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Privatization, Competitive Entry and Rational Rules for Residual Regulation

William J. Baumol

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1997 Annual Giblin Lecture*
30th September 1997

Privatization, Competitive Entry and Rational Rules for Residual Regulation

by

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Giblin Lecture Series
Hobart, Tasmania

September 30, 1997.

1997 ANNUAL GIBLIN LECTURE

6 pm, 30th September 1997
Lecture Theatre 1
Commerce and Economics Building

ORDER OF PROCEEDINGS

1. Mr John Streeter, the Academic Dean of the Faculty of Commerce and Economics, will welcome the Lecturer and audience.
 2. Dr William Coleman, of the Economics Department, will say a few words about LF Giblin.
 3. Mr Stuart James, the President of the Tasmanian Branch of the Economics Society, will introduce the Lecturer.
 4. Professor William Baumol, of New York University, will speak on "Privatisation, Lightened Regulation and Rational Policy".
 5. Professor Ranjan Ray, of the Department of Economics, University of Tasmania, will propose a vote of thanks.
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The Giblin Lecture and Lyndurst Faulkner Giblin

When the Economics Department decided to organise a annual public lecture by a distinguished economist, the decision to call it the L.F. Giblin lecture was irresistible.

Lyndhurst Faulkner Giblin was a Tasmanian, an University man, an advisor to government, economist concerned to reasoning about practical economic problems.

He was a man of many gifts.

Before revealing his special, gift for economics, he proved his talents in widely different paths of life.

Before the age of 50 he was scholar at Kings College, Cambridge; a lumperjack in British Columbia he prospected for gold in the Klondike; he won a seat in the Tasmanian parliament; and he played rugby for England.

In these pursuits, he demonstrated initiative and courage. In 1898 he endured -50 degree temperatures to rescue a party of starving miners trapped in the snows of Alaska. In 1899 en route from Vancouver to Melbourne, he taught himself navigation, and piloted his vessel through the rips of Port Phillip heads.

In 1914 he volunteered for the Australian Imperial Force. Three times he was severely wounded in combat on the Western Front. He was awarded an M.C. for "conspicuous gallantry". He remained a firm opponent of conscription.

In 1920 he became an economics adviser to the Tasmanian government; the first such adviser in any government in Australia.

In the 1920s he was "decisive" in establishing the School of Economics at the University of Tasmania (the first such school in Australia). He was instrumental in making the University of Tasmania the centre of economic studies in Australia in the 1920s.

In 1938 returned for sabbatical at Kings College. He was made a Supernumerary Fellow by Keynes ("an academic distinction above all others"). A Giblin Studentship was also established by Keynes.

He died in 1951.

He made many contributions to theory and policy.

- 1. In 1939 he devised the Special Reserve Deposit scheme, which was to be an important arm of monetary policy for 50 years.*

2. *His research into the taxable capacity of Australian states instigated the creation of the Commonwealth Grants Commission in the 1920s.*
3. *In 1929 he coauthored "Brigden Report" with James Brigden, which drew attention to the nexus between protection and distribution. This came to the attention of the labour economist, Marion Samuelson, and thereby to the attention of Paul Anthony Samuelson. Giblin may be considered an inspiration for the Stolper-Samuelson theorem.*
4. *In 1925 he began to discuss with Tor Hytten and James Brigden (two Economics department members) an idea which would become known as "the multiplier". In 1928 he wrote up the idea in an unpublished manuscript. In 1930 he published his exposition the multiplier; a year before Cambridge multiplier.*

His memorialists record him as, "shrewd but not cynical", "fearless... but never aggressive", a man with "many critics but no enemies", "a natural leader of men", "a superb teacher", and "a fabulous old man, who ... good judgement, clear thinking and intellectual honesty ... almost single handedly founded an Australian political economy".

Giblin was brought to political economy by his allegiance to reason and sympathy to humankind. Giblin was preoccupied with democracy; he wanted to make democracy work; and not sicken on quack remedies.

In 1930 as Depression gathered force, Giblin published in 16 Letters to John Smith on economic questions: unemployment, debt, banks, monetary policy. In these letters he was concerned to present reasoned facts on a topical issue to a public audience.

The Giblin Lecture is in the spirit of his letters to John Smith. The 1996 Giblin Lecturer was Professor Geoffrey Brennan, topic: "The Economics of Politics And the Politics of Economics". The 1997 Giblin Lecturer is Professor William Baumol, topic "Privatization, Competitive Entry and Rational Rules for Residual Regulation".

*William Coleman
Department of Economics*

Giblin Lecture: Introductory Address

I must admit that it was with some trepidation that I commenced the process of trying to get Will Baumol to come to Tasmania.

It is not everyday that you approach one of the giants of your profession to seek an audience - I suppose that it is a bit like a parish priest writing to ask the Pope to say Mass in a village church.

I am happy to report - and you can plainly see - that Will accepted our invitation, and I would like to put on the record my enormous appreciation for the patience and good humour with which he has dealt with my innumerable faxes and e-mails in the process of arranging his visit.

Although this is not Professor Baumol's first visit to Australia - he previously spent a month at Monash University some 15 to 20 years ago - it is his first trip to Tasmania.

Will, I hope that you and your wife like what you have seen of our small island treasure so far, and that, perhaps, one day, you may be able to return for a pure holiday, rather than the working holiday of this trip.

I have always believed that I had an enormous amount to learn about economics, and that if I worked very, very hard for a long, long time I might just make a small dent in the surface of learning.

Having studied Professor Baumol's C.V, I now realise how impossible a task that is - because at the rate of learning of which most of us are capable, we could not hope to reach even one-tenth the level of knowledge possessed by Will, even if we devoted a lifetime to study.

My hoped-for dent, will be barely a scratch.

To summarise Professor Baumol's achievements merely as "substantial", is an understatement akin to suggesting Jack Nicklaus is merely "a better than average golfer".

William Baumol has been shooting course records for 50 years and he is still at the top of his game!

Professor William J. Baumol was educated at the B.S.S. College of the City of New York and gained his Ph.D. from the University of London in 1949.

In 1949 he was appointed Professor of Economics at Princeton University and became Emeritus Professor in 1992.

In 1971 he was appointed Professor of Economics and Director of the C.V. Starr Center for Applied Economics at New York University - where he is still based.

He is the recipient of at least 20 major Awards and Honours, including (among many others):

- Honorary Doctorates from Rider College,
- the Stockholm School of Economics, Knox College
- the University of Basel and
- numerous fellowships.

He is also a notable member of several professional Societies and Associations.

Professor Baumol is listed as the author for over 30 published books - and I am sure has made substantial contributions to the work of many others. In addition to this he has authored some 400 articles published in professional journals.

Professor Baumol has also taught in wood sculpture.

It would need far more time than we have available this evening to list all of Will's achievements. So, in order that we may listen to the wisdom of Baumol, instead of the rambling's of me, we will move on.

Ladies and gentlemen, to deliver the 1997 (Tasmanian) Giblin Lecture, it is my great privilege to welcome Professor William Baumol.

Stuart James
President
Economic Society (Tasmanian Branch)

Privatization, Competitive Entry and Rational Rules for Residual Regulation

William J. Baumol*

Until quite recently, regulation of prices, investment decisions and other standard activities of the business firm was carried out predominantly in the U.S. Now, as the free market economies have turned away from nationalisation and have sought to extend the degree to which market forces guide the economy, regulation has, paradoxically, elicited substantially more attention than before. Something similar has happened in the United States, where a resolve to deregulate and to rely on competition to do the regulator' s job has raised the same regulatory issues that have come to the forefront elsewhere. The issues can be expected to grow even more critical as countries begin to carry out the Telecommunications Agreement of 1997 under which some 70 countries have committed themselves to open their telecommunications markets to invasion by foreign rivals.

Here I deal with the reasons for this resurgence of interest in regulation. Then, I will turn at greater length to the opportunities for rational and irrational action in the regulatory arena, stressing how much guidance has already been contributed by economic analysis. However, this brings up the most disturbing issue in the arena under discussion, the propensity of even well-intentioned public servants to sabotage the market mechanism. It is they who are likely to have made the privatized firm into a monopoly. It is they who, believing that they are encouraging competition, create what are, in effect, governmentally sponsored cartels, in which there coexist many enterprises, each of which is prohibited from competing with the others, and in which the most inefficient of the firms in the industry are kept alive at the consumers expense by impediments to price reductions by more efficient rivals. It is the well-meaning civil servants who, paying lip service to the market mechanism, but distrusting it profoundly, seek to take away the power of the privatized firms to make decisions for themselves, under the constraining influence of market forces. Finally, it is they who are prone to

* Director, C.V. Starr Center for Applied Economics, New York University and professor emeritus, Princeton University. The author is deeply grateful to the Alfred P. Sloan Foundation and the C.V. Starr Center for their support of this work.

restrict the profits of the privatized firms and the incomes of their entrepreneurs, without recognizing that they are thereby destroying the very engine that can in time yield the benefits so widely expected to flow from private enterprise.

The main reason that supposedly deregulated firms in the U.S. and privatized firms in the remainder of the industrial world have attracted regulation is straightforward. Very soon after they are released to control by the market mechanism, or even before that, it is recognized that many of these enterprises possess or seem likely to possess substantial market power that will enable them to exploit consumers through excessive prices and that will enable them to destroy or thwart competition by strategic and temporary price cuts and other destructive devices. It is generally recognized that these powers can undermine the workings of the competitive market and deprive the public of its benefits. The fact that so many of the privatized or deregulated firms turn out to possess substantial monopoly power is, moreover, hardly accidental. Rather, the process by which they have been chosen systematically selects firms likely to have market power, so they are apt to elicit the attention of regulators or other government agencies that can impose regulation upon them. Let us, therefore, begin our discussion by noting why monopoly power is so prevalent among privatized and "deregulated" industries.

I. The Tendency To Monopoly in Western Firms Picked for Privatizing

There are at least three reasons why a considerable proportion of the candidates for privatization have been farmhouse with monopoly attributes, none of them accidental.

1. Monopolies as Targets of Previous Nationalisation.

In the free enterprise economies, monopolies and near monopolies have been prime targets of takeover by government, so that when it was proposed to return nationalized firms to the private sector it is not surprising that a considerable proportion of the group of candidates had either a monopoly position or some degree of monopoly power. Public utilities are strongly represented in the group, for example.

2. Management's Desire for Protection from Competition.

A second powerful influence that skewed public enterprises toward monopoly has been the predictable behavior of their management's. Public sector management's, like most persons, enthusiastically favor competition when it affects others, but not when it constrains themselves. So, governmentally owned firms were often protected by law from all but the most insignificant forms of rivalry.

3. Competition Undermines Popular Cross Subsidies.

A more subtle influence skews the nationalized firms toward possession of monopoly power. Partly in response to political pressure, the agencies that run them, like the regulators in the U.S., have strongly and persistently favored a policy of "universal service," meaning, roughly, maximization of the number of household customers. It is considered bad policy for public agencies such as the postal service to require those consumers whom it is particularly difficult to supply to pay the high cost of serving them; rather, the same price is to be offered to everyone, whether expensive or cheap to supply. In addition, prices to residential customers as a group may be set so low that they do not cover the cost of serving them, with the shortfall made up from high prices to business customers. Characteristically, all this ended up in a complex system of internal cross subsidies, with an electric utility, for example, required to charge big business customers prices sufficiently high to cover losses incurred in serving isolated farmers or inner city user firms or household customers in general.

However, such cross subsidies are incompatible with competition and free entry. New rivals in electricity, for example, can be counted upon to focus their sales efforts upon the highly profitable business customers. So those high profits are soon forced down by competitive pressure, and the original incumbent finds itself deprived of the source of funds to make up for the losses incurred in serving more distant firms and households. To avoid this, those who set the rules for the operation of nationalized firms, like the regulators in the U.S., found a variety of excuses to prohibit competition and

entry. This contributed to the frequency with which candidates for privatization turned out to be monopolies.

The result of all this is that when a government enterprise is transferred to private ownership it often finds itself suspect. Its goals are often taken to be exploitation of the public and subversion of competition, and it is widely judged to have the power to attain those goals. The forces of the market are deemed, sometimes with good reason, to be too weak to constrain that enterprise adequately. Hence, private it may be permitted to become, but only under the heavy hand of regulation. Individuals are allowed to own it but they are given little opportunity to control it.

The presence of market power may then make regulation unavoidable, at least until competition can arise and become sufficiently strong to constrain the privatized enterprises effectively. But regulation, as is well known, is hardly costless, and its actions can often be damaging to the public interest that it is intended to protect. Aside from the costly record keeping and paper work and other direct administrative burdens it engenders, it is likely to give rise to continuing and expensive litigation that diverts the attention of management; it is certain to delay the adoption and execution of decisions, so that the actions of the firm are condemned to lag behind changes in market conditions; perhaps worst of all, incentives are likely to be distorted, so that the motivation for efficiency, innovation and proper pricing is attenuated if not altogether removed.

A major difficulty besetting the regulatory process has been what amounts to distrust of the market on the part of the regulators, even those who consider themselves to be avid partisans of the free enterprise system. The regulatory agency resists attempts to offer any significant range of discretion to the management of the privatized firm in making its economic decisions. Prices, accounting methods, perhaps investment and other decisions are constrained closely, so that the firm may find itself left with less freedom to act and the market with less influence over those acts than they possessed when the enterprise was a property of the government.

II. Recipes for Misguided Regulation

However, perhaps the most serious regulatory burden is caused when the rules are poorly designed. One encounters in some form in the regulation of the newly privatized enterprises virtually all of what economists consider to be the mistakes that had long plagued regulation in the United States. Thus, the following list of questionable actions will seem familiar to those who have studied American regulatory history.

(i) Prevention or limitation of Effective Competition

One of the central problems that has plagued the adoption of rational regulatory policy has been the conflict between two of its goals -- the encouragement of competition and the promotion of universal service. Competition, as we have just seen, is incompatible with retention of the cross subsidies that are valued so highly by many regulators. This can impel regulators to adopt rules that protect the cross subsidies by undermining or prohibiting competition.

Thus, in a report on privatization in the U.K. *The Economist* tells us that:

More subtly, the government has modified its policy. The original plan was to open [rail] passenger services to competition...[with] trains...run by franchised providers, offering competing services on each line....The government is backing away from that. Its fear is that the entrepreneurs would pick the best peak time services. Off peak services would be left to British Rail, or disappear altogether.

SoOnly on a few routes will "open access" (that is, competition) be allowed. Even in those cases, the core service will be provided by one operator who will be eligible for government subsidy. Any other operator running a train on the route will have to compete without subsidy....

[Another] big privatization, that of the Post Office, could soon get a green light....[But ministers] worry that privatization threatens the universal postal rate, which ensures that it costs the same to post a letter to any part of Britain.

The Economist, [1993 p. 53]

(ii) Ossification of Cross Subsidy

Cross subsidy is also sometimes preserved by other means. For example, when New Zealand Telecom was transferred to private hands, a condition of the sale was that the firm taking over the company from the government continue the price advantages the nationalized predecessor firm had offered to residential subscribers. This stipulation,

referred to as "the Kiwi Share," is believed to entail losses in at least some of the residential services. Profitability of the enterprise then requires a cross subsidy from other customers of New Zealand Telecom, presumably the business subscriber. This has led to litigation with Clear Communications, the new rival of Telecom, as to whether Clear should somehow bear part of the cost burden.

(iii) Imposed Cartelization

Despite the fact that continued monopoly permits retention of the politically popular cross subsidies, the monopolistic character of many of the privatized firms has elicited a schizophrenic reaction from regulators. Since monopoly is accepted as an evil, many of them have undertaken to destroy it by the introduction of competitors into the regulated industry. But apparently driven by a desire to have it both ways, they have in at least some cases ended up with an arrangement entailing a multiplicity of firms as well as continued cross subsidy. In what appears to be a compromise they have carried out what the U.S. courts have described as "protecting competitors while undermining competition." This they have done by imposing some form of cartel arrangement upon the industry, one in which continued coexistence of two or more firms is ensured, but none is given the freedom to compete with the others in prices and related matters. Where this is done, cross subsidy need not be threatened, since each of the firms in the market can confidently offer a number of services at prices that exceed costs substantially and then provide the profits that can finance the desired subsidies to other services.

This is sometimes accomplished in subtle ways. For example, the price ceilings imposed on British Telecom have resulted in very low prices on rental of telephone lines for which the company felt forced to make up by means of high prices on number and duration of calls. Large business customers normally keep their lines very busy with calls, resulting in a high call/line ratio, so that this pricing arrangement made it difficult for British Telecom to compete for business customers with its relatively unregulated rival, Mercury. The call/lineratio pattern is reversed for residential and small business users, so that Telecom found itself with a considerable price advantage in this segment of the market. The result was virtually a split market, with Mercury in effect assigned the large-volume business customers, with near immunity from competition, while Telecom found itself in the same position in the residential market. It was as though Mercury had

been assigned an exclusive license for operation in Scotland, and Telecom had received the same for Wales.

The net cost to society of imposition of a cartel arrangement is likely to be high. It clearly does little or nothing to curtail monopoly power. In addition, it creates inefficiencies that a monopoly is likely to avoid. For any particular segment of the market may not happen to be assigned to the firm that can serve it at lowest cost. Moreover, in a cartel there may be costly replication of facilities, and facilities that are withdrawn from service by each firm because of the limited market segment assigned to it may not be those that are the most inefficient in the industry. That is, plant A of firm X that is shut down may be more efficient than firm Y's plant B that continues in operation. Yet the regulator whose actions have created such a cartel is likely to congratulate himself for having injected competition into the arena without endangering universal service.

(iv) Imposition of Avoidable Regulatory Risk

Risk is costly to firms and that cost is usually passed on to consumers, at least in part. In addition to the risks that normally face an enterprise, the regulated firm faces the danger that regulators will change their minds and behave in a manner not foreseen by management. This means that managements may have made costly errors in their decisions, errors that could have been avoided if the regulators had given earlier notice of their future courses of action. This is true of all regulation but it affects privatized western firms in a distinctive way. When the regulatory agency oversees entry it usually does what it can to give the new firm a chance to survive. An infant-firm argument often leads the regulator to extend special protection to the new enterprise, intended to continue until that firm attains "maturity" and acquires strength sufficient to enable it to fend for itself. The privatized firm -- the earlier sole incumbent -- may, for example, be required to supply services to the entrant at especially low prices, or to offer it other forms of implicit subsidy. These presumably will be phased out at a suitable time, but normally no date is specified, nor is anyone told the precise circumstances when that will occur (e.g., when the entrant's sales reach X percent of the industry's). No one is told whether subsidies will all be removed at once or whether it will be done gradually, and if the latter, at what rate. All this imposes unnecessary uncertainty not only upon the

privatized firm, but also upon its new rival. And as usual, much of that cost will be borne by consumers.

(v) Pointless Restriction Upon Managements Freedom of Decision

The large privatized firm is predicably distrusted by the regulator. Even when the latter adopts rules ostensibly designed to reduce restrictions upon management, steps are often taken to curtail that freedom or eliminate it altogether. For example, regulation has in recent years made use of floors and ceilings upon prices, with the bounding magnitudes based in a rough and ready way upon economic analysis (see below). This suggests that once such limits are determined the privatized firm will be left free to select the intermediate price that best suits its interests and changing market conditions. However, regulators are often shocked that management should be given such unrestricted license. They seek to narrow the firm's options further, or require a waiting period before the proposed prices can be put into effect, or subject the prices adopted to ex-post review and possible penalties. There are at least two costly consequences. First, it restores a feature of traditional regulation which has long been criticized -- the delays it imposes on the decisions of the regulated firms and the resulting lag in adaptation of its decisions to evolving market conditions. Second, it all but removes the influence of the market upon the firm's price-setting process and its economic activity more generally.

(vi) Adoption of Discredited Regulatory Criteria

The privatized firms often find themselves regulated with the aid of accounting conventions, notably fully-distributed (or allocated) costs, that are universally admitted to be arbitrary, that only by happenstance will bear the slightest resemblance to the costs economic analysis has shown to be pertinent to economically efficient decisions, that undermine incentives for innovation, and that often serve as protectionist devices undermining true efficiency. Fully-allocated costs are the accountants' attempt to provide figures resembling average costs for each of the firm's products in a multi-product enterprise. The results are always arbitrary because there are typically substantial costs fixed and common to two (or more) company products, A and B, and there is no way based on the pertinent facts to determine what share of those costs is properly attributable to A, and what share to B. The result is that speciously associated criteria,

e.g., the value of the output of A relative to that of B, or the relative weights of the products, are used to apportion those costs arbitrarily. Because the resulting figures generally bear no resemblance to marginal costs or any other real and pertinent cost figure, prices based by the regulator on fully distributed costs will generally lead to outputs, sales, investment levels, etc., that have no resemblance to those required for economic efficiency. Because regulatory prices based on fully distributed costs are set with absolutely no consideration of the different demand conditions faced by the various products those prices often prove uncomensatory. Because such prices are "cost plus" in character, they eliminate any incentive for process innovation or other cost cutting efforts. Moreover, because of their arbitrary character, the fully distributed cost figures lend themselves to manipulation and they have often been used in litigation before regulatory agencies by firms determined to protect themselves from the setting of low prices by more-efficient rivals. All this was experienced in the U.S. for many decades and it is now being re-enacted in other economies.

III. Are More-Promising Regulatory Principles Available?

(i) The New Regulatory Principles

Out of the discussion in the literature of economics that accompanied and followed deregulation in the U.S. there has emerged a new body of principles for the guidance of economic regulation. These principles are designed to minimize interference with economic efficiency, to expand the role of the market as far as seems advisable in areas of the economy where the strength of competitive forces is suspected of being inadequate and, incidentally, to reduce litigation. There is reason to believe that what may be dubbed "the new regulatory principles" have, at least so far, largely lived up to their promise, and lightened the burden of regulation significantly, while contributing to efficiency.

(ii) On the Objective of Economic Regulation

This is not the place to lay the underlying principles out in any detail, but they can be summarized rather briefly. The guiding premise is that the sole purpose of economic regulation is to facilitate and encourage effective competition where that is feasible, and to provide an effective substitute for competition where that is not possible, at least for

some substantial period. If it is agreed that this is the proper task of the regulators, then two things follow at once. First, it is their obligation, in markets where the strength of competition is deemed inadequate, to constrain regulated firms to adopt only such decisions and act only in such ways that effective competition would permit. That is, the regulators must permit firms to choose only among courses that would be open to those enterprises if, contrary to fact, the markets had been effectively competitive. Second, it follows from our specification of the regulators' underlying role that they must not constrain the firms under their jurisdiction any further than this, that is, the regulators must accept a self-denying ordinance obligating them never to prevent managements from any action that they could have carried out in an effectively competitive market.

The task of the regulator, then, consists of two parts. First, it must determine which choices competitive markets do and which they do not leave open to firms, and second, it must adopt procedures to ensure that the firms will act in a manner consistent with the competitive standard. The literature of economics provides considerable help in carrying out the first of these task, for it contains very substantial discussions of the behavior of competitive industries. Here, one caveat applies. The industries containing newly privatized firms will often be characterized by scale economies, at least up to some rather substantial level of output. Hence, a large multiplicity of firms probably will neither be feasible nor desirable, and marginal cost pricing will very likely be incompatible with solvency of the firms. Thus, the competition that serves as the standard for regulators here is not the model of perfect competition. Rather, the equally theoretical concept of perfect contestability, with its totally unimpeded freedom of entry and exit, must serve as the model because it is compatible with the presence of scale economies and the existence of only a small number of firms, and contestability theory does lay out the requirements of economic efficiency in such circumstances.

(iii) The New Rules for Price Regulation

We can now summarize very briefly the rules and principles that emerge from the analysis, expanding the discussion of those whose logic or operation requires explanation.

1. Prices should not be permitted in the long run to exceed the levels that in a perfectly contestable market would make entry profitable, entry that would

subsequently drive those prices back down. These price ceilings are referred to in the literature as the "stand-alone costs" of any product or combination of products.

2. In order to prevent deliberate destruction of competitors, prices should not be permitted to go below those that would be viable for any substantial period in a competitive or contestable market. This generally means that those prices should not fall short of the marginal cost of any product or the per unit incremental cost of the entire output of any homogeneous product.
3. Because in a contestable market one may encounter prices close to the stand-alone cost ceiling or the marginal-average incremental cost floor, the firm should be left free to adopt any price within these limits, adjusting that choice to current demand conditions in accord with the judgment of management.
4. As an incentive for growth in efficiency and productivity, ceilings on profits are to be removed, with price ceilings substituted for them. But those price ceilings are not to be adjusted downward immediately after any reduction in costs the regulated firm is able to achieve. This delay gives the firm an automatic reward for enhanced efficiency.
5. When inputs are supplied by a regulated firm, both to itself as a component of one of its final products, X, and to a competitor producer of X, then the regulated firm should charge the rival the same price for that input that the former implicitly charges to itself. This rule is called "the parity principle," "the efficient component pricing rule (ECPR)." The price of the input should equal the (incremental) cost entailed in supplying it, as usual in a competitive or contestable market, including any associated opportunity cost. That opportunity cost, in the circumstances under discussion here, includes any profit, aside from monopoly profit, the regulated firm forgoes by the sale of a unit of input to its rival because that permits the rival to take away some sales of final product X.

These rules lead to regulatory behavior very different from that often encountered by privatized firms. But even where the new rules have been adopted ways have often been found to prevent them from working as they should. Let us turn to a significant example.

IV. How to Undermine the New Rules: The Case of Price Caps

One of the major criticisms of the old regime of regulation by profit ceiling was the very limited incentives that it provided for innovation and other measures to improve product quality and enhance the growth of productivity. The ceiling on the regulated firm's rate of return is the obvious way to prevent monopoly profits, but it automatically deprives the firm of efficiency incentives because it also prevents any profit reward for a superior performance in growth of productivity or product quality.

This is in marked contrast to the profit experience in unregulated competitive markets where firms whose productivity performance is below the norm can expect to suffer financial losses, while the company whose performance in these areas is outstanding can expect substantial compensation in additional profits it earns by its superiority over its rivals. Attempts to offer rewards for superior performance under earlier regulatory regimes generally ran into a difficulty that often proved insuperable. Measurement of the efficiency of operation of a firm is exceedingly difficult to carry out or even to define. It cannot be done in terms of costs alone because costs are often affected profoundly by developments outside the industry and often the firm can reduce costs simply by cutting product quality. Moreover, product quality itself is difficult to measure, particularly when it entails a variety of attributes of the good or service supplied. As a result, regulators generally failed in their attempts to rate the regulated firms in terms of efficiency and quality of performance and to modify their financial returns accordingly. As will be shown presently, the price cap approach obviates the need to undertake any direct measurement of the performance of the regulated firm and to calibrate a suitable reward or deterrent for difference in performance among firms. Like the free market, it provides appropriate rewards and penalties without detailed regulatory intervention or oversight.

What is a price cap and where is it currently used? A price cap is a moving ceiling over some price or over the average of some group of prices that is automatically adjusted for inflation in accord with some fixed formula, but in which the ceiling is adjusted upward at a rate some amount X, lower than the actual rate of inflation. The difference between the rate at which the ceiling increases and the actual rate of inflation is intended to approximate the industry's normal productivity growth, which obviously can serve as an offset to the rising price of fuel, labor and other inputs.

Price caps are increasingly being used by regulatory agencies as a means to move toward "light-handed regulation" while continuing to protect the public interest against abuse of market power. This approach is now employed in the United States by a number of agencies including the Federal Communications Commission in its regulation of long-distance telephone charges, in Great Britain in regulation of electricity, telecommunications, airport fees and in a number of other uses. It is in use in Argentina and a number of other countries.

Price caps force regulated firms to pursue increased productivity relentlessly, for under a price cap regime the firm that falls behind in the productivity race is automatically condemned to experience losses, while only the firm that beats the productivity norm can earn a return greater than the normal competitive earnings rate. The way that price caps do this is straightforward. By raising price ceilings at a rate equal to the rate of inflation of industry input prices, minus the "X deduction" that is meant to correspond to normal productivity growth of the industry, price caps make it possible for a regulated firm to continue to earn a profit equal to the competitive rate if and only if its current productivity performance just matches the X percent norm. If input prices are rising 6 percent per year and average industry productivity growth offsets the resulting cost increase at a rate of $X = 2$ percent a year, then the firm that matches the industry average will experience a 4 percent net increase in cost. In these circumstances the price cap will also grow at $6 - 2 = 4$ percent per year, so that this regulated firm, with its average performance, will be able to match its prices to the 4 percent increase in its costs. However, a firm with a superior productivity performance, say, one that achieves a 2.5 percent growth, will experience a cost increase of only $6 - 2.5 = 3.5$ percent, which is less than the 4 percent rise in the formula-driven price cap. The difference can accrue to this productivity-achieving firm in the form of additional profit that serves as a reward for its contribution to the economy's dynamic efficiency. For exactly the same reason, a firm that is a productivity laggard in this industry will experience cost increases more rapid than that of the price cap and so such a firm will undergo a corresponding loss of earnings.

In this way, a price cap puts the regulated firm under constant and unrelenting pressure to beat the norm in its productivity performance and never to fall behind the norm. The result is a substitute market incentive for each firm to work determinedly for

improvement in economic efficiency. It is this incentive that traditional regulation failed to provide.

The record of price caps has been impressive. Where they have been adopted, prices have fallen, at least in real terms, and standards of service have improved dramatically. For example, in Argentina, according to A. Herrera (1989), from 1950 to the date of privatization unsatisfied demand usually was about 45 percent of the total number of lines already installed. The annual installation rate varied between 6.000 and 200.000 new lines. In contrast, between 1991 and 1994 an average of 670.000 new lines was installed each year. At the time of privatization unrepaired breakdowns were 5.3 percent of lines in service; only one year later, this figure had dropped to 0.9%. In this period the number of breakdowns per 100 public pay telephones dropped from 11.5 to 2.7. Delay in customer repair was 16.4 days in 1990 and 1.2 in 1995. Predictably, with lower costs and more attractive services, the profits of the firms increased substantially under the price cap arrangement, just as was intended to follow superior performance. But instead of being interpreted as an appropriate reward, the high profits were considered obscene and popular pressure arose for measures to restrict them, in effect returning to a profit ceiling regime.

In the ensuing debate it was noted that huge investments had been sunk by the privatized firms, having been induced to do so by the promise of high profits. But it was argued by those who pressed for the government to retract its profit commitments that it was too late for the private firms to withdraw their investment outlays. These scenario has recurred in many of the countries in which privatization has been carried out. The recent history of the telephone industry in Great Britain illustrates the point. The prices charged by British Telecom, the privatized former state monopoly, were regulated under a price cap regime with its "X deduction" intended as a reward to consumers as their share in any earnings the company could obtain via growth in its productivity. Thus, the higher the X deduction is, the lower is the profit that the company is to keep. According to one report:

At the time of privatization [1984] the X factor was set (until 1989) initially by the government (not the regulator) at 3 percent... [however] In a subsequent Price Review [by the regulatory agency,] OFTEL (1988)....The general X deduction was raised from 3 to 4.5 percent....

These new arrangements were supposed to stand for a duration of four years, in the middle of the review period, however, a White Paper (Department of Trade and Industry, 1991) announced....

A further intensification of the main price cap, with X being raised from 4 to 6.25 percent

But one year after the White Paper's appearance, OFTEL (1992...) Initiated another Price Review, which predetermined the parameters of the Telecom price cap regime for the period running from mid-1993 to mid-1997. This involved: A further turning of the screw in the main price cap, with the imposed reduction in real prices intensifying from 6.25 to 7.5 percent per annum.

John Burton, "*The Competitive Order Or Ordered Competition?*", University of Birmingham Business School, and, unpublished, pp. 13-14

In sum, in a period of eight years the government went back on its promised profit arrangement no less than three times, each time raising the X deduction well before the announced period of duration of the preceding X deduction figure had expired. Overall, the X deduction was more than doubled from an initial 3 percent to a 7.5 percent figure in 1992 .

Here it is illuminating to take note of the conclusions of President Clinton's Council of Economic Advisers -- certainly not a group that can plausibly be accused of having been co-opted by the regulated firms -- as expressed in the January 1996 Economic Report of the President. They write:

"The equity reason for doing so is clear, but there is also a strong efficiency reason for honoring regulators' promises. Credible government is key to a successful market economy, because it is so important for encouraging long-term investments."

When, in the future, investment resources are required by the regulated firms for expansion, maintenance or modernization they may find investors willing to provide the funds only at a very much higher price than would have been paid for them otherwise, as insurance against the risk of repeated exercise of the demonstrated untrustworthiness of government commitments.

IV. New Regulatory Principle 2: Price Ceilings and Price Floors

The selection of appropriate constraints on pricing is the most obvious issue that arises when regulating a firm, including a newly privatized firm. The firm must not be permitted to charge prices that are excessive, and yield monopoly profits by exploiting consumers. But it also must not be permitted to charge prices so low that they can destroy any new competitor, prices that no competitive firm would accept for any substantial period. We have already seen what is indicated for this purpose by contestable market analysis. We have noted that no firm in a perfectly contestable market will be willing in the long run to supply any product at a price below the incremental cost of that product, because only a price equal to or above the incremental cost of the product will enable the firm to recover the cost that is caused by its decision to supply that product. Consequently, incremental cost becomes the regulatory price floor that the analysis gives us. Similarly, stand-alone cost is the appropriate ceiling over prices, according to the analysis, since no price above stand-alone cost can persist for any significant period in a perfectly contestable market. That is so because, by definition, any price above stand-alone cost will attract entrant competitors who will be able to take the business away from the firm with these high prices. To summarize, the contestable markets rule that at least some regulatory agencies have adopted to constrain pricing by firms considered to have market power is the following:

No price is allowed to be higher than stand-alone cost and no price is allowed to be lower than incremental cost, but any price in between these two levels is permitted.

These rules guarantee consumers that they will pay no more for what they buy than they would in a market that is very competitive as a result of perfect freedom of entry. Moreover, potential competitors are guaranteed that their entry will not be blocked by cross-subsidized prices below the minimum level that competitive firms will accept in the long run.

This conclusion solves the price regulation problem in principle. But how does it work out in practice? One legitimate concern, for example, is whether anyone in reality knows how to calculate stand-alone cost. The answer is that since the ideas just described first appeared and began to be used by courts and regulatory agencies, these calculations have been made with increasing frequency by regulated firms or their competitors or their customers and have been submitted by them to courts and

regulatory agencies. Indeed, there are now research firms in Washington and elsewhere that specialize in collection of the required financial and output data and their use in providing incremental and stand-alone cost statistics.

But economic theory goes beyond just suggesting such rules. It can sometimes help in making the required calculations. The price-floor price-ceiling issue is a clear example. There the analysis has provided a number of short cuts that can greatly facilitate the calculations. Only one of these will be described here. There is a theorem derived from the analysis showing that it is unnecessary to calculate both the firm's incremental and its stand alone costs. Either of these calculations alone will do the job, because if the firm is earning no more than competitive profits overall and none of its prices are below incremental costs, then none can possibly be above stand alone costs (and conversely). So, to enforce the price ceiling and price-floor rules, the regulator only needs data on the firm's rate of return and either its incremental or its stand-alone costs, but not both. Exhibit 1 gives the simple proof (next page).

EXHIBIT 1.

ONE PRICING TEST, NOT TWO:

INCREMENTAL COST FLOOR *OR* STAND-ALONE COST CEILING

Consider a firm with two products, Good X and Good Y. Then since,

*TOTAL COST OF X AND Y must equal COST OF PRODUCING Y ALONE plus
COST OF PRODUCING X IN ADDITION TO Y, by definition:*

- (1) **Incremental cost of X = Total cost - Stand-alone cost of Y.**
Suppose the firm earns competitive profits overall, so that
- (2) **X Revenue + Y Revenue = Total cost** (including competitive return)
then (1) becomes
- (3) **Incremental cost of X = X Revenue + Y Revenue - Stand-alone cost of Y,**
that is,
- (4) **X Revenue - Incremental cost of X = Stand-alone cost of Y - Y Revenue.**
It follows at once that
- (5) **X Revenue > Incremental cost of X** (the IC test criterion)
if and only if
- (6) **Stand-alone cost of Y > Y Revenue** (the SAC test criterion)

Basic result: **IF ALL OF THE FIRM'S PRICES PASS EITHER TEST, THE PRICES MUST PASS BOTH TESTS.**

V. New Regulatory Principle 3: Pricing of the Services of Bottleneck Facilities

My last illustration, is somewhat more complicated, but it deals with an issue that is already very important, and is likely to become an international matter of great urgency in the near future. The reason for this is the Telecommunications Agreement of 1997, under which about 70 countries agreed to open their telecommunications markets to foreign competition. If that competition is to become a reality and to provide the benefits of lower prices and better service, obstacles that impede the entry by foreign rivals must be removed or reduced. Normally, one of the most serious obstacles to such entry is the need for the entrant to incur a large amount of sunk investment before it can begin operation. Sunk investments, that is, investments from which the investors cannot recover their outlays quickly or easily, clearly make exit difficult and can obviously be very risky. Therefore, if the sunk investment required for successful entry is very large, entry will be discouraged or it will be prevented altogether.

In telecommunications, the way in which this barrier to entry is being overcome is through a rule under which the current monopoly provider of telecommunications services is required to offer its facilities for rental by any entrants that desire to use them. In this way, the entrant can be saved from the need to build expensive plant and equipment of its own, and entry will become a practical possibility. In such a situation, the plant and equipment of the monopolist telephone company is called a bottleneck facility, meaning that no entrant can operate without it, that the facility is available from only one owner, and that this owner will be a competitor of the entrant who uses these facilities. All this seems to solve the entry barrier problem in a straightforward manner, but it is an illusion unless the regulating government agency specifies the *price* at which the facilities will be offered to entrants. Clearly, if the owner of the facilities is permitted to charge as high a price as it wants to it can protect itself from entry by setting the price at a level so high that no entrant can afford to pay it.

The same issue arises in practice in other fields. Bottleneck pricing is now a key issue in at least three industries: electric power, telecommunications and rail transportation. In electricity it has been raised by the inauguration of competition in the generation of electricity. Now, and increasingly in the near future, the established electric utility firms in the U.S. will face the competition of rival generators of electricity. However, before electricity can be sold as a final product it must be transported to

customers. The large capacity and high cost of the electricity transmission facilities make rivalry in electricity transmission (as distinguished from generation) impractical. These transmission facilities are the exclusive property of the electric utilities which, along with all their competitors in generation, must use those facilities to get the electricity from the generating stations to the customers. Thus, the transmission facilities are bottleneck inputs to the supply of the final product, delivered electric power, and the issue of pricing these facilities is clearly analogous to the setting of a fee for monopoly-owned telephone facilities.

The railroad case will bring out most clearly the traditional regulatory rules for bottleneck-service pricing and their difference from the competitive-market rules that will be described presently, but which tell us, in brief, that the bottleneck price should equal the full incremental cost of supplying the bottleneck's services as competitive market analysis describes. Roughly speaking, regulators have often approached the bottleneck pricing decision in the manner suggested by the following example. Consider two railroads, A and B, that want to compete in serving cities C and D. The cities are separated by high mountains with a single pass, through which railroad A owns tracks and in which there is no room for a second set of tracks. Railroad B therefore requests rental of permission to use that portion of A's route. The mountain pass is clearly a bottleneck input to the transportation of freight between the two cities. Suppose railroad A's incremental cost of carrying a carload of lumber between the two cities is \$1000, with \$10 of this amount attributable to wear and tear of track when a carload of lumber crosses the pass. Railroad A has been charging shippers \$ 1500 per carload for this traffic, and using the \$500 surplus over the incremental cost of lumber transport for the entire route to cover costs common to lumber and other types of freight -cost such as track maintenance and replacement. The railroad earns no more than a competitive profit overall.

Under these circumstances, we will see that the competitive-markets price for the right of railroad B to send a carload of lumber over the mountain pass is \$510, the incremental cost of \$ 10 plus the incremental opportunity cost to And the loss of \$500 contribution if B's shipment replaces a carload of A traffic. As we know from standard economic analysis, incremental opportunity cost is a legitimate part of incremental cost and is therefore covered by competitive price. However, at least until very recently, the

regulators would have calculated the fee quite differently. Since the \$10 incremental cost of B's traversal is only 1 percent of the total incremental cost of the route, they would have reasoned that railroad A is entitled only to 1 percent of the contribution to common costs that flows from B's shipments between the two cities, making the regulatory fee \$ 15 rather than the \$510 price required by the parity principle.

We see that the two prices can be dramatically different, the one based on a regulatory concept of equity and the other, the competitive market price, set at the level of full incremental cost. And Chile at first glance it may appear that the far higher competitive market price is "unfair," extracting so high a fee for traversal of a small portion of the route, it will be demonstrated here that with the fee set at this level both railroads can be said to be paying the same price for traversal of the mountain pass. The lower traditional fee is therefore not only a subsidy to the other railroad, that can permit it to take business away from a more efficient competitor, but it treats the two railroads differently, permitting railroad B to rent use of the mountain-pass tracks at a cost far lower than what, as we will see, it really costs railroad A.

VI. The Parity-Pricing Rule for Efficiency in the Use of a Bottleneck Input

More generally, when several firms compete with one another in the sale of an identical final product, but one of them is the monopoly owner of an input (such as telecommunications equipment) that is indispensable in the supply of that product, the problem is how competition in the final product market can be preserved and not tilted to favor either the owner of the indispensable input or its rivals. The answer, in principle, is that the input should be made available to all of the competitors, including the bottleneck owner, on equal terms, with an appropriate price charged for it by the proprietor of the bottleneck input. But what is the appropriate price? And is adoption of that price enough to preserve competition and to ensure efficiency?

The discussion that follows will describe a pricing rule for a bottleneck input service sold by its owner to competitors in the supply of final product if inefficiency in resource allocation among producers of final products is to be prevented. Recent critics have argued, correctly, that the rule, by itself, is certainly not sufficient to ensure efficiency, a reservation my co-authors on this subject and I have been at pains to

emphasize since we first enunciated the rule, some years ago. However, it will be shown here that the rule is a necessary requirement for economic efficiency.

The efficiency issue is straightforward. If the bottleneck input is priced in such a way that sales of the final product are diverted to a supplier (the bottleneck owner or its rival) that incurs in the process real costs higher than those that would be incurred by another of the possible suppliers, then the result is surely inefficient. Such an inefficiency will clearly occur whenever the prospective supplier who incurs the lower real incremental cost in providing the final product cannot afford to charge a price as low as that of a rival with a higher incremental cost of supplying the output in question.

Here it will be shown that only pricing of access to the bottleneck input service satisfying what has come to be called parity pricing or the efficient component-pricing rule (ECPR) can ensure avoidance of any such inefficiency. In this sense, any price that violates ECPR is inconsistent with efficiency, so that ECPR is, indeed, a necessary efficiency requirement.

In the ensuing discussion, it is convenient to think of the final product, F, as being composed of two inputs, the bottleneck input, B, and the remaining input (or set of inputs), R. The objective is to preserve competition and efficiency in the competitive market for R, even if the market for B retains its monopoly character. By ensuring that all competing suppliers of R pay the same price for the bottleneck input, B, competition in the supply of R can be preserved and encouraged. But, in addition, to prevent inefficient restriction of the output of B something must be done to exclude monopoly earnings from that common price. Such earnings can be prevented, as has just been argued, by requiring all prices to be no higher than the corresponding stand-alone costs.

In brief, as will be demonstrated presently, ECPR requires that the price of the bottleneck input satisfy either (and, hence, both) of two equivalent rules. The first is expressed in the formula:

- (1) **Parity price of bottleneck use = bottleneck owner's final product price minus incremental cost to the owner of all other inputs to the final product.**

Alternatively and equivalently (as will be shown) the ECPR price of the bottleneck input must satisfy”

- (2) **Parity price of bottleneck use = owner's (incremental) cost of bottleneck use + the bottleneck owner's profit per unit of Final-product output.**

Equation (1) tells us that ECPR establishes a tight link between the price the bottleneck owner charges for its final product and the price it charges its rivals for the bottleneck input. If production costs do not change, a rise in one of these prices must be matched exactly by a rise in the other. Equation (2) tells us that the efficient price of B is its direct incremental cost plus the opportunity cost (the foregone profit) that the bottleneck owner incurs when it loses a sale of a final product to a rival, a loss made possible because the bottleneck input has been sold to the rival. Thus, the second form of the ECPR rule asserts that the price of the bottleneck input should equal any direct cost caused by supplying it to a competitor, plus any opportunity cost incurred as a result of that transaction. Standard economic analysis tells us that this is the way price is set in a perfectly competitive market or a perfectly contestable market, so that, for this reason, the result should not be surprising.

Yet, the opportunity cost element of this result is the focus of current discussion of ECPR both among economists and practitioners. The problem is that the bottleneck owner is a monopolist, and its final product price may therefore be set at a level that yields monopoly profits. These monopoly profits are among the profits foregone as a result of a lost sale of final product and, consequently, constitute a part of opportunity cost for which, according to (2) (at least without further modification of the ECPR regime) the bottleneck owner should be compensated when it sells bottleneck input to a rival. Aside from any equity issues this raises, my co-authors and I have long emphasized that such overpricing of both final product and bottleneck input [in accord with (1)] must lead to resource misallocation and inefficiency. My co-authors and I have consequently always maintained that efficiency requires both ECPR for bottleneck input prices and a stand-alone cost ceiling on final-product prices. This prevents overpricing of both final product and bottleneck input and, consequently, removes all monopoly profit from the opportunity cost component of (2).

An obvious rule for the pricing of a bottleneck service in a way that does not handicap the more efficient supplier is that the owner of the bottleneck input be required

to charge exactly the same price to all competing final-product providers, including itself. By avoiding discriminatory pricing in the sale of bottleneck input to rival final-product providers they are left free to compete for customers strictly on the basis of their relative efficiency in the non bottleneck activities that constitute the rest of the final-product production process.

Reality, however, makes this non-discriminatory pricing requirement more difficult than it first appears. For it is not even obvious at what bottleneck price the owner would be charging others the same amount that the owner is charging itself for use of the bottleneck facilities. Such a price may be specified in the firm's accounting records, but that price is really an artificial and arbitrary number that tells us nothing about what the owner really gives up financially (that is, what it really costs that firm) when it supplies bottleneck input to itself. After all, a rise in the accounting figure that purports to be the inter division bottleneck-input price merely moves money out of one pocket of the bottleneck-owner firm and transfers it to another of its pockets.

The analysis underlying the parity principle solves this problem. Formula (1) tells us that the price that the bottleneck-owner firm really charges itself for bottleneck input is simply the price the farewell charges to the final-product customer, minus the incremental cost to that firm of the remaining inputs of the final product, including the requisite capital. The parity principle tells us that this is, consequently, the price at which competing final-product providers should be entitled to purchase bottleneck input.

The logic of the proof that the parity-pricing formulas satisfy this requirement is not difficult to understand. We can say that a bottleneck owner and a rival final-product provider that uses the same input have a level playing field if and only if at the given bottleneck-input price the rival can afford to sell final product at a price that differs from the bottleneck owner's by precisely the amount that the rival's incremental cost of its remaining inputs differs from the bottleneck owner's. If the competitor -firm, A, can provide the remaining inputs of the final product at an incremental cost that is lower than B's by X cents per unit of final product, then the playing field is level if A can afford to charge a final-product price that is also X cents per unit lower than B's.

Let us then prove that at the parity price given by formulas (1) or (2) (and only at that price) the playing field will be level. Specifically, it will be proven, (Exhibit 2) that:

Proposition: The parity price for a bottleneck input, as given either by formula (1) or by formula (2) is both necessary and sufficient in order for the playing field to be level, i.e., for the maximum difference between the remunerative prices of the perfect-substitute final products of the two firms, the bottleneck-input provider and its final product competitor, to be exactly equal to the difference in their incremental costs for the remaining input portions of their competing final product supply.

EXHIBIT 2.

DERIVATION OF THE PARITY PRICING RULES:

We have the LEVEL PLAYING FIELD DEFINITION:

- (1) **Owner final-product price - min competitor final-product price = cost of owner supplied (non bottleneck) input - cost of competitor supplied input.**

But we know that the competitor's minimum price is

- (2) **Min competitor final price = price of bottleneck use + cost of competitor supplied input.**

Adding these two equations we immediately obtain

PARITY PRICING FORMULA I:

- (3) **(Parity) price of bottleneck use = owner final - product price - cost of owner supplied input.**

To derive the second (equivalent) parity-pricing formula, note that, by definition,

- (4) **Owner final-product price = owner final-product cost per unit + owner profit per unit = cost of bottleneck use per unit + cost of owner supplied input per unit + owner profit per unit.**

So, substituting (4) into (3) we obtain:

PARITY PRICING FORMULA II:

- (5) **(Parity) price of bottleneck use = cost of bottleneck use per unit + profit per unit = cost of bottleneck use per unit + opportunity cost of business lost to competitors as a result of the sale of a unit of bottleneck use.**

The derivation in exhibit 2 confirms that pricing in accord with either of the equivalent ECPR formulas is necessary for the achievement of economic efficiency. For if those pricing rules are violated, so that the playing field is not level, then the less efficient of two suppliers of the non-bottleneck inputs to the final product may be able to charge a price lower than the more efficient supplier. In other words, the firm that uses a larger quantity of non-bottleneck inputs (as measured by their incremental cost) to produce a given quantity of input may nevertheless be able to take the business away from its rival that can supply the output using a smaller quantity of inputs. Clearly, that is a violation of economic efficiency and must cause consumers to pay higher prices and to suffer a loss in welfare.

Here, then is another example of a practical rule for regulatory oversight of firms that emerges from economic analysis. These are rules that continue to play a role in the arena of regulation in practice. They are rules that will be at the center of the debates sure to break out throughout the world as foreign telephone systems seek entry into countries now served only by telephone monopolies. And that may only be the beginning.

VIII. Concluding Comment

This paper has tried to describe the current status of the economic analysis of regulatory issues and has used it to describe the insights that can be produced by marriage of formal economic analysis and actual practice. I have reviewed some of the pertinent portions of the theory and described some of the issues it can be used to analyze. I have given concrete examples of both the theory and the practice. The discussion suggests also that the practitioners have much to learn from the theorists and that much useful learning can also go the other way.

Vote of Thanks

It gives me great pleasure to move the motion of thanks to tonight's speaker, Professor William Baumol. Before I do so, may I express my appreciation to all members of the Organising Committee of this year's Annual Conference of Economists and, especially, the Chairman, Stuart James, for their time and efforts in organising this Conference.

The Giblin Lecture is a recent initiative of the Economics Department at the University of Tasmania, and is jointly organised by the Economics Department and the Tasmania Branch of the Economic Society of Australia. We are all delighted to have, as tonight's speaker, Professor William Baumol who is, undoubtedly, one of the most outstanding Economists of our generation. For many of us, our introduction to Economics and Professor Baumol's writings was almost simultaneous. Professor Baumol's texts take a large part of the credit in initiating many a mind into the world of Economics. He has pioneered contributions in several areas, and his papers are read by students at all years of their undergraduate and post graduate training in the subject. His contributions cross over into other disciplines. Today's talk, in a topic that is almost as old as Economics itself, was truly stimulating. May I, on behalf of the Organisers of this year's Giblin Lecture, thank Professor Baumol for accepting our invitation to deliver this year's Giblin Lecture and for his talk. I request you all to join me in showing Professor Baumol our appreciation in the usual way.

Ranjan Ray
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