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# REGULATED PUBLIC GOODS

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Regulation of utilities may be considered an aspect of public finance. The regulatory process is effectively a form of taxation and expenditure, under which some consumers may be charged enough to permit subsidy to others.[1/] The process of rate-making by the regulatory agencies also implicitly involves the same economic criteria as purportedly guide public investment decisions, or at least it would involve such criteria if social optimizing were the objective.[2/] This paper examines the tasks the agency would have to perform in order to work toward a social optimum. We are not dealing with the question whether utility prices would be the same under regulated and unregulated conditions. We are considering the problems that would be involved in setting prices that fully reflect social costs and benefits, including externalities.

When the regulatory agency approves rates (i.e. prices of the utility services) it indirectly permits or prevents the provision of certain services currently and certain investments that will provide future service. We assume that the aim is the social good. (We must note, however, that this assumption is not universally adopted by writers in the field.[3/]) If the agency pursued that aim it would be seeking an efficient allocation of

resources. This presents problems that are still in process of solution in the field of public finance and are particularly challenging in a regulatory context.

The regulatory process may itself be considered the public good (or bad) that is to be evaluated. (The term "public good" is used here to refer to collective consumption goods, whether publicly or privately provided.) The benefits (positive and negative) of regulation are available to each consumer, including intermediate consumer, and the enjoyment of the good by each does not reduce the enjoyment by others, except insofar as the regulated service itself suffers from congestion or crowding.[4/] Regulation is a public good rather than a bad only insofar as it effects an improvement in social welfare, an excess of social benefits over social costs. The decisions that have to be made by regulatory agencies in search of the social optimum are similar to public investment decisions that are made in the same quest. The regulated industry essentially submits its service and investment plans to the tender mercies of the regulatory agency when it applies for rate (price) changes. By virtue of regulation, the industry is precluded from responding solely to the operations of the market in making its decisions on providing a service or making an investment.

The services of regulated industries themselves resemble public goods. They do not have all the characteristics of public goods like national defense since there is usually no problem of exclusion -- those who pay get and those who don't, don't. Externalities exist, but of substantially the same order of magnitude, relative to size of enterprise, as in the case of private goods. The similarity to public goods lies in the fact that a

governmental agency, the public utilities commission, is given authority to review or make the major decisions and that agency is purportedly imbued with the public interest. One may say it has an obligation to internalize externalities or enable its wards to do so. In that respect we would expect it to be influenced by the same considerations as purportedly govern any governmental decisions concerning public goods. It is in this restricted sense that we call the services of regulated industries "regulated public goods". (They are not "public goods" as defined above.)

There are special problems in finding monetary measures of costs and benefits and obtaining their present value. Among these (to be discussed in detail below) are: (1) inadequacies of "cost of money" evidence in providing the appropriate discount rate for multi-year projects; (2) limitations of consumer choice in the market for regulated public goods, resulting from the imperfections or monopolies generally involved; (3) redistributive effects of utility investments and services; (4) effects of unemployed resources on the evaluation of costs and benefits; and (5) difficulties in internalizing externalities.

## I INADEQUACIES OF "COST OF MONEY" EVIDENCE

Rate-making proceedings rely heavily on financial testimony directed toward the "cost of money" for the utility. This provides the regulatory agency with information on interest and dividend requirements for the enterprise as a whole. It may guide the body in setting an appropriate rate of return. In any case, it provides information that will help it arrive at rates (prices) that will achieve a given rate of return on the given rate base.

The "cost of money" relevant to rate of return calculations is not necessarily the appropriate social discount rate. Neither the "cost of money" nor the rate of return provides evidence of the relevant public's time preference for the service to be provided by a particular utility investment. The "cost of money" represents the investing public's evaluation of the utility's securities, covering the enterprise's operations and financial characteristics as a whole, not the particular investment project under consideration. In deciding on the allocation of society's resources to a particular purpose, one of the prime considerations is the time preference of the beneficiary public for the service to be provided, e.g. a certain amount of electric power now compared with a certain amount greater in the future. Whatever relevance "cost of money" evidence has for the regulatory function (e.g. avoiding confiscation, attracting capital), it does not give us the discount rate that should be used in evaluating a proposed investment project rather than the enterprise as a whole. This does not mean that there is any bias in the "cost of money" figure. The latter relates to the enterprise as a whole -- all its projects -- rather than a single project. (Analogously, the "cost of money" to a particular governmental jurisdiction is generally not the appropriate discount rate for a particular public project undertaken by that jurisdiction.) Once the enterprise receives approval of certain rates (prices) it will presumably allocate the resulting revenue so as to maximize its position by best satisfying the preferences, current and prospective (through investment), of its customers. Unless the agency correctly determines the rates (prices) it will be providing the enterprise with too much or too little revenue. The suggestion here is

that it should evaluate each project appropriately rather than relying on the "cost of money" to the enterprise as a whole. Then the rates (prices) will yield the revenue that will enable the enterprise similarly to make appropriate decisions concerning each project.

Many interest rates exist in the capital markets. Which should be used for discounting costs and benefits? The differences among rates may arise from "imperfections" or little islands of borrowing and lending activity separated by substantial or prohibitive transaction costs. To the extent that the markets are actually interrelated, it may be assumed, and it has been shown, that differences in risk may explain the differences in rates.[5/] Differences in tax treatment also explain some of the prevailing rate dispersion.

The variety of rates has given rise to an equal variety of suggestions in selecting or compiling a discount rate that may be used in a particular case. For governmental projects the suggestions include the government bond rate, the highest private rate, the rate of interest in the comparable private risk class, and a weighted average of various rates.[6/]

Problems remain even if we somehow select a market rate or combination of rates. The rates of time preference expressed in the market are expressed by those who save and invest. The saving/consumption allocation of those who save are affected by the consumption goods that are available. (Compare the savings that occurred during World War II while shortages of many goods existed). Those who are unable to save do not reveal their marginal rate of time preference except to announce, in effect, that it is higher than the interest rate that they could get if they saved. If fewer goods were avail-

able they might find it worthwhile to save at going rates. But under the existing availability of goods they are not saving. And they are not revealing their marginal rate of time preference in any market rate. Yet their preferences are relevant to any decision concerning the provision of utility services.

The diversity of relevant rates and the need for an arbitrary formula means that the discount rate used can only be a rough approximation to the "true" rate. The use of a single, specific rate for discounting purposes, e.g. the highest private rate of return, avoids but does not solve the problems introduced by the existence of a multiplicity of private rates. There is still the need to resolve the divergence between rates reflecting productivity (e.g. gross rate of corporate return before taxes) and rates primarily reflecting time preference (e.g. rate on government bonds). Both rates are relevant to the social optimum and any differences between them in equilibrium should be explainable. It is hard to resolve this problem other than tautologically insofar as the differences are attributable to transactions costs and not risk.

The complexities involved in finding an appropriate rate or average of rates makes it difficult to avoid error in evaluating public investment or regulated investment projects. The "cost of money" evidence in a rate hearing gives us the rate of return required to attract or keep the capital in the enterprise itself: it is not the rate that is appropriate in evaluating any particular investment project of the utility.

## II LIMITATIONS OF THE MARKET FOR REGULATED PUBLIC GOODS

Employment of a market rate formula does not improve the acceptability

of market rates for unique, pure public goods in an imperfect market for such goods. Devices to allow for the imperfections of the capital market do not deal with the imperfection of the public goods market.[7]

The market for regulated public goods is notoriously imperfect: by law or nature generally only one enterprise provides a given service in a given area. The consumer does not have a choice of a large variety of regulated goods: his choice is severely limited to one or two such in each major category such as water, power, telephone, etc. How or why this has arisen is beyond the scope of this paper. Its significance for public choice is our concern. The preferences and time preferences that the consumer reveals in the market in the free allocation of his budget among various expenditures and savings and the allocation of his time between work and leisure are not necessarily indicative of his attitude toward public goods, including regulated public goods. He can usually consume one or two goods on a take it-or-leave-it basis.[8] He can generally adjust the quantity of the regulated good he takes (hence regulated public goods are different from collective goods) but the variety of goods available to him is severely limited. There may be no realistic counterpart in the unregulated market to the service provided by the regulated utility.

Since the service is usually available on a one-source basis, and since necessaries (i.e. high priority services) are usually involved, the consumer will use the service and adjust the rest of his work/leisure and expenditure/saving decisions accordingly. Thus marginal adjustments of a maximizing nature may be made but within the restricted sphere prescribed by the limited number of regulated public goods available. The monetary

values put on the benefits are affected by the constraints of limited choice. The consumer makes the best of a bad job, so to speak, but the evaluation revealed in his taking of a certain quantity of the service at the price charged does not necessarily represent the optimal (or even an optimal) evaluation from a social point of view. This could result from the agency setting the wrong price by taking too narrow a view of its objectives.

The imperfect nature of the market for regulated public goods particularly affects the selection of a discount rate for the present evaluation of future cost and benefit streams. The marginal time preferences revealed by the interest rates prevailing in the capital markets are not the time preferences appropriate to the regulated public goods. The consumer does not have an opportunity to freely choose among a large variety of goods both unregulated and regulated, now and in the future. Accordingly, we get no clue from the market interest rates concerning the time preference of the relevant population for the regulated public goods. For instance, a particular consumer may be saving and investing some of his income at 6%. This implies that at the margin his time preference is 6%: having chosen among a wide variety of consumer goods he is willing to forgo an additional dollar of consumption in return for a dollar and six cents worth of consumer goods to be chosen freely by him a year hence. That does not tell us that his time preference for the regulated public good to be provided by the proposed utility investment is 6%. He may have a very high time preferance for the particular good involved, say water, and not be at all anxious to wait a year for only a 6% increment.

It may be argued that this is a problem in the pricing of utility

services, now and in the future, rather than a problem in the interest rate, which appropriately reflects present and future demands for money. The difficulty is that the commission has to decide now whether to encourage or discourage the long-term project by the rates (prices) it sets now for current utility services. If it uses the wrong discount rate in evaluating the long-term project, it is likely to provide excessive or inadequate revenues by setting the wrong rates (prices).

Assume that the regulated utility project is unique in that similar services are not available in the private unregulated market, for whatever reason. Consumers have had no opportunity to express themselves on the proposed services in any market context although they may have had an opportunity to appear at a public hearing or write letters to the agency. It is not likely that their time preferences for the services to be provided have been expressed in any way, let alone in any rigorous way. The available market rates do not express the relevant time preferences and a commission hearing is not likely to reveal them.

No market rate, whether on government bonds or private equities, and no combination of market rates, can give us the time preference pertinent to a unique, regulated public good. Use of market rates can only lead to erroneous decisions. Use of an incorrect or inappropriate discount rate in evaluating investments of regulated industries will in turn result in a misallocation of economic resources.

## III REDISTRIBUTIVE EFFECTS OF UTILITY INVESTMENTS AND SERVICES

Any utility service will have some redistributive effect which will in turn alter individual evaluations of the service. Differential rates (prices)

in favor of one group and against another have a redistributive effect.[9] Even if we were able to obtain a useful estimate of costs and benefits before the redistribution, it would have to be revised for the after-investment distribution of income and wealth. This would be a never-ending process since each revision might alter the distribution of wealth and income. The same problem arises in the usual case of public goods.[10] The after-investment distribution will affect the marginal rates of time preference, hence the appropriate discount rate in multi-period projects. Discount rate and "cost of money" data (if used to arrive at a discount rate) based on before-project information is incorrect once the project is in operation. The project and its attendant rates (prices) change the distribution of income and wealth, which in turn change the discount rate relevant to the evaluation of the project.

The utility projects may also modify the basic characteristics of the good (e.g. spillovers), thus inextricably intertwining the problems of allocation and distribution. The same problem arises with any public goods.[11] Of course, private projects may have similar effects but the governmental bureau or the regulatory agency is not then called upon to evaluate the project and decide whether to proceed. The private subjects do that. They do it even with "collective" goods where transactions costs are not prohibitive and the relevant property rights are defined.[12] Where "market failure" occurs, i.e. property rights are unclear or transaction costs are high enough to prevent private negotiation and agreement,[13] the governmental bureau or the regulatory agency is left with the task of estimating the interrelated allocational and distributive effects of the proposed public investment or regulated investment.

"Cost of money" evidence is deficient to the extent that it fails to allow for the redistributive effects and the altered allocative effects of the proposed projects. "Rate of return" based on such cost of money evidence will similarly lead to incorrect results. Rates (prices) set by the regulatory agency can then only result in mistaken decisions on investment projects and a resulting misallocation of resources.

## IV. EFFECTS OF UNEMPLOYED RESOURCES ON EVALUATION OF COSTS AND BENEFITS

The existence of unemployed resources presents a problem in the social evaluation of costs of a proposed public project, including a regulated public project. Of course the problem does not exist if we assume full employment. It does exist, though, even if we treat unemployment of both human and capital resources as a voluntary search for information.[14/] It is still necessary to put a valuation on the resources that are diverted from the unemployed or searching pool of resources. The unemployed or searching factors are not currently being exchanged at a market price and we do not know how far from the prevailing market price they are, i.e., how much search cost they (or their owners, in the case of physical capital) are implicitly undertaking. The difficulty is accentuated if the search process is indistinguishable from leisure to all appearances.

Since wage and price rigidities exist, the social value of the unemployed resources may well be below the market wages and prices. The resources may be unemployed because they are worth less in production than the prevailing wages and prices (which are unresponsive to unemployment). If they are put to work at a money wage or price by virtue of the governmental or regulatory decision, the market wage or price may not be the measure of the

opportunity cost to society. If nothing else, it may be necessary to offset any governmental payments to the unemployed in setting the appropriate opportunity cost. This is done in some cost-benefit studies. A regulatory agency would have a massive task in making the required adjustments from a social point of view. In essence, the agency would be changing its cost valuations according to the prevailing level of unemployed (or searching) resources.

A specific formula has been proposed for the adjustment of the market price of labor according to the level of unemployment.[15/] A certain percentage level of unemployment results in a specified reduction from the market price. A similar procedure might be adopted for underutilized capacity of plant and equipment. The bureau chief or utility enterprise might still have to pay market price but the cost-benefit analysis would use values below the market. The governmental budget-makers or the regulatory agency would have a social budget that would differ from the financial budget. The cost-benefit analysis of the proposed project would use hypothetical figures related, hopefully, to actual data. The regulated utility would, of course, be faced with actual market wages and prices. It would have to accept the level of investment indicated by the agency and based on the hypothetical social calculation. This would tend to enlarge the role of the agency and accentuate the tensions between the agency and the regulated enterprises. Yet there is no alternative if the services of regulated utilities are to be treated like regulated public goods.

The regulated enterprise would have to set the level of investment called for by the cost-benefit calculation based on the factor prices corrected

for unemployment. Its actual cash outlays, however, would be at the higher prevailing market prices. The agency would have to take account of the resulting threat to return on capital in the rates (prices) it sets for the utility services. The juggling of relevant variables is complicated by the concern with social costs and benefits but a workable solution would generally exist assuming sufficient flexibility of demand. It may be that in some cases, proposed investment projects that are now feasible would be found to be socially undesirable, and vice versa.

## V. DIFFICULTIES IN INTERNALIZING EXTERNALITIES

A basic task of the agency that accepts responsibility for social maximizing is to enable the enterprise to take account of external costs and benefits that it would not otherwise consider, any more than any freely operating enterprise would. The utility cannot fully capture, if it can capture at all, the external benefits it confers. If a transit line raises the level of business and property values, only part of the benefit will accrue to the line through increased business. The utility will not be able to collect the full "rent" resulting from the transit line. Yet the regulatory agency would take this into account in its evaluation of social costs and benefits.

A similar problem arises with external costs. If the utility proposed to build a polluting power plant, the impact on the surrounding community would be considered by the socially maximizing agency.

None of this would present a problem if "transactions costs" were zero. The utility could theoretically negotiate in advance with all possible beneficiaries of the transit line and extract the benefits by agreement. Once we depart from the "small numbers" case we must recognize the prohibitive

nature of transactions costs for the efficient private provision of goods whose external component is significant.[16/] Whether the polluter or the pollutee (not to be confused with the polluted) is liable matters for resource allocation when transactions costs are significant (the usual if not universal case) and matters, in any case, for wealth distribution.[17/] The regulatory agency concerned with social maximization or optimal resource allocation and concerned also with wealth distribution (at least as constitutionally constrained to protect the property rights of shareholders) would have to look beyond the external arrangements that the utility would be able to make and enforce on its own. Baumol [2] suggests that in a practical situation a tax on the polluter may lead in the direction of a social optimum when transactions costs are significant. The socially maximizing regulatory agency would implicitly include such a tax in its calculations while evaluating a proposed project. In the case of external benefits it would implicitly include a subsidy or negative tax. The taxes and subsidies would be hypothetical; hence, there would not be a direct incentive effect on the taxpayers or subsidy receivers. It may even pay to use actual subsidies and induce the pollutees to move away by covering all their costs of moving. Similarly, the bestowal of external benefits may induce more beneficiaries to move in, leading to congestion costs, including traffic control, etc. These are all things that the wise regulatory agency will take into account and that the enterprise on its own cannot be expected to take into account fully, if at all, under prevailing property law.

The costs incurred in providing the current service or undertaking the proposed investment present problems of evaluation similar to other public goods. There are the opportunity costs of the resources used plus the

external diseconomies, such as pollution. The regulatory agency must put a value on these if it is to make a decision on the services or the investment in the public interest. Unless required to do so by the regulatory agency, the regulated enterprise would not ordinarily include externalities in its cost calculations. The agency must recognize the externalities as relevant costs and announce that those costs will be included in its calculations and decisions. The enterprises would then be able to include such items in their calculations. In addition, of course, there are the usual problems of finding a value for the external benefits. As in the case of costs, the regulated enterprise would be able to take the externalities into account in its calculations if it were known that the regulatory agency would be doing likewise.

## VI. TASK OF THE SOCIALLY MAXIMIZING REGULATORY AGENCY

The regulatory agencies have a difficult task ahead of them if they accept responsibility for maximizing social net benefits along the lines of this paper. Our earlier suggestion [18/] would have them scrap the rate base/rate of return approach and concentrate on the total number of dollars (as revealed by the cost of money evidence) required to achieve the desired level of service currently and in the future. In order to achieve a social optimum, the regulatory agency will additionally have to define the relevant public for each proposed investment project and try to get a reading on the strength of the preference of that public for the proposed service; and in the case of an investment project, on the rate of time preference. If the particular utility service involved does not already enter the consumption pattern of the public, there is no market rate of interest or combination

of rates that will reveal the time preference applicable to the service. The agency is then unable to obtain a discount rate to use in evaluating the investment project. The "cost of money" refers to the enterprise as a whole and does not give us the project-unique information that we need. At best, it tells us the rate at which investors are willing to lend money to the enterprise. That provides little or no clue to the relevant time preference of the beneficiary population and the discount rate applicable to the investment project. Moreover, the regulatory agencies would have to develop techniques of allowing for interactions between allocation and distribution and for placing lower-than-market valuations on unemployed resources. They would have to deal explicitly with the external benefits and costs resulting from the investment and the resulting services.

Regulated public goods require a decision-making process that resembles that involved in governmental allocations even though the regulated enterprises may be private wealth-maximizing units. The geographic and demographic areas involved may be more or less extensive than political units. Since the justification (assumed here) for regulation is the promotion of the public interest through achievement of a social optimum, the agency cannot very well shirk the duty of making socially-maximizing decisions in the public interest. Yet the agency is handicapped compared with governmental units in that it does not have subsidy and tax powers in the ordinary sense. It can subsidize and penalize through the rates(prices) it approves but it cannot generally make outright cash subsidies and tax imposts applicable to those who do not purchase the utility services.

In order to fulfill its function of promoting the public interest the regulatory agency would have to have the power to make cash subsidies and impose taxes comparable to that enjoyed by political units. Alternatively, there would have to be a revision of property law to enable the enterprise to capture (and the agency to take account of) the external benefits and to require the enterprise to pay for the external costs it imposes on the community. It will be interesting to see which happens more slowly, revision of agency powers or revision of the law of property.

FOOTNOTES

* Valuable comments on an earlier draft were received from Harold Demsetz, who should not, however, be held responsible for the contents of the present version.

1/ See Posner [14]. Cf. Lerner [11].

2/ See Somers [20].

3/ See Hilton [9] and Demsetz [4].

4/ See Buchanan [3] p. 175 and Thompson [22].

5/ See Sharpe [15, 16].

6/ See Hirshleifer and Shapiro [10].

7/ See Somers [21].

8/ Ibid.

9/ See Posner [14].

10/ See Weisbrod [23].

11/ See Buchanan [3] p. 181.

12/ See Lindsay [12].

13/ See Arrow [1].

14/ See Phelps [13].

15/ See Haveman [7].

16/ See Buchanan [3] pp. 174-177.

17/ See Demsetz [5, 6].

18/ See Somers [17, 18, 19].

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