

Toward Achieving Workable Competition in Industries Undergoing a Transition to Deregulation: A Contractual Equilibrium Approach

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In the late nineteenth and early twentieth centuries, economic regulation emerged in a variety of industries to respond to certain perceived problems. For most of these industries, students of economic regulation became convinced over time that, whatever the correctness of the original diagnosis, the regulatory cure was often worse than the market-imperfection disease. Moreover, new technology and changing markets often eliminated the perceived problems that regulatory institutions were designed to solve.¹ Partly as a consequence, a political reaction set in against regulation, resulting in substantial deregulation of several previously regulated industries.²

Changing an industry from a regulated to a free market status has not always proven easy. Difficult transitions have been encountered. Such

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1. For example, railroads were originally regulated in the belief that they were abusing a monopoly of intercity freight transportation. Technological change in the form of the development of highly competitive intercity motor carrier and barge industries (along with the necessary rights-of-way) permitted competition for both bulk commodities and manufactured goods. But regulatory institutions were unable to respond to the new competitive environment, and the rail industry began a long decline that was only arrested by regulatory reform. Even when pockets of market power persisted in the rail industry, regulatory cures were all-encompassing rather than narrowly tailored to the problem.

2. Many regulated industries have participated in the deregulation movement. The most notable industries undergoing some form of transition to deregulation are transportation, *see* Staggers Rail Act of 1980, Pub. L. No. 96-448, 94 Stat. 1895 (codified at 49 U.S.C. § 10101a (1982)); Motor Carrier Act of 1980, Pub. L. No. 96-296, 94 Stat. 793 (codified at 18 U.S.C. § 1114 (1982) and in scattered sections of 49 U.S.C.); Airline Deregulation Act of 1978, Pub. L. No. 95-504, 92 Stat. 1705 (codified in scattered sections of 49 U.S.C.), electric utilities, *see* Public Utilities Regulatory Policies Act of 1978, Pub. L. No. 95-617, 92 Stat. 3117 (codified in scattered sections of 15, 16, 30 & 42 U.S.C.), gas pipelines, *see* Natural Gas Policy Act of 1978, Pub. L. No. 95-621, 92 Stat. 3350 (codified at 42 U.S.C. § 7255 (1982), 15 *id.* § 3301-3432), and telecommunications, *see* United States v. American Tel. & Tel. Co., 552 F. Supp. 131 (D.D.C. 1982), *aff'd mem. sub nom.* Maryland v. United States, 460 U.S. 1001 (1983). Other industries undergoing some form of deregulation are broadcasting, financial services, and energy. The postal services and oil pipeline industries are additional candidates.

transitions, to succeed, must ensure the development of new institutions and market practices—for example, contractual arrangements as explained below—to replace regulation in circumstances where some public policy problems may remain, even if the regulatory answers do not. Ironically, in many instances these problems may be as much a creation of past regulation as inherent in the industry or its markets. For example, as regulatory institutions ossified, extreme forms of price discrimination that could not have endured competitive forces were often seen as the solutions to problems created by regulation itself. As the deregulation movement has taken its course, concerns over the transition to deregulation have therefore emerged from certain legacies bequeathed by prior regulatory practices and policies, frequently resulting in various constituencies seeking some form of residual regulation.³ Demands for residual regulation have been especially persistent whenever extreme forms of price discrimination have been suggested or have played a key role. While regulatory institutions themselves arose partly in response to demands to suppress price discrimination,⁴ the regulatory reform literature⁵ has rightly condemned much of this attempt to eliminate price discrimination, some of which was the natural result of short-term disequilibrium that would eventually have cured itself had regulatory constraints not interfered. A successful transition to deregulation, however, is often threatened by the belief that extreme forms of price discrimination are the answer to the problems of the transition to deregulation. This in turn gives rise to perverse and unexpected demands for residual regulation during the transition.

In sum, the process of deregulation can be extremely complex in industries that have long been regulated. The legacy of regulation imposes sunk costs and buyer/seller relationships during the transition that are very different from those that would have existed if a free-market environment had always existed. Parts I and II explain the source of such concerns as well as the ingredients for a successful solution. Part III presents and

3. Examples of demands for residual regulation may be found in each of the industries undergoing a transition to deregulation. In the railroad industry, for example, captive shippers retained residual regulation to protect "market dominant" traffic, and regulators retained powers to approve mergers and regulate terms of joint services by carriers. The Interstate Commerce Commission (ICC) retained rights to regulate motor carrier tariffs and to impose conditions for antitrust immunity for collective ratemaking. The Civil Aeronautics Board (CAB), and later, the Department of Transportation, retained authority over consumer protection, mergers, route awards for international service, terms of access for computer reservation systems, and slot allocations at capacity constrained airports. These are only a few examples of residual regulation.

4. See A. FRIEDLAENDER & R. SPADY, *FREIGHT TRANSPORT REGULATION* 1-13 (1981).

5. See, e.g., Horn, *Rail Rate Equalization to and from Ports: Some Preliminary Comments on Preliminary Content*, 46 *INTERSTATE COM. COMMISSION PRAC. J.* 30 (1978); sources cited *infra* note 25.

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evaluates some of the most common suggestions for coping with the transition and why some of these suggestions may have inherent limitations. Part IV proposes a contractual approach, which focuses on what market conditions would have been without the distortions of prior regulation and sunk costs. These proposals are explicitly designed to facilitate a successful transition to deregulation in which market forces play a prominent and effective role.

I. The Legacy of Sunk Costs and Prior Agreements

Patterns in the demand for residual regulation can be explained as a response to the strength of the entry threat relative to the magnitude of sunk costs incurred by the affected parties in the previous regulatory regime.⁶ Where obstacles to entry are low, the incumbent suppliers, firms, and labor, ordinarily seek some “protective conditions” during the transition to permit them to recover some or all of their sunk costs, such as specialized labor skills and capital. In contrast, when the obstacles to entry are high, customers are likely to demand protective conditions, particularly when the customers’ own sunk costs severely restrict their competitive options after deregulation.

A demand for residual regulation during the transition to deregulation thus usually arises from commitments made under the old regulatory rules. Some of these commitments persist as fixed, yet-to-be-amortized investments. Some of these investments, by both customers and the previously regulated industries, might never have been made in the absence of the regulatory rules. However, the very existence of these assets (their sunk costs) influences negotiations in the new and freer market existing after deregulation. Immediate market results during the transition are constrained by the presence of prior agreements and sunk costs. Market performance during the transition therefore cannot easily be equated with a long-run equilibrium where deregulated prices and quantities are established in the absence of sunk costs or agreements predicated on the assumption of continued regulation. Furthermore, other markets or potential contractual opportunities elsewhere in the economy can also be affected, as for example when the sunk investments represent alternative sources of supply.

A clean slate for negotiating a market-driven contract between the various participants—a contract that provides incentives for all participants to commit the needed capital under market rather than regulatory circumstances—will emerge only as the previously committed capital (sunk cost)

6. See Meyer & Tye, *The Regulatory Transition*, 75 AM. ECON. REV. 46 (Papers & Proc. 1985).

is amortized. Until then, a common regulatory problem during the transition is to define a set of residual, self-terminating economic constraints that will satisfy political demands for equity—and other considerations created by the short- to medium-term continuation of sunk costs—without creating insurmountable obstacles to approaching a market-determined outcome in the long run.

Demands for continued regulation can also arise where competitive access or network-interconnect problems occur, as in industries such as railroads, gas pipelines, and telecommunications. Because elements of service in an integrated network are sometimes characterized by economies of scale and barriers to entry, at least in the short run, effective competition is not always immediately possible across the entire spectrum of services offered in the regulated industry.

A commonly proposed solution is to design policies that enhance competition wherever possible by giving all competitors access to the bottleneck portions of the network on roughly equal terms⁷ to prevent vertical foreclosures of competition across the network.⁸ In most cases, the anticompetitive effects of these restrictions on entry should be attenuated over time, for example, by entry, relocation, or product substitutions.⁹ Nevertheless, limited provision for access and pricing rules on the monopoly portions of the system are sometimes deemed necessary to effect a successful transition. When instituted, a balance must carefully be struck between demands for re-regulation to solve what should be transitory problems and the demands of special interest groups who hope to use artificial competitive advantages that arise as a legacy of regulation to frustrate competition during and after the transition.

7. For example, regulators in the rail industry were told that they should seek to become surrogates for contestability when setting rates for captive traffic. See Verified Statement of William J. Baumol & Robert D. Willig at 25, Coal Rate Guidelines, Nationwide, Ex Parte No. 347 (Sub-No. 1), 1 I.C.C.2d 520 (1985) [hereinafter Statement of Baumol & Willig]. Proponents of the theory of contestability stated that “[r]ather than relying exclusively on traditional rate and entry regulation” the appropriate policy was “government intervention to ensure equal access to the sunk facility”; that all firms seeking such competitive access should get it; and that “the access price be reasonable.” Bailey & Baumol, *Deregulation and the Theory of Contestable Markets*, 1 YALE J. ON REG. 111, 124 (1984) [hereinafter *Contestable Markets*]. Bailey applied these concepts to suggest policies for open competitive access in the rail industry. See Bailey, *Contestability and the Design of Regulatory Policy*, 71 AM. ECON. REV. 178 (Papers & Proc. 1981).

8. A vertical foreclosure arises where the firm owning the bottleneck restricts access to it or engages in a restrictive practice that has a substantial adverse impact on competition in upstream or downstream markets. See generally F. WARREN-BOULTON, *VERTICAL CONTROL OF MARKETS* (1978) (for general economic model of vertical control).

9. An example where a perceived bottleneck generally no longer exists is gate space at major airports. During the early years of deregulation, access to gate space was perceived to be a bottleneck because it was often tied up by exclusive contracts with incumbent carriers. As a result of either forced divestiture or increased flexibility over time, gate space is generally not considered to be a barrier to entry in the airline industry, although some exceptions remain.

II. The Legacies of Regulation: High Costs and Excess Capacity

The problems raised by sunk costs incurred in a prior regulatory regime often have been exacerbated by a legacy of uneconomic practices created during that regime.¹⁰ In particular, the regulatory equilibrium in the prior period often amounted to an informal taxation and cross-subsidy scheme in which individual prices seemed to have little to do with the costs of individual services.¹¹

Such arbitrary pricing schemes rarely advanced economic efficiency; on the contrary, some factors of production were often overgenerously rewarded while others were underrewarded, and consequently some factors were oversupplied and others undersupplied.¹² Similarly, political considerations perpetuated some activities that never had any economic justification.¹³ Finally, as part of their excise taxation and cross-subsidy schemes, regulators often imposed operating or marketing constraints—for example entry limitations or restrictions on operating authority that limited incumbents' ability to compete—that prevented efficient use of productive resources. Furthermore, if the regulators did not impose such constraints, labor unions often did, taking advantage of the peculiarly permissive character of labor negotiations in many regulated industries to achieve restrictive work rules and practices.¹⁴ As a result, many firms in recently deregulated industries were operating inefficiently and, in particular, had excess or unneeded capacity—at least as long as demand and income elasticities were not sufficient to absorb the excess when deregulation unleashed the industry from pricing and marketing shackles.¹⁵

In the airline industry, this meant too many wide-body, long-range jets

10. For example, airline regulators maintained high profit margins for long-haul passengers to cross-subsidize short-haul passengers. As shown below, this resulted in depressed prices for long-haul markets and greater profitability on short-haul routes after deregulation.

11. See generally Peltzman, *Toward a More General Theory of Regulation*, 19 J.L. & ECON. 211 (1976) (analysis and critique of Stigler model of regulation); Posner, *Taxation by Regulation*, 2 BELL J. ECON. & MGMT. SCI. 22 (1971) (regulation as form of taxation); Stigler, *The Theory of Economic Regulation*, 2 BELL J. ECON. & MGMT. SCI. 3 (1971) (regulation designed and operated primarily for benefit of industry).

12. For example, regulation induced a significant shortage of natural gas for interstate markets in the 1970s; see S. BREYER, *REGULATION AND ITS REFORM* 240-60 (1982). Also, rail maintenance under strict regulation failed to prevent a substantial decline in track quality. Restrictions on abandonment forced railroads to preserve a network that was too large in terms of miles of track. See A. FRIEDLAENDER & R. SPADY, *supra* note 4, at 121-27.

13. For example, political considerations limited for many years the railroads' ability to shed deficit passenger operations. See T. SEELER, *RAILROADS, FREIGHT AND PUBLIC POLICY* 30-31 (1983).

14. See Annable, *The ICC, The IBT, and the Cartelization of the American Trucking Industry*, 13 Q. REV. ECON. & BUS. 33, 37-43 (1973); Bohlander & Farris, *Collective Bargaining in Trucking—The Effects of Deregulation*, 20 LOGISTICS & TRANSP. REV. 223, 228-30 (1984).

15. The great "miracle" of early "administrative" airline deregulation (1976-79) was that these elasticities, fed and enhanced by general cyclical recovery, seemed sufficient to do this mopping up. See AIRLINE DEREGULATION: THE EARLY EXPERIENCE 41-90 (J. Meyer & C. Oster eds. 1981).

suitable for transcontinental and similar services but too few small, narrow-body airplanes suitable for short hauls. In financial services, it meant too many retail brokers and related support staff supplying information and advice to investors; in petroleum refining, too many small inefficient teakettle refineries whose very existence depended on privileged access to low-cost domestic crude; in trucking, too many trailers and tractors; in railroading, too many underused branch lines, boxcars, and; locomotives in natural gas production, too many deep wells and LNG tankers; in broadcasting, too many over-the-air relay transmitters, known as local stations; and, finally, in electric utilities, too many plans for conventional and nuclear baseload expansion of generation.

Attached to each of these capacity excesses in most instances were, of course, excess labor forces. Indeed, in the case of stock brokerage, labor represented most of the excess. The costs of carrying excess workforce were intensified for many newly deregulated industries because of their excessively generous collective bargaining agreements, usually arrived at prior to deregulation when the industry could simply pass such costs through to consumers. Airline pilots were the most conspicuous example, but over-the-road Teamsters, some rail operating brotherhoods, and others were seemingly not far behind.

From both a public and private management perspective, the transition problem lies in finding an alternative to the old regulatory regimes of excess costs and cross-subsidies while still meeting revenue needs. The best solution, from the standpoint of economic efficiency, is to eliminate excess services, capacity, and costs. However, that is sometimes easier said than done. Capital equipment is usually durable and takes some time to be physically exhausted. Uneconomic services often have constituencies that use the political process to delay abandonment. Labor contracts normally have a fixed term and benefits which, once won, are typically not quickly forsaken by unions; indeed, management may view a rollback of labor benefits as a last recourse, because of the problems such rollbacks can cause. Furthermore, ability to extract labor rollbacks will depend on the extent to which labor perceives a real threat to job security; easy-entry industries like airlines and trucking have been more successful in obtaining such rollbacks than the hard-to-enter railroad industry. But even with labor concessions, cost cutting will normally not solve all the fiscal problems of a deregulated industry, especially in the short to medium—three to five year—term.

Again, some problems observed during transition, including misaligned tariffs as well as excess capacity, may be temporary legacies of prior regulation rather than inherent features of the long-run industry structure. In the United States airline industry, for example, regulators allowed higher

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markups over direct costs on long-haul markets than on short hauls, where tariffs were often set below direct costs; the result was an oversupply of long-haul aircraft that manifested itself in transcontinental rate wars after deregulation. Similarly, regulatory and tax incentives created a surplus of rail boxcars that has resulted in sharp downward pressure on boxcar rates since deregulation; much the same process, involving a surplus of tractors and trailers, seems to have been at work lowering many motor carrier tariffs.

Maintaining revenue adequacy, at least by many common definitions, can be a problem for previously regulated firms in this new environment. After deregulation, rates in highly competitive markets were under severe pressure. Indeed, where too much capacity exists during the transition, rates under competition should tend toward short-run average variable costs until excess capacity is eliminated. In these markets, contributions to overhead and other unassignable costs should be driven toward zero.

These pricing actions pose the question of how to define short and long-run revenue adequacy. If revenue adequacy is defined as return on all investment¹⁶ sufficient in the short run to meet the broad financial market cost of the underlying capital requirements, rather exceptional returns may have to be garnered from the less competitive markets served by the deregulated industry during the transition. Of course, the very concept and definition of revenue adequacy has been hotly disputed. Not only is there a question of what should be included in the equity base, or denominator, but arguments could be made that availability of capital to an industry depends on its degree of systematic risk (relative to realized returns) and possibly the dispersion and modality of returns as well.

III. Coping with the Competitive Access and Sunk Cost Problems

In response to differing deregulation experiences across industries, various solutions to the competitive access problem have arisen. Typical examples include mandatory interconnections with competitors, line-of-business restrictions, divestiture, such as the Bell Operating Companies from AT&T,¹⁷ or “unbundling”, such as the transportation and energy

16. The investment base for defining revenue adequacy during a transition to deregulation has been the subject of considerable debate. The two principal candidates are original cost less depreciation and reproduction cost new less depreciation (or trended original costs). The revenue requirements of the latter usually exceed the former, but many firms undergoing the transition have achieved neither standard. See Myers, Kolbe & Tye, *Inflation and Rate of Return Regulation*, in 2 RESEARCH IN TRANSPORTATION ECONOMICS 83 (T. Keeler ed. 1985).

17. For a review of the competitive access issues and solutions in the telecommunications industry, see Baker & Baker, *Antitrust and Communications Deregulation*, 28 ANTITRUST BULL. 1 (1983); Kahn, *The Road to More Intelligent Telephone Pricing*, 1 YALE J. ON REG. 139 (1984); MacAvoy & Robinson, *Winning By Losing: The AT&T Settlement and its Impact on Telecommunications*, 1

components of price in natural gas markets.¹⁸ Elsewhere, regulations have been designed to give all competitors equal access to vital marketing channels. Examples of these regulations include the attempt to achieve unbiased computer reservations systems in the airline industry¹⁹ and the award of trackage rights over a merged rail carrier's system to restore competition ostensibly eliminated as a consequence of merger.²⁰

Despite differences in industries and particular policy suggestions, these approaches share a common feature: all govern vertical relationships among competitors. Regulators have tried to establish reasonable terms of access to the remaining limited access portions of the network—or, equivalently, to solve the “revenue divisions” problem where the carriers are joint ventures in a situation of limited entry possibilities—so that effective competition may be enhanced in the rest of the system during the transition.

A. Regulation During the Transition

Some economists have suggested that during the transition to deregulation regulators should seek a “surrogate for competition unimpeded by entry barriers.”²¹ An appropriate surrogate, it has been suggested, would be the results of a “contestable market”—a market subject to costless hit-and-run entry—where entry is difficult and sunk costs substantial such as railroads and pipelines.²² The underlying concept is that in “a perfectly

YALE J. ON REG. 1 (1983); MacAvoy & Robinson, *Losing by Judicial Policymaking: The First Year of the AT&T Divestiture*, 2 YALE J. ON REG. 225 (1985); see also *MCI Communications Corp. v. American Tel. & Tel. Co.*, 708 F.2d 1081 (7th Cir.), cert. denied, 464 U.S. 891 (1983); *United States v. American Tel. & Tel. Co.*, 524 F. Supp. 1336 (D.D.C. 1981).

18. See Regulation of Natural Gas Pipelines After Partial Wellhead Decontrol, 50 Fed. Reg. 42,408 (1985), vacated sub nom., *Associated Gas Distribs. v. FERC*, 824 F.2d 981 (D.C. Cir. 1987). For a review of the antitrust issues, see Mahinka & Johnson, *New Antitrust Issues in a Deregulated Environment: Access to Pipelines*, 4 ENERGY L.J. 211 (1983); Mogel & Gregg, *Appropriateness of Imposing Common Carrier Status on Natural Gas Pipelines*, 4 ENERGY L.J. 155 (1983); Tye, *Competitive Access: A Comparative Industry Approach to the Essential Facility Doctrine*, 8 ENERGY L.J. 337 (1987).

19. The Department of Justice conducted an extensive investigation and concluded that certain airline-owned computer reservations systems were or could be used to foreclose competition in the airline industry. See Advance Notice of Proposed Rulemaking—Computer Reservations Systems, CAB Docket No. 41,686 (Nov. 1983) (Comments and Proposed Rules of the Department of Justice). These conclusions led the Civil Aeronautics Board (CAB) to implement rules that were designed to “deal with competitive abuses and consumer injury” such as discrimination, tying, bias, and impeding objective service information. *Carrier-Owned Computer*, 49 Fed. Reg. 32,540, 32,540-64 (1984) (codified at 14 C.F.R. § 255 (1987)).

20. See Tye, *Post-Merger Denials of Competitive Access and Trackage Rights in the Rail Industry*, 53 TRANSP. PRAC. J. 413 (1986); Tye, *Preserving Postmerger Rail Competition Via the Parity Principle*, 26 TRANSP. J. 39 (1986).

21. Statement of Baumol & Willig, *supra* note 7, at 25.

22. Baumol, *Contestable Markets: An Uprising in the Theory of Industry Structure*, 72 AM. ECON. REV. 1 (1982); see also W. BAUMOL, J. PANZAR & R. WILLIG, *CONTESTABLE MARKETS AND THE THEORY OF INDUSTRY STRUCTURE* 476-83 (1982); Baumol & Willig, *Contestability: De-*

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contestable market . . . under certain entry and exit conditions, the presence of potential competition can generate performance that maximizes market welfare.”²³ Under this approach, the apparent task of regulators in the transition is to remove impediments to contestability in order to permit movement toward the welfare ideal of a perfectly contestable market. These policy prescriptions have gained some recognition outside the economics literature, particularly at the Interstate Commerce Commission (ICC).

Specifically, two important pricing recommendations for the rail industry have been offered:²⁴ Carriers should engage in Ramsey Pricing²⁵ to achieve revenue sufficiency while sacrificing a minimum of economic efficiency in customers’ use of facilities, and these Ramsey prices should be constrained only by overall revenue adequacy²⁶ or a Stand-Alone Cost (SAC) test,²⁷ whichever is the lower.

velopments Since the Book, 38 OXFORD ECON. PAPERS 9 (Supp. 1986).

23. Morrison & Winston, *Empirical Implications and Tests of the Contestability Hypothesis*, 30 J.L. & ECON. 53, 54 (1987).

24. See Baumol & Willig, *Pricing Issues in the Deregulation of Railroad Rates*, in ECONOMIC ANALYSIS OF REGULATED MARKETS 11 (J. Finsinger ed. 1983); see generally Baumol, *Minimum and Maximum Pricing Principles for Residual Regulation*, 5 E. ECON. J. 235, 235-48 (1979); Statement of Baumol & Willig, *supra* note 7, at 7. Baumol and Willig were joined in their support for the Commission’s SAC test by 14 other prominent economists, including George Stigler, Almarin Phillips, Kenneth Arrow, Elizabeth Bailey, and Ann Friedlaender. Verified Statement of Economists Supporting The Principles of Constrained Market Pricing at 5-8, Coal Rate Guidelines, Nationwide, Ex Parte No. 347 (Sub-No. 1), 1 I.C.C.2d 520, 542-46 (1985).

25. Ramsey Pricing, a variant of value of service pricing, sets the highest rates for the most demand-inelastic traffic. More formally, the markup of price over marginal cost (sometimes measured by the revenue to variable cost ratio) is inversely related to the elasticity of demand, which is the ratio of the percentage change in quantity divided by a (supposedly causal) percentage change in price. Where the regulated firm produces substitutes and complements, these relationships are evaluated by more complex versions of the pricing rule. See Ramsey, *A Contribution to the Theory of Taxation*, 37 ECON. J. 47 (1927), for development of the basic theory in the context of minimizing the economic burden of imposing taxes when demand and supply elasticities are known to differ across economic activities; see also Hotelling, *The General Welfare in Relation to Problems of Taxation and of Railway and Utility Rates*, 6 ECONOMETRICA 242 (1938) for extension of Ramsey’s basic idea to justify differential pricing for railroads and other public utilities; Baumol, Bonbright, Brozen, Dean, Edwards, Hoover, Pegrum, Roberts & Williams, *The Role of Cost in the Minimum Pricing of Railroad Services*, 35 J. BUS. 357, 357 (1962), for a discussion of the relevant cost concept which is pertinent to Ramsey pricing; and Baumol & Bradford, *Optimal Departures from Marginal Cost Pricing*, 60 AM. ECON. REV. 265 (1970), for the seminal work developing the theoretical formulas for establishing Ramsey prices for a regulated utility with known revenue requirement, demand functions, and marginal costs; see generally Verified Statements of William J. Baumol, Robert D. Willig, and Stephen Goldfield, Coal Rate Guidelines, Nationwide, Ex Parte No. 347 (Sub-No. 1), 1 I.C.C.2d 520 (1985); Verified Statements of Kenneth Arrow, Leon N. Moses, Ronald R. Braeutigam, and William Wecker, *id.*; cf. Levin & Stram, *Nursing the Railroads Back to Health*, REGULATION, Sept.-Oct. 1981, at 29, for a proposal to apply Ramsey pricing principles to railroads in an actual application.

26. See McFarland, *Did Railroad Deregulation Lead to Monopoly Pricing? An Application of q*, 60 J. BUS. 385 (1987).

27. A SAC test stipulates that prices should never exceed the levels that would be charged by a *specialized* stand-alone competitor producing only a subset of the regulated firm’s services. See Willig & Baumol, *Using Competition as a Guide*, REGULATION, Jan.-Feb. 1987, at 28. Shippers have complained that the particular form of the SAC test offered by proponents would, as a practical matter,

1. *Ramsey Pricing*

In its simplest form, Ramsey Pricing starts with the principle that regulators should set prices maximizing consumers' surplus, the difference between the customers' maximum willingness to pay and the actual rate. It assumes that demand for each service is dependent only on the rate for that service and is independent of the rates set for other regulated services. The resulting Inverse Elasticity Rule (IER) determines a set of prices for each of the services of the firm such that the firm's overall revenue requirement is achieved and the cost of raising this revenue is minimized where cost is measured in terms of aggregate lost consumers' surplus (ignoring in this simple form changes in producers' surplus). Each price is set such that the percentage contribution of net revenue for each output above marginal cost is inversely related to its demand elasticity.

Ramsey Pricing has a long history in ratemaking practice. The closely related concept of charging what the market will bear has an instinctive appeal to the regulated firm because it affords an opportunity to earn high profit margins on captive volume while meeting competition in other markets. The United States Postal Service, for example, has justified a high markup over incremental cost for First Class mail on the grounds that it is protected from competition in this service by the Private Express Statutes but can charge only a low markup for parcel services where it faces intense competition.²⁸

Prescriptions of Ramsey Pricing policy for railroad regulators are based on two important assumptions about that industry. The first is that the industry is subject to substantial economies of scale or scope.²⁹ If so, the theory states that revenue adequacy requires prices well in excess of the relevant marginal or variable costs to recover a substantial body of joint or

never actually restrain rail rates, and supporters of the test have argued that the need for regulatory intervention in individual cases is minimal so long as the rail carrier is revenue-inadequate overall. See Reply Verified Statement of Robert D. Willig at 8, 38-39, *Mobil Chem. Co. v. Seaboard Sys. R.R., Inc.*, No. 37,850S (I.C.C. Sept. 18, 1984); Statement of Baumol & Willig, *supra* note 7, at 4, 9-10, 32, 69. Furthermore, one of the principal proponents of the test has asserted that the rail industry operates in a contestable market because of the ready availability of motor carriers and water carriers supplying almost identical (or even superior) services at comparable incremental costs. For the exposition of these theories, see Verified Statement of William J. Baumol, *Santa Fe S. Pac. Corp.—Control—S. Pac. Transp. Co.: Merger—the Atchison, Topeka, and Santa Fe Ry. Co. and S. Pac. Transp. Co.*, Fin. No. 30,400 (March 1984); see also Anderson & Rennie, *The Contestable Market Defense: Measuring Competition on Freight Transportation*, 54 *TRANSP. PRAC. J.* 199 (1987).

28. See Waverman, *Pricing Principles: How Should Postal Rates be Set?*, in *PERSPECTIVES ON POSTAL SERVICE ISSUES* 7 (R. Sherman ed. 1980).

29. In the theory of multiproduct monopoly, economies of scale exist when pricing at marginal costs does not produce revenue adequacy. Economies of scope result where a single firm can produce multiple outputs more cheaply than a combination of firms specializing in each of the products—usually because of the presence of joint costs.

common costs that are not assignable to any particular traffic. The second assumption is that the revenue adequacy of the incumbent carriers should be a major, if not the highest, goal of regulators.³⁰ In essence, then, the goal of revenue adequacy can be achieved only by some sort of discriminatory pricing scheme, such as Ramsey Pricing.

2. *Problems of Ramsey Pricing*

These assumptions can create a paradox for regulators during transition to less regulation. This is perhaps best understood by considering the status of mainstream economic theory prior to the entrance of contestability theory. That conventional theory was largely concerned with the two ends of the competitive spectrum: the perfect competitor pricing at marginal cost and the price discriminating monopolist.³¹ In between were monopolistic competition and oligopoly, usually analyzed under different assumptions concerning recognized interdependencies.

Ramsey Pricing policies were initially designed to permit a multiproduct monopoly firm to price above marginal cost to achieve a revenue requirement at a minimum social cost relative to marginal cost pricing. As long as competition was restricted, Ramsey Pricing minimized the static welfare costs of that restraint. According to conventional economic theory, at least before the arrival of contestability theory, the Ramsey Pricing model was of primary interest to a firm when it and its regulators were seeking guidance on how best to exercise discretion over price. Prices in excess of marginal costs, particularly if they were differentiated or discriminatory, usually are assumed to signify less than perfect competition. This feature would seem to limit the applicability of Ramsey Pricing as an invisible hand replacing traditional regulatory rate setting.³²

The theory of multiproduct industry structure and sustainability analysis provided an economic efficiency rationale for preserving the large multiproduct monopoly as an institution. Some constraint, however, is needed on the firm's power to earn monopoly profits or otherwise to abuse its position as an incumbent supplier. The needed discipline was seemingly

30. On the importance of this revenue adequacy objective, see Baumol & Willig, *supra* note 24, at 15:

One of the most crucial of the tasks that is assigned to prices is that they yield total revenues sufficiently large to cover production costs. This component of efficiency in pricing can perhaps be considered to be of overriding importance Under this philosophy there is an important sense in which the opportunity for financial viability for the supplier is the matter of highest priority. It is a condition absolutely necessary

31. This theory goes back to Ramsey, Boiteux, and Dupuit, among others.

32. See Baumol, Bailey & Willig, *Weak Invisible Hand Theorems on the Sustainability of Multiproduct Natural Monopoly*, 67 AM. ECON. REV. 350 (1977).

provided if markets were contestable. The theory of contestability thus was offered as a single "standard of welfare-maximizing structure and behavior"³³ that would span the spectrum of industry cost structures from constant returns to increasing returns and from single product to multiproduct.

A paradox arises because a welfare-maximizing monopolist that is subject to rate of return regulation and restrictions on entry will have available to it Ramsey efficient price sets that are denied to the contestable monopolist. Movements toward perfect contestability are not unambiguously welfare enhancing in the static efficiency world of Ramsey Pricing because removal of constraints on contestability may eliminate the possibility of Ramsey efficient prices that would be feasible in a less than perfectly contestable market.³⁴ Endorsement of Ramsey Pricing and revenue adequacy as the principal goal of regulators thus can have profound implications for competitive policies during the transition. Specifically, these recommendations have been invoked to support policies that suppress competition via foreclosures of competitive access and to encourage mergers to the degree necessary to facilitate the Ramsey Pricing believed essential to revenue adequacy.³⁵

To a considerable extent, regulators are being asked to choose between using Ramsey Pricing to achieve the goal of revenue adequacy and having regulation serve as a surrogate for competition unimpeded by entry barriers, thus allowing movements toward greater contestability. A high degree of contestability would appear to be an arbitrary assumption or contrivance for many regulated industries (even though at least somewhat plausible, though not totally verifiable, for an example of substantial interest at the time the theory was promulgated, that of airline deregulation).³⁶ What eventually emerged, nevertheless, was almost a general justification for a permissive regulatory posture toward even a multiproduct monopoly that faces little or no immediate competition from other incumbents.³⁷

Understandably, the theory was well received by firms in a variety of

33. Baumol, *supra* note 22, at 2.

34. See Braeutigam, *Optimal Pricing with Intermodal Competition*, 69 AM. ECON. REV. 38 (1979) (showing that Ramsey Pricing justifies extending regulation to cover competing suppliers "even if those modes serve markets which are potentially quite competitive"); see also Phillips, *Ramsey Pricing and Sustainability with Interdependent Demands*, in REGULATED INDUSTRIES AND PUBLIC ENTERPRISE 187 (B. Mitchell & P. Kleindorfer eds. 1979). It may be useful to think of the world as a monopoly amusement park, see Oi, A KAPLAN, *DEREGULATING THE AIRLINES* 153-71 (1985); Bailey & Panzar, *The Contestability of Airline Markets During the Transition to Deregulation*, 44 LAW & CONTEMP. PROBS. 125 (1981).

35. See Verified Statement and Reply Verified Statement of William J. Baumol and Robert D. Willig, *Intramodal Rail Competition*, Ex Parte No. 445 (Sub-No. 1), 1 I.C.C.2d 822 (1985).

36. See E. BAILEY, D. GRAHAM & D. KAPLAN, *DEREGULATING THE AIRLINES* 153-71 (1985); Bailey & Panzar, *The Contestability of Airline Markets During the Transition to Deregulation*, 44 LAW & CONTEMP. PROBS. 125 (1981).

37. *Contestable Markets*, *supra* note 7, at 111-12.

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industries seeking to be deregulated.³⁸ Surprisingly, in a few cases, the theory has also captured the imagination of permissive regulators seeking to relinquish their duties during the transition, despite the fact that the relevant markets could hardly be labelled perfectly contestable.³⁹

The Ramsey Pricing proposal has also been criticized both because of the practical infeasibility of applying the pricing algorithms⁴⁰ and the failure of the pricing rule to protect some so-called captive consumers who were granted statutory safeguards against “unreasonable rates”⁴¹ during the transition. The SAC test has also been criticized as being simply a necessary, but not a sufficient, surrogate test for competition in a regime of contestable markets.⁴² The danger, however, is that the theory’s prescriptions for public policy in the transition to deregulation will become nothing less than an atavism of pricing and entry policies under regulation.⁴³ Indeed, Ramsey Pricing has long been tempting as a rationalization for regulators cross-subsidizing uneconomic lines of business,⁴⁴ and free entry has long been perceived by regulators as a threat to these discriminatory pricing schemes.

In the case of both regulation and the transition, a tendency can thus arise to consider substantial price discrimination as consonant with an idealized welfare norm.⁴⁵ At the same time, the severe deviations from a

38. *See id.*

39. *See* Coal Rate Guidelines, Nationwide, Ex Parte No. 347 (I.C.C. Feb. 8, 1983). Of course, perfect contestability may not be needed to maintain some semblance of competitive threat which would be sufficient to exert a downward pressure on prices. *See* Morrison & Winston, *supra* note 23, at 58.

40. Tye & Leonard, *On the Problems of Applying Ramsey Pricing to the Railroad Industry with Uncertain Demand Elasticities*, 17A *TRANSP. RES.* 439, 444-45 (1983); *see also* Tye, *The Pricing Policy of the Postal Service: Policymaking Misunderstood*, 4 *J. POL’Y ANALYSIS & MGMT.* 256 (1985); Tye, *The Postal Service: Economics Made Simplistic*, 3 *J. POL’Y ANALYSIS & MGMT.* 62 (1983); Tye, *Ironies to the Application of the Inverse Elasticity Rule to the Pricing of U.S. Postal Services*, 19 *LOGISTICS & TRANSP. REV.* 245 (1983).

41. Allen & Berardino, *The Application of Ramsey Pricing in the Railroad Industry*, 25 *TRANSP. RES. F.* 204, 204-13 (1984); Tye, *Ramsey Pricing and Market Dominance Under the Staggers Rail Act of 1980*, 24 *TRANSP. RES. F.* 667, 667-74 (1983); Tye, *Balancing the Ratemaking Goals of the Staggers Rail Act*, 22 *TRANSP. J.* 17 (1983).

42. *See* Tye, *Stand-Alone Costs as an Indicator of Market Dominance and Rate Reasonableness under the Staggers Rail Act*, 13 *INT’L J. TRANSP. ECON.* 21 (1986); Tye, *Problems of Applying Stand-Alone Costs as an Indicator of Market Dominance and Rail Rate Reasonableness*, 12 *INT’L J. TRANSP. ECON.* 7 (1985); *see also* Weiss, Nitzan & Lee, *Sustainability of the Multiproduct Monopoly and Ramsey-Optimal Pricing*, 142 *J. THEORETICAL ECON.* 473 (1986) (showing that SAC test is not necessary and sufficient condition for sustainable contestable monopolist and thus cannot serve as surrogate for contestability).

43. The argument that revenue adequacy is threatened by procompetitive policies resurrects the oldest debate in railroad regulatory policy. For an extensive review of the debate and its antecedents, *see* Locklin, *The Literature on Railway Rate Theory*, 47 *Q.J. ECON.* 167 (1933).

44. Inability to abandon uneconomic branchlines and unprofitable passenger service have commonly been cited as examples in the rail industry. *See* Levin, *Regulation, Barriers to Exit, and the Investment Behavior of Railroads*, in *STUDIES IN PUBLIC REGULATION* 181 (G. Fromm ed. 1981).

45. *See* Breen, *Antitrust and Price Discrimination in the Trucking Industry*, 28 *ANTITRUST*

highly competitive or contestable environment—such as restrictions on entry, franchised monopoly, cross-subsidies, or sunk costs—that facilitated the price discrimination and restricted the options of those disadvantaged by it are forgotten.⁴⁶ In the particular case of railroads, moreover, Ramsey Pricing and the SAC test fail as transition mechanisms because the SAC test starts with an artificial attempt to force the transition problem into the mold of contestability theory in an industry where, according to most observations, “hit and run” entry by specialized competitors with cost structures identical to the incumbent is somewhat limited.⁴⁷ Indeed, if far more competitive and easy-to-enter transport markets, such as trucking and airlines, do not achieve full contestability,⁴⁸ then the difficult-to-enter railroad market should fall significantly short of that ideal.

B. *The Implications of Sunk Costs*

The enduring contribution of contestable markets theory is likely to be its focus on sunk costs, which previously had been inadequately explored by economists on the ground that, once sunk, costs are irrelevant to

BULL. 201, 220–25 (1983); Frank, *When Are Price Differentials Discriminatory?* 2 J. POL'Y ANALYSIS & MGMT. 238 (1983). Some observers have characterized price discrimination as an attribute of competitive markets. See Beilock, *Is Regulation Necessary for Value of Service Pricing?*, 16 RAND J. ECON. 93 (1985). The problem started when proponents of airline deregulation argued that competitive forces would undermine the departures from long-run incremental cost pricing that were believed to have arisen from the cross-subsidies induced by regulation. When competition resulted in price structures that appeared to depart at least as far from long-run incremental costs, some proponents of deregulation lost confidence in their own case and asserted that demand rather than cost was the primary determinant of prices under competition. An alternative explanation would be that these departures are a legacy of the uneconomic investments induced by regulatory incentives rather than a permanent feature of competitive markets. See Schwieterman, *Fare is Fair in Airline Deregulation—The Decline of Price Discrimination*, REGULATION, July-Aug. 1985, at 32.

46. Price discrimination usually implies some departure from the norms of perfect competition and is unsustainable against intense competition among incumbents. See Benson, *On the Ability of Spatial Competitors to Price Discriminate*, 33 J. INDUS. ECON. 251 (1984). Product differentiation and the transaction costs which accompany customers' efforts to evade the price discrimination are two sufficient conditions for the existence of discriminatory pricing even with free entry. See Borenstein, *Price Discrimination in Free-Entry Markets*, 16 RAND J. ECON. 380 (1985).

47. Ramsey Pricing is alleged to be necessary because of the large pool of costs that cannot be assigned to any particular class of traffic. But if this is true, then a specialized hypothetical new entrant will always suffer an economy-of-scope entry barrier. Efforts to eliminate the scale disadvantages to the hypothetical new entrant by giving it the advantages of the incumbent only delay, rather than eliminate, the original cost allocation problem.

48. Many observers have suggested this. See E. BAILEY, D. GRAHAM & D. KAPLAN, *supra* note 36, at 165; S. MORRISON & C. WINSTON, *THE ECONOMIC EFFECTS OF AIRLINE DEREGULATION* 64 (1986) (arguing that structure of aviation industry represents “a combination of some version of the dominant firm model and imperfect contestability”); Call & Keeler, *Airline Deregulation, Fares and Market Behavior: Some Empirical Evidence*, in *ANALYTICAL STUDIES IN TRANSPORT ECONOMICS* 221, 244–45 (1985); Shepherd, *Contestability vs. Competition*, 74 AM. ECON. REV. 572, 584–85 (1984); Graham, Kaplan & Sibley, *Efficiency and Competition in the Airline Industry*, 14 BELL J. ECON. 118 (1983); Levine, *Airline Competition in Deregulated Markets: Theory, Firm Strategy and Public Policy*, 4 YALE J. ON REG. 393, 405–08 (1987). But see *Contestable Markets*, *supra* note 7, at 127–34 (arguing that aviation and trucking industries closely approximate perfect contestability).

decision-making about future costs and benefits. Contestability theory correctly stresses that it is precisely this foreclosure of future options caused by sunk costs that generates risk for entrants and gives incumbents the power to make credible threats to deter entry. In short, the contestability focus on sunk costs leads to the conclusion that risks can arise from the irreversibility of certain decisions.

While making sellers' sunk costs the centerpiece of their new theory, the practitioners of contestability theory have, ironically, ignored the equally important implications of buyers' sunk costs for public policy during the transition to deregulation. In essence, when vertically related firms sink costs into specialized investments that are idiosyncratic to the relationship, the resulting quasi-rents can be appropriable by opportunistic behavior designed to change the income shares specified by the original terms of the relationship.⁴⁹ Highly discriminatory Ramsey Pricing during the transition could be interpreted as a potential example of such opportunistic behavior, often being crucially dependent on the existence of sunk costs. Indeed, quite perversely, a purported inadequacy of enough buyers with enough sunk costs could even become the rationale for suppressing contestability to achieve revenue adequacy.

The long-run equilibrium implicit in Ramsey Pricing and the SAC test is likely to be a system of rather extreme price discrimination to be enforced principally by the constraints on buyers' choices that sunk costs provide.⁵⁰ Any such power to engage in price discrimination is, however, illusory, or temporary at best, because sunk costs are usually transitory. Even in the short run, statistical studies of demand elasticities show large errors that impose difficulties in making the necessary distinctions.⁵¹ In the long run, the frustrating history of value of service⁵² rate making, propounded by regulators and systematically undermined by markets,⁵³ is eloquent testimony to the impermanence of any set of demand elasticities.

49. For a discussion of the role of sunk costs in creating short-term monopoly power to extract both economic rents and quasi-rents, see Klein, Crawford & Alchian, *Vertical Integration, Appropriate Rents and the Competitive Contracting Process*, 21 J.L. & ECON. 297 (1978).

50. The ICC, in endorsing Ramsey Pricing and proposing the SAC test, specifically identified the difference between oil-fired and coal-fired electrical generating costs as an apparently permanent source of economic rent that could be appropriated by the rail industry as the answer to rail revenue adequacy. See Zimmerman, *Rent and Regulation in Unit-Train Rate Determination*, 10 BELL J. ECON. 271 (1979).

51. See Tye & Leonard, *supra* note 40, at 441.

52. "Value of service" is a term usually connoting ratemaking methodologies that attempt to account for differing elasticities, but without the theoretical elegance or quantitative precision of the Ramsey Pricing approach.

53. See J. MEYER, R. WILSON, M. BAUGHUM, E. BURTON & L. CAQUETTE, *THE ECONOMICS OF COMPETITION IN THE TELECOMMUNICATIONS INDUSTRY* 75-109 (1980); J. MEYER, M. PECK, J. STENASON & C. ZWICK, *THE ECONOMICS OF COMPETITION IN THE TRANSPORTATION INDUSTRIES* 242-74 (1959).

No carrier should therefore expect to achieve permanent revenue adequacy by confiscating quasi-rents resulting from temporarily sunk costs. Disadvantaged shippers will relocate to areas where they have access to the same lower rates as their competitors or will refuse to sink additional costs without long-term rate guarantees. Substitutes will be found, in the form of new products or materials, or in new sources of supply, or entirely new transportation systems, such as trucks in place of railroads in the first half of the twentieth century and railroads in place of canals, barges, and riverboats in the nineteenth century. The composition of traffic carried by the price-discriminating carrier also will change over time, almost inevitably tilting toward so-called lower-rated traffic, traffic carrying smaller markups over costs.

Therefore, it may only be a slight exaggeration to suggest that, without government intervention, in the long run all market relationships are contestable, at least in the sense of being renegotiable and redefinable. One could almost state it as an extension of the Coase theorem: If regulation results in what people perceive to be inefficiently high mark-ups over costs, then they will pursue other alternatives and negotiate until they achieve what they perceive to be a more efficient outcome.⁵⁴

The sustainability literature accompanying contestability theory commonly has focused on the incumbents' short-run defenses against the potential entrant, so as to maintain Ramsey Pricing,⁵⁵ while ignoring the countermeasures available to buyers to evade price discrimination. These buyer defenses cause the elasticities of the various classes of output or traffic to converge; the elasticities also increase substantially over time, and through product competition cross-elasticities can become much more substantial. Unless there are true economic rents captured or created by the pricing structure, not just temporary quasi-rents resulting from sunk costs,⁵⁶ the result is the near impossibility of sustaining in the long run the high degree of discrimination possible in the short run because of buyers' sunk costs.

As a consequence, Ramsey Pricing in practice is often either a contrivance of a regulated market environment,⁵⁷ a monopoly,⁵⁸ or a transitory

54. Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1 (1960) (arguing that economic actors will attempt to negotiate to achieve efficient allocation of resources despite legal rules which produce inefficient initial allocation).

55. See Baumol, Bailey & Willig, *supra* note 32.

56. See Damus, *Two Part Tariffs and Optimum Taxation: The Case of Railway Rates*, 71 AM. ECON. REV. 65 (1981); Friedman, *In Defense of the Long-Haul/Short-Haul Discrimination*, 10 BELL J. ECON. 706 (1979); Tye, *On the Effectiveness of Product and Geographic Competition in Determining Rail Market Dominance*, 24 TRANSP. J. 5 (1984).

57. See Boyer, *Equalizing Discrimination and Cartel Pricing in Transport Rate Regulation*, 89 J. POL. ECON. 270 (1981); Trotter, *The Price-Discriminating Public Enterprise, With Special Reference to British Rail*, 19 J. TRANSP. ECON. & POL'Y 41 (1985).

feature based on the temporarily sunk costs of certain participants, leading to degrees of price discrimination that cannot be sustained in the long run in a fully competitive deregulated equilibrium. Moreover, suppliers may be encouraged to sink additional costs in the belief that a highly discriminatory Ramsey Pricing scheme enforced by costs sunk in the prior regulatory regime is a permanent feature of the marketplace.⁵⁸ Some price discrimination may well persist, of course, for some time but not in the substantial degree permitted by a carryover of regulation-induced sunk costs.

C. *The Anticompetitive Results of the Revenue Adequacy Focus*

Combining an implicit belief in the incompatibility of intramodal competition and revenue adequacy with a highly motivated search by disadvantaged customers for alternatives, a propitious environment is not created for a successful transition to deregulation. The goals of capacity rationalization and revenue adequacy will continue to be frustrated and carriers, shippers, and regulators may each decide to abandon any commitment to deregulation. The major danger is that the inability to achieve revenue adequacy under Ramsey Pricing will frustrate the transition to deregulation by fostering the impression among regulators that revenue adequacy is necessarily and intrinsically incompatible with procompetitive goals. While this outcome may or may not be true depending on the particular case, and is provable only when a new equilibrium is established, it is only one more step to endorse whatever additional restrictions on competition are necessary to achieve the goal of immediate revenue adequacy above all else.

In general, the premise that the revenue needs of incumbents are the highest priority of regulators is not likely to be a tenable basis for a work-

58. Given the assumed cost structure of the rail industry, revenue-adequate Ramsey Pricing is not sustainable against direct intramodal competition among incumbents with identical cost structures and can be practiced only by a firm that can disregard the pricing response of identically situated incumbents. This fact should be evident from observing that two incumbents with identical cost structures cannot both set their rate structures based on determinate mutual estimates of elasticities formed by the competitive threat of the other incumbent. This, together with that fact that most traffic moves on joint rates, means that there is a serious question as to whether Ramsey Pricing can even be practiced in the rail industry unless the carrier is freed from intramodal competition and the constraints of the antitrust laws. See Damus, *supra* note 56, at 74-79; Damus, *Ramsey Pricing by U.S. Railroads: Can It Exist?*, 18 J. TRANSP. ECON. & POL. 51 (1984); Damus, *An Evaluation of Ramsey Pricing: Argentine Railways ca. 1905*, 24 TRANSP. RES. F. 418 (1983).

59. Katz has pointed out that "price discrimination also may affect the costs incurred to produce a given level of total output." Katz, *Price Discrimination and Monopolistic Competition*, 52 ECONOMETRICA 1453, 1453 (1984). Indeed, the history of the transportation industries has been largely influenced by the creation of competitive alternatives, many of them involving what has become known as uneconomic bypass, to evade the price discrimination fostered by faith in price discrimination as an answer to a regulated carrier's problems.

able transition to deregulation. If an industry already approaches substantial contestability, revenue adequacy of incumbents should, as a matter of logic, carry little weight in the choice of policy. Even if an industry is not contestable, sunk costs existing at the onset of deregulation are almost surely an erroneous standard for assessing future revenue needs. Indeed, if past investment patterns were a reliable basis for future revenue needs, a major rationale for deregulation would be invalidated. While the sunk costs of past investments cannot be totally ignored, an exclusively backward-looking view of revenue needs, based on costs sunk under the prior regulatory regime, will provide little basis for establishing priorities for future regulatory policies.

Concerns over revenue adequacy also originate in assumptions about industry cost structure, assumptions that may owe more to prior regulation than to technology or economics. The assumption of strong economies of scale and the existence of a large pool of costs that cannot be attributed to a particular traffic or business can become the basis for the belief that prices must exceed incremental costs, and therefore that revenue adequacy and intramodal competition are not compatible. Scale economies commonly derive from some form of indivisibility in an underutilized resource or factor of production.⁶⁰ As noted above, regulation often encouraged investment in excess capacity, which must be squeezed out during the transition to deregulation. The existence of underutilized capacity in an industry with very substantial and long-lived sunk costs can therefore easily be confused with true scale economies, that is underutilized resources that arise from indivisibilities (fixed costs) which are a permanent feature of the technology of the industry. One cannot necessarily infer that an industry in disequilibrium with excess capacity, where prices are equal to marginal or average variable costs and produce inadequate revenues, must necessarily be subject to long-run scale economies. The industry's revenue-adequacy problems might just as well be solved by a restructuring of the industry's market relationships, for example via long-term contracts as discussed below or by a restructuring of its cost structure as by schemes of price discrimination based on current cost structures.⁶¹

IV. An Alternative Vision of the Transition

If regulators are to fashion their policies with the goal of a successful transition to deregulation in mind, a new set of explicit regulatory policies

60. Hicks, *Annual Survey of Economic Theory: The Theory of Monopoly*, in *MICROECONOMICS: SELECTED READINGS* 188, 204-05 (E. Mansfield ed. 1971).

61. This observation may be of particular relevance to current disputes about appropriate access charges for local telephones.

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may be needed. Toward that end, the following policy guidelines are suggested:

1. Incentives for efficiency and innovation via reliance on competitive forces should be pursued vigorously and incumbents should feel strong pressures from actual and potential competitors to squeeze out the inflated costs that commonly become associated with regulated industries;
2. Contracts should be encouraged to protect buyers and sellers from extreme forms of opportunistic behavior, for example, substantial departures from the regulatory status quo ante immediately after deregulation as these opportunities arise from sunk costs, long-lived assets, and buyer/seller relationships established under regulation;⁶²
3. Prices and services should be unbundled⁶³ wherever necessary to promote competition during the transition, to encourage new entry, and to eliminate cross-subsidies;
4. Some residual but strictly phased and limited regulation should be employed where contracts or competition will not quickly supplant prior regulatory contracts or where some network bottlenecks persist. The appropriate mix of these ingredients will depend on the degree to which the regulated industry is characterized by large sunk costs, economies of scale, and small numbers of competitors.⁶⁴

62. Of course, transportation services in a competitive market would be sold with a mixture of contract, publicly posted ("tariff"), and spot prices, depending on the needs of shippers and carriers. See T. HEAVER & J. NELSON, *RAILWAY PRICING UNDER COMMERCIAL FREEDOM: THE CANADIAN EXPERIENCE* 63-105 (1977); Lacoste, *The Structure of Railroad Fares and Rates in a Highly Competitive Freight Transportation Market*, in *ECONOMIC REGULATION: ESSAYS IN HONOR OF JAMES R. NELSON* 83 (K. Boyer & W. Shepherd eds. 1981).

63. Adams & Yellen, *Commodity Bundling and the Burden of Monopoly*, 90 Q.J. ECON. 475 (1976).

64. Baumol notes that markets and contracts will not automatically achieve efficiency under circumstances of "asset specificity (sunk costs), limits on information and calculation ability ('bounded rationality'), and willingness to profit at the expense of others ('opportunism')." Baumol, *Williamson's "The Economic Institution of Capitalism"*, 17 RAND J. ECON. 279, 280 (1986). For a discussion of the types of institutions that have developed in the absence of regulation to deal with these problems, see O. WILLIAMSON, *THE ECONOMIC INSTITUTIONS OF CAPITALISM* 163-364 (1985); Phillips, *Schwinn Rules and the "New Economics" of Vertical Relations*, 44 ANTITRUST L.J. 573 (1975); Williamson, *Assessing Vertical Market Restrictions: Antitrust Ramifications of the Transaction Cost Approach*, 127 U. PA. L. REV. 953 (1979); Williamson, *The Economics of Antitrust: Transaction Cost Considerations*, 122 U. PA. L. REV. 1439 (1974).

A. *The Need for Efficiency*

The maximum reliance on competitive pressures in the first guideline coalesces with the discouragement of extreme forms of quasi-rent-seeking (opportunistic) behavior in the second. Firms going through the regulatory transition should not be encouraged to believe that opportunistic behavior that exploits costs sunk under prior regulatory rules are a substitute for the true efficiency gains in capacity reduction, cost minimizing, and marketing arrangements to be sought from deregulation. For some time it has been recognized that regulation can be a form of contract that permits buyer and seller to sink costs and thereby become captive to one another.⁶⁵ A major task of deregulation is to supplant this regulatory contract with private contracts to recover sunk costs while discouraging opportunistic behavior.⁶⁶ The long-run model for regulators to seek during the transition, therefore, should be a contractual equilibrium in which shippers and carriers and sellers and buyers establish the terms of the agreement before they sink costs.⁶⁷

B. *A Contractual Approach*

The place to begin in developing appropriate regulatory rules during the transition to deregulation is therefore to ask what kind of contracts would have already been in place had private-market contractual institutions, rather than regulation,⁶⁸ performed these functions historically—if a

65. The idea originates in Coase's pathbreaking work. Coase, *supra* note 54. *But see* Goldberg, *Regulation and Administered Contracts*, 7 BELL J. ECON. 426 (1976). For an intriguing demonstration that procedures for resolving similar "sunk costs" issues must be developed for intrafirm relationships, see Fitzroy & Mueller, *Cooperation and Conflict in Contractual Organizations*, 24 Q. REV. ECON. & BUS. 24 (1984).

66. Section 208 of the *Staggers Rail Act of 1980* amended the law by creating Section 10,713 to the *Interstate Commerce Act*. See *Railroad Transportation Contracts*, Ex Parte No. 387, 367 I.C.C. 9 (1982), corrected, 367 I.C.C. 397 (1983); Uggin, *Railroad Contract Rates: A Working Analysis of Sections 10713*, 48 INTERSTATE COM. COMMISSION PRAC. J. 526, 526 (1981). Such contracts had an uncertain legal status under the prior law. See R. DART, *CONTRACTING FOR COAL TRANSPORTATION* (1982); Altrogge, *Railroad Contracts and Competitive Conditions*, 21 TRANSP. J. 37 (1981).

67. In posing the contractual equilibrium as one of particular interest, we do not mean to preclude consideration of other regimes. For other suggestions or procedures for recovering sunk or fixed costs, see French & McCormick, *Sealed Bids, Sunk Costs, and the Process of Competition*, 57 J. BUS. 417 (1984); Mohring, *Profit Maximization, Cost Minimization, and Pricing for Congestion-Prone Facilities*, 21 LOGISTICS & TRANSP. REV. 27 (1985); Oren, Smith & Wilson, *Capacity Pricing*, 53 ECONOMETRICA 545 (1985).

68. Coase's original contribution was to note that the efficiency rationale for regulatory and legal intervention into disputes arises from the presence of transaction costs—the cost of negotiating and enforcing contracts that foreclose efficient contracts from solving these disputes. If the original rationale for regulatory intervention is no longer valid, the purpose of the proposed thought experiment is to imagine the kinds of efficient contracts that would have been negotiated in the absence of regulatory intervention.

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Coase approach to these problems had been pursued rather than regulation.

A variety of possible or plausible contractual outcomes consistent with an unregulated negotiating or contracting process can be identified. Regulators would have to judge among them based on achieving a reasonably “equitable” transition from the regulatory rules understood when the parties sunk their costs, incentives for efficiency, deterrence of opportunistic behavior, and contribution to the goal of a successful transition to deregulation. Some acceptable possibilities involve some continuing price discrimination, perhaps within ever wider bounds (as stipulated, for example, in the Staggers Act), but would probably rule out highly discriminatory Ramsey Pricing based on short-run opportunistic behavior on the grounds that this would have potentially adverse consequences for achieving a successful transition to deregulation.

In general, much of what is conventionally called “price discrimination” might be expected to persist even after deregulation, especially in transportation industries where almost every haul or trip between a given origin and destination or city pair is likely to have unique characteristics. The important point is that any such discrimination should not be based on regulatory constraints, or overtly opportunistic exploitation of a transitory situation bequeathed by previous regulation. Rather it should be a consequence that evolves from market forces or mutually acceptable contracts (always subject to further competitive and technological challenge). The potential welfare advantages of such open market-devised discrimination have long been recognized.⁶⁹

1. *Changes Under a Contractual Approach*

Experience with the general use of contracts in the economy suggests some of the relevant features of a long-run contractual equilibrium. For example, through-put agreements and take-or-pay contracts⁷⁰ are often signed in transportation industries precisely to shift risk of revenue variances away from the suppliers who have sunk costs in the right-of-way to the suppliers of the operating services or shippers who are presumably more knowledgeable about their future demands or are better able to bear the risks.

69. See Ekelund, *Jules Dupuit and the Early Theory of Marginal Cost Pricing*, 76 J. POL. ECON. 462 (1968); Friedman, *supra* note 56, at 706.

70. A through-put agreement is a term of art in an oil pipeline agreement whereby shippers agree to pay for their share of the pipeline expense whether or not they use their share of capacity. More generally in contract terminology, “take-or-pay” refers to a commitment of a buyer to accept delivery or pay anyway regardless of future market conditions, with excused nonperformance depending on the particular terms of the contract.

Thus, suppose that there are ten oil-drilling or mining companies with projections of demand for use of a new railway or pipeline. Prior to construction, the existence of a competitive market for coal or petroleum reserves would preclude any extreme discriminatory rate structure from emerging. The option of the shippers to construct their own facility, which is a common solution in the case of oil pipelines and an occasional one for railroads, means that the contract price of capacity should approximate long-run average costs even in the presence of long-run declining costs because competition among sellers will usually succeed in preventing any extreme sorts of price discrimination recommended by the Ramsey Pricing approach.⁷¹ As distinguished from this long-term contract price, a spot price will reflect short-run costs, demand, and competitive alternatives, and will sometimes differ significantly from the long-term contract price. Nevertheless, the ability to subdivide the indivisibility of the single facility through contracts with numerous competitive and approximately equally advantaged suppliers should mean that long-term contract prices all roughly equal long-run average cost.

A more difficult issue is raised in the case where all suppliers are not equally advantaged. This would happen when they are spaced equally along the line so that economic rents would be created for resource owners who are closer to the end market if the rate per ton-mile is constant. Economically efficient Ramsey Pricing schemes applied by competitive carriers operating under increasing returns to shippers with substantial true economic rents available to finance the carriers' revenue requirements cannot be rejected in such circumstances.

Work by Sylvester Damus⁷² and going back to David Ricardo,⁷³ suggests that a discriminatory rate scheme could be devised to capture these economic rents in order to move toward marginal cost pricing of the transportation system. As long as the rate discrimination captured economic rents created by the transportation facility itself, the theory says that the discrimination might not be avoidable by shippers and would be more efficient than a nondiscriminatory rate structure. In effect, such a rate scheme is the device a single firm would employ if it were developing the transportation facility with the objective of covering its costs and maximizing the rental value of the adjacent land. The amount of discrimination

71. When capacity is widely owned and in some cases is assignable, one could imagine that a competitive market could emerge even though only one facility exists. The Trans-Alaska Pipeline, for example, is owned by numerous separate interests which can be bought and sold. This contracting procedure for dealing with sunk costs and economies of scale has been dubbed the condominium model. See Hogan, *The Boundaries Between Regulation and Competition*, in *DRAWING THE LINE ON NATURAL GAS REGULATION* 75 (J. Kalt & F. Schuller eds. 1987).

72. Damus, *supra* note 56, at 70.

73. D. RICARDO, *ON THE PRINCIPLES OF POLITICAL ECONOMY AND TAXATION* (1817).

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needed would depend directly on the degree of scale economies (determining the amount to be raised).

By contrast, suppliers in regulated industries have often sunk substantial amounts based on an understanding that these costs would be amortized via the regulatory contract or process.⁷⁴ During the transition to deregulation, a problem may arise because under certain circumstances sunk capacity costs cannot be retroactively imposed on newly competitive markets or spheres.⁷⁵ In some instances, much of the existing capacity would not have been constructed without prior contractual or regulatory commitments from consumers in potentially competitive markets to pay for substantially more of those capacity charges than they can be assessed under a deregulated scenario. These sunk costs also generate genuine concerns of equitable treatment for investors who made these investments with the expectation that the previous rules of regulation would continue.⁷⁶ By the same token, as already noted sunk costs of customers create the opportunity to solve these problems of transition by schemes of price discrimination. However, the availability of these expedencies in the short run should not be called competitive, nor confused with a long-run non-regulated equilibrium where the sunk costs are amortized and contracts negotiated *de novo*.

74. Regulation had previously prevented opportunistic behavior (holdups) by replacing the contracts that would have protected suppliers' interests in the absence of regulation. Such behavior might be thought of as quasi-rent-seeking behavior. Rent-seeking behavior describes competition for economic rent, which in turn is defined to be a windfall gain to a factor of production arising from receipt of income not necessary to ensure continued commitment of the resource to a designated use. See *NEOCLASSICAL POLITICAL ECONOMY: THE ANALYSIS OF RENT-SEEKING AND DUP ACTIVITIES* 7-8 (D. Colander ed. 1984). The pure case of economic rent would be the income derived by a land owner because of the location of the property. Quasi-rent is a term applied to the income accruing to a depreciating asset temporarily committed to a particular use. Sunk costs by definition mean that the income is not necessary to assure continued employment of the resource in the designated use in the short run.

75. For example, a particular shipper may fortuitously have access to competing railroads prior to deregulation, but minimum rate regulation may have stifled price competition and enhanced the carrier's ability to charge rates sufficient to amortize sunk/fixed costs. Once deregulation is inaugurated, neither carrier has a contractual commitment from the shipper to recover sunk/fixed costs and the price competition that emerges is often likely to prevent the carriers from recovering all costs incurred as a consequence of this customer's service. The question in the transition is whether captive shippers who do not enjoy this competition should be asked to make up these deficiencies through Ramsey Pricing.

76. For example, regulation previously served the functions of the courts in enforcing and regulating contracts in unregulated markets by preventing opportunistic behavior among rail carriers in serving joint-line traffic. Sunk costs also therefore must be considered when establishing policies towards "competitive access" (carrier access to joint operating agreements with other carriers on interline movements). These may call for departures from the rules, such as these advanced in McFarland, *The Economics of Vertical Restraints and Relationships Between Connecting Railroads*, 23 *LOGISTICS & TRANSP. REV.* 207 (1987), that ignore sunk costs in the prior regulatory regime.

2. *Limits to the Contractual Approach*

Not all regulated markets are equally suited to the contractual equilibrium as a substitute for regulation.⁷⁷ Particularly relevant distinguishing features in identifying potential obstacles to a successful contractual transition are the number of buyers and sellers involved and their ability to protect their interests via long term contracts.

Buyers and sellers must be able to make credible and irreversible commitments to contracts that preclude recourse to regulatory intervention when subsequent events make the traditional regulatory answer temptingly preferable for one of the parties. Unless buyers and sellers are able to commit irreversibly to contracts, the ability to resort to regulatory intervention can create incentives for a situation in which one party chooses the better of regulation or competition at a future date as expediency suggests.

The feasibility of long-term contracts also depends on reasonably low transaction costs in negotiating and enforcing the contracts. Large numbers of buyers and sellers may drive up the transaction costs of the contracting process to unreasonable levels and create politically unacceptable disparities in the distribution of the benefits. Such considerations would suggest that a transition from regulation to competition will be easier in interstate markets for natural gas transmission, for example, than in markets for local telephone or gas distribution systems. Rather than attempt to out-guess the market in deciding at the appropriate margin between competitive and regulatory solutions, the appropriate course for regulators is to encourage, or even intensify, competitive alternatives and let the market decide, reserving any regulatory answers for market failures if they appear.

Interestingly, as a method of resolving current regulatory disputes over how to deal with the legacy of sunk costs, particularly rates for captive shippers and competitive access for unintegrated competitors, the vision of a "contractual equilibrium" as a long-run goal is consonant with the spirit of contestability theory.⁷⁸ While sunk costs as a legacy of regulation are a fact of life, economically sound answers to problems of the transition can be found if regulators seek to become "surrogates for competition unimpeded by entry barriers" (sunk costs). To do this, the relevant question is what the world would look like if those costs were not yet sunk, not

77. For an interesting and suggestive discussion of these limits, see Farrell, *Information and the Coase Theorem*, 1 J. ECON. PERSP. 13 (1987).

78. Bailey and Baumol suggest that long-term contracts be used to achieve the results of contestability even when exit is not costless because of sunk costs: "[R]egulation, long term contracts, or other impediments can slow the response of incumbents to entry. Moreover, a new firm can forestall retaliation by entering into contracts, before it actually opens for business, with customers it lures from incumbents." Bailey & Baumol, *supra* note 7, at 115.

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how to exploit those sunk costs by indulging opportunistic behavior during the transition.

Conclusion

Since the goal of a successful regulatory transition is to bring the level of government intervention into accord with the levels of other industries as closely as possible, deregulation does not necessarily mean total withdrawal of government involvements. Somewhat paradoxically, withdrawal of traditional regulation may require more activist intervention to ensure competition on equal terms where competitive access concerns are raised. Indeed, since regulation has probably caused atrophy of many of the usual institutions that protect buyers' and sellers' interests in unregulated markets, somewhat greater attention to other regulatory mechanisms, such as antitrust and consumer protection may be necessary. Government attention to the development of adequate infrastructure, such as airports, airways and roads, can also help by providing adequate opportunities for competitive entry. This intervention should not be regarded as backsliding on the goal of deregulation, but rather as part of creating an environment conducive to making competitive markets function in a complex and changing world.

