A GUIDE TO
CROSS-SUBSIDIZATION AND PRICE PREDATION:
TEN MYTHS

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(Revised)

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Introduction

The identification and prevention of cross-subsidization and price predation figure prominently in telecommunications regulatory proceedings across the United States today. This concern reflects the interaction of a number of different factors including: (1) Increasing competition in telecommunications submarkets; (2) New technologies with increased proportions of shared costs; (3) Increased recognition that the dawn of the Information Age harbors the prospect of profitable opportunities for market incumbents and would-be entrants alike; (4) Recognition that the hearing room is in some sense a surrogate for the marketplace—a forum where market advantage can be won or lost. In fact, experience suggests that it may be easier to win in the hearing room than in the marketplace. Regulators have grappled with these issues by the introduction of "regulatory safeguards" (involving differential treatment of incumbents and potential entrants), "structural and non-structural restrictions" (limiting service offerings, requiring separate subsidiaries, or facilitating access to essential facilities) and "price cap regulation" (preventing core customers from being burdened with costs arising from the production of non-core services).

Telecommunications regulators today endure a seemingly endless maze of hearings, witnesses and briefs—all advancing a different point of view and all claiming simultaneously to be protecting the public interest. Thus, the length and complexity of regulatory hearings will only increase over time in geometric proportion to the number of participants vying for their piece of the pie. Indeed, partly in recognition of this phenomenon, Alfred Kahn proposed a flash-cut approach to deregulating the airline industry: avoiding lengthy administrative and regulatory proceedings wherein competitors would be expending effort and resources that would have been more productively applied in the marketplace. While telecommunications is not airlines, regulators in telecommunications can benefit from Kahn's insight regarding how the regulatory process could, almost unknowingly, be subjected to strategic and counter-productive manipulation.
This article outlines the economic principles necessary for understanding the issues of cross-subsidization and price predation. We explore the issues using a series of straw-men, or myths, involving regulatory costing and pricing. While understanding why these points are fallacious may not reduce the number of regulatory proceedings, we hope the principles expedite the decision making process by enabling regulators to more easily discern reality from fantasy, positive (factual) from normative (judgmental), public interest from self-interest. In the regulatory process, participants will raise questions of black or white, to which economics can supply only grey answers. Conversely, there are some questions commonly thought to be grey, that really carry black and white answers. We will be careful to identify the different situations as we proceed. Note that myths come in several flavors: from grand archetypes to simple homilies. Mythology is not false by definition—myths can point to ultimate truths. However, some myths are repeated incorrectly, or are applied inappropriately. The myths examined here are of the latter genre; they often sound sensible, but they ultimately breed confusion. We begin with some basic economic principles to set the stage for the analysis.

**Basic Economic Principles**

Consider the following definition of cross-subsidization to be used for independent products: *Product A is being subsidized by product B if the price for product B is set above its incremental cost so that the price for product A can be set below its incremental costs.* Incremental cost is the change in total cost caused by an increase in output, so price is compared to the incremental cost per unit. At first glance, this approach to the problem appears straightforward. After all, why not simply compute the incremental costs for products A and B and determine whether price for A exceeds the incremental cost for A and the price for B exceeds the incremental cost for B? In principle, this is all there is to the matter. In practice, things are not quite so simple. In general, some inputs will be exclusive (able to be directly assigned) to either A or B, while others are shared by both A and
B. The presence of shared inputs, and ultimately shared costs, is what complicates the calculation of incremental costs and the test for cross-subsidization.

In general, the existence of cross-subsidies is inherently inefficient in that the price fails to adequately reflect the resource costs borne by society in producing it. With the efficient output level as the benchmark, products that are cross-subsidized are "over-consumed" and products that are used to subsidize other products are "under-consumed." In the former, price is so low that some consumption occurs which is valued less than the cost of the additional resources. For the latter, some consumption fails to occur for which the valuation exceeds the resource costs.

For example, Figure 1 shows two markets, with $P_X = $1 and $P_Y = $4. If the multiproduct firm has long run incremental costs of $2 and $3, respectively, for the goods, then overconsumption of X occurs and underconsumption of Y occurs. If the average cost equals incremental costs, total revenues from the two goods cover total costs. But $300 collected from consumers of product Y is used to cover the deficit resulting from pricing good X at $1. The shaded areas correspond to misallocations stemming from this particular pattern of prices. Such inefficiencies are often labeled deadweight losses since they represent overconsumption (using resources worth $2 to produce a unit of X valued at $1) or underconsumption (restricting Y so that consumer valuations--here, $4--are greater than the resource cost of additional output--here, $3). Thus, cross-subsidies are clearly inefficient if demands are not completely unresponsive to price. Over- and under-consumption implies less value is obtained from use of scarce resources: these resulting deadweight losses arise due to departures of price from marginal cost in both the market that is being subsidized and the market generating the cross-subsidy. Of course, this example is somewhat artificial since there are no shared costs, cost complementarities, or demand interdependencies.

Whether the cross-subsidies are unfair depends on one's definition of fairness. Unlike efficiency, which has a precise definition, fairness has a number of dimensions. Under some
In this example, there are no shared costs. $300 collected from consumers of product Y is used to subsidize consumers of product X.
dimensions, and in some circumstances, cross-subsidies would be classified as fair. For example, a subsidy may be desired on income distributional grounds. If high income customers feel better off when low income consumers have telephone service, they will be willing to contribute to programs benefitting low income customers. That is, high income customers might feel worse with low penetration rates—not because they are unable to call these other subscribers (the network externality) but because the high income customers desire that low income customers be able to make emergency calls. Such an attitude translates to basic phone service being viewed as an "economic right" in our highly interdependent society. Both the externality and the income distributional arguments can support some form of below-cost pricing.

The issue is how to target such income distributional subsidies. When a price is held down to all in order to meet the social goal of aiding a few, the dollars transferred can be very high relative to the distributional objectives which might be achieved. In fact, some of the dollars may have come from the very ones we are trying to assist! Thus, a policy issue is whether a generalized subsidy for all consumers is needed, or whether the subsidy can be targeted towards specific sets of customers. The answer will be situation-specific, depending on the source of problem (externality or income distributional concern) and whether customer sub-groups can, indeed, be identified. State Lifeline programs and the Link-up America Program are designed to restrict participation to low income households (Johnson, 1988). Setting aside income distributional concerns, let us consider our first myth involving the efficiency consequences of pricing below incremental cost.

**Myth 1: Cross-subsidization is always inefficient.**

Subsidies which result in prices which are less than incremental costs are not necessarily inefficient. The efficiency result that prices should be set equal to incremental (or marginal) cost implicitly assumes that all goods are purely private in nature. In other words, consumer A's consumption decisions are completely independent of Consumer B's consumption decisions. When
this independence condition breaks down, externalities in consumption are said to exist and the
simple rules for economic efficiency are no longer valid. The most noteworthy example of this
phenomenon in telecommunication is the so-called access or network externality. My decision as to
whether to subscribe to the network is not independent of the decisions of other would-be
subscribers. In fact, the value I place on subscribing to the network is a function of how many other
subscribers I could contact if I were to subscribe. Economists refer to this as a positive externality,
since the subscription decision of one individual increases (rather than decreases) the value to other
subscribers on the network.

In the case of positive externalities, the efficiency rule requires that price be set less than
marginal cost rather than equal to marginal cost. Conversely, in the case of negative externalities,
the private consumer does not take into account the external costs (e.g., pollution or congestion)
associated with his consumption, it is desirable to curtail output by setting price greater than private
marginal cost. The main point here is to demonstrate that in the presence of positive externalities
in consumption, there are efficiency arguments for subsidizing the consumption of a good or service.
Financing the subsidy is an entirely different matter. In general, efficiency dictates that the subsidy
be financed in a manner that generates the smallest deadweight losses possible.

Myth 2: When regulators correct inefficiencies and inequities, the best policy, from an
efficiency perspective, involves raising the prices of the most inelastic regulated services.

We observed in the case of positive externalities that social optimality requires subsidization
of the product generating the externality. This implies that failure to account for the positive
externality in pricing of the product will result in a welfare loss to society. But to subsidize
consumption of one service, we may have to price some other services above marginal cost in order
to finance revenue shortfalls. This solution implies that we could create deadweight losses (resource
misallocations) in these other markets. We do not wish to generate larger deadweight losses in other
regulated markets (from financing the subsidy) than those losses which we are attempting to eliminate in the market that is the target of the subsidy.

The problem with the second myth is that the time frame is not clearly delineated. In general, burdening (taxing) inelastic demanders will not reduce the output level much. However, although a demand for a service is inelastic from the standpoint of the market, quantity demanded is not necessarily unresponsive to price from the standpoint of an individual firm. The presence of potential alternative suppliers—even at higher cost—still puts a limit on how high a price can be raised to subsidize other services. Thus, the long-run demand faced by a firm could be quite elastic. Policy-makers have to recognize the role of new entrants.

Furthermore, even if there are no suppliers of an identical service, substitute services can mean a high cross-elasticity of demand. If rival firms lower their prices, the incumbent telco may not capture much net revenue from the market with an inelastic demand, since that demand shifts in with price changes by rival suppliers. Furthermore, a telco with an inelastic demand is still susceptible to technological change which creates substitute services. In fact, an artificially high price for a particular service will tend to induce R&D by potential entrants (including coalitions of demanders). Such artificially-encouraged innovation diverts inputs away from investments yielding more socially productive technological change. Thus, while the principle of burdening inelastic demanders has substantial merit from the standpoint of minimizing output distortions, the application of the principle is problematic when competing technologies or substitute services can be introduced in the long run.

Myth 3: To ensure against the flow of cross-subsidies, it is sufficient that the price for an individual service cover its corresponding incremental cost.

This is not a sufficient condition, but merely a necessary condition for ensuring that prices are subsidy-free. It is necessary to test every product individually as well as every possible subset of the firm's product line in order to ensure that prices are subsidy-free. The reason is that the sum of the incremental costs for products does not (in general) add up to the total production costs of the firm.
Hence, it cannot be said that prices passing such a test on an individual product basis are compensatory because there are costs that remain unaccounted for that are in fact incremental to no single product individually, but only to two or more products together.

A number of factors must be considered. In the absence of demand interdependencies, the price of product X is understood to be compensatory—to involve no cross-subsidy—if the revenues contributed by the purchasers of X at least cover the costs borne by the producer of X in the course of supplying the desired output. However, this accounts only for the revenues and costs in adding X to the product line in isolation, without consideration of the distortions that "ripple" throughout the firm's product line in the form of changes to Y's costs and revenues. These potential effects need to be taken into account. Thus, we need to be concerned here with both consumption and production interdependencies. Indeed, if we fail to account for the net effects of adding product X to the product line, we risk drawing an incorrect conclusion regarding the existence of cross-subsidies.

Suppose goods X and Y are substitutes. When product X is deleted from the product line, demand for Y increases. Hence, in the case of substitutes, the incremental revenues associated with adding X to the product line must be reduced to reflect the reduction in the demand for Y. Conversely, if X and Y are complements, the addition of X to the product line will cause demand for Y to increase. Hence, in the case of complements, the incremental revenues must be credited for the increase in the demand for Y coincident with the addition of x units of the product line.

There are two separate effects on the firm's costs associated with the introduction of X. The introduction of product X may make it more costly (diseconomies of scope) or less costly (economies of scope) to produce product Y. In addition, the firm's costs vary directly with the demand-side effects: whether output for Y increases or decreases upon the addition of product X to the product line. The composite effect on the firm's total costs from adding product X is thus captured in the
net incremental cost measure. On this basis we conclude that the *Net Incremental Cost Test* is a sufficient test for the existence of cross-subsidies.

In order to show that prices are subsidy-free (compensatory), it is necessary to apply the net incremental cost test to every product individually as well as to every subset of products across the firm's entire product line. Hence, if the firm sells products X, Y and Z, it is necessary to test each of these individually as well as to test all possible subsets at their output levels. Such cost calculations are not necessarily simple to make, especially when long-lived shared capacity serves different output levels of the various services over time. In addition, these forecast prices, outputs, and cost (and demand) interdependencies involve assumptions regarding the performance of new technologies, as well as knowledge about consumer preferences for new services. The task is not simple. However, conceptually, this approach is the appropriate one. Replacing it with a simplistic (and arbitrary) fully distributed cost test requires a comparable set of assumptions—without the methodology having much merit. Regulators can require telecommunications companies under their jurisdiction to prepare net incremental cost and revenue forecasts—monitoring the results as they evolve over time. Consistent over-optimism by firms can be addressed by regulators in later rate hearings. In other words, it is essential that these cost changes be measured relative to some baseline scenario—fully accounting for the degree to which changes in demand and/or the product line cover capital investments which would be either accelerated or deferred.

**Myth 4:** Protection against cross-subsidization requires that the minimum and maximum pricing rules hold at each point in time.

When services are capital-intensive, projected capacity life-times and associated depreciation schedules are key determinants of revenue requirements *assigned* to different time periods. Such assignments represent potential pitfalls for regulators. In a recent article, Faulhaber and Boyd (1989) consider the problem of a regulated firm that introduces new products and services. Two conditions are analyzed: (1) The market is subject to demonstration effects which serve to shift the demand
curves out in period two after consumers have gained experience with the product in period one (greater consumption today implies greater demand in the future); and (2) The firm is subject to "learning curve effects" so that costs are lower in the second period, based on the quantity produced in the first period (more output today implies lower costs tomorrow). Faulhaber and Boyd prove that requiring that revenues cover costs in each period rather than intertemporally (over two or more time periods) will lead to less than optimal new product introduction, with a corresponding welfare-diminishing effect on society as a whole.

These results suggest that regulatory rules not be structured so as to require the firm to recover its costs period-by-period, but collectively over two or more periods. In other words, when regulators set the time periods over which costs must be recovered, recognition needs to be given to the life cycle of the product in question. Arbitrarily allocating capacity costs equally to each period (via, say, straight line depreciation) can induce inefficient pricing patterns--raising prices in the early periods when you want to familiarize customers with the new service and incurring higher production costs in later periods due to relatively small production runs in the first period. Consider, for example, the adverse consequences such policies would have had in the evolution of cellular telephony.

This question of the appropriate time horizon over which costs should be recovered highlights the short-run/long-run dichotomy in the context of telecommunications costing issues. It is important to note that the cross-subsidization tests we have discussed herein are long run rather than short run benchmarks. Strict adherence to these tests indicates acceptance of a long run marginal cost pricing standard. The debate over long run and short run marginal costing pricing suggests that efficiency may well dictate a departure from the long run marginal cost standard in some circumstances. Similarly, appropriate tests for cross-subsidization require explicit recognition of time horizons over which the net incremental cash flows are to be compared.
Myth 5: Separate subsidiaries protect core consumers from high prices used to subsidize non-core competitive services.

In one sense, this entire issue of cross-subsidization in a multi-product firm centers on one question and one question only. How are shared costs, costs otherwise not able to be assigned, addressed in determining whether prices are compensatory (subsidy-free)? Since shared costs are the problem, why not eliminate them completely by requiring multi-product regulated firms to create arms length subsidiaries or divisions? This certainly addresses the shared cost problem, but it is likely that the cure is worse than the disease. In forcing this artificial separation, in the name of fairness, cost complementarities in the form of economies of scope are lost. Consumers end up worse off. Furthermore, with the loss of efficiencies enjoyed through joint production, the regulated firm will be less inclined to innovate and introduce new services when the costs of creating separate subsidiaries are substantial. Former FCC Chairman Mark Fowler (1986, p. 188) notes "All these structural restrictions have imposed significant costs on society, both directly through the duplications of costs and indirectly through the absence of services and products for which the public would be willing to pay their true costs." As we have seen, the gains to the firm in terms of economies of integration play a fundamental role in the design of tests for cross-subsidization.

Suppose we have a plastic fruit manufacturer who produces apples, bananas, and grapes. Three inputs are used: (1) Plastic Resin; (2) Paint; and (3) Adjustable Mold Press. Each piece of fruit requires 10 ounces of plastic resin and 1/2 ounce of paint. Apples and grapes require 10 seconds in the Mold Press and Bananas require 14 seconds. How do we ensure that bananas are not subsidizing apples, or that grapes and bananas collectively are not being subsidized by apples? Clearly, we can directly assign the plastic and paint costs to the fruit pieces unambiguously, plastic resin is perfectly divisible, red paint, purple paint and yellow paint are used exclusively for apples, grapes and bananas respectively. But what about the adjustable mold press? This is a shared input for all three pieces of fruit and cannot be unambiguously assigned to any one or combination of them.
Why not simply allocate the cost of the mold press to each of the three fruit pieces on the basis of relative use? This would certainly serve to put all of the costs in some bucket, but how do we know that we have allocated them correctly? For now we simply state the operative economic principle: \textit{Costs that can be unambiguously apportioned to certain products individually should be; those that cannot be so apportioned should be recovered from product groups, product families and product divisions (where we have increasing levels of aggregation)}. Requiring that the plastic fruit manufacturer establish separate subsidiaries for the production of apples, bananas, and grapes results in higher production costs--due to the duplicative investment in adjustable mold presses. In their zeal to "protect" consumers, the advocates of separate subsidiaries could end up eliminating some service offerings (reducing consumer choice) and raising the price of other offerings.

Similar to the fairness and efficiency issues surrounding separate subsidiaries and cross-subsidization are those associated with predatory pricing. In a very real sense, cross-subsidization and price predation are companions of one another. This will be clear once we establish a definition of predatory pricing. The following definition is offered.

\textit{Pricing is predatory when the firm forgoes short-term profits in order to drive rivals out of business, with the intent of later raising prices, recouping lost profits, and gaining additional profits based on augmented market power.}

There are any number of formal definitions of predatory pricing, but the general idea is that the firm is selling its product(s) below "cost" with some "sinister intent." The losses the firm incurs would generally be financed by raising prices for some of its other products, unless the firm has a "deep pocket" so that some form of inter-temporal cross subsidization occurs: Tomorrow's consumers subsidize today's consumers. Cross-subsidization between products suggests itself as the natural way in which the firm could finance these deliberate losses, which leads to another myth.
Myth 6: Setting price floors on the basis of average cost is sufficient for the prevention of predatory pricing.

The key problem with average cost as a benchmark is that a multiproduct firm will have some shared inputs. If the costs of these inputs are allocated on the basis of relative outputs, directly attributable costs, revenues, volume, weight, or some other arbitrary mechanism, the resulting "fully distributed" cost, or "average" cost, need bear no relation to incremental costs. The antitrust benchmark for determining predation is marginal or incremental cost, rather than average cost.

Areeda and Turner (1975) propose a test for predatory pricing based on a short run marginal cost measure. A price is then considered non-predatory if it is no less than short run marginal cost. The Areeda-Turner standard for predatory pricing is accepted by the legal community and, of course, has strong economic support as well. They recognize that short run marginal cost may be difficult to measure, so they propose that average variable cost be used as a proxy for short run marginal cost. Baumol (1986, p.159) argues that it is reasonable to define average variable cost as gross incremental cost divided by the output level. Note, however, that the average gross incremental cost measure includes capital costs, whereas the average variable cost measure does not. Hence, the Baumol proxy does not precisely match the Areeda-Turner measure, since Baumol's test is long-run, rather than short-run, in nature. Hence, assuming away cross-effects in demand and production, the test initially proposed for cross-subsidization appears applicable for predatory pricing as well. This, of course, should not be surprising, since both cross-subsidization and price predation imply a price less than some appropriate cost benchmark.

Myth 7: The incentives to engage in price predation are the same under both price cap and traditional rate of return regulation.

This is not true since the gains from cost shifting are largely eliminated under price cap regulation. Baumol (1979) recognized that the success of a predatory pricing venture ultimately rests on the ability of the firm to raise its prices to excessive levels after it has succeeded in driving its
competition from the market. Baumol proposes that the firm contemplating the price reduction be informed that it will not be allowed to withdraw these low rates in the future except in response to exogenous changes in costs and market demands. The effects of this policy action are clear. A quasi-permanent pricing rule for the incumbent does not protect the entrant from a competitive response by the incumbent. The incumbent may respond, but it has no incentive to respond in predatory fashion, since it has no avenue by which to recoup its losses even if the entrants ultimately exit the market. The incumbent will only adjust its price if the value of the resulting competitive gains exceed the cost of a quasi-long run reduction in price. Baumol notes also that the chances of the entrant's survival are increased as well. He can expect to survive if his costs are at least as low as the established firm. That is, he is entitled to survive on the merits of his relative efficiency, which is precisely what a truly competitive marketplace would enable him to do. Should the established firm decide to undercut the competitor anyway, it will be left with continuing deficits in this market with no prospect for recouping the losses. The prospect of such losses will cause managers to think long and hard before engaging in such tactics—which is precisely the desired effect.

We can draw some parallels between Baumol's proposal for quasi-permanent price reductions as a solution to the predatory pricing "problem" and price cap regulation. In terms of the ability of the regulated firm to finance predatory pricing via cross-subsidization, price caps, assuming the caps are set properly, should preclude this type of behavior by the same logic employed by Baumol. In addition, the regulator may still grant the regulated firm sufficient downward pricing flexibility—perhaps even down to short run marginal cost—while being assured that other products are not being asked to finance predatory behavior. Finally, we recognize that the firm has no incentive to allocate costs either to product lines subject to significant competitive pressures or product lines whose rates cannot be altered (since they are capped) to cover these costs. This suggests that price caps for core services used in the proper fashion can serve as a deterrent to predatory pricing in competitive
services in much the same way as Baumol's quasi-permanent price reductions. A similar issue arises when determining the appropriate costing standard for protecting against cross-subsidies.

Myth 8: Setting prices on the basis of fully distributed costs is the only way to definitively protect against the flow of cross-subsidies and ensure that the public interest is served.

Just as average cost is an inadequate benchmark for preventing predatory pricing, it is inappropriate for identifying cross-subsidies. In terms of FDC protecting ratepayer interests, quite the opposite can be demonstrated. Suppose a telephone company provides 2 types of service. Service 1 is a noncompetitive service and service 2 is subjected to competition from other suppliers. There are significant shared costs incurred in producing 1 and 2. Because service 2 is subjected to competition, the demand that the telephone company faces in this market is highly elastic. This means that if the telephone company raises its price, a large number of customers will purchase service 2 from other suppliers instead of from the multi-product regulated firm.

Now suppose that the regulator imposes a fully distributed cost pricing scheme on the regulated firm. A large portion of the shared costs are allocated to service 2 in the interest of protecting the captive ratepayer. If the firm attempts to raise its rates for service 2 in order to cover the costs that have been allocated to it, then a large portion, perhaps all, of the demand for service 2 will go to another supplier. The costs that were allocated to service 2 will now have to be covered by consumers of service 1 if telephone rates are to generate revenues sufficient to cover total costs. In this example, captive ratepayers are actually hurt by a fully distributed costing methodology because of the increased revenue burden they must bear due to elimination of other offerings that would have contributed to the shared costs of the firm. Furthermore, the Fully Distributed Cost methodology can lead to losses of economies of scope in production and may actually lead society to produce these products via a relatively inefficient (albeit unregulated) specialized production process, or worse, not produce these products at all.
That a fully distributed cost methodology is problematic in this regard should come as no surprise. After all, we know that fully distributed costs are (1) unavoidably arbitrary and (2) have no foundation in cost-causality. Conversely, economists' support of incremental costs--the crux of the test for cross-subsidization--is based on the fact that these cost measures satisfy the cost-causality criteria. Intuitively, if the rate for a particular service is set below the costs that are caused in producing it--incremental costs--then that service is being cross-subsidized. Fully distributed costs, being averages, do not adequately reflect the incremental nature of the relevant costs.

Myth 9: If the price of a service is set so high that it fails the stand-alone cost test, prices are not subsidy free.

We may define stand-alone cost in terms of what it would cost a multi-product firm to produce a single product in isolation after divesting itself of all other products in its product line. Another interpretation of stand-alone cost rests on the idea of self-supply. That is, what would it cost the consumers of product X to break away and create their own company in competition with the incumbent firm?

With these definitions as background, we may proceed to address the substance of the myth. In general, the failure of the stand-alone cost test implies that prices are not subsidy-free only when the firm is subject to a binding zero profit constraint. This is easily understood. Suppose that all of the firm's products are priced in excess of their stand-alone cost. The firm may well be earning excess profits, depending upon scope economies (or on outstanding success of cost-reduction programs), but it is clearly not engaged in cross-subsidization. This is an important observation, since price cap regulation does not rely upon a zero profit constraint.

Conversely, suppose the firm is subject to a binding zero profit constraint and one of the products is priced above stand-alone cost. If the firm is earning zero profit, then it can be shown that some other product must be priced below its net incremental cost. Hence, the conclusion that when
the firm is subject to a binding zero profit constraint, the failure of the stand-alone cost test implies the failure of the net incremental cost test and vice versa.

Finally, we recognize that fairness considerations enter into both the net incremental cost test and the stand-alone cost test. For the net incremental cost test, fairness considerations are reflected in the idea that a consumer pay no more and no less than the cost his consumption causes society to incur. The stand-alone cost test reflects the notion that it is unfair to extract more from a consumer group than it would cost that group to serve itself. Recognize that implicit in our discussion is the idea that the firm enjoys scope economies from multi-product production (i.e., it is less costly to product products jointly than separately). In this sense, fairness might be judged in terms of whether some of these economies are passed onto consumers in the form of prices which are below stand-alone costs.

Myth 10: In a natural monopoly market, it is always possible to find a set of prices that is subsidy-free, allows the firm to break even, and yet is sustainable against competitive entry.

In this era of partial deregulation, entry is often viewed as a completely positive force, which could never undermine a multiproduct firm which was the least-cost supplier of a set of services. This is not the case, however, as was demonstrated by Faulhaber (1975). We offer a simplified example. Suppose four neighboring farmers want irrigation and flood control systems for their farms. Each farmer can install his own system for $15,000. If two farmers go together they can build a joint system for $25,000, and if three farmers form a coalition they can build a system for $30,000. If all four farmers go together in a single system, its cost will be $44,000. A few calculations will demonstrate that the least cost way for society to serve these farmers is to build one system for $44,000. Yet, there is no way of dividing up this $44,000 that eliminates incentives for coalitions to develop and build stand-alone systems. In other words, there exists no subsidy-free price vector that is sustainable against entry. In this case, as Faulhaber argued, welfare maximizing regulation could
well require restrictions on entry. To see why this result is so important, consider the following citation from Kahn (1971, p. 223). "If a natural monopoly is producing and pricing as efficiently as possible, there is no need to bar competitive entry: it is economically unnecessary and will not take place anyhow." This was the traditional view of the problem prior to Faulhaber's analysis.

The regulatory implications of this point are somewhat problematic. If efficient prices are susceptible to entry, then entry limitations appear to be called for. However, self-production is always an option for a customer or group of consumers. Furthermore, there are potential gains to having multiple centers of initiative—in terms of exploring potential markets for new products and discovering new production processes. Just because a multiproduct firm is the least-cost supplier today, does not mean that this is the production configuration that is best for all time. Regulators must make a judgement call here—weighing the potential costs of inefficient duplication today against potential benefits from lower costs in the future. In general, competition is a better "discovery process" than regulation, especially when the latter discovery process involves platoons of lawyers making claims and counter-claims in court or the hearing room.

Concluding Observations

In this paper, we have examined some myths related to cross-subsidization and price predation. We have shown that in order to ensure that the firm is not cross-subsidizing, it is sufficient that each and every product individually as well as every possible subset of the product line pass the Net Incremental Cost Test. Alternatively, the stand-alone cost test yields equivalent information when the firm is constrained to earn a non-excessive rate of return on investment.

The issues of cross-subsidization and price predation are in some sense one and the same. Cross-subsidization represents a natural way in which the firm could finance predatory pricing. To date, there has been little empirical work done on the extent of predatory pricing, and the work that has been done has not focused on regulated industries where incentives for engaging in such activities
may differ markedly from those in competitive markets. We discussed a number of possible policy instruments that regulators may choose to employ in protecting against predatory pricing. Price caps applied in the proper manner may serve this end.

The cross-subsidization issue has received considerable attention in regulatory proceedings across the country. We can expect future investigations to accelerate in direct proportion to the degree of potential competition in these markets. While cross-subsidization is a legitimate public policy concern, regulators must draw the line between the rhetoric of cross-subsidization and the actual practice. Intervenors and potential entrants provide a useful public service by raising this issue, but they have a vested interest in keeping incumbent prices high or in restricting incumbent service offerings. Consumers can benefit from new services, whether provided by an incumbent or by a new entrant. Competition is well-suited to reveal the long run efficiency of different industry configurations, with incremental and stand-alone costs establishing lower and upper bounds for sustainable prices. Thus, regulators need to recognize that artificial constraints on the incumbent, including separate subsidiary requirements, have costs as well as potential benefits. Policy-makers need to distinguish between legitimate checks on monopoly power and attempts by potential entrants to adopt inappropriate cost allocation schemes or artificial organizational structures that would restrict otherwise socially beneficial competition.
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