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I. INTRODUCTION

In the last couple of decades, most of the world's major economies have begun a fundamental shift toward a greater market orientation. Governments have privatized state-owned enterprises, reduced the extent and scope of regulation and sought to remove barriers to competition. These changes have transformed the workings of major industrial sectors including telecommunications, energy and transportation, replacing state-owned or highly regulated monopolies with private firms competing in a liberal market environment.

This article addresses a set of issues that arise in the context of market liberalization for a special and important class of industries, the so-called "network industries," which include electricity, natural gas, rail transportation and telecommunications. Each of these industries combines activities that are potentially competitive, such as generation of electricity, with ones that are naturally monopolistic, such as transmission of electricity. This combination produces a unique set of challenges to competition law and policy in designing a market structure and regulatory framework which maximize the benefits of liberalization while effectively controlling any tendencies to monopolistic abuse.

These issues are of special relevance in Europe, where efforts are currently underway to liberalize the natural gas and electricity industries through the implementation of two recent European Commission

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directives. The directives allow each country to choose between "regulated access" and "negotiated access." Under regulated access, the government sets the prices and terms by which potential new competitors can obtain access to essential networks. Under negotiated access, competitors must negotiate the terms of access directly with incumbents. Negotiation must be non-discriminatory and undertaken in good faith, with potential disputes subject to an independent settlement procedure.

We analyze "Chicago School" theories that would support negotiated access as an efficient option. According to the Chicago School, incumbents naturally have incentives to offer access on terms that will promote efficient entry. The predictions of the Chicago School, however, are directly contradicted by the United Kingdom's experience with voluntary negotiations in the case of British Gas. Over an extended period of years, the British government relied on voluntary negotiations to provide entrants with access to the British Gas pipeline network. However, British Gas engaged in a pattern of behavior including obfuscation and discrimination that made entry infeasible.

After exploring the apparent contradictions between Chicago School predictions and British Gas's behavior, we analyze the theoretical weaknesses in the Chicago School approach and identify several reasons why voluntary negotiations should not form the basis of government policy. We review the limited experience with negotiated access to electricity transmission in Germany, which confirms our conclusion that negotiated access would deter the development of competition in the European gas and electricity industries. We propose an alternative frame for regulation based on vertical separation of the network and regulated third party access with cost-based pricing. Incumbents may merit compensation for past investments or for continuing obligations such as universal service. However, any such compensation should be provided by transparent and competitively neutral funding mechanisms.

II. NETWORK INDUSTRIES

A number of common features distinguish the network industries. First, provision of the final product to the consumer relies upon a "network" such as the transmission grid, railroad system or local telephony network. Second, this network is a "natural monopoly." Competition in provision of network services would entail grossly inefficient duplication of facilities. Third, the final services provided by the industry are potentially competitive. Transmission of electricity and gas and the provision of railroad track are all natural monopolies, but that in no way rules out competition in generating electricity, supplying gas or running trains.

Finally, these industries share a common historical pattern. Until recently they have typically been dominated by monopolies which were either state-owned, as in many European countries, or heavily regulated, as

in the United States. Consequently, the current market structure typically consists of large, vertically integrated incumbent local or national monopolies, competing with firms seeking entry. In France for example, the electricity industry consists of a single, vertically integrated company, the state-owned Electricité de France. In Germany eight utilities, each with a historical monopoly in its area of operation, own and operate the transmission grid, and together generate about 80% of all electricity consumed.

The peculiar characteristics of network industries lead to a fundamental tension in competition policy. The central aim of liberalization is to promote competition, to discipline inefficient firms and to ensure that consumers benefit from the potential gains of deregulation. In these industries competition can only come from new entrants who must rely upon the incumbent, their main competitor, for access to the network and therefore to the market. Competition policy first acknowledges the natural monopoly of an essential network facility. It then faces the task of protecting both entrants and consumers from the potential harmful effects of the monopoly. While doing so it must also avoid the danger of excessively harsh regulation of the incumbent. Over-regulation may lead to inefficiency and, at its most extreme, excessive regulation may constitute an effective "taking" or expropriation of the incumbent's previous investment in the network.

The policy issues can be summarized as a sequence of fundamental decisions. First is the question of market structure: should ownership of the network be separated from participation in the final market? For example, in the United Kingdom the national transmission grid (in England and Wales) belongs to the National Grid Company, a regulated company which plays no part in the generation, supply or retailing of electricity.[1] This kind of "vertical separation" is however relatively unusual, and the issue currently receives little attention in European policy debates. It arises most naturally where liberalization occurs simultaneously with privatization, providing a natural occasion to create a vertically separated network owner.

If the network owner is allowed to remain vertically integrated, then the second key decision relates to market conduct. Specifically, is there a need to regulate the terms under which competitor firms may access the network, or should it be left open to negotiation subject only to general provisions of competition law? Most European countries have chosen formal regulation of so-called "Third Party Access" (TPA) but there are exceptions, of which perhaps the most noteworthy is the German electricity industry. Finally, if regulation is chosen, what form should it take? Specifically, should the price of access be set on some basis related only to the direct cost to the incumbent of providing access? Alternatively, should

[1] Except through its control of certain specialized assets that provide "ancillary services" related to the maintenance of frequency, avoidance of "blackouts," etc.

it include a component to compensate for any profits that the incumbent may lose through the provision of access? As we shall see, this has been the subject of considerable controversy.

III. BACKGROUND IN EUROPEAN LAW AND POLICY

Competition cases affecting more than one member state of the European Union (EU) are subject to European law, which in those cases overrides any provisions in domestic law. EU competition law is based on Articles 85 and 86 of the Treaty of Rome and subsequent decisions and directives of the European Court and Commission. Article 85 of the Treaty relates to collusive behavior such as price-fixing agreements. Article 86 prohibits "[a]ny abuse by one or more undertakings of a dominant position within the common market...in so far as it may affect trade between Member States."

Article 86 has been interpreted by the European Court and Commission to cover "essential facilities," guaranteeing non-discriminatory access to networks and other "bottleneck" facilities.[2] According to the Treaty:

> An undertaking which occupies a dominant position in the provision of an essential facility and itself uses that facility (i.e. a facility or infrastructure, without access to which competitors cannot provide services to their customers), and which refuses other companies access to that facility without objective justification or grants access to competitors only on terms less favourable than those which it gives its own services, infringes Article 86 if the other conditions of that Article are met. An undertaking in a dominant position may not discriminate in favour of its own activities in a related market. The owner of an essential facility which uses its power in one market in order to protect or strengthen its position in another related market, in particular, by refusing to grant access to a competitor, or by granting access on less favourable terms than those of its own services, and thus imposing a competitive disadvantage on its competitor, infringes Article 86.[3]

We discuss below whether a general "essential facilities" provision in competition law is a suitable and sufficient instrument for the regulation of network industries.

In accordance with the principle of subsidiarity, cases which affect only a single member state are subject to the provisions of domestic law. Member states are, however, increasingly keen to ensure consistency between domestic and European competition law. Germany's 1998 Act Against Restraints on Competition and the United Kingdom's 1998 Competition Act are both explicitly designed to align domestic competition law with European. Over time, domestic and European law can be expected to form an increasingly seamless web, ensuring consistent treatment of competition issues across Europe.

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[2] 1994 O.J. (L15) 37.

[3] *Id.*

While the United Kingdom has more than a decade of experience with privatized and liberalized energy markets, other European nations are only now beginning down the same road. For many, the impetus toward deregulation comes from the European Union. Competition law and policy at the European level is in its infancy, but has already had powerful effects. Most recently, the European Commission has promulgated two directives aimed at liberalizing the key energy markets of gas and electricity. Both directives have now received the approval of the Council and Parliament, and passed into law.[4] For many member states, implementation of these directives will entail massive and wholesale restructuring of the industries in question, leading to a new era in European energy.

The European Gas Directive entails the phased opening of European gas markets to competition.[5] Under the directive large customers may choose between competing suppliers when purchasing natural gas, and the network operator is obliged to facilitate such transactions by providing network services in a non-discriminatory fashion. The directive defines two methods of organizing access, referred to as "regulated" and "negotiated" access.

Article 15 of the Directive states:

> 1. In the case of negotiated access, Member States shall take the necessary measures for natural gas undertakings and eligible customers either inside or outside the territory covered by the interconnected system to be able to negotiate access to the system so as to conclude supply contracts with each other on the basis of voluntary commercial agreements. The parties shall be obliged to negotiate access to the system in good faith.
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> 2. The contracts for access to the system shall be negotiated with the relevant natural gas undertakings. Member States shall require natural gas undertakings to publish their main commercial conditions for the use of the system within the first year following implementation of this Directive and on an annual basis every year thereafter.[6]

Article 16 provides in part that:

> Member States opting for a procedure of regulated access shall take the necessary measures to give natural gas undertakings and eligible customers either inside or outside the territory covered by the interconnected system a right of access to the system, on the basis of published tariffs and/or other terms and obligations for use of that system. This right of access for eligible customers may be given by enabling them to enter into supply contracts with

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[4] 1997 O.J. (L27) 40 (concerning common rules of the internal market in electricity); 1998 O.J. (L204) 41 (concerning common rules for the internal market in natural gas).

[5] 1998 O.J. (L204) 18. The directive provides for market opening in three stages (on December 10, 2000, December 10, 2003, and December 10, 2018). At each stage, member states are required to extend freedom of choice of supplier to a larger proportion of customers. The initial proportion includes all gas-fired power generators and other final customers consuming more than 25 million cubic meters of gas per year, and must constitute at least 20 percent of total annual consumption. At the two subsequent stages this proportion must increase to first 28 percent and then 33 percent. *Id.*

[6] 1998 O.J. (L204) 15.

competing natural gas undertakings other than the owner and/or operator of the system or a related undertaking.[7]

Member states are free to choose either or both procedures.[8] They are also required to "ensure that the parties negotiate access to the system in good faith," and to "designate a competent authority. . .[to] settle disputes concerning negotiations and refusal of access."[9]

The Gas Directive entered into force in August 1998 and member states have until August 2000 to implement its requirements. Pending its implementation, negotiated access is the effective policy in most of Europe.

The European Electricity Directive similarly entails the phased opening of European electricity markets to competition.[10] Large customers may choose between competing generators when purchasing electricity, and the transmission network operator is obliged to facilitate such transactions by providing network services in a non-discriminatory fashion.[11] As in the case of natural gas, member states are free to choose between negotiated and regulated access.[12] Under negotiated access, the directive requires that: "producers and. . .eligible customers. . .[are] able to negotiate access to the system so as to conclude supply contracts with each other on the basis of voluntary commercial agreements."[13]

Regulated access gives "eligible customers a right of access, on the basis of published tariffs for the use of transmission and distribution systems, that is at least equivalent, in terms of access to the system, to the other procedures for access referred to in this Chapter."[14]

The directive entered into force in February 1997 and member states had until February 1999 to implement it.[15] At present implementation varies widely across Europe. Germany is the only state to have chosen

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[7] *Id.* Art. 16.

[8] *Id.* Art. 14.

[9] *Id.* Art. 21.

[10] As with natural gas, the electricity directive provides for market opening in three stages (on February 19, 1999, February 19, 2000 and February 19, 2003). At each stage, member states are required to extend freedom of choice of supplier to a larger proportion of customers (the initial proportion corresponds to all customers with annual consumption exceeding 40GWh, reducing to 20GWh and 9GWh at subsequent stages). 1997 O.J. (L27) 16.

[11] *Id.*

[12] *Id.*

[13] *Id.* Art. 17.1.

[14] *Id.* Art. 17.4. The directive also allows for a "single buyer" procedure, which seems to be very similar to regulated access. The main difference is that under the single buyer system, supply contracts between customers and independent generators are combined with a centralized electricity purchasing system through the use of "contracts for difference." *Id.* Art. 18.

[15] *Id.* Art. 27. Three states have been allowed to delay implementation. Belgium has been allowed a delay of one year. Greece and Ireland have been allowed a delay of two years.

negotiated access as the basis for implementing the Electricity Directive. Later in this article we discuss the implications of this choice for the development of competitive electricity markets in Germany.

IV. THE ECONOMIC EFFICIENCY ARGUMENTS FOR NEGOTIATED ACCESS

The most common concern surrounding negotiated access is that a vertically integrated network owner may seek to deny its competitors access to the network, thus "foreclosing" the market from competition. Proponents of negotiated access argue to the contrary. Existing arguments within antitrust theory, attributable to the "Chicago School" of economic and legal theorists, are used in support of negotiated access. They imply that concerns about market foreclosure are unfounded. Rather, negotiated access will lead to an efficient outcome: more efficient firms will always be able to enter the market through negotiation, while inefficient firms will be driven out. All the potential economic gains from liberalization can be achieved through negotiation, without imposing the burdens entailed in regulation.

In this section we introduce a simple example to analyze the prices that we would expect to arise under negotiated access. We use the example to illustrate the logic of its advocates' claims that voluntary negotiations will automatically produce an access price that ensures efficiency in the provision of competitive services.

Suppose that firm A is the incumbent electric utility, owning both generation assets and a transmission network connecting those assets to consumers. It costs firm A 4p/kWh to generate electricity, and an additional 1p/kWh to transmit.[16] The firm sells electricity at 7p/kWh, giving it a profit of 2p/kWh. Suppose also that there is an entrant, firm B, which owns its own power plant but has no transmission network of its own, so relies upon access to firm A's transmission network.

Under negotiated access, firm A has a clear opportunity to foreclose the market by refusing firm B access to its network. By doing so it will be able to continue selling its own electricity, instead of being undercut by its competitor. Suppose however that firm B's cost of generation is lower than that of firm A, at say 3p/kWh. Then in this very simple example it is clearly not in firm A's interest to refuse access, since it can make at least as large a profit from transmitting firm B's electricity as from selling its own. Firm A is currently making a profit of 2p from every kWh of electricity consumed. Suppose that it allows firm B to make use of its transmission network, at a charge of 3p/kWh. Since firm A's cost of transmission is just 1p/kWh, A will make the same 2p profit from every kWh sold by its competitor. This transmission charge therefore leaves it indifferent as to

[16] The abbreviation "p/kWh" stands for pence per kilowatt-hour. There are one hundred pence in one British pound.

whether consumers buy electricity from itself or from its competitor, since its profit is the same in either case.[17]

Notice that such an arrangement would induce entry by firm B. Firm B's total cost of supplying electricity will be 6p/kWh (3p for generation plus another 3p in transmission charges), while it can sell electricity for up to 7p/kWh, the current price being charged by A. Even after paying A's access charges, therefore, it will still find it profitable to enter this market. In fact B would be willing to enter at any access price up to 4p/kWh. However, any price above 4p/kWh will effectively prevent entry, since it will push B's total cost of supply above 7p/kWh, which is the highest price it can hope to get for its electricity.[18]

The effect of negotiated access in this example is therefore easy to predict. Firm A must charge at least 3p/kWh for transmission to avoid a reduction in profits as a consequence of providing access to firm B. Furthermore, it can charge up to 4p/kWh for transmission and still induce entry. Negotiations will therefore lead to an agreement giving firm B access to the network at a price somewhere between 3p/kWh and 4p/kWh, the exact figure depending on the bargaining skills of each side. At a price between these two extremes, the effect will be to increase the profits of firm A, and allow a positive profit to firm B.

A similar argument establishes the converse proposition: no inefficient firm can survive under negotiated access. As we have seen, firm A will be happy to provide access to its network provided it receives at least 3p/kWh in transmission charges. Suppose now that firm B is in fact an inefficient producer, that is, its generation costs are higher than those of firm A (say it has a generation cost of 5p/kWh). Its total cost of supplying electricity to the customer will now be at least 8p/kWh (5p for generation plus 3p for transmission). Since the current price of electricity is only 7p/kWh, it is impossible for firm B profitably to serve the market. Consequently, B will not enter, or if it does it will operate at a loss and be forced to exit from the market.

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[17] William J. Baumol, *Some Subtle Pricing Issues in Reinforced Regulation*, 10 INTL. J. TRANSPORT ECON. 341 (1983). In this article, Baumol sets this price according to a formulation he labels the "Efficient Component Pricing Rule" (ECPR). The ECPR specifies that the access price should be set so as exactly to compensate the network owner for any profit lost as a result of providing network access to a competitor. Almost everything we say about negotiated access (both positive and negative) applies *mutatis mutandis* to the ECPR. *See also* Robert D. Willig, *The Theory of Network Access Pricing, in* ISSUES IN PUBLIC UTILITY REGULATION (H. M. Trebing ed., 1979).

[18] It is convenient, and conventional in the economic literature, to assume that consumers can be persuaded to switch suppliers (from A to B) if both firms charge the same price. Similarly, we assume that B can be persuaded to enter if its expected profits are zero. These assumptions have no substantive content however. We could easily suppose for example that B must reduce its price to 6.9p/kWh to gain customers, and thereby enhance the realism of our example at the cost of an increase in arithmetic complexity.

Negotiated access therefore appears to have the attractive property of guaranteeing that the market will be served by the most efficient producer. Far from foreclosing the market, the incumbent firm will positively encourage new entrants provided they are more efficient than itself in generation. Regulation of access is not needed to promote entry, or to ensure that production is carried out by the most efficient firm.

This approach to the issue of market foreclosure in fact forms part of a larger body of work in legal and economic scholarship concerning "vertical" agreements, such as exclusive contracts between an auto manufacturer and the dealers who sell the manufacturer's autos.[19] One of the chief complaints made against vertical agreements is that they foreclose competition. In the case of the auto manufacturer and the dealer, the claim would be that an exclusive contract between the two will foreclose other manufacturers from access to the dealer's retail facilities. Supporters of the Chicago School however would argue that consumers will only suffer from this arrangement if there are no other dealerships in reasonable proximity. If there are, then other manufacturers can sell to consumers through the other dealers and no problem arises. If not, then there is indeed a problem, which is that the local market in car dealerships is insufficiently competitive. However, this problem is a "horizontal one" that would exist independently of the vertical arrangement with the manufacturer. It is not a problem with the vertical arrangement *per se*. Generally speaking, the Chicago School argues that vertical agreements exist to increase efficiency rather than to diminish competition.[20]

In the context of network industries, this would imply that the network owner has no incentive to exclude competitor firms from the market: "a monopolist has no inventive to gain a second monopoly that is vertically related to the first, because there is no additional monopoly profit to be taken."[21] The whole monopoly profit can be earned by setting a high enough access price, without interfering in the workings of the related markets. If the incumbent is less efficient than a competitor in the provision of the competitive service then it will negotiate a mutually advantageous arrangement to have the competitor firm replace it in that

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[19] Other kinds of vertical contracting arrangements include such practices as "tying" and Resale Price Maintenance.

[20] *See, e.g.*, ROBERT BORK, THE ANTITRUST PARADOX: A POLICY AT WAR WITH ITSELF 225-245 (1993); RICHARD POSNER, ANTITRUST LAW: AN ECONOMIC PERSPECTIVE 196-201 (1976). One well-known summary of this view is that "there is no such thing as a vertical 'problem'....The only possible adverse competitive consequences of vertical arrangements inhere in their horizontal effects. Only where vertical arrangements facilitate restricted output and raised prices—horizontal impacts—should they be inhibited." William Baxter, then new assistant attorney general for the antitrust division of the U.S. Department of Justice, *quoted in* JEANNE TIROLE, THE THEORY OF INDUSTRIAL ORGANIZATION 185 (1993).

[21] BORK, *supra* note 20, at 229. Bork notes that the reasoning relies on assumptions ("fixed proportions") which in this context would be equivalent to ignoring the possibility of inefficient bypass of the network.

activity, not discriminate in favor of itself. Negotiated access therefore creates no "new" anti-competitive issues. Any problems that arise are a consequence of horizontal market structure, specifically the network owner's monopoly status, and should be addressed directly rather than through interference with the terms of access.[22]

V. BRITISH GAS: THE FAILURE OF NEGOTIATED ACCESS

An early European experiment with negotiated access can be found in the United Kingdom's natural gas industry. The results of that experiment provide unambiguous evidence for the weakness of negotiated access as a means of facilitating entry and competition.

Before 1986, the natural gas industry in the United Kingdom consisted essentially of a single, state-owned firm, the British Gas Corporation, which held an effective monopoly over the sale of natural gas, and was sole owner of the national transmission and distribution networks.[23] The Gas Act of 1986 enabled privatization of British Gas. It deregulated supply in the large users market,[24] and established a new regulatory framework for the industry.

From our perspective, two aspects of the Gas Act are of special interest. First, the legislation recognized the natural monopoly status of the pipeline network, by prohibiting the construction of competing pipeline networks.[25] Second, it sought to promote competition by a series of provisions relating to TPA (referred to in the Act as "common carriage"). In this respect the Act was in fact an extension of already existing legislation.[26]

Both the 1982 and 1986 Acts entailed relatively light-handed regulation of TPA. Under the 1986 legislation, British Gas was required to provide access to third parties wishing to supply gas, subject to conditions of technical feasibility.[27] The Act apparently envisaged that price and non-

[22] It should be noted that in practice proponents of negotiated access typically represent the incumbent firm, and consequently may be keener to emphasize the absence of vertical problems than to point up the presence of horizontal ones.

[23] The industry was taken into state ownership in 1948, at which time it comprised over 1000 companies. For details of the history up to 1986 *see* MONOPOLIES AND MERGERS COMMISSION, GAS -- A REPORT ON THE MATTER OF THE EXISTENCE OF A MONOPOLY SITUATION IN THE SUPPLY IN GREAT BRITAIN OF GAS THROUGH PIPES TO PERSONS OTHER THAN TARIFF CUSTOMERS (1988) (hereinafter MMC).

[24] Gas Act, 1986, ch. 44, § 8 (Eng.). The large users market is defined as those customers purchasing over 25,000 therms per year.

[25] *Id.* § 7, ("Authorisation of public gas suppliers"). Subsection 9 of section 7 states in part that "[a]n authorisation under this section shall not include in the designation any area which is situated within 25 yards from a main of another gas supplier" (it goes on to give certain rather special exceptions). *Id.* § 7-9.

[26] Oil and Gas (Enterprise) Act, 1982, ch. 23 (Eng.). The Act contains provisions for TPA, *see id.* §17, and makes a first step toward introducing competition in the large users market, *see id.* §12.

[27] Gas Act, *supra* note 20, §19(1)-(3).

price conditions for access in any particular case would be determined by negotiation between British Gas and the firm seeking to supply gas. However, in the event that the parties could not reach agreement on access terms, the third party could ask the regulator to set terms, including prices.[28] The Act provides guidance on the principles that should determine access charges:

> [T]he Director shall apply the principle that the public gas supplier should be entitled to receive by way of charges for the conveyance of gas by virtue of the right [of third parties to have gas conveyed by British Gas]—the appropriate proportion of the costs incurred by the supplier in administering, maintaining and operating his pipe-line system; and a return equal to the appropriate proportion of the return received by the supplier (otherwise than by virtue of the right) on the capital value of that system (including so much of that return as is set aside to meet the need from time to time to renew that system).[29]

This guidance was interpreted by British Gas as requiring prices reflective of the average cost of transmission, including an appropriate return on the capital embodied in the network.[30] British Gas was further required to publish information on common carriage, including examples of the access prices it would charge.[31]

In 1988 the Monopolies and Mergers Commission investigated allegations of market power abuse by British Gas. Their report provides a detailed account of the failure of negotiated access.[32]

British Gas had negotiated one common carriage agreement prior to the 1982 Act. However, this agreement was of a rather special kind, since it involved a gas producer that sold part of its output to British Gas and retained some gas, carried by British Gas, for use in its own plant.[33] Between 1982 and 1988, ten approaches were made to British Gas for common carriage, five of them subsequent to the 1986 Act becoming law. In 1988 none of these had led to common carriage, although the five post-1986 approaches were still under negotiation.[34] No access agreement was actually signed until 1990.[35]

British Gas made use of a number of tactics in order to foreclose the market. It provided only minimal information concerning access charges and insisted on receiving commercially sensitive information concerning the identities of the potential customer and supplier before it would negotiate access. When it did negotiate, it appears to have done so in bad

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[28] *Id.* § 19(4).

[29] *Id.* § 19(5).

[30] *See, e.g.*, MMC, *supra* note 23, ¶ 8.87 at 109.

[31] *Id.* ¶ 3.37 at 24.

[32] *Id.*

[33] *Id.* ¶ 3.34 at 24.

[34] *Id.* ¶ 3.34-36 at 24.

[35] M.A. ARMSTRONG, ET. AL., REGULATORY REFORM: ECONOMIC ANALYSIS AND BRITISH EXPERIENCE 265 (1995).

faith. In addition, it used its monopsony position to attempt to deny potential competitors access to sources of natural gas.

The general information provided by British Gas for firms wishing to use its network was woefully inadequate. As a guide to what the charges might actually be, it provided just two examples, for specified input and destination points, load factors and quantities.[36] However, British Gas informed potential applicants that actual charges would "depend principally upon the exact input point and destination of the gas[,]. . .the load factor[,]. . .the quantity of gas conveyed and the duration of the agreement" although additional charges might be involved to cover the costs of any necessary extra expenses involved (including the cost of metering).

The information content of these examples was close to nil. The charges quoted did not include use of the local distribution system, which would have been the largest component of the total charge.[37] Nor did these charges include any initial payment that British Gas might require. Moreover, British Gas informed potential applicants that even in these specific examples the prices quoted were not the prices that would actually be charged. Instead the actual payments would take the form of an undisclosed two-part tariff consisting of a capacity charge plus a use-based charge, the latter with a minimum payment provision. Finally, the number of examples was itself completely inadequate to provide any real guide to the use of the pipeline system, since the United Kingdom has at least six input points and dozens of possible destinations, with quantities and load factors varying widely. It was impossible to extrapolate from the two examples since British Gas provided no explanation of the underlying methodology. When such an explanation was finally provided, the MMC found that it contained significant biases:[38]

> We have examined the method used by BG in calculating its two published examples of common carriage charges. BG has employed a different method of cost apportionment to that used for its own internal purposes. It has also employed different principles of calculating costs, for example the assumption of a 20-year asset life compared to up to 40 years in its own accounts, the effect of which is to increase the calculated charge for providing the common carriage system.

The MMC concluded that:

> [w]e do not think that the information made available by BG provides sufficient guidance to prospective users. . . We believe that BG's failure to

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[36] *See* MMC, *supra* note 23, Appendix 3.1 at 122. Appendix 3.1 of the Act reproduces BRITISH GAS (BG), STATEMENT ON COMMON CARRIAGE (1988). For example, British Gas "assum[ed] an average daily flow rate of 50mcfd...[g]as received by British Gas at Bacton...and delivered to a point...near to Birmingham, at a load factor of 60 percent...4p/therm." *Id.*

[37] *Id.* ¶ 3.37 at 24. BG told the MMC that "use of the distribution system would add about 7.5 pence per therm." *Id.*

[38] *Id.* ¶ 8.85 at 109.

provide adequate information is attributable to the monopoly situation, and that this failure will make it difficult for third-party suppliers to estimate transmission costs and negotiate contracts with customers.[39]

British Gas resisted any suggestion from the MMC that it provide more transparent and detailed information concerning access charges:[40]

> BG also argued that a [general] tariff [for common carriage] would be inconsistent with the framework for common carriage set out in section 19 of the Gas Act. In BG's view this section of the Gas Act presupposed the possibility of negotiation between BG and third parties. . .a published tariff would preclude this approach.

British Gas also claimed that it would be impractical to construct a general tariff owing to the complexity of the United Kingdom network.[41]

The MMC received testimony from companies that had expressed an interest to British Gas in obtaining common carriage. A number of respondents complained that British Gas had demanded commercially sensitive information as a precondition for negotiation:[42]

> A property company told us that BG adopted a negative attitude to the use of its pipeline distribution system by third parties. . .BG had stated that a prerequisite for such an arrangement was in effect the disclosure to BG of the prospective alternative supplies. . . The company said that under these circumstances new suppliers of gas. . .were unwilling to be identified.

In fact British Gas adopted a standard policy of requiring that both the potential supplier and customer be identified. This would of course enable them to approach the potential customer and undercut whatever price was being offered by their competitor. They could also punish the supplier in future dealings.

There was also some evidence that when negotiation took place it had not always been in good faith:[43]

> MEUC [Major Energy Users' Council] said that the gas producers it had approached had clearly been reluctant to be seen discussing direct supply with industrialists, but MEUC had since met BG on behalf of a consortium to discuss the transmission of gas through BG's pipeline system. MEUC told the Commission [the MMC] that [it] had received a letter from BG quoting between 13 and 20 pence per therm to carry third party gas. MEUC said that its members regarded these terms as 'ludicrously high', and considered that BG was clearly determined to inhibit competition in gas supply from developing at all costs.

Finally, there was evidence that British Gas also used its dominance as a purchaser of natural gas to restrict competition in supply:

> AGAS [Associated Gas Supplies Ltd]. . .complained that all producers approached by AGAS had stated that BG's purchasing policy was to demand

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[39] *Id.* ¶ 8.83 at 108.
[40] *Id.* ¶ 3.44 at 26.
[41] *Id.* ¶ 3.45 at 26.
[42] *Id.* ¶ 6.89 at 62.
[43] *Id.* ¶ 6.93 at 63.

> exclusive rights to 100 percent of the gas reserves in any one field for the life of that field. 'As a result of this practice, all current production is fully committed to BG under contract and none is available for purchase by third parties. In short, there is no free market in existing gas supplies.'[44]

Not surprisingly, the MMC concluded that the operation of the natural gas market in the United Kingdom was unsatisfactory in this regard, and that British Gas was indeed seeking to exclude potential competitors from the market for natural gas supply:

> . . .BG's failure to provide adequate information on the costs of common carriage, its ability to use information obtained when negotiating common carriage terms to identify potential customers of competing suppliers and the potential source of gas, and its position as a dominant purchaser of gas, may all be expected to act against the public interest by deterring new entry into the market.[45]

The United Kingdom has since retreated from its reliance on negotiated access in the natural gas industry. In 1992, under threat of proceedings before the MMC, British Gas agreed to targeted reductions in its market share.[46] In 1992, legislation was passed allowing for separate regulation of the pipeline network.[47] Whereas only the retail price of gas was previously regulated, a separate set of regulations was introduced to cover the prices for using the pipeline network. Shortly thereafter, British Gas was forced to negotiate a comprehensive code concerning the terms of access for all market participants. The negotiations were conducted under the supervision of government officials, and the resulting Network Code was approved in 1994. Another important step towards ensuring non-discriminatory access took place in 1997, when British Gas voluntarily divested its trading operations by creating a new company, *Centrica,* which was floated on the stock market as a separate entity. British Gas still operates the pipeline business but no longer sells gas to retail customers,[48] and owns no shares in Centrica. The United Kingdom government has effectively abandoned negotiated access. Non-discriminatory access to the British Gas network has been produced by a combination of regulated access and vertical separation.

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[44] *Id.* ¶ 6.88 at 62.

[45] *Id.* ¶ 1.4 at 1.

[46] *See* George Yarrow, *Progress in Gas Competition, in* REGULATING UTILITIES: UNDERSTANDING THE ISSUES, 65, 68-72 (1998).

[47] *Id.* ¶ 2.3 at 70.

[48] Some British readers may be confused by the continued visibility of the British Gas name in advertisements to retail customers. However, these advertisements simply reflect Centrica's use of the British Gas name and logo in Great Britain. The associated rights were transferred to Centrica upon its creation.

VI. NEGOTIATED ACCESS CANNOT BE RELIED UPON TO PROMOTE EFFICIENT ENTRY

The history of British Gas contradicts the claim that negotiated access ensures efficient entry. In practice, the incumbent network owner may use discriminatory provision of access to deny its competitors access to the market. In this section we explain why, contrary to the arguments put forward by Chicago School theorists, a vertically integrated incumbent may seek to foreclose the market to its competitors. We also argue that even if negotiated access actually promoted efficient entry, many other regulatory schemes would have the same property. This is of particular importance since negotiated access fails to address the central issue of monopoly profits accruing to the network owner.

Recall the basic Chicago School argument that "monopoly profits can only be earned once." The incumbent can set an access price that extracts all profit from the market, and therefore, it has no need to foreclose or otherwise discriminate against competitors. The elegance and simplicity of this prescription to the would-be monopolist suggests one possible flaw in its practical application. Using the access price in the manner suggested would be a highly transparent way of extracting monopoly rents. To do so would undoubtedly draw the attention of regulators, customers and politicians to the existence of monopoly power and its potential and actual abuse, thus inviting further regulation. It was safer for British Gas, because it was more discreet to deny access on a case-by-case basis, thus engaging in bad faith negotiation and relying on technical obfuscation rather than publishing prices so high as to retain the full monopoly rent. In sum, considerations of political economy contradict the simple economic arguments we presented above.

We should also note a number of more technical objections to the Chicago School arguments. Economists who have formalized these arguments have observed that they rely on a number of implicit assumptions.

> The first of these points is correct in a famous special case. Suppose that the two inputs are combined in fixed coefficients, that there are no economies of scope between the vertically related activities, that there are no vertical externalities, and that there are constant returns and perfect competition between symmetric firms in the competitive sector (*i.e.*, "generation" in our example). Then it is indeed true that *M* [the network owner] can extract all the monopoly profit that there is to be had while remaining in the transmission activity alone. It will be apparent, however, that this is a very special case, and the argument that there is no market power reason for vertical integration and foreclosure may not be robust.[49]

Similarly, we note briefly that managerial risk-aversion and a taste for empire-building would also tend to encourage foreclosure. Foreclosure may be of significant benefit to the incumbent firm's management, even if

[49] ARMSTRONG, ET AL., *supra* note 35, at 142.

it is detrimental to the shareholders. By retaining an overall monopoly position, managers avoid a number of risks. First, if they negotiate an access contract with the aim of extracting full monopoly profits, they may miscalculate or be outwitted in negotiation. Second, once other firms enter the competitive activity, the entrants' managers may reveal themselves to be more capable or efficient than the incumbent's. At its most extreme this might even lead to the threat of a hostile takeover. Finally, by preventing entry, managers can hope to ensure that they will retain the perquisites and prestige traditionally associated with large national monopolies, especially in Europe.

In some cases, negotiated access can create barriers to entry even if the incumbent refrains from discriminatory behavior, as a consequence of the well-known "hold-up" problem.[50] Returning to our example, suppose as before that firms A and B have generation costs of 4p/kWh and 3p/kWh respectively. For simplicity's sake, suppose that the total available market is one billion kWh and that given access, firm B can capture the whole of this market from firm A without having to lower its retail price.[51] The potential increase in industry profit, defined as the sum of the two firms' profits, from using firm B's generation assets in place of firm A's is therefore £10 million.[52] When the two firms negotiate over the access charge, they are effectively negotiating over the division of this £10 million. If the charge is set equal to 3p/kWh then firm A will make the same profit as before, and firm B will get the £10 million. Conversely, if the access charge is set at 4p/kWh, then firm A will increase its profit by £10 million, while firm B will make zero profit. If we assume that each firm has equal "bargaining power," then the access price arrived at will be 2.5p/kWh, and firm B will make £5 million.

The hold-up problem arises as follows: we add one more detail to the hypothetical scenario above, assuming that before negotiations began firm B had made an (irreversible) investment of £6 million to establish itself in the market. For example, it might have spent that sum on building its power station in the area covered by firm A's network.[53] Then, overall it will have lost money, since the £5 million profit will not compensate for the £6 million investment. However, by the time negotiation begins the investment is a "sunk cost" that adds little or nothing to firm B's bargaining power. Although there might be an ethical case for firm A to lower the access price in recognition of firm B's investment, that case has no legal or practical force.

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[50] *See, e.g.*, OLIVER E. WILLIAMSON, THE ECONOMIC INSTITUTIONS OF CAPITALISM (1995).

[51] We ignore the time dimension to avoid tiresome calculations. On the assumption that no price reduction is needed to induce a switch, *see supra* note 19.

[52] A saving, and hence an increase in profit, of 1p/kWh from switching to firm B, multiplied by one billion kWh.

[53] For simplicity's sake, we assume that the power station will have no alternative use if firm B cannot access firm A's network.

Unless some way around this problem can be found, firm B will never build its power station. This will clearly be inefficient, since the £6 million investment produces a benefit of £10 million. In this case a simple solution presents itself: before the power station has been built the two firms should sign a long-term contract, fixing the access price at a rate which makes the investment an attractive one. Notice that before the investment is made, firm B can rationally refuse to accept an access price that does not produce a profit on the investment. In more complex situations, however, it may not be possible to write such a long-term contract. For example, the irreversible investment may be in developing a new technology. By its very nature, the technology may be difficult to describe or define until it has been developed. Alternatively, it may be that by entering into negotiations firm B will be forced to reveal to firm A some commercially sensitive information which will enable firm A to reduce its own costs to 3p/kWh without making any deal.[54] Whenever there are obstacles to the writing of long-term contracts, the danger of this kind of hold-up will occur. Consequently, negotiated access can deter firms with potential innovations from ever entering the market, even though both entrant and incumbent could benefit.

Finally, we turn to the issue of preventing inefficient entry. It is plausible that negotiated access will have the desirable effect of preventing inefficient firms from entering the market. However, it is also clear that any non-discriminatory regulatory regime will have the same effect. Natural competitive forces mean that inefficient firms can survive only under a scheme which artificially subsidizes them in some way.[55] In the absence of such subsidies, negotiated access is not needed to deter inefficient entry.

VII. NEGOTIATED ACCESS FAILS TO ADDRESS THE MONOPOLY POWER OF THE NETWORK OWNER

Whatever its flaws, the "Chicago School" approach does perform a valuable task in focusing attention on the fundamental problem of network regulation: the monopoly power enjoyed by the network owner. In the Chicago terminology, this is a "horizontal" rather than a "vertical" problem. However, since the network is a natural monopoly, the usual kind of "horizontal" solutions such as forced demerger or the removal of barriers to entry are by definition inappropriate. The Chicago approach therefore begs the question of how the network monopoly problem is to be resolved. In our example of the electricity market, although negotiated access led to efficiency in production, it did little or nothing to reduce the

[54] A discussion of "incomplete contracts" can be found in OLIVER HART, FIRMS, CONTRACTS AND FINANCIAL STRUCTURE (1995).

[55] *See* William B. Tye & Carlos Lapuerta, *The Economics of Pricing Network Interconnection: Theory and Application to the Market for Telecommunications in New Zealand*, 13 YALE J. ON REG. 419 (1996) (hereinafter Tye).

final price of electricity. From a purely economic point of view, the efficient outcome would be a price equal to the (marginal) cost of producing and transmitting electricity in the most efficient manner possible. If firm B has generating costs of 3p/kWh, then this price would be 4p/kWh.[56] However, firm A uses its control of the network to extract monopoly profits from the market, leading to a much higher price than is socially desirable.

Proponents of negotiated access and the ECPR do not claim that either approach can solve the problem of monopoly power:

> A key problem is that the bottleneck [i.e., the network] owner is a monopolist, albeit a regulated one, and its final product price may therefore be set at a level that yields monopoly profits. Such monopoly profits may be among the profits foregone as a result of a lost sale of final product and, consequently, constitute a part of opportunity cost, [and therefore the ECPR price]. . . We have consequently always maintained that efficiency requires *both* ECPR and some arrangement that prevents overpricing of both final product and bottleneck input[.][57]

In this section we discuss possible solutions to this problem and conclude that there is no effective solution that is compatible with negotiated access. Specifically, we first ask whether general provisions of competition law might be sufficient to prevent monopolistic abuse by the network owner, without the need for more burdensome forms of regulation. Unfortunately, this appears not to be so. We then examine the only other approach compatible with negotiated access, that of regulating the final price charged to consumers.[58] We argue that such an approach is incompatible with some of the fundamental aims of liberalization.

Attempts to use general provisions of competition law against abuse of the network monopoly have already failed in the well-known case of *Telecom Corporation of New Zealand, Ltd.* v. *Clear Communications, Ltd.*[59] This case took three years to adjudicate and involved several million

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[56] Efficiency requires that production take place at the least possible cost, hence that firm B becomes the producer. This gives a production cost of 3p/kWh, to which is added the transmission cost of 1p/kWh to give the total of 4p/kWh.

[57] William J. Baumol, Janusz A. Ordover & Robert D. Willig, *Parity Pricing and Its Critics: A Necessary Condition for Efficiency in the Provision of Bottleneck Services to Competitors*, 14 YALE J. ON REG. 145, 150-51 (1997).

[58] We ignore a third "solution," which would be to accept the monopoly as a necessary evil and take no steps to mitigate it, on the grounds that the costs imposed by regulation would outweigh its benefits (in the economists' jargon, that market failure is less costly than government failure). In practice, regulation typically does impose substantial costs, both directly (the existence of a regulatory agency, and the demands it makes upon the time and administrative resources of the regulated firm) and indirectly (through poor regulatory decisions). However, in the European context a policy of laissez-faire towards the industries in question is ruled out by the requirements of EU Competition Law and is therefore merely of theoretical interest.

[59] Telecom Corp. of N.Z. Ltd. v. Clear Communications Ltd., [1992] 5 T.C.L.R. 166, *rev'd* [1993] T.C.L.R. 138 (P.C), *rev'd* 4 N.Z.B.L.C. 340 (C.A.), *rev'd* [1995] 1 N.Z.L.R. 385 (P.C.).

dollars in litigation fees.[60] It was characterized by disagreement over the proper scope of the laws in question, and complex economic arguments which at times clearly confused the courts.[61] Even a decision by the Privy Council failed to settle the issue: Clear Communications continued to lobby the New Zealand government for intervention until reaching a settlement with Telecom in March 1996. Since then a new round of related litigation has begun.[62] The costs in time and resources, and the courts' difficulties in evaluating economic arguments, illustrate the drawbacks of competition law as a regulatory instrument. Moreover, this is by no means an extreme example. The economic arguments in the case remained at the general and theoretical level, thus avoiding the immense added complications that would arise if a court actually engaged in setting prices.

The alternative instrument usually proposed by Chicago-style theorists as a means of preventing the network owner from obtaining monopoly rents is to regulate the final price of the service in question. In our example, this would involve a cap of 5p/kWh on the price charged to consumers for electricity. Firm A would earn zero profit (*i.e.*, no monopoly rent -- recall that "costs" already include a reasonable return on capital) since 5p/kWh is by design exactly equal to its average costs. If negotiation allows firm B to serve consumers, also at 5p/kWh, then this will create a surplus of 1p/kWh. Of course the exact division of this surplus between the two firms will depend on the details of the access contract negotiated. However, the surplus is a return on firm B's technological superiority, which is generally regarded as a legitimate source of supernormal profit, in contrast to any surplus that would be earned by firm A (absent the price cap).[63]

Unfortunately, this idea contains an irremediable flaw. Recall that one of the characteristics of network industries is that provision of the final service is potentially competitive, with only the network itself having the characteristics of a natural monopoly. Indeed perhaps the key purpose of liberalization is to enable competition to occur in activities such as electricity generation. The suggestion that final prices be regulated is therefore highly paradoxical. It would entail regulation of activities which

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[60] Fees cited in "Better Rules Needed," *New Zealand Herald* (Oct. 15, 1993), length of case cited in *Telecom Corp. of NZ Ltd. vs. Clear Communications Ltd.*, [1993] 6 T.C.L.R. 138, 148 (P.C.), (W. EMMONS & M. CALLES, CLEAR COMMUNICATIONS LTD. VS. TELECOM CORPORATION OF NEW ZEALAND LTD. (B), (Harvard Business School Case Study No. N9-798-091, 1998).

[61] *See* Tye, *supra* note 55.

[62] W. EMMONS & M. CALLES, CLEAR COMMUNICATIONS LTD. VS. TELECOM CORPORATION OF NEW ZEALAND LTD. (B), (Harvard Business School Case Study No. N9-798-091, 1998).

[63] The distinction exists because any rent earned by A would be a consequence of the artificial scarcity (there is only one network) created by regulation. In contrast, firm B's technological superiority is genuinely scarce - - if other firms can also produce at the same price as B, then competition will lower the price of electricity to 4p/kWh, eroding B's extra profit.

are inherently competitive and hence have no need for regulation, combined with a laissez-faire approach to a natural monopoly. Such an approach would remove many of the major benefits of competition, for a purpose that can better be achieved simply by directly regulating the pricing of access to the monopoly facilities.

VIII. THE TAKINGS ARGUMENT FOR NEGOTIATED ACCESS

In this section, we examine an entirely separate argument for the use of negotiated access. It involves the assertion that prior to deregulation there existed an implicit "regulatory contract" between the government and the incumbent. Under this contract the incumbent made investments, at the behest of government, which would not have been economic in a deregulated environment. Examples of these so-called "stranded costs" include investments in nuclear power, and the construction of infrastructure to serve remote areas. According to the theory, regulated prices contained an element of compensation for these investments, as the government's side of the regulatory contract.[64]

Deregulation represents a potential breach of the regulatory contract and the government should compensate the incumbent for any damages incurred. This obligation is, of course, in line with the prohibitions found in many legal systems against uncompensated expropriation of private property by the government.[65] The advantage of negotiated access is that it enables the incumbent to carry on earning the same profits as it would have absent the breach, and thus indemnifies the incumbent against its effects. It can also be used to compensate for the cost of ongoing "incumbent burdens" such as a "Universal Service Obligation" (USO), for which similar arguments can be made.

This argument has recently been developed in great detail by two scholars, Gregory Sidak and Daniel Spulber.[66] Their discussion takes place mostly in the context of the U.S. telecommunications industry and draws heavily on U.S. legal history and scholarship. However, the underlying

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[64] Proponents of this theory view monopoly rents as a gratuity rather than part of a valid regulatory contract and therefore do not propose compensation for the potential loss of monopoly rents by incumbents. For example: "The regulatory contract is a bargained-for exchange between the state and individual firms that is intended to benefit consumers. That relationship between the private firm and state differs fundamentally from the relationship that frequently exists when...the state or federal government confers a statutory gratuity on a firm[.]" J. GREGORY SIDAK & DANIEL F. SPULBER, DEREGULATORY TAKINGS AND THE REGULATORY CONTRACT: THE COMPETITIVE TRANSFORMATION OF NETWORK INDUSTRIES IN THE UNITED STATES 455-56 (1998) (hereinafter Sidak).

[65] This legal prohibition can be justified on economic grounds. The requirement to pay compensation for breach of contract, whether applied to private parties or governmental bodies, has the same efficiency properties. Efficiency means that the gains to the party that breaches outweigh the costs to the injured party, which equal the compensation that has to be paid. Hence breach is profitable if and only if it is efficient.

[66] *See* Sidak, *supra* note 64.

logic could apply to any of the network industries.[67] As Sidak and Spulber point out,[68] the prohibition on confiscation of property embodied in the Takings Clause of the Constitution[69] is not unique to the United States. It can be found in other English-speaking nations and is enshrined in European treaties including the European Convention on Human Rights: "Every natural or legal person is entitled to the peaceful enjoyment of his possessions. No one shall be deprived of his possessions except in the public interest and subject to the conditions provided for by law and by the general provisions of international law."[70]

However, while we approve of the goal, we are skeptical that negotiated access is an effective or appropriate means of providing compensation for incumbent burdens. First, we suspect that the compensation provided prior to deregulation was of a highly inexact kind. We doubt that regulators prior to deregulation set prices that exactly compensated the regulated firm for its uneconomic investments. Consequently, even if the profits earned under a system of negotiated access were close in magnitude to those earned prior to deregulation, they are unlikely to provide the correct level of compensation.

Second, we note that deregulation is likely to produce radical changes in the whole market environment, and therefore have a very significant effect on the level of profits enjoyed by the incumbent. Under negotiated access they are likely to be much higher than the profits earned under regulation, since negotiated access allows the incumbent to earn full monopoly profits. Consequently, there is even less reason to think that the profits earned by a deregulated incumbent subject to negotiated access will bear any relation to the cost of uneconomic investments. Negotiated access is an illogical and opaque mechanism of compensation for those costs.

IX. AN ALTERNATIVE APPROACH: VERTICAL SEPARATION, COST-BASED PRICING AND COMPETITIVELY NEUTRAL STRANDED-COST RECOVERY

We are now in a position to enumerate the three fundamental goals for competition law and regulatory policy toward network industries: first, to ensure that competition occurs in the potentially competitive sector of the industry; second, to prevent the network owner from earning monopoly profits from the network; and third, to compensate properly the network owner for stranded costs and ongoing regulatory burdens. We believe that it is possible to achieve all three through well-designed regulation.

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[67] The argument as a whole is however, clearly not relevant to the case where deregulation occurs simultaneously with privatization.

[68] *See* Sidak, *supra* note 64, at 3.

[69] "[N]or shall private property be taken for public use, without just compensation." U.S. CONST. amend. V.

[70] *See* Article 1 of Protocol No. 1, European Convention on Human Rights.

The correct regulatory approach can itself be divided into three parts, corresponding to the goals listed above. Vertical separation of the network will prevent the incumbent from stifling competition in the potentially competitive sector. Clearly this advantage would come at a high cost if there are significant economies of scope between the provision of network and complementary services, but we see little evidence for that claim. Whether or not vertical separation occurs, access prices should be regulated directly through "cost-based pricing" to remove the element of monopoly profits. Finally, explicit funding of stranded costs and ongoing burdens through dedicated user fees or surcharges will provide proper compensation in an efficient, non-discriminatory and transparent manner. Taken together these elements provide the best possible basis for effective regulation of network industries.

We have already discussed the problems inherent in allowing the network owner to compete in downstream markets. We believe that the problems in the United Kingdom natural gas industry were to some extent unavoidable while British Gas remained vertically integrated.[71] It is probably not possible for the regulator to prevent a vertically integrated incumbent from discriminating against its competitors. Moreover, if it is possible, it requires such frequent intervention in the company's affairs, on so burdensome a scale, that the company itself might prefer vertical separation. As noted above, this was the path eventually chosen by British Gas.

In some countries, full vertical separation is politically infeasible. If so, we recommend an alternative involving an "independent system operator" or ISO for the network. The concept of the ISO has developed in the United States to ensure non-discriminatory access to the transmission networks owned by vertically integrated incumbents.[72] The incumbent continues to own the transmission network, but relinquishes management of network operations and the provision of transmission services to a neutral third party, the ISO. The ISO has no incentive to discriminate in providing access to competitors.

The second lesson from British Gas is that the price and non-price terms of access must be formally regulated. The rules should be non-discriminatory, which will be of particular concern in the absence of vertical separation. Prices should be regulated via some form of cost-based pricing. By cost-based pricing we mean any approach that aims to ensure that the network owner's total access revenues are no higher than what is

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[71] The MMC came to the same conclusion in 1993. *See* MMC, British Gas plc, Aug. 1993, Cmnd. 2315-2317, at 32.

[72] For example, see Order No. 888, *Final Rule,* "Promoting Wholesale Competition Through Open Access Non-discriminatory Transmission Services by Public Utilities," 75 FERC 61,080 (Apr. 24, 1996); Order No. 592, "Merger Policy Statement," FERC 31,049 (Dec. 18, 1996); Notice of Proposed Rulemaking, "Regional Transmission Organizations," 87 FERC 61,173 (May 13, 1999).

needed to cover costs. Here the notion of costs naturally includes an appropriate return on the capital employed.[73] Many possible pricing schemes satisfy this requirement. Choice among them is complex and will depend on the particular industry and the availability of information.[74] Even without vertical separation, there is every reason to choose cost-based access pricing.

The recovery of stranded costs and compensation for ongoing regulatory burdens are, from an economic point of view, essentially questions about optimal taxation. In principle, such compensation could be provided from general tax revenues, which might well be the most efficient approach theoretically.[75] In practice, the government usually requires that the necessary revenues come directly from the industry in question. In that case, it should be raised in a "competitively neutral" fashion, minimizing the associated distortions. This is best achieved by applying non-bypassable fees to all customers who use the network. Such an approach has the added advantage of transparency, in contrast to the negotiated access approach where consumers have no direct way of seeing how much of the cost of service they pay is applied to stranded cost recovery.

X. IMPLICATIONS FOR THE EUROPEAN GAS AND ELECTRICITY INDUSTRIES

In most of Europe, no attempt at vertical separation has been made during the implementation of the gas and electricity directives. Several countries have chosen regulated access, but Germany has chosen negotiated access, and negotiated access remains the effective regime pending full implementation of the directives throughout Europe. Consequently, in the next few years we anticipate continued competitive problems concerning access to natural gas pipelines and electricity transmission networks.

Our concerns find confirmation in the experience to date with negotiated access in Germany, where claims of undue denial of

[73] Our definition includes UK-type "RPI-X" schemes, under which the regulated firm can increase its return on capital by achieving greater than expected improvements in efficiency.

[74] Here we avoid discussions of non-linear pricing, the multi-product case, "Ramsey pricing" and so forth. These technical topics are covered exhaustively in the economics literature: *see* J.J. Laffont & J. Tirole, *Creating Competition Through Interconnection: Theory and Practice*, 10 JOURNAL OF REGULATORY ECONOMICS 227 (1996). Note that their use of the term "cost-based" differs from ours. An approach such as Ramsey pricing, where the access charge depends on demand elasticities as well as cost factors, is "cost-based" according to our definition, but not according to theirs.

[75] In the United Kingdom, the central government pays direct subsidies to railroad companies in return for the provision of uneconomic services considered to be socially desirable. The level of subsidy is decided by a public tender, where competing firms made bids stipulating the level of subsidy they would require in order to provide the services in question. The scheme is run by the *Office of Passenger Rail Franchising* <http://www.opraf.gov.uk/index.htm>.

transmission access have already been brought before the federal antitrust authority, the Bundeskartellamt.[76] Access to transmission in electricity in Germany is now governed by a "network code" that lays out a methodology for determining transmission prices and principles, the Verbändevereinbarung ("VV"), negotiated by associations of incumbent utilities and large customers. We have analyzed the charges under the German VV and found that, for comparable transactions, they significantly exceed those in the United Kingdom, Norway and the United States.[77] The VV's charges are most unreasonable for transactions of particular interest to entrants, such as transmission over longer distances, over short-term periods and particularly at off-peak periods.[78] The level of service offered under the VV is extremely inflexible relative to other transmission markets and imposes scheduling and approval requirements that are disproportionately burdensome for entrants.[79] Finally, the VV is devoid of specific rules that would ensure transparent and non-discriminatory access to transmission networks, and leaves significant aspects of transmission access to the complete discretion of incumbents.[80]

We conclude that negotiated access to electricity transmission in Germany is likely to impede the development of effective competition under the directive. Similar problems can be anticipated in other countries that choose negotiated access. Even for countries choosing regulated access, competitive issues are likely to arise pending development of a comprehensive set of regulations to ensure transparency and prevent discrimination.

XI. CONCLUSION

The shift toward a competitive, market-oriented environment for the network industries has the potential to produce enormous increases in efficiency and consumer welfare. However, inadequate or misguided regulation can limit the realization of these gains. The experiences we have outlined above suggest the importance of proper regulation of the network monopoly, in order to prevent monopolistic abuse and remove barriers to competition in the potentially competitive sectors. As major states in Europe begin upon this path, we expect to see a common pattern of experience as the problems posed by a vertically integrated network owner become apparent, exacerbated in places by the initial choice of excessively light-handed regulation. These problems can be fully resolved

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[76] *See Power in Europe*, 288 Financial Times Energy, Dec. 7, 1998, at 5; *Power in Europe*, 296 Financial Times Energy, Mar. 29, 1999, at 13-14.

[77] Johannes Pfeifenberger et al., *Transmission Access in Germany Compared to Other Transmission Markets* (Dec. 1998, updated Feb. 10, 1999). (unpublished article, on file with the *Northwestern Journal of International Law & Business*).

[78] *Id.* at 6-10, 29-44.

[79] *Id.* at 5-6, 24-25.

[80] *Id.* at 6, 25-29.

only by the approach we have outlined in this article: vertical separation of the network, cost-based access charges, and transparent, competitively neutral mechanisms for the recovery of stranded costs.