reflect poorly upon this individual. Secondly, the over-reliance on quantitative methods of evaluation may create an environment which stifles the creative or innovative manager. The fear of even a temporary dip in reported earnings may induce him/her to discard a promising project or to decide against investing funds in a risky venture, even though it may promise considerable future profits. In the long run, then, a firm may be left without any innovative projects which might enable it to compete more effectively.

Studies have shown that organizational size is inversely related to the number of innovations that appear. Innovative firms are most often those that stress creativity and do not seriously penalize failure. Because of the less rigid pyramidal
command system characteristic of smaller firms, such firms tend to rely less on quantitative performance evaluation and are more likely to encourage the generation of ideas. As a result, smaller firms are responsible for a disproportionately large fraction of revolutionary and/or large scale innovations (U.S. Congress, House Committee on Science and Aeronautics, 1967, p. 358).

To the list of factors contributing to management's preoccupation with short-term earnings and the resultant cuts in R&D spending might be added the so-called "fear of Wall Street." The ultimate goal of many managers today seems to be the maximization of shareholders' earnings per share (EPS). In the late 1960s, the salaries and bonuses of top executives were increasingly tied to price/earnings ratios (Day & Pascarella, 1980, p. 55). Stockholders and CEOs have both grown up in the same world of immediate gratification. Stockholders want visible returns "now." And while in an era of uncertainty this desire is understandable, pressure from shareholders to improve the EPS may often force managers to reject projects whose initial outlay would drastically reduce current earnings. Under increasing pressure to improve income each quarter, managerial focus is necessarily drawn toward the present. This fact can partially explain why intangible programs such as R&D are more easily dropped in rough economic times. When firms are in need of capital and are looking to borrow, they will find few lenders who will be satisfied by the promise of future returns in lieu of present earnings.

Many medium-sized firms often find themselves forced into implementing short-term remedies for long-term problems. In order to grow, it is necessary for firms to obtain equity capital. However, stock prices will usually respond only to very rapid growth. This can sometimes induce a firm to achieve rapid growth at the expense of the future of the firm. To cite an example, Microdata (a medium sized computer firm) has used techniques such as bypassing the establishment of a much needed direct sales force to avoid a large expense and subsequent decline in earnings. It has also announced a new computer model long before it was commercially ready to order for the purpose of making an impact on Wall Street (Business Week, June 30, 1980, p. 70).

Perhaps one reason that U.S. businessmen have not sufficiently emphasized productivity growth over the longer term was that after World War II U.S. consumers had almost no choice but to turn toward domestic corporations for their products. War-torn Europe and Asia offered virtually no competition in terms of technological knowledge, productive capabilities or quality control. U.S. businesses dominated world markets and were thus able to command high prices for products with varying degrees of quality. However, as foreign competitors gradually reindustrialized, U.S. businesses found themselves faced with unexpectedly stiff competition. This fact is most strikingly evidenced by the European and Japanese penetration of the auto, steel, and consumer electronics industries in the U.S. For example, in 1960 about 95% of all radios and television sets sold in the U.S. were supplied domestically. However, by 1979 foreign producers had captured 50% of this market (Business Week, June 30, 1980, p. 59). In 1960, the
U.S. accounted for 25.3% of the world's exports. By 1978, this percentage had fallen to 17% (U.S. Department of Commerce, Bureau of the Census, 1980, p. 813).

### IV. THE CONSEQUENCES

In the previous sections, we have suggested the existence of an increasingly short-run focus among top U.S. business executives. We have also offered explanations for the growth and development of this mentality. In this section we will discuss several consequences and manifestations of this short-run mentality in various areas of business practice. We will then relate these to the ability of U.S. businesses to compete effectively in world markets.

One important consequence of this short-run focus on profits is the high degree of activity in the area of mergers and acquisitions. This action usually produces a surge in the price of a particular stock and can rapidly improve a firm's position on Wall Street. The real danger of excessive numbers mergers and acquisitions, however, is the resulting shift in emphasis away from the seeking of higher profits through innovation and improved technology. In 1978, there were 80 mergers in the U.S. involving companies with assets in excess of $100 million each; in 1979, there were nearly 100. This latter figure represents roughly $20 billion in transfers of large companies from one owner to another, fully two-thirds of the total amount spent in that year on R&D by U.S. industry. Such activity, however, creates no new product or value for the economy as a whole (Hayes and Abernathy, 1980, p. 75).

Another consequence of the short-run orientation of management is the increasing aversion to the undertaking of innovative, yet risky, projects. Although the initial outlays required may be large, the returns are usually neither certain nor immediate. As Burton G. Malkiel states:

> As in the case of investment, one can also see a shortening of horizon periods. The investment and R&D problems are the two ends of the same mustache. Our willingness to take risks, to commit resources to the future, is declining. We seem now to be motivated by the promise of a quick return rather than long-term growth. [Business Week, June 30, 1980, p. 70]

Many experts claim that this short-run focus has increased risk premiums in financial markets. A higher risk premium means that a project must produce a higher return on investment in order to cover its cost of financing. Executives operating according to a short-run philosophy desire an immediate payback period, while a project offering high returns in future years might be considered too risky to be undertaken. This reasoning, of course, may lead to the adoption of fewer projects and, consequently, to fewer allocations for R&D.
There are two methods used to measure the trend of risk premiums. First, the spread between the yields on long-term government bonds and those of BAA corporate bonds gives a rough estimation of the risk premium (Malkiel, 1979, p. 82). Secondly, risk premiums can be measured via anticipated equity returns, calculated by adding the expected growth rate to the dividend yield. The difference between this and the return on long-term Treasury securities is an alternative estimate of the risk premium. The results of both of the above methods are similar; and although risk premiums have fluctuated greatly, the trend in recent years has been generally upward.

Managerial efforts directed exclusively toward the present can greatly endanger the long-run health of a firm in still another way. In order to improve the earnings in a given period, management may try to keep current expenses to a minimum. Aged or obsolete equipment may be repaired instead of replaced in an intensified program of cost reduction. Since older processes and processes in states of disrepair result in a lower quality product, such declines in dependability or workmanship may dampen a firm’s ability to compete effectively in world markets. As Dr. Rahn of the U.S. Chamber of Commerce states:

Whereas we were adding to our net capital stock at a 4.5% annual rate from 1948–1968, we let that slip to a 3.6% rate during the 1970s. This includes significant amounts of legally mandated investment which may reduce productivity. Net new investment is no longer sufficient to lower the average age of property, plant and equipment. Both plant and equipment have been aging since 1974, something we last experienced during the Great Depression. Advances in technology largely enter the production process through new capital investment, and a slowdown in business investment implies that we are not fully utilizing the available technology. [U.S. Subcommittee on Science and Technology, 1981, p. 669]

A related and equally important problem concerns the investment decision in human capital and the improvement of employee resources. The introduction of new technology must be considered not only from a technical standpoint, but from a behavioral and organizational standpoint as well. In both the short- and the long-run, skilled workers may be needed to operate new equipment and man new facilities. Unfortunately, necessary training programs are all too often thought of as a short-run variable cost; and should the economy take a turn for the worse, these programs are often the first to be cut. There is usually no immediate effect on production or productivity, and the cut has a positive effect on current net income. The need, however, for trained workers does not disappear. New technology requires new skills, and firms lacking employees with these skills will not be using their equipment to its potential, nor will they be able to compete effectively with other companies. As one critic states:
Disturbing evidence comes from a series of studies which suggest that our failing competitive advantage in foreign markets owes to our underinvestment in human capital. The Bureau of International Labor Affairs reports that the declining U.S. trade performance since the sixties is the result of differences in the growth in net real investment in equipment and in the acquisition of labor skills through education and training. Between 1963 and 1975, U.S. share of world’s skilled workers fell from 29% to 26%. We have dropped from second to seventh in skill endowments of our workers. This results in the skill content of U.S. imports rising while U.S. exports steadily lose their competitive advantage.

Analysis by Denison and Baily [1979] reports that between 1948 and 1979, human capital improvements have accounted for an equal and perhaps a larger share of productivity growth than increases in machine capital per worker. [U.S. Subcommittee on Science and Technology, 1981, p. 752]

V. CONCLUSION

Summarizing the major ideas presented in this paper, we have stressed that the apparent short-run orientation of many U.S. executives today has been a natural result of the era in which they grew up and received their training—a period of “effortless” prosperity, abundant wealth, and record growth for many corporations. The psychology of this period simply did not encourage or anticipate future changes in the fortunes of business. When faced with the uncertain economics of today, CEOs imbued with this short-run mentality too often minimize the importance of R&D, which does not have immediate positive effects on corporate profits. This situation has, in turn, contributed greatly to the problems faced by the U.S. today—problems such as declining productivity, a scarcity of trained labor, and a lower rate of commercialization in technologically innovative products.

In the minds of many experts, American industry has lost its competitive edge in many world markets. The old formulas seem to be no longer valid, and the world business environment has changed. It now requires business executives to look beyond the current bottom line into the futures of their organizations in developing long-term strategies which again recognize the importance of R&D as a major influence on productivity. The U.S. business community is truly at a crossroads, and it must now turn inward to reexamine, reevaluate and act positively in reordering its priorities.
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