Rational Management Responses to External Effects

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This paper is a discussion of the external or side effects of business and rational responses to these external effects for profit-maximizing firms.[1] Some people would argue that the rational response for the profit-maximizing firm is to do nothing about its external effects until required by law; whereas others, as we in this paper, argue that the rational response for the profit-maximizing firm is to take some action.

The first section of the paper deals with the meaning of externalities, of which pollution is a fundamental type, and the phases of a solution to such problems. In the second section, the paper deals with rational responses for the profit-maximizing firm regarding its externalities, in which many aspects of the popular arguments against the rationality and the practicability of independent corrective action by a firm are examined.

AN OVERVIEW OF EXTERNALITIES AND SOLUTIONS

We agree with Friedman [9] that the overall goal of the firm is to maximize profits or, more correctly, to maximize the present value of the firm. But, we add that today, voluntary actions regarding external effects are essential for such wealth maximization. Having stated the argument in brief, we acknowledge, as Friedman implies, that probably the ideal solution to external effects or other social problems is enactment of socially just and economically sound *legislation* which would have the merit of leaving little or nothing to the judgment and timing of businesses in regard to correcting the problems. But, the "ideal solution" can, in many cases, be a long time in coming. The logical question, then, must be: What, if anything, can we say about the "social responsibility" of business in the interim? Regarding pollution, no doubt comprehensive pollution regulations are the

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ideal answer, but until such time as they are formulated and enforced (during which time the cumulative effects of pollution mount, indeed rendering some waters, such as Lake Erie, to an irreversible inability to support life), voluntary action may be rational, both socially and privately. We stress: To get socially sound, effective legislation passed is very difficult and takes time and, of course, a law itself without effective enforcement and/or willing compliance is largely irrelevant.[2]

Let us turn briefly to a consideration of externalities and the specific case of pollution. Externalities, in general, are economic consequences conferred on a firm (or person) through no choice of its own. These external effects may be either costs or benefits. An external diseconomy means that because of someone else's actions, one's costs are higher, i.e., polluted water for a fish hatchery which requires pure water. An external economy, on the other hand, is one in which there are reduced costs of operation due to an outside source, such as more highly skilled labor of a type required by a firm coming into a market.

The basic nature of an external effect is that actions of individuals have effects on other individuals, for which it is usually not feasible to charge or recompense them. The man who pollutes a stream is, in effect, forcing others to exchange good water for bad. The people who have been forced to exchange good water for bad might be willing to make the exchange at a price, but it is not feasible for them acting individually to avoid the exchange or to enforce appropriate compensation [10].

With an external diseconomy, the cost borne by either some third party or the community at large is a cost that does not automatically enter into the private cost and demand calculations of the producer. As a result, the social costs of such production usually exceed the private costs. Thus, the basic cause of social costs is that the pursuit of private gain places a premium on the minimization of the private costs of current production. Accordingly, the greater the reliance the economic system places on private incentives, the greater the probability of external "unpaid" social costs unless appropriate measures to avoid minimizing the private costs are taken [9]. With the social costs inadequately imputed to the sources of pollution, prices of the polluters will be artificially lower with the result that more pollution occurs than is desirable from society's viewpoint as a whole [13, p. 80].

The rational solution of virtually any problem, especially the environmental problem, may be seen as requiring three phases: (1) setting criteria, (2) establishing standards, and (3) implementing the corrective action [15]. Regarding pollution, *setting criteria* implies ascertaining the biological and

[2] Congressional committee fragmentation is but *one* reason for the difficulty in passing sound environmental legislation. See "Pollution: Everyone's In On the Act," *Business Week* (January 24, 1970), pp. 116 ff.

economic conditions required for various possible uses of a resource. Thus, criteria, the respective requirements for specific alternative uses, are the scientific basis for decision-making concerning the suitability of the resource to support designated uses. The uses may be single or multipurpose and may include one or a combination of types of recreation and aesthetics, commercial purposes, agriculture, industrial uses, etc. We see, then, that the essential feature of setting criteria is the acquisition of technological, biological, economic, social, and other relevant facts to provide a sound basis for policy and standards decisions as to optimal resource use. We stress the important distinction between defining criteria on the one hand and setting policy and standards on the other. Whereas criteria are the analyses of effects and interrelationships of different assumed uses of water or any other resource, *establishing standards* is the policy which specifies uses and quality levels. Standards are established ultimately by governmental or other authority and specify whatever prevention and/or abatement is required to achieve the desired quality. Because establishing standards is an extremely difficult task, it should utilize many perspectives and incorporate value judgments as well as the objective economic and scientific data. Standard-setting must—though unfortunately it frequently doesn't—involve the notion of acceptable risks. In general, certainty (zero risk) is too expensive from both private and social standpoints, and the innocent-until-proven-guilty basis (high-risk) is also potentially too expensive. This is not to say that low risk or, at times, even zero risk is inappropriate; it is to say that a policy of zero risk as a general rule is uneconomic. Accordingly, establishing pollution standards is far *more complex* than the simplistic notion of "eliminating all pollution" or opposing all construction of nuclear and fossil fuel power plants, hydroelectric dams, or other power-generating devices. Also, it is *more complex* than the equally simplistic notion of continuing to engage in any activity until it is certain that ecological harm is being effected at some substantial level.[8]

The complexity in setting criteria and establishing standards was seen recently when for 5 days a panel of state and federal water quality experts held hearings on the effects of the discharge of heated water into Lake Michigan. At the hearings, there was a lengthy procession of witnesses, including scientists appearing on behalf of the Department of the Interior and conservation groups. They testified that if thermal wastes weren't strictly controlled now, the lake would soon go the way of Lake Erie and be unfit for marine life and human recreation. Other scientists with equally impressive credentials testified on behalf of the industries which used the lake water for a variety of cooling purposes.

[8] In principle, one will continue to improve resource quality to the point that the cost of the last unit of effort in quality improvement is equal or exceeds the benefit derived from the last unit of effort [10, p. 20]. See also Sanford Rose, "The Economics of Pollution," *Fortune* (February 1970), p. 120.

Generally, the scientists claimed that putting the heated water back into the lake isn't dangerous. The debate, in short, was a standoff, and, in one sense, could have been dismissed as an interesting and educational demonstration of the inconclusive nature of scientific evidence—except that the issue is anything but theoretical [2, p. 16]. Thus, even when the purposes for which one seeks abatement or redemption are stated, there still can be considerable difficulty in arriving at acceptable standards. Seemingly absent in many of these discussions is the concept of an acceptable (from a total ecological standpoint) level of risk. The final phase is *implementing* corrective action, which is the enaction of appropriate corrections implied or specified by the standards. At times complex inter-firm as well as private-public structures will be required for complete compliance with standards.

RATIONAL RESPONSES TO EXTERNAL EFFECTS

We turn now to the most critical part of this discussion, namely, rational responses by firms to external effects. There are two fundamental questions: (1) *Why* should a profit-maximizing firm voluntarily assume some amount of extra cost?; and (2) Precisely *how* can the profit-maximizing firm assume these costs but yet not commit suicide in the market place?

With respect to the first question, it is *only* by such behavior (which can be of various sorts) that a firm can best attain its purported goal of maximizing the market value of the firm. This reasoning is based on the objective evidence of the present and future environmental expectations of society, customers in product markets, and investors and lenders in capital markets. The present market-value of a firm depends only minimally on the current earnings of the firm. More important are the *expected earnings* and the *expected variability* (risk) in regard to future earnings. The lower the expected earnings and/or the greater the expected variability (risk) perceived by the capital market, the lower the present market-value of the firm.[4] In the case of external effects (specifically pollution), the present market-value of the firm is based ultimately on the capital market's perception of product-market demands and expected variability of earnings as affected by various potential legal and product-market risks.

With respect to the second question, *how,* there are a variety of possible responses for the firm. Considerations include the purely internal efforts to reduce the disparity between social costs and private costs, assisting in establishing factual criteria, and/or assisting in setting equitable public policies and quality standards, and/or implementing corrective

[4] Discussion of the valuation of the firm may be found in virtually any current managerial finance text. See for example, Myron J. Gordon, *The Investment Financing, and Valuation of the Corporation* (Irwin, 1962), and J. F. Weston and E. F. Brigham, *Managerial Finance* (Holt, Rinehart & Winston, 1966).

action. But there is a second and *essential* element in how a firm viably can engage in these costly activities: the rational firm, upon assuming whatever analytic, legislative, and/or technological actions, will then *inform fully* both its product markets and the capital market of its actions. Socially responsible behavior, absent communication of such actions, is at best irrational and at worst possibly suicidal. It is precisely because the environmental awareness and expectations of society and customers are changing, and, hence, the capital market's risk perceptions are as well, that firms *must* inform of their substantive social actions. We return to the communication issue in a subsequent section.

Let us consider some evidence for the basic premise—which restated is—a rational firm in order to maximize its present market-value will both voluntarily engage in costly activities in regard to its side effects and communicate the fact of its action *precisely because* the environmental expectations of society, in general, and customers, in particular, are ever-rising. To *ignore* these fundamental changes would induce the capital market to perceive lower expected earnings and/or impute a higher risk factor resulting in a lower present value to the firm.

In the following order we shall consider (1) evidence that society's and customers' environmental awareness and expectations are rising; (2) some economic fallacies regarding the costs to a firm in dealing with its external effects, the allocation of the costs, and the passing on of the costs in higher prices; (3) some evidence that firms already recognize the connections between certain types of "social responsibility" and the explicit communication of such actions and profits; (4) evidence that both the debt and equity portions of the capital market recognize the changing environmental demands of society and customers and, thus, the foregone profits and/or substantial legal risks to the recalcitrant firm; and (5) the probable costs to a firm if it attempts to deceive society regarding its external effects and environmental actions.

First, a perhaps relatively easy question, what evidence is there that society's environmental awareness and expectations are rising? Our general response is that there is a new citizen/consumer emerging. Considerably before the dust of Earth Day had risen, let alone settled, such spokesmen for the ecological and consumer movement as Rachel Carson, Ralph Nader, Paul Ehrlich, John Galbraith, Lewis Mumford, David Brower, Kenneth Boulding, Robert and Lenore Reinow, and John Gardner, not to mention Henry David Thoreau, enjoyed a substantial following. One cannot dispute that our society is definitely changing, since now even grade school children are relatively sophisticated on matters of pollution and ecology.

How do we characterize this new citizen/consumer which we argue is emerging? One close and astute observer of the American social scene

and marketplace, Commissioner Philip Elman [7] of the Federal Trade Commission, calls the contemporary change in the citizen/consumer no less than a real revolution:

> The real revolutions in world history have been the revolutions in human values, ideas, feelings, and tastes. Mankind is passing through such a cultural revolution now. Unmistakable signs of its presence are all about us, here at home and abroad, in all parts of the globe and among all classes of people. Generated primarily by the young, its essence is a new birth of freedom for the individual; a joyous liberation of the human spirit; insistence on truth and honesty in personal relations; a total rejection of hypocrisy and cant; a renewed concern for the uses to which power, public and private, is put, and a fixed determination that it be used to preserve and enrich life, liberty, and the pursuit of happiness, not to destroy them, to protect the beauties of nature and the good earth, not to lay them waste. Its consequence, we may hope, will be to close at last the ancient gap between the ideals men preach and the injustices they practice in their daily lives. *Its sure effect, in any event, will be to transform radically the structures and institutions of society, political and economic as well as social . . . . His expectations of you, your products, and the way you sell and advertise them, will be vastly different from those of his parents; and you will do well to mark these differences and to respond to them* (emphasis added).

Within this revolution of values, we note specifically society's increasing interest in establishing and preserving a quality environment. Pacific Northwest Bell commissioned Louis Harris and Associates to examine public attitudes in Oregon and Washington on environmental problems. The survey, conducted in January 1970, produced the following results:

Question: "What are the two or three most serious problems facing *your community?*"

Response: In both Oregon and Washington, pollution in its various forms was cited *more often* than any other problem area (that it was cited *first* was especially interesting in view of the poor economic conditions in January 1970).

Question: "What do you think are the two or three most serious problems facing the whole state of (Oregon) (Washington)?"

Response: In Oregon, 98 percent of the respondents mentioned pollution; in a poor second place was the economy mentioned by 43 percent. In Washington, 56 percent of the respondents mentioned pollution and 66 percent mentioned the economy (however, the Boeing cutbacks and economic slowdown was primarily a King County/Northwest-Washington phenomenon, thus, only this sector of the state ranked the economy ahead of pollution).

Presently, there are more than 150 national organizations as well as thousands of local groups of one type or another which are interested in conservation. Two of the oldest organizations, the Sierra Club and the National Audubon Society, have doubled their membership in the last 3 or 4 years.

The cross-section of support that conservation engenders in our society was easily seen in 1969 when a broad coalition of citizens lobbyed for a larger pollution appropriation in Congress. Specifically, the Citizens Crusade for Clean Water, which encouraged Congress to vote $800 million

for pollution control instead of the $214 million requested by President Nixon, was a coalition of some 40 organizations coordinated by the Isaac Walton League. In addition to the Sierra Club and other predictable conservationists, the cause attracted the A.F. of L. - C.I.O., the United Auto Workers, the U.S. Conference of Mayors, The League of Women Voters, and the National Rifle Association [8, p. 144].

The history of the 1969 San Francisco Bay Conservation and Development Commission Act is an enormous testimonial to the increasing cross-section support for a quality environment. In 3 years, the Save the Bay Association working uninterruptedly sending out communiques on new developments, ringing hundreds of telephones, and promoting its cause on radio and television, expanded its support from 5,000 to 22,000 dues-paying members. More than 200,000 signatures were gathered on petitions asking Governor Reagan to support the bill establishing the San Francisco Bay Conservation and Development Commission. In fact, so many telephone calls were made in support of the bill that the President Pro-tem of the Senate had to plead with conservation groups to cut them off so that state business could be transacted [18, p. 148].

The Survey Research Center of the University of Michigan, asking what program people thought government should spend money on, found the biggest vote was 64 percent for air pollution abatement, which topped the 62 percent who chose education [3, p. 73].

As 1970 progressed, some people suggested that environmental concern might be a passing fancy—in spite of all the evidence of a deep-seated revolution of values in general and a recent history of environmental activism in particular. Those suggesting a possible diminution of fervor for a quality environment based their arguments in part on the low visibility of the issue in some 1970 political campaigns [14, p. 10]. But, any doubts concerning the permanency of the quality-environment issue were laid to rest in the November 1970 election. As Gladwin Hill [6, p. 10] reported: "Crusaders for environmental reform chalked up victories from coast to coast in the first national election in which conservation issues figured prominently." From these and other empirical indications, we may conclude that environmental awareness and expectations are widespread and continually rising.

Second, one frequently hears from business that *even though* society's attitudes are changing, the substantial costs to the firm in dealing with externalities can not be passed on in higher prices. This frequently voiced objection—that the costs would be high and the firm could not pass them on to the customer—is a several-fold oversimplification. First of all, it assumes that all costs would be high, which is erroneous. This ignores the fact that socially responsible behavior in regard to pollution covers a *variety* of actions. The actions could be in the realm of either legislative effort

seeking socially sound policies and regulations; analytical activities concerning the criteria; or technological activities in regard to implementation, among which the costs, of course, will vary. Moreover, the objection of "exorbitant" cost assumes that the firm *itself* must perform all aspects of any activity rather than employ outside specialists, establish joint ventures, or otherwise effect scale economies in the effort. One estimate, however, expresses doubt that over the long run environmental control will figure unduly in any industry's cost. The estimate states that even in electric power generation where the problems of air and water pollution are joined, meeting maximum standards will add only 5 percent to production costs.[5]

Another oversimplification, if not error, in economic reasoning implied in the popular argument is that whatever the costs, they must be borne (1) in the immediate period, and (2) by the directly involved product or products. (Little wonder there is the popular assumption of economic suicide if a firm deals with its side-effects.) Thus, the argument implies, for example, that forest products firms (those in both lumber and paper products) would charge their paper-mill, pollution-control expenditures solely to paper products and largely in the immediate period. Correctly viewed, most pollution-control expenditures are in the nature of investments in the sense that expenditures today will yield a stream of future benefits. Such investment expenditures are no different than renovating a lunch room or engaging in research and development—in neither of these cases is it rational to charge the cost to just a few products or attempt to have an immediate cost recovery. Because of less price sensitivity in some markets of the firm than in others, the firm accordingly should spread the costs disproportionately into the less sensitive markets, as well as amortize the cost over some reasonable time period. We recognize that cost-spreading runs head-on into the concept of decentralized profit centers in the firm. But, after all, the *total* firm is the correct maximizing unit, especially if we assume the firm's goal as present-value maximization.

Aside from oversimplifications concerning costs, this same frequently voiced objection also suggests a credibility gap. Many firms acknowledge society's strong rising interest in the environment, but then automatically conclude that *their* customers are not that same society and, thus, that *their* customers will not pay anything for pollution control. We have already noted that the costs of social responsibility regarding pollution are not uniformly high and, in many instances, would not lead to higher prices if they were coupled with rational cost allocation. But that begs the question: on what grounds do firms assume that at least a substantial block of

[5] *Business Week* (April 11, 1970), p. 86. Moreover, the costs are always less with prevention than with cure. It is estimated that the costs of curing pollution once it exists are on the order of 16 times the costs of prevention, *Ibid.*

customers in a substantial number of markets would not pay more for pollution control? Have firms really assessed the question, or have they generalized from one or two casual observations? Are not, at least in part, purchasing agents, corporation presidents, and ultimate consumers also members of this same society which we have admitted is ever-more environmentally aware and adamant? The evidence would suggest that many intermediate and ultimate customers *are* willing to assume additional costs for a higher quality of life.

Before elaborating, let us recognize at the outset that whatever costs of pollution control have to be passed on as higher prices, many customers are already paying for the pollution effects in one way or another by taxes, by inconvenience, or in other tangible and intangible ways. So, in effect, any higher price resulting from pollution control is more a transfer than a net increase. As such, it is a more equitable price in that to a greater extent only the producers creating the problem and direct users are involved.

There is mounting evidence that a sizeable and increasing number of citizen/consumers care sufficiently about the quality of their life to pay for an improved environment. Respondents in the Pacific Northwest Bell-Louis Harris survey were asked if they would be willing to accept a $200 increase in total family expenses to improve the environment. In Washington 30 percent and in Oregon 28 percent of the respondents responded that they would. Those saying "no" to $200 were asked if they would accept a $100 increase in total family expenses to improve the environment. In Washington 51 percent and in Oregon 47 percent of this latter category would be willing to accept such increase. Thus, the approximately three in ten in both states who would accept a $200 increase coupled with the approximately five in ten of the residual group willing to accept a $100 increase constitute a significant percentage for whom an increase of at least $100 would be acceptable. In both states, approximately 50 percent of all respondents who were college graduates would accept the $200 increase. Also among all respondents, the 21-29 age group was most willing to accept the $200 increase.

A survey conducted for the National Wildlife Federation found that 75 percent of a sample of 1,500 adults would be willing to pay something to improve their surroundings [3, p. 73]. The passage of environmental bond issues is another piece of evidence of not only the rising social concern for a higher quality of life, but willingness to pay something for it. Bonds for water, air, recreation, and the like have passed more readily than any other kind in recent years. In June 1969, the previously mentioned Citizens Crusade for Clean Water reported that eight out of nine statewide votes for air pollution bonds had been approved since 1964. Among local issues, Cleveland voted a $100 million water pollution abatement issue in 1968. In the fall of 1969, Suffolk County on Long Island approved a $300 million issue which they had rejected a few years earlier. San Francisco

has committed $1 billion to the mass transportation system, including $30 million just to clean up Market Street [3, p. 74].

If we define the cost of an activity as the amount of foregone opportunities and allow that a person's time has a monetary equivalent, one has to be impressed with the substantial personal "expenditures" people have willingly made in behalf of environmental issues. Volunteer groups of one type or another have spent countless hours in environmental causes providing clean-up crews, doorbell ringing, lobbying, and political campaigning, etc.

We may conclude that in general a substantial number of citizen/consumers are willing to pay (at times, a substantial amount) for a quality environment. At this point in the argument, we have established only that the costs of social responsibility regarding pollution are not uniformly high, but even if some costs have to be passed on, nontrivial segments of substantial numbers of markets would be willing to pay more.

Third. The objection that pollution costs cannot be passed on implies *passivity* in regard to demand magnitude and elasticity. Thus, in our argument, we so far have looked only at the costs of correcting externalities and the *extant* willingness of consumers to accept higher prices. The point to which we now turn is, given whatever extant willingness of consumers to pay for pollution control, a firm *can* affect the demand for its current products as well as effect new markets. Thus, the previous discussion of costs and current willingness-to-pay is only one part of the voluntary action/wealth maximization argument. We contend that a firm, by addressing its external effects, can gain more control over the revenue function, for in many markets such voluntary actions in regard to side effects will change customer perceptions of the firm and thereby increase both demand and the inelasticity of demand.

In any theory of the firm vis-a-vis externalities or in general, it is important to remember the frequently overlooked point that cost minimization is not necessarily profit maximization, let alone wealth maximization. The discussion of *revenue* (demand schedules and elasticity) vis-a-vis external effects may be divided into two parts: (1) evidence that customers would pay more for a product from a "socially responsible" firm than for the same physical offering from a competitor which is perceived to be less socially responsible; and (2) new uses (new markets) for some of the components of air, water, or solid-waste pollution.

We turn first to the former. From our previous discussion of the willingness of consumers to pay more *in general* for an improved environment, one intuitively could argue that they similarly would favor a socially responsible firm—specifically a higher-priced socially responsible firm—to other competitors. Obviously, for consumers rationally to do so, they

would have to perceive utility (we would suppose psychic in largest part) from the firm *disproportionately greater* than the higher cost to them.

Is there evidence that firms have perceived a connection between voluntary social actions and favorable market response? That is, do we find evidence that firms engage in philanthropy or other "responsible" behavior in part, at least, to differentiate themselves from their competitors? If philanthropy or other types of social actions were to be used as competitive tactics, we would expect to find them only in *rivalistic* markets (oligopoly par excellence), pitting firm against firm. We would *not* expect to find them as competitive or differentiating techniques in either purely competitive (completely impersonal) markets or monopolized markets (where differentiation is irrelevant). A study by Johnson of charitable contributions and the apparent motivations of firms supports our expectation that philanthropy is perceived by firms in rivalistic markets as one positive means of differentiation. Analyzing the philanthropic-constribution ratios of three different industry structures—competition (atomistic), monopoly, and rivalry[6]—for the period, 1936-1961, Johnson states,

> The significant association of rivalry with higher-than-average contribution ratios—and the lack of any general tendency for the largest-sized firms to give at the highest rates—confirms the prediction that corporate contributions are motivated by a striving for competitive advantage.[7]

We do not say that intermarket differences are the sole explanation of corporate philanthropy. The evidenced relationship between the desire for differentiation and corporate contributions is sufficient to support our expectation; however, we would agree with Johnson there are also other determinants of unknown magnitude, such as tax benefits.[8] But the latter would not explain the particular observed intermarket difference.

A necessary implication of the "philanthropy-for-the-purpose-of-differentiation" argument is that the firm fully communicate to its product and capital markets the fact of its charitable giving. Otherwise, in regard to differentiation, the initial expenditures would be irrational. It would follow that a firm, having to some degree addressed its pollution externalities, similarly would always immediately convey this fact to its product markets.

Another implication of voluntary actions vis-a-vis the environment is that the actions need not be limited to one's own external effects. For example, recognizing the increased interest in conserving our natural resources, the firm might insist on buying inputs made of recycled material, which would find favor with a substantial and increasing number of citizen/consumers. If many firms bought only recycled paper, there could be a

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[6] The sectors comprising each type of structure were: competition (agriculture); monopoly (utilities, finance, and mining); rivalry (manufacturing, services, trade, and construction). Johnson, "Corporate Philanthropy: An Analysis of Corporate Contribution," *Journal of Business,* Vol. 39, (October 1966), p. 496.

[7] *Ibid.,* p. 503.

[8] *Ibid.,* pp. 503-504.

substantial resource economy. The American Paper Institute estimates that each ton of recycled paper eliminates the need to cut seventeen trees [1].

We may conclude that there is reasonable empirical evidence relating a firm's voluntary social actions, at least in some areas, to increases in demand and demand inelasticity for its products. From previously cited evidence, we may infer that voluntary actions regarding externalities is translatable into increased receptivity for a firm in its product markets. Thus, given the environmental concern in society, voluntary actions in regard to external effects, coupled with informing the market of one's actions, is rational behavior in seeking differentiation.

The second means by which attention to external effects can lead to more control over revenue is the recycling and reclaiming of pollutants in water, air, or solid wastes, either in their present form or with additional processing. In recycling and reclaiming, firms in effect are seeking new internal or external markets. For example, the clarifier sludge of paper mills is finding use as a land fill [1]. A sweeping conception of pollution in terms of recycling and, hence, the development of new internal or external markets, was offered by Aaron J. Teller, former Dean of Engineering at Cooper Union [16, p. 651]: We can no longer look at pollution as something to get rid of. We have to look at pollution as unused resources.

With careful consideration, not only will firms increasingly be able to find uses for some of their currently undesirable joint products, but also a careful reflection on the nature of their technology and capabilities of their resources will suggest many *additional markets* to which the firm's productive know-how and capabilities can be addressed. Firms too often succumb to a sense of predestination or mission with respect to current products, feeling obligated to pursue current paths. The far more rational approach is for the firm to analyze carefully its productive capabilities and *then* to continually assess potential markets to determine to which of them the resources *at that time* could most efficiently be addressed. Accordingly, the most useful concept of a firm is not in terms of its current products, but rather in terms of it comprising one or more pools of resources which can respond to a range of wants—and at any one time, of course, manifesting those resources in a specific form (specific goods and services).[9]

To summarize the revenue implications of certain voluntary social actions, firms may, and in rivalistic markets do, utilize such actions as

[9] The concept of firms as pools of resources is discussed and the implications explored in John C. Narver, "Supply Space and Horizontality in Firms and Mergers," *St. Johns Law Review* (Spring 1970). Of course, the concept of recycling waste materials is a recognition of *both* the potential markets for output from waste materials and the adaptability of resources in utilizing these materials.

a means of differentiation. The proposition holds for firms' pollution externalities as well as any other social problems for which there is substantial citizen/consumer concern. The actions may relate to some aspect of current inputs or outputs, or to recycling of pollutants, but in either case the rational firm fully communicates its acts to the product and capital markets.

A parenthetical note on pricing. The firm at any time faces markets with varying degrees of demand elasticity. By means of differentiation, it attempts to increase the inelasticity of demand. The obvious implication is that the wealth-maximizing firm must continually analyze its markets to locate and enlarge the segments that are less price-sensitive. As pointed out in economic theory, rational pricing calls for isolating market segments in terms of preferences and varying the markups over costs in accordance with the respective sensitivities to price.[10]

The whole of prices and pricing of course is far more complex than simply the amount one writes on a price tag. A transaction is an exchange of scarce resources of the customer for perceived value from a seller. The price tag frequently is only one element in the perceived value of an offering. Competitive pricing often is complex. In industrial pricing, as well as in consumer pricing, many times the tag or list price remains unchanged, but the total bundle of utility is increased or decreased to effect price decreases and price increases respectively. Thus, to retard immediate competitive matching, the rational firm may compete by altering accompanying services leaving the list or tag price alone, and thereby avoiding also the psychological reactions of some customers to changes in the tag or list price.[11]

Fourth. There is some suggestive evidence that the debt and equity markets are, as we have posited, increasingly sensitive to the actions of firms with respect to pollution, among other areas. Of interest in this part of the discussion is the capital market's perception of firms' expected earnings and risk in a society with rising environmental awareness and demands. To the capital market there are at least four closely related reasons for perceiving lower expected earnings or greater risk in the earnings stream: (1) failure to deal in any degree with side effects, thereby ignoring an opportunity for positive differentiation and market gain; (2) insensitivity or misrepresentation in product and input markets in regard to citizen/consumer desires, thereby increasing the probability of negative responses such as economic boycotts; (3) failure to reclaim or recycle

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[10] For a basic discussion, see for example, Donald S. Watson, *Price Theory and Its Uses* (Boston: Houghton Mifflin, 1968), Chapter 17.

[11] A discussion of the complexities of prices and pricing may be found in John C. Narver and Ronald Savitt, *The Marketing Economy: An Analytical Approach,* (New York: Holt, Rinehart and Winston, 1971), Chapter 13.

effluents, thereby losing not only an opportunity for positive differentiation but also new internal or external markets as well; and (4) through recalcitrance or even spurious claims, firms subjecting themselves to legal actions, including class-action legal suits.

Turning now to some evidence of the capital market's concern with firms' behavior vis-a-vis the environment, the First Pennsylvania Bank in the summer of 1970 instituted a program to channel low interest loans to companies investing in pollution control equipment. As of July 4, 1970, the bank had sold 300 earth bonds worth about $200,000. Interest rates ranged from 5 percent for 90-day bonds to 5¼ percent for 2-year bonds. The bank lends money at preferential rates at about ½ point below the going rate to environment conscious companies. The First National Bank of Miami in the summer of 1970 introduced nearly identical pollution bonds, and both Security National Bank in Oakland and Winters National Bank and Trust in Dayton were offering similar programs. Chase Manhattan Bank recently appointed a coordinator of environmental systems to help the bank's industrial clients formulate antipollution plans and obtain financing. Chemical Bank in New York is offering nonprofit loans to New York landlords who are required to install $15,000 cleansing devices on some 13,000 apartment house incinerators.

But perhaps the toughest environmental stand of all has been taken by the more than 70 banks in relatively unspoiled Maine and Vermont which have signed a bankers' pollution code directing them to extend additional credit for pollution abatement and also to refuse financing for projects that "encourage or abet pollution" [3, pp. 19-20].

Sensitivity is rising also in the corporate share market, in which, according to some observers, a company's social policy will have an increasingly important effect on its stock price. The Council on Economic Priorities, a research firm created in the spring of 1970 and oriented to research on companies' social responsibility, has been called the "Dun and Bradstreet for the socially concerned." The Council will make detailed monthly reports on how well business serves society in four areas: (1) defense contracts, (2) environment protection, (3) minority hiring, and (4) overseas investments. Some effects of the Council already are apparent. The first report prompted the president of one mutual fund to unload a block of shares in one company cited, giving the reason that "information like this will hurt a company sooner or later." The impetus of the Council on Economic Priorities was a Boston Synagogue that wanted a "peace portfolio." The organizer of the Council drew it up and got 600 enquiries from investors. The initial response of potential customers is encouraging, and the head of the College Retirement Equities fund which invests some $1.2 billion says, "If the Council generates hard factual information, it has to become an ingredient for decision-making." Dr. Leroy Brininger of the National Council of Churches says there is a growing awareness

of churches to use investment programs to assist in the changing social roles. And, John Westergaard, President of Equity Research Associates, states, "Anyone doing analysis without a sociological input is doing an incomplete job. Management is going to be pressured, and a company with a poor score card will have long-term bad effects [3, p. 85].

Fifth. It is clear why the rational firm will communicate the facts of its voluntary actions to both its product and capital markets. But the next obvious question is, "How are society in general and customers in particular to distinguish between substantive and exaggerated claims? Why couldn't a firm simply *deceive* society as to its efforts in correcting side effects?" The answer is that deception would be self-defeating, if not suicidal, given society's rising education level and everbroadening environmental awareness and expectations, not to mention the constant probings of the corps of energetic workers with Ralph Nader and others.

The emerging citizen/consumer will not easily be sold a bill of goods. As Commissioner Philip Elman of the Federal Trade Commission states:

> The younger generation—soon to be the primary consumers of business wares and ultimately the leaders of this country—will not be persuaded by, nor tolerate, the silly commercials and advertising gimmicks that are so prevalent today. Tomorrow's consumers will be more concerned with the safety and ecology aspects of a soda bottle than its color, size, or accompanying jingle. With higher levels of education than any previous generation of Americans, these consumers of the future will want food products that have a full complement of nutrients and not merely a pretty package. Business must adjust—and soon—to a generation that is no longer over-awed by the flashiness of television; a generation that questions, rather than blindly accepts, the gospel of the modern-day hawkers; a generation that will not sit idly by if products are not honestly advertised or do not perform as promised [7].

In short, society is developing a higher doubt factor in regard to environmental claims. There is a rising reluctance to accept readily statements concerning serious matters such as pollution, as well as an increasing probability of detection of spurious claims. In such a world, devious actions could be immensely costly for firms, for lost good-will in product markets will induce perceptions of increased risks and decreased expected earnings by the capital market. In such a world, once a firm lost its credibility, it would be difficult and expensive to regain it. If the firm utilized additional spurious claims to re-establish a favorable perception, but these claims were similarly detected, the problem for it would have risen exponentially. Aside from any deceptive statements, there is ample evidence that even under the best of conditions, once attitudes are formed it is extremely difficult to alter them by persuasion alone [12, pp. 58-61]. Thus, in even the simplest case, the costs of a tarnished reputation could be substantial.

The rising doubt factor of society, increasingly protecting it from bogus claims of firms, is reinforced by a consumer movement—or better stated, an *ecological and consumer movement*—which is more vigorous than ever. Commissioner Elman sees the new movement of the 1970's as

a fresh state—with less talk and more action [7]. One action front is Congress where new consumer legislation will surely be forthcoming; a second front is the private action of consumer groups and concerned citizens, including consumer lawsuits—and class-action suits—that are being filed in growing numbers. Also, citizen groups have begun to intervene and plead the public interest before federal and state agencies, supported by a burgeoning legion of able and dedicated public interest lawyers; on a third front are the expanding consumer protection activities of federal agencies; and on a fourth front, is the activism by state and local consumer and environmental agencies. Thus, not only is there a real and growing doubt factor among individuals, but there is also an expanding ecological and consumer surveillance and redress system, both governmentally and privately based. It would be increasingly cavalier and expensive for a firm to mislead the citizen/consumer regarding its environmental actions.

SUMMARY

The argument in the present paper is that the assumed goal of the firm is to maximize its present market-value, but it is *only* by voluntary actions with respect to externalities (specifically pollution) that a firm can maximize its wealth. In brief, the components of the argument are that such actions regarding external effects may be at the expense of short-run profits. But, diminished short-run profits do not necessarily affect the present market-value of the firm; rather, the critical determinants of present market-value are the expected earnings (expected revenues vis-a-vis expected costs) and the expected variability (risk) of the earnings stream. In a society showing ever-rising environmental awareness and expectations of firms, there are many potential legal and economic risks to which the capital market is increasingly sensitive. In regard to its pollution, the rational firm will voluntarily incur added costs pertaining to the criteria, standards, or implementation phases of reducing the social cost-private cost difference. In an equally important second step, the rational firm will then communicate to its product markets the fact of its actions so as to differentiate itself and thereby to more than proportionately increase its revenues. The logical end, of utmost importance to the wealth-maximizing firm, is that the favorable product-market response will tend to induce a lower perceived risk and/or higher perceived expected earnings in the capital market.

REFERENCES

1. Boise-Cascade Corporation, *Paper Times* (June-July 1970).
2. Brown, Terry P., "The Dilemma in Pollution Fighting," *Wall Street Journal* (November 10, 1970).
3. *Business Week* (April 11, 1970).
4. *Business Week* (June 20, 1970).
5. *Business Week* (July 4, 1970).
6. "Conservation Forces Score in Elections," *Seattle Post-Intelligencer* (November 8, 1970).
7. Elman, Philip, "The Consumer Movement—and What It Means For Business," Speech to the National Association of Manufacturers Marketing Conference, New York (October 7, 1970).
8. *Fortune* (February 1970).
9. Friedman, Milton, *Capitalism and Freedom* (Chicago, Ill.: The University of Chicago Press, 1962).
10. ———————, in Marshall I. Goldman, ed., *Controlling Pollution: The Economics of a Cleaner America* (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1967).
11. Johnson, Orace, "Corporate Philanthropy: An Analysis of Corporate Contribution," *Journal of Business,* Vol. 39, (October 1966), p. 496.
12. Katona, George, *The Mass Consumption Society* (New York: McGraw-Hill, 1964).
13. Mills, Edwin, "Economic Incentives in Air Pollution Control," in Marshall I. Goldman, ed., *Controlling Pollution: The Economics of a Cleaner America* (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1967).
14. Reich, Charles A., "The Greening of America," *New Yorker* (September 26, 1970).
15. Schorr, Burt, "What Happened to the Ecology Issue?" *Wall Street Journal* (October 26, 1970).
16. Touhill, C. J., "Environmental Policy Formation," Paper presented at the Northwest Regional Meeting of the American Chemical Society (June 19, 1970).
17. "Turning Junk and Trash into a Resource," *Business Week* (October 10, 1970).
18. "Victory on San Francisco Bay," *Fortune* (February 1970).