

## **ECONOMICS OF DOWNWARD REVISION OF ENVIRONMENTAL STANDARDS AND ACTIONS**

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### **ABSTRACT**

This article examines the theoretical ramifications of a downward revision of environmental standards or actions. It points out that firms complying with earlier standards make capital commitments based on the higher standard. Since the earlier standard is the only signal the firm has in its planning process, the issue is raised, but not resolved, of whether the earlier standard represents an implicit contract between society and the firm. If so, this might imply compensation is needed for the firms unrecoverable capital expenditures. It is also pointed out that society may also bear some of the lost capital cost. Lastly, the article considers the advantage gained by firms that did comply with the earlier regulation.

Society has frequently relied upon minimum standards to protect the environment. For example, federal automobile regulations specify maximum amounts of pollutants that automobiles can emit. The problem with minimum standards is that they usually encourage the complying individual to only meet the minimum standards. Thus, a change in the minimum standard usually has wide economic ramifications for a particular industry, firm, region, and/or group of individuals. An increase in a standard generally raises the cost of production

and market prices to consumers of the affected products. This article deals with the frequently neglected “other side of the coin,” the ramifications of a decrease in a minimum environmental standard.

## **ECONOMICS AND MINIMUM STANDARDS**

Before proceeding to the issue of decreasing minimum standards, it is useful to look at the economics of the minimum standard itself. The standard is based on the perceptions of the public, the producers affected, and the perception of the creator of the ultimate regulation. Hopefully, the participation of the latter is based on the proper application of technical and economic knowledge at the state of the art to best resolve the conflicts of the first two participants in the standard setting process. The public sees a need for a standard when it feels the producer is creating too many negative externalities or that the producer is abusively using a common property such as an air basin or aquifer. The public feels that it owns the common resource, and has a right to limit the producers use although it may not necessarily directly charge the producer for these rights. In other cases, such as zoning to restrict private land use, the public feels that economic and social benefits flow from regulating the producer's activity. However, once a minimum standard is set, the producer is likely to regard it as fixed when planning plant expansion, production processes, or waste control systems. With a few exceptions, the firm has little reason to exceed the minimum standard by diverting stockholder earnings, profits, or corporate consumption expenditures to pay for the excess pollution control. This can particularly be seen in competitive markets when homogeneous products of different producers should command the same prices in their markets. After all, whether the producers goal is profit maximization, sales maximization, or long term security, it would not be useful to achieve any of these goals by expanding generally unproductive (output, profit) environmental protection expenditures beyond those necessary to meet the minimum standard. In fact, the producer is likely to perceive the minimum standard as what the public desires and has negotiated through the political process. It is the only clear signal from the public as to what is desired and how much should be done by the producer to control pollution. Although the signal may represent a compromise that actually pleases no one, it is the best signal a firm has in a world of uncertainty. Some certainty is better than none in planning production, plant sites, expansion, and loan or bond repayments.

## **AN IMPLICIT MARKET?**

One might ask, has an implicit market been set up by the minimum standard? In effect, the minimum environmental standard has set up an implicit market by defining the rights of the producer to pollute, free of charge, a portion of the

public's common resource. In quantitative terms, it sets the maximum allowable pollution. Any excess pollution violates the rights granted and must be paid for in fines, taxes, effluent improvement, or revenue lost through enforced shut-downs (i.e., these represent the price of excess pollution to the producer). There is no incentive for the producer to exceed the standard, except for "safety margin" considerations to avoid a shut-down, as this would represent a gift of the resource to the public that imposes an internal cost on the producer. The public would most likely have to offer financial incentives such as grants, tax credits, or similar subsidies to encourage the plant to exceed the minimum standard on a voluntary basis. In effect, the public must purchase the right to pollute from the producer regulated by the standard. Admittedly, the public could destroy the market by arbitrarily raising the minimum standard. However, in this same case some compensation is frequently offered the firm in the form of tax exempt bond financing, tax credits, or tax exemption to offset the feared potential loss of employment or production if the plant should follow through on threats to close, frequently raised in this situation.

The foregoing discussion of an implicit market created by the imposition of minimum standards has dealt with the problem of increasing the minimum standard. It does not imply that there are no economic considerations associated with a decrease (i.e., allowing more pollution) in the standards. One might assume that a producer under such circumstances would joyously accept the gift of greater access to the common resource and, most likely, lower production costs that result from the lowered standard. Indeed, this might be the case if welfare redistributions and capital investment were not involved. Such a move may involve giving an advantage to a competitor who did not comply with the standard by making earlier and costly capital adjustments to his production facility. This competitor may have chosen to ignore the standard or pay inadequate fines that were a cheaper alternative to the capital cost of meeting the more stringent older standard. The competitor is then left with lower costs and, most likely, a larger market share and/or profits resulting from being able to offer relatively lower prices. A second complaint of the firm is that it may have invested in related capital improvements when the government took direct environmental action through a project such as flood control. In this case the capital may be destroyed, or have its earning power reduced by the environmental regulation or physical change. In all of these cases, the producer may feel that it should be compensated for its losses of market share and/or capital.

### **REASONS FOR DOWNWARD ENVIRONMENTAL REVISIONS**

One of the foremost reasons for changes in environmental regulations is a change in tastes and preferences of the citizens themselves as reflected in the political arena. In the words of J. H. Dales, "To Live is to Pollute." [1] Thus,

all human activities are likely to produce pollution. The regulations or actions aimed at controlling the negative externalities represent the consensus of political opinion as to how great the negative externalities associated with an activity should be. Since much of the basis of pollution control is public opinion, these opinions are subject to change. Examples of this include a possible rollback in auto emissions standards or gasoline mileage requirements. A major influence in downward revisions may be the costs, both pecuniary and non-pecuniary, of living with the regulation. Wages and value of output lost in the closing of plants, capital investment that flows to less restrictive regions of the same country or even to other countries, higher product prices, higher management costs, higher capital costs, and higher maintenance costs are all examples of the increased pecuniary cost of regulation. Lost time in compliance (i.e., waiting in line for auto emissions inspections) and inconvenience are examples of non-pecuniary costs. Such costs may bring about a public clamor for a reduction of environmental regulation and its attendant costs. This is not, however, without some willingness to accept greater negative externalities.

A second circumstance, closely related to the first, is when a government project designed to accomplish one goal must be replaced by a new project to accomplish a new goal. An example of this is the reinstallation of the meanders of the Kissimmee River in Florida [2]. In the 1950's, reasons of flood control and encouragement of the dairy industry led the Federal government to channelize this river. Construction actually took place during the period from 1962 to 1971. In the 1980's, government decided that the channelization resulted in adverse effects on the wildlife in the Everglades and Lake Okeechobee. Since this aquifer is important to the South Florida region and the Everglades represent a significant tourist attraction, the current benefits of replacing the meanders outweigh the considerations of the dairy region.

A third reason is more associated with raising standards than lowering them. However, it could also apply to the case of rolling back standards. This is when the adopted technology is unsuccessful. For example, the writer of a technology specific regulation may be forced to accept more pollution from an alternative when the initial technology specified is found to be incorrect. In the case of land use zoning, an overrestrictive code may slow land development. Cities desiring to see a tract develop faster or desiring multiple land uses may relax the restrictions.

The zoning case also raises the possibility of a regulation being changed because of an unforeseen need. For example, restrictive zoning may exclude the commercial or industrial development the community needs for its growth or tax base. Overrestrictive zoning may also exclude needed workers from living in the community. In wartime, lower costs of production may be necessary which force a rollback of environmental restrictions on producers of military goods.

## COSTS OF REGULATION ROLLBACKS

Some of the costs of regulatory rollbacks to the producer have been mentioned above. These included a loss of capital investment in the pollution control equipment and lost profits from a reduced market share relative to a non-complying competitor who is able to charge lower prices. The costs to the producer may be even greater if additional capital investment is made in the belief that the government action will continue. For example, research and development costs for both product and process to meet the regulation may be expanded under this assumption. In the case of the Kissimmee River, pasture improvements were made on the basis of the protection from flooding achieved from channelization [2].

Agthe and Roden have shown that dilution of stockholder equity to make investments in environmental controls to meet the former standard is unlikely as most firms tend to borrow to finance these assets [3]. However, interest payments on the no longer needed capital may reduce profits relative to a non-complying producer in the same industry. This is even true in the case of financing from retained earnings as the opportunity cost of the "lost" capital investment must be considered as a "lost" return. If it were not for the original regulation, this capital could have been invested elsewhere instead of in the capital needed to meet the now void regulation. In the case of zoning, the established land uses tend to lose capital value if land is downzoned (i.e., higher value to lower value use).

Up to this point, only the direct costs to the producer brought about by reduction of the environmental regulation or actions have been discussed. The public also has the direct non-pecuniary costs of increased negative externality. This may impose a health risk or perhaps only a reduction in esthetic value. These costs may later translate to pecuniary costs of increased health care, litigation for damages, and reduced property values.

Pecuniary costs may also be borne by the public. For example, the value of a government grant, tax credit, or tax exemption given to the producer to finance the no longer necessary environmental control is lost to the public. Agthe and Roden have found that business firms are more likely to comply if tax help or government loans are available [3]. Thus, these losses to the public of publicity financed capital investment are likely and are sustained on complying firms rather than non-complying.

A final consideration is that a differential impact may have been placed on the producers by the cost of meeting the original standard. Pashigian suggests that large firms can financially meet environmental regulations more easily than smaller firms because of better access to financing and economies of scale in environmental control capital [4]. If this is so, then the rollback in regulation will most likely leave the smaller producers in the industry in a relatively less competitive position as the bigger firm can absorb the capital losses more easily. For example, a downward change in pollution regulations or gasoline mileage

requirements could most likely be more easily met by General Motors than Chrysler Motors.

### HOW TO TREAT ADVERSELY AFFECTED PRODUCERS

The foregoing discussion demonstrates that a welfare redistribution will occur when environmental regulations are revised in a downward direction. Complying firms will definitely suffer losses and any governmental body financially aiding them to comply will suffer a similar fate. Non-complying firms are left at an advantage whether they just willfully ignored the law or followed a "wait and see" strategy in their compliance plans. The latter strategy is more likely a result of messages being transmitted from the regulatory agency or legislative body that the exact regulation had a probability of not being stable. An intense legislative debate or litigation pending that indicates the potential vulnerability of the regulation would encourage the wait and see strategy. Inadequate or uneven enforcement by the regulatory agency would have a similar effect.

A number of strategies would appear to be possible. Since the welfare functions of the public appear to have shifted and preferences now appear to favor less regulation to achieve social optimum welfare conditions, one could argue as Kaldor [5] and Hicks [6, 7] that compensation is not necessary from the gainers to the losers when gains in welfare are realized. One could follow Rawls and argue that compensation only be granted if the smaller and/or weaker firms were adversely affected [8]. One could also argue, however, that compensation should be granted to all of the producers adversely affected. The basis of this argument is that the public may change its thinking and later require the installation of the original regulation and control devices. If compensation was not granted in the case of the downward revision and non-complying firms (with the original law) clearly gained an advantage, this would encourage most of the firms complying with first regulation to become noncompliers of the second upward revision. Their probability estimates of the stability of the regulation would be much lower. In addition, other firms facing new regulations would be encouraged to engage in noncompliance because of the experience of their "sister" firms. In the longer run, this last observation may lead to higher costs of enforcement of future regulations than the cost of the compensation to the firms adversely affected by the downward revision of an environmental standard.

Unfortunately, history does not leave evidence as a guide to our need for and the extent of compensation. In a case of downzoning for example, owners of the higher uses are expected to bear their losses. High value property owners may fight zoning for lower priced housing, but they eventually have to accept any lowered property values if the ordinance is passed.

We find little useful insight when we look at the initial imposition of such regulations as environmental controls or zoning. They are imposed with the attitude that the common user has been abusing the other users to gain unfair economic advantage and, therefore, no compensation is needed. The gain to the

public is considered to be greater than the loss in this case and no compensation is given. The same assumption is, of course, made for the downward revision. However, in this case there are frequent occurrences of capital losses resulting from publicly mandated capital investment or investment based on the public regulation. Thus, some sort of implicit contract, as discussed earlier, may exist that morally calls for compensation but does not require it.

The above discussion raises two basic issues. The first deals with direct investment to meet the earlier higher standard while the second deals with any secondary cost to the firm that is associated with meeting this standard.

The key point in the direct investment issue is that a downward revision is unlike an upward revision of an environmental regulation in at least two ways. First, the investment is directly – in the case of technology specific regulations – mandated by the environmental agency or is at least forced by this agency in establishing the original standard. Thus, any losses to the firm result from government decisions and not market place decisions. Thus, the losses are arbitrary in nature. The second point is the problem that noncompliers with the original regulation are left at an advantage because of the arbitrary government action. Thus, some offsetting government action is called for on at least grounds of equity if not efficiency. In the case of downzoning, perhaps the higher land use should be taxed at a lower rate with the new zoning. If land use is changed, because of a physical change in the environment, the government usually purchases the land to be changed through negotiation with owners or the eminent domain process. In the case of replacing the meanders in the Kissimmee River, this procedure is being followed [2]. When environmental control capital is involved, the best solution may be for the government to buy back the undepreciated portion at book value (tax record books). Variable costs should pose no problem as they could be ended immediately. However, some human capital costs may be incurred in training maintenance worker and operators of the environmental equipment. In this case, some of the training costs should be absorbed by the government. The above raises the issue of the conversion of the environmental control equipment and its associated work force to meet the new standard. For example, only a lower capacity of operation may be needed. In this case, the governmental agency needs to develop a formula for prorating the compensation for physical and human capital described previously.

The second basic issue is of what to do about secondary capital, both human and nonhuman, expenditures. Since the initial standard sent a signal that the regulation must be met, the affected producers may have undertaken both process and product research and development to lower future costs of meeting the regulation. Admittedly, some of the research and development effort is likely to be applicable to the lesser regulation. However, if the cost of meeting the lesser regulation is lower, the affected producers may not have allocated the amount of research and development funds to this problem that is warranted by the stronger regulation.

A second aspect of the assessment of secondary capital losses occurs when direct government environmental action is taken to change a physical control. For example, the reinstallation of the meanders in the Kissimmee River may do more than destroy the capital investment in pasture improvements on the directly affected land. The capital value of similar improvements on adjoining land may be lost if economies of scale of operation are lost because the remaining tracts are too small. Thus, on occasion when economies of scale are lost by the regulation or contingent investments must be abandoned, a cost of downward revision exists for the producer. Difficulty in measuring these secondary costs, however, may preclude compensation for them.

### SUMMARY AND CONCLUSION

This article has shown that there are welfare redistributions resulting from downward revision of an environmental regulation or action by the government. The costs borne by the affected producers include a loss of capital invested to meet the more stringent regulation, some losses on expenditures associated with the expectation that the original standard would remain in force, and also potential losses of market position to non-complying firms. Governments may also suffer some losses to the extent that they subsidized the investments to meet the earlier standard. The key issue is that the downward revision of a standard is unlike an upward revision. The loss is associated with government mandated capital and is unlike that of a change in market conditions. One could possibly argue that an implicit contract exists between the government authority and the producer who complies with the regulation. This contract allows the producer to plan and expand his enterprise on the expectation of the continuance of the regulation and also protects the producer for unfair practices of competitors who refuse to comply. On the basis of this implicit contract, one could also argue that the firm is entitled to compensation for losses resulting from the downward revision or action of the government. However, problems of measurement probably would allow for compensation to be limited to direct losses resulting from the downward revision.

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