Response

Having Your Cake—How to Preserve Universal-Service Cross Subsidies While Facilitating Competitive Entry

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Introduction

When the Telecommunications Act of 1996[1] was signed into law, supporters proclaimed it would revolutionize the $200 billion a year telecommunications industry and put Americans at the threshold of the information super-highway of the 21st century.[2] Three years later, the Act has generated more controversy than progress. Among other things, there has been a Supreme Court challenge to the authority of the Federal Communications Commission ("FCC" or "Commission") to set the prices at which local exchange companies must lease their networks to new entrants;[3] a federal court decision that the Act's restrictions on Bell Operating Companies create an unconstitutional "bill of attainder" (a

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††† PM Industrial Economics, Inc. We would like to thank Paul MacAvoy for careful reading and most helpful comments. The paper is in memory of Ken Dunmore who introduced us to access pricing issues in local telephony.

1 Pub. L. No. 104-104, 110 Stat. 56 (codified in scattered sections of 47 U.S.C.).

2 *See, e.g.*, Implementation of the Local Competition Provisions in the Telecomms. Act of 1996, 11 F.C.C.R. 15,499, at 16,243-53 (1996) (first report and order) (statements of FCC Commissioners James H. Quello and Susan Ness).

3 *See* AT&T Corp. v. Iowa Utils. Bd., 119 S. Ct. 721 (1999).

decision overturned on appeal);[4] and repeated FCC and U.S. Department of Justice denials of Bell Operating Company petitions to enter in-region, long-distance markets under section 271 of the Act.[5]

The Act requires incumbent local exchange companies to provide "nondiscriminatory access to network elements on an unbundled basis" to competitors.[6] This provision of unbundled network elements (UNEs) is intended to allow competing local providers to assemble services, using some or all of the incumbent's facilities, purchasing them in an *à la carte* fashion.[7] How to set the prices paid by competitive local exchange carriers for the UNEs of local exchange carriers has become perhaps the most contentious issue arising under the Act.

Throughout the debate, two primary pricing methods have been advocated: (1) the uniform, total element long-run incremental cost (TELRIC) approach, which is currently favored by the FCC and many state regulatory agencies, and (2) the efficient component pricing rule (ECPR). The TELRIC approach sets the price of an UNE equal to its direct, forward-looking cost (both capital and operating). The ECPR approach, by contrast, sets the price equal to (1) the incremental cost of an UNE plus (2) the incumbent's opportunity cost of providing the UNE to a competitor. This opportunity cost, in turn, equals the amount that the incumbent would have earned had it sold retail services using the unbundled network element.[8]

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4 *See* SBC Communications, Inc. v. FCC, 981 F. Supp. 996 (N.D. Tex. 1997), *rev'd*, 154 F.3d 226 (5th Cir. 1998), *cert. denied*, 119 S. Ct. 889 (1999).

5 *See, e.g.*, Application of BellSouth Corp., BellSouth Telecomms., Inc., & BellSouth Long Distance, Inc., for Provision of In-Region, InterLATA Servs. in La., 13 F.C.C.R. 20,599 (1998) (memorandum order and opinion); Application of Ameritech Mich. Pursuant to Section 271 of the Communications Act of 1934, as Amended, to Provide In-Region, InterLATA Servs. in Mich., 12 F.C.C.R. 20,543 (1997) (memorandum order and opinion); Evaluation of the United States Department of Justice, Application of SBC Communications Inc. Pursuant to Section 271 of the Telecomms. Act of 1996 to Provide In-Region, InterLATA Servs. In the State of Okla., No.97-121(F.C.C. May 16, 1997) (visited Apr. 21, 1999) <http://www.usdoj.gov/atr/public/comments/sec271/sbc/afdvt03.htm>; Evaluation of the United States Department of Justice, Application by BellSouth Corp., BellSouth Telecomms., Inc., & BellSouth Long Distance, Inc. for Provision of In-Region, InterLATA Servs. in S.C., No. 97-208 (F.C.C. Nov. 4, 1997) (visited Apr. 21, 1999) <http://www.usdoj.gov/atr/public/comments/sec271/bellsouth/1262.htm>.

6 47 U.S.C. § 251(c)(3). "Elements" are the discrete network facilities that must work in concert to provide a "service." For example, in order to provide basic local telephone service to a residential end user, many elements of the local network come into play and can include the following: the local loop (typically, the twisted pair of copper wires connecting the end user's premises to the local exchange company's central office switch); the port, which connects the loop to the switch and generates dial tone for the line; the switching and routing performed by the switch hardware and software; specialized local network databases; network signaling facilities, which are separate from the circuits employed to carry voice; and the interoffice transmission facilities that connect a number of these elements to one another. *See* 47 U.S.C. § 153(45) (Supp. II 1996).

7 According to the statute, an "incumbent local exchange carrier shall provide such unbundled network elements in a manner that allows requesting carriers to combine such elements in order to provide . . . telecommunications service." 47 U.S.C. § 251(c)(3).

8 For example, if the incumbent's incremental cost of providing a loop to a business

In a recent article in this Journal, Professor William Baumol presents a methodology for establishing competitively neutral prices for accessing the network elements of a bottleneck facility, such as the unbundled loops of a local exchange carrier.[9] As Professor Baumol notes, pricing access to bottleneck facilities is a matter of great urgency, having widespread application in such network industries as electric, gas, rail, and telecommunications, both in the United States and overseas.[10] The system of non-uniform or differential access prices he recommends is an extension of the ECPR methodology, with due allowance for the possibility that cross subsidies in the retail rate structure may require access prices below incremental cost. We agree with Professor Baumol's pricing recommendation. Indeed, we have made the same recommendation previously in arbitration proceedings under the Act.[11] In those proceedings, however, state utility commissions frequently relied on an earlier affidavit co-authored by Professor Baumol, in which he stated that "the appropriate forward-looking benchmark for pricing [UNEs] is total service long run incremental cost, or TSLRIC."[12] After much debate and litigation, state

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customer is $30, its retail business rate is $60, and the incumbent's cost of inputs the competitor will supply (for example, retailing costs avoided by the incumbent when making the loop available for resale) is $5, then the ECPR methodology sets a price of a business loop UNE equal to [$30 + ($60 – $30 – $5)], or $55. ECPR prices can also be calculated using an alternative, "top-down" approach—that is, by subtracting the cost of competitively supplied inputs from the incumbent's retail price for the input. Under this approach, the ECPR price would be $60 – $5 = $55 for the example business loop. Note that the "top-down" approach yields the same result as the "bottom-up" approach.

9 *See* William J. Baumol, *Having Your Cake: How to Preserve Universal-Service Cross Subsidies While Facilitating Competitive Entry*, 16 YALE J. ON REG. 1 (1999). Some unbundled network elements (such as switching) are comparatively easy for competitors to provide themselves, while others (such as the local loop) may be more difficult to duplicate. Professor Baumol identifies the latter type as "bottleneck" facilities or elements, as access to them must generally be secured from the incumbent local carrier. *See id.* at 3.

10 *See id.* at 4-6.

11 *See* Michael J. Doane et al., An Economic Framework for Implementing the Pricing Provisions of the Telecommunications Act of 1996, at IV-1 to IV-12 (1996) (unpublished manuscript filed on behalf of GTE Corporation before state commissions pursuant to the arbitration provisions of the Telecommunications Act of 1996, on file with the *Yale Journal on Regulation*).

12 *See* Affidavit of William J. Baumol, Janusz A. Ordover, and Robert D. Willig ¶ 3, at 2, Implementation of the Local Competition Provisions in the Telecomms. Act of 1996, 11 F.C.C.R. 15,499 (1996) (No. 96-98). Following both the filing of this affidavit and the release of the FCC's First Report and Order, it became industry practice to use the term "TSLRIC" to refer to the long-run incremental cost of a service and "TELRIC" to refer to the long-run incremental cost of a particular network element. Unfortunately, there has been some laxity in the use of these terms in telecommunications fora, so that the older and more familiar "TSLRIC" is sometimes mistakenly employed in discussions of element access pricing. The reader should not be confused by this inconsistency but should instead focus upon the fact that a total long-run incremental cost pricing methodology is being applied. The concept behind TELRIC is the same as that of TSLRIC but is specific to a particular network element.

To determine the incremental cost to an incumbent of providing a service, one must look at the change in total cost to the firm resulting from a decision not to provide the service; in other words, the difference between total cost to the firm when the service is provided and the total cost if the service is not provided equals the portion of total costs attributable to the particular service. To illustrate this notion, assume a simple case in which a firm provides two services, *A* and *B*. The incremental cost (IC)

public utilities commissions have overwhelmingly adopted the TELRIC approach in interim proceedings.[13]

The purpose of this Response is not to focus on Professor Baumol's (welcome) change in position, but rather to assist policymakers in understanding the subtleties of access pricing. In particular, we intend to highlight the substantial deficiencies of the TELRIC approach when used to price local telephone network elements for the transition to a more competitive environment. State commissions throughout the United States are now in the process of establishing "permanent" prices for UNEs.[14] (Telecommunications Act arbitration proceedings generally produced only "interim" prices.)[15] Unfortunately, Professor Baumol's prior affidavit, in our opinion, created some confusion over and was a factor in commission decisions to adopt TELRIC pricing in favor of ECPR. But as Professor Baumol's recent article in this Journal makes clear, when cross subsidies or other forms of discrimination exist in the retail rate structure, a uniform access price such as TELRIC cannot be competitively neutral.[16] Indeed, the application of TELRIC pricing in an environment characterized by such retail price discrimination (as is the current rate structure for local exchange telephony) is likely to promote inefficient market behavior. This Response demonstrates these points and further proves that in a comparison of TELRIC pricing versus what we refer to as the Market-Determined Efficient Component Pricing Rule (M-ECPR). M-ECPR is far superior to TELRIC in terms of allocative and productive efficiency.[17] We believe this latter finding has not been recognized by regulatory

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of service *A* is equal to the change in total cost (TC) resulting from a decision to provide only *B* instead of both *A* and *B*: $IC(A) = \Delta TC = TC(A,B) - TC(0,B)$. Since total cost when only *B* is supplied is equal to the stand-alone cost (SAC) of *B*, the incremental cost of *A* can also be expressed as: $IC(A) = TC(A,B) - SAC(B)$. Similarly, $IC(B) = TC(A,B) - SAC(A)$. If the total cost of providing *A* and *B* together is less than the sum of the incremental cost of *A* and *B* individually, then $TC(A,B) < SAC(A) + SAC(B)$, and the firm realizes efficiencies from supplying both *A* and *B* together. With regard to the incremental cost of network *elements*, the same concept applies.

13 *See, e.g.*, Sprint Communications Co., No. 96-0375, 1997 WL 56,906, at *6 (Haw. Pub. Utils. Comm'n Jan. 17, 1997).

14 *See, e.g.*, Unbundled Network Elements, No. P-100 Sub 133d, 1998 WL 995837 (N.C. Utils. Comm'n Dec. 10, 1998) (order adopting permanent prices for unbundled network elements). In addition, many state commissions are now holding similar proceedings in the electric and natural gas industries to determine the pricing of distribution-related services. *See, e.g.*, Restructuring of the Emerging Competitive Natural Gas Mkt., No. 93-G-0932, 1994 WL 758686 (N.Y. Pub. Serv. Comm'n Dec. 20, 1994); New York Pub. Serv. Comm'n, *Policy Statement Concerning the Future of the Natural Gas Industry in New York State and Order Terminating Capacity Assignment* (last modified Nov. 3, 1998) <http://www.dps.state.ny.us/fileroom_htm/doc4962.htm>.

15 *See, e.g.*, Local Exch. & Local Exch. Access Telecomms. Competition, No. P-100 Sub 133, 1996 WL 130775 (N.C. Utils. Comm'n Feb. 23, 1996).

16 *See* Baumol, *supra* note 9, at 11.

17 As explained in Part II, *infra*, there are crucial differences between ECPR and M-ECPR. *See also* David S. Sibley et al., Pricing Access to a Monopoly Input (Dec. 28, 1998) (unpublished manuscript, on file with the *Yale Journal on Regulation*).

agencies.[18]

I. The Road to Competitively Neutral Access Prices

A. *Background on the Debate over Access Pricing*

After President Clinton signed the Telecommunications Act into law on February 8, 1996, the FCC initiated proceedings to implement its provisions. On April 19 of that year, the Commission released a Notice of Proposed Rulemaking (NOPR) that described its preliminary positions on a wide range of issues raised by the Act, one of the most important being the establishment of prices for UNEs under section 252(d)(1) of the statute.[19] In the NOPR, the Commission stated that it "tentatively conclude[d] that use of ECPR or equivalent methodologies to set prices for interconnection and unbundled network elements would be inconsistent with the section 252(d)(1) requirement that [prices] be based on 'cost.'"[20] As we have demonstrated elsewhere,[21] the Commission's rationale was based on a complete misunderstanding of ECPR. In particular, the FCC failed to recognize that the presence of market alternatives would, in some instances, reduce an incumbent's opportunity costs, thus necessitating a reduction in UNE prices.[22]

In response to the NOPR, Professor Baumol wrote an affidavit (with Professors Janusz Ordover and Robert Willig) on behalf of AT&T in which he argued that ECPR pricing was inappropriate for the local telecommunications industry:

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18 In Iowa Utilities Board the Supreme Court reversed the Eigth Circuit and held the FCC has the authority to set pricing principles. However, the Supreme Court did not address the merits of TELRIC pricing. Cf. AT&T Corp. v. Iowa Utils. Bd., 119 S.Ct. 721, 728 n.3 (1999) ("Incumbents argued . . . that [TELRIC] was unreasonable because it stranded their historic costs and underestimated the actual costs of providing interconnection and unbundled access. The Eighth Circuit did not reach this issue, and the merits of TELRIC are not before us.").

19 *See* Implementation of the Local Competition Provisions in the Telecomms. Act of 1996, 11 F.C.C.R. 14,171, ¶ 8, at 14,176, ¶¶ 117-156, at 14,209-25 (1996) [hereinafter *NOPR*] (notice of proposed rulemaking). Section 252(d)(1) of the Act states in relevant part that UNE charges "(A) shall be (i) based on the cost (determined without reference to a rate-based proceeding) of providing the interconnection or network element (whichever is applicable), and (ii) nondiscriminatory, and (B) may include a reasonable profit." 47 U.S.C. § 252(d)(1) (Supp. II 1996).

20 *NOPR*, *supra* note 19, ¶ 148, at 14,222.

21 *See* Doane et al., *supra* note 11, at III-11, IV-4 to IV-12.

22 The pricing rule that takes into account such market alternatives is the M-ECPR. *See infra* Part III; *see also* Doane et al., *supra* note 11, at IV-1 to IV-12 (providing a description of how M-ECPR can be used to establish unbundled network element prices). This rule, in addition to reducing access prices in the presence of market alternatives, involves the use of a competitively neutral surcharge that is required to ensure that the incumbent can satisfy its break-even constraint and remain solvent. As demonstrated in Part III, *infra*, M-ECPR yields the differential access prices now advocated by Professor Baumol.

> The existing structure of end-user prices for local telecommunications is *not* appropriate as a baseline for ECPR or any other pro-competitive purpose; it is utterly inconsistent with the competitive policies of the 1996 Act. Cross-subsidies are common in the rate structure, and rates depart systematically from pertinent costs. In these circumstances, the old structure of rates is the wrong baseline for the pricing of network elements through the application of ECPR.
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> Indeed, applying ECPR to the existing rate structure would result in component prices that lock in the [incumbent local exchange carrier's] monopoly profits and inefficiencies, would attract inefficient entry where rates are too high, and would preclude efficient entry where rates are too low. ECPR was never intended to (and cannot) substitute for competition for the monopoly network elements, or limit to fully competitive levels the prices paid by end users for services that use those network elements.
>
> Of course, as unbundling proceeds and competition spreads as a result of economic-cost-based pricing of network elements, end-user prices should be driven toward incremental costs. With the *appropriate* end-user prices at incremental costs, the component prices dictated by ECPR are no higher than [total service long run incremental cost].[23]

On the basis of this argument, Professor Baumol concluded that "the appropriate forward-looking benchmark for pricing is total service long run incremental cost, or TSLRIC."[24]

Following comments filed in response to the NOPR, the Commission released its First Report and Order on August 8, 1996.[25] In the order, the Commission concluded that ECPR pricing should not be used to establish rates for unbundled network elements: "ECPR is an improper method for setting prices of interconnection and unbundled network elements because the existing retail prices that would be used to compute incremental opportunity costs under ECPR are not cost-based."[26] There is some evidence that Professor Baumol's affidavit was influential with the Commission, since his affidavit advanced this same argument while the FCC's earlier NOPR did not.[27]

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23 Affidavit of William J. Baumol, Janusz A. Ordover, and Robert D. Willig ¶¶ 22-24, at 8-9, Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, 11 F.C.C.R. 15,499 (1996) (No. 96-98).

24 *Id.* ¶ 3, at 2. Professor Baumol further concluded that a particular engineering cost model produced by Hatfield Associates, Inc. "provides good empirical estimates of the TSLRIC of basic network elements." *Id.*

25 *See Implementation of the Local Competition Provisions*, 11 F.C.C.R. at 15,499 (first report and order).

26 *Id.* ¶ 709, at 15,859.

27 While the FCC "tentatively conclude[d]" in *NOPR* "that use of ECPR or equivalent methodologies to set prices for interconnection and unbundled network elements would be inconsistent with the . . . requirement that [prices] be based on 'cost,'" *NOPR*, *supra* note 19, ¶ 148, at 14,222

After the FCC issued its First Report and Order, state public utilities commissions held arbitration proceedings in accordance with the requirements of the Act to establish interim prices for unbundled network elements.[28] Collectively, the authors of this Response testified in more than forty such proceedings and advocated the same ECPR prices that Professor Baumol now agrees should be charged. However, with a few exceptions, commissions followed the FCC's lead and adopted uniform UNE prices based on TELRIC (usually with a modest, uniform markup for forward-looking common costs), frequently referring to the FCC's position on ECPR, which in turn cited the affidavit by Professor Baumol.[29]

It is not surprising that the agencies responsible for implementing section 252(d)(1) of the Act were influenced by Professor Baumol's recommendation. After all, Professor Baumol's name is closely associated with the ECPR pricing methodology, which is also known as the "Baumol-Willig Rule." Rejection of that rule by a principal advocate was a powerful argument in favor of uniform TELRIC access prices. Since uniform access pricing promotes cream skimming (or subsidizes entry), it is also unsurprising that competitive local exchange carriers (CLECs) advocated this method.[30]

B. *Problems with the Government's Position on Access Pricing*

Advocates of TELRIC pricing often assert that firms in competitive markets are limited to prices that recover forward-looking economic costs. For example, Professor Baumol argued in his affidavit before the FCC that "a defensible pricing standard must be based on forward-looking economic costs, not historic book costs, because the expansion, contraction, entry

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(1996), it did not examine the pervasive presence of cross subsidies in pre-Act local telephone rate structures. The Commission did recognize that the "structure of incumbent LEC rates for interconnection and unbundled network elements will influence the incentives for interconnectors to purchase and use these services, independent of the level at which rates are set," but it limited this discussion of rate structures to separations between shared and dedicated facilities. *See generally id.* ¶¶ 117-154, at 14,209-24 (discussing "Pricing of Interconnection, Collocation, and Unbundled Network Elements" and local "Rate Structure").

28 *See, e.g.*, AT&T Communications of the Midwest, Inc., No. C-1400, 1997 WL 1055198, at *3-*4, *9 (Neb. Pub. Serv. Comm'n Apr. 14, 1997); Pricing Proceeding for Interconnection, Unbundled Elements, Transport and Termination, & Resale, No. UT-960369, 1996 WL 773361, at *1-*2 (Wash. Utils. & Transp. Comm'n Nov. 21, 1996).

29 *See, e.g.*, Petition of AT&T Communications of the Pacific Northwest, Inc., for Arbitration of Interconnection Rates, Terms, and Conditions with GTE Northwest Inc., Pursuant to 47 U.S.C. § 252(b), No. ARB 5, slip op. at 12 (Ore. Pub. Util. Comm'n Dec. 12, 1996) (arbitrator's decision); Petition of AT&T Communications of Pa., Inc. for Arbitration to Establish an Interconnection Agreement with GTE North, Inc., No. A-310125 F0002, slip op. at 4-5 (Pa. Pub. Util. Comm'n Dec. 5, 1996) (opinion and order).

30 Some of the appeal of uniform TELRIC pricing appears to have been based on the following result-oriented (and mistaken) syllogism: Many CLECs are better than few CLECs; low UNE prices encourage CLEC entry; therefore, low, uniform TELRIC prices are desirable.

and exit decisions of competitors efficiently and necessarily turn on expected prices and costs and have nothing to do with costs expended historically or reflected on accounting books."[31] Professor Baumol further argued that the "measure of costs on which efficient prices are based, and to which efficient prices converge in competitive markets, is *incremental* cost."[32]

As we have demonstrated elsewhere, and as recognized by Professor Baumol in his recent article, any system of uniform access prices imposed in the presence of retail price discrimination (e.g., cross subsidies) cannot achieve competitive neutrality.[33] In particular, the TELRIC approach induces entrants to engage in cream-skimming and simultaneously prevents them from offering service to subsidized customers. Moreover, TELRIC pricing will not permit an incumbent local exchange carrier (ILEC) to recover the forward-looking incremental costs on which most commissions have based their pricing methodologies. These points can be seen with the aid of Figure One, as shown below. In that figure, an ILEC offers two services, residential (R1) and business (B1). The retail rates are not based, however, on forward-looking incremental costs because they contain cross subsidies. Consequently, the resale rate, which is defined as the retail rate minus the avoided cost of retailing, also contains a cross subsidy. Now suppose that CLECs could lease the underlying unbundled network elements required to provide R1 and B1 services at prices equal to their TELRICs. Uniform TELRIC prices, in combination with discriminatory resale prices, create an arbitrage opportunity that prevents the ILEC from recovering its forward-looking incremental costs. The most profitable route of entry for CLECs is to provide R1 service by resale and to provide B1 service through UNEs. Because provision of B1 service through UNEs just covers forward-looking incremental costs and provision of R1 service through resale fails to cover forward-looking incremental costs, the ILEC cannot recover its total forward-looking incremental costs.

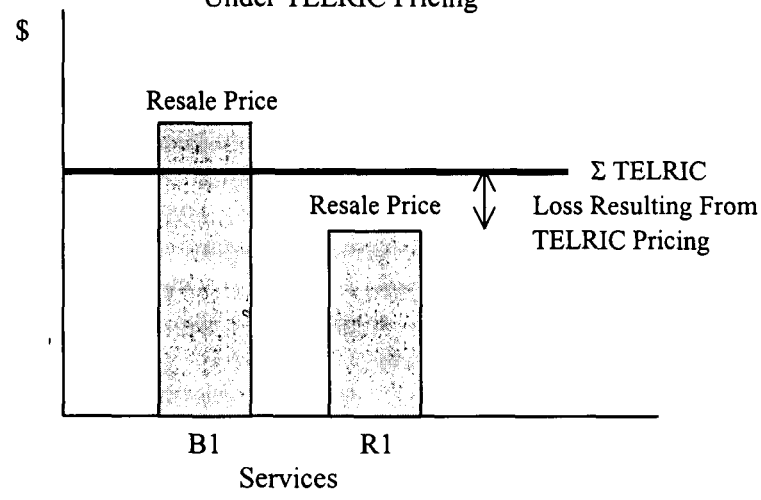
31 Affidavit of William J. Baumol, Janusz A. Ordover, and Robert D. Willig ¶ 3, at 1, *Implementation of the Local Competition Provisions*, 11 F.C.C.R. at 15,499 (No. 96-98).

32 *Id.* ¶ 11, at 4.

33 *See* Baumol, *supra* note 9, at 11.

FIGURE ONE

Illustration of an ILEC's Inability to Recover its Total Forward-Looking Incremental Costs Under TELRIC Pricing



Professor Baumol now agrees that if the final-product prices are discriminatory,[34] then the application of uniform prices to bottleneck services "will either force the bottleneck owner to end its discriminatory pricing of the final product, or the market must, in effect, be transformed into a cartel in which different suppliers specialize in the supply of different products and do not compete with one another."[35] In other words, if a uniform access price is set for a bottleneck service in the presence of discriminatory retail prices, then either (1) the discrimination in the retail prices must be eliminated, or (2) the markets must be bifurcated so that one firm serves customers receiving the discriminatorily low prices (perhaps with the assistance of a universal service fund to make up any difference between a subsidized rate and the cost of service), while another firm serves customers paying discriminatorily high prices. Note that the status quo is not a possible outcome. That is, setting uniform access prices in the presence of a discriminatory retail rate structure is not an equilibrium, because competitors will focus on the more lucrative products of the regulated firm, which are the products that provide the revenues that finance the cross subsidies.[36] That is another way of saying that the

34 That is, if (1) the differences between prices of retail services using a bottleneck service do not equal (2) the differences between the incremental costs of the non-bottleneck inputs.

35 Baumol, *supra* note 9, at 12.

36 *See id.* at 11.

competitor will have no option but to engage in "cream skimming."[37] Of course, if the incumbent supplier of the two services had been earning a fair, competitive rate of return prior to entry, such cream skimming will thereafter prevent the firm from covering its total costs, contrary to the purpose of the Act.[38]

C. *Professor Baumol's Suggestion of Differential Access Pricing*

Differential access pricing solves this cream-skimming problem by setting the price of the "bottleneck" service to be paid by entrants equal to (1) the ILEC's resale price minus (2) the incremental cost of remaining inputs supplied by the ILEC. In practice, the Telecom Act may require ILECs to provide more than a single element on an unbundled basis to CLECs.[39] If the price of each element were set equal to its TELRIC, a surcharge could be assessed equal to the difference between (1) the resale price and (2) the sum of the TELRICs for the UNEs required to provide that resale service. Notice that in Figure 1 this assessment would result in a positive surcharge for B1 and a negative surcharge for R1. Such a surcharge would eliminate the arbitrage opportunity created by uniform UNE prices and enable the continuation of discriminatory retail rate structures.[40] This system of surcharges creates competitive neutrality by eliminating cream-skimming opportunities, while at the same time facilitating competitive entry into the market for the subsidized services.

The positive surcharge on B1 to prevent cream skimming, however, may not be sustainable if applied to UNEs other than true "bottlenecks." That is, if CLECs can themselves provide facilities at a cost lower than the differential UNE price (inclusive of the surcharge), then the surcharge will not be collected and the ILEC will be unable to recover its forward-looking incremental cost. In this circumstance, a competitively neutral, non-bypassable, end-user charge would be required to ensure competitive neutrality and to enable the ILEC to recover its forward-looking costs.

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37 *Id.*

38 *See, e.g.*, Michael J. Doane & Michael A. Williams, *Competitive Entry into Regulated Monopoly Services and the Resulting Problem of Stranded Costs*, HUME PAPERS ON PUB. POL'Y, Autumn 1995, at 33, 47 (1995) (explaining that a utility will exit a market if its marginal cost exceeds the competitive price in that market).

39 *See* Telecommunications Act of 1996, 47 U.S.C. § 271(c)(2)(B) (Supp. II 1996). In *Iowa Utilities Board*, the Supreme Court vacated the FCC rule requiring ILECs to unbundle specific elements, holding that the FCC did not adequately consider the "necessary and impair" test set forth in Section 251(d)(2) of the Act. *See* AT&T Corp. v. Iowa Utils. Bd., 119 S.Ct. 721, 734-36 (1999). The FCC is promulgating new rules to determine which elements, if any, incumbents are required to unbundle. *See generally* Implementation of the Local Competition Provisions of the Telecoms. Act of 1996, 64 Fed. Reg. 20,238 (1999) (to be codified at 47 C.F.R. ch. 1) (proposed Apr. 26, 1999).

40. Of course, rebalancing the retail rates to cost also could eliminate the arbitrage opportunity. But if regulators choose to maintain cross subsidies, then differential access prices are necessary.

In his recent article, Professor Baumol supports the adoption of a differential access approach with the efficient component pricing methodology. He argues that:

> [ECPR prices are] not very difficult to carry out in practice or for the regulator to monitor. Nowadays in regulatory arenas, estimates of incremental costs are provided fairly routinely and appear to be determinable to a reasonable degree of approximation without enormous cost or effort . . . . Thus, if the rule is correct, to calculate the efficient price of a bottleneck service, one merely needs to observe the final-product price currently charged by the owner of the bottleneck facility and subtract from it the pertinent incremental cost.[41]

However, as raised by Professor Baumol, there are practical "shortcomings" that complicate the application of differential access prices.[42]

The first such shortcoming is that the Telecommunications Act may require ILECs to unbundle more than just a single "bottleneck" element. Thus, it is necessary to determine the UNEs to which the surcharge (or surcredit) should be applied. As explained above, no surcharge can be applied to the many elements (e.g., switching service) provided in competitive markets. The least elastic network element is the local loop, although "competitive access providers" have bypassed the loop itself in many business districts. Thus, a solution to this shortcoming is to assign the surcharge only to the local loop, which is least likely to be bypassed.

A second shortcoming to the application of differential access pricing is that the size of the surcharge or surcredit varies with customer usage levels. For example, in order to be competitively neutral, the loop surcharge on business customers must be higher on high-volume customers than on low-volume customers. If a single surcharge were applied to all business customers, CLECs could profitably cream-skim customers with above-average monthly bills, while they would be effectively prevented from serving customers with below-average monthly bills through the use of UNEs.[43] There are two ways to mitigate this problem. First, a set of graduated surcharges and surcredits could be applied to capture most of the variation in customers' usage levels. Second, a single surcharge and a single surcredit could be calculated based on the usage levels of average business and residential customers. The consequent reduction in the recovery of forward-looking costs caused by

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41 Baumol, *supra* note 9, at 8-9.

42 *See id.* at 17.

43 Of course, efficient CLECs could profitably serve customers with below-average monthly bills through the use of resale.

CLEC cream-skimming would be recovered through the use of a competitively neutral, non-bypassable surcharge.

A final shortcoming is that any system of differential access prices provides incentives to misreport data. For example, a CLEC leasing a loop to serve a business customer has an incentive to report that the loop actually serves a residential customer. Similarly, if a system of graduated surcharges and surcredits were imposed, CLECs would have an incentive to report that their loops served low-usage rather than high-usage customers. These and other similar reporting problems suggest that practical applications of differential access pricing should be kept simple. For example, regulators should impose a single surcharge or surcredit based on the average usage levels of business and residential customers. Since such a simple system cannot prevent cream-skimming, however, a competitively neutral and non-bypassable surcharge would accompany the system of differential access prices to allow the ILEC to cover its forward-looking costs.

II. The Advantages of the M-ECPR Approach

We have proposed elsewhere an extension of the ECPR, which we call the Market-Determined ECPR (M-ECPR).[44] The M-ECPR differs in two crucial aspects from the ECPR. First, the additional opportunity cost used in calculating the access price of a bottleneck service equals the contribution obtained from the service(s) produced using the monopoly input, taking into account any price reductions realized in the market. The maximum M-ECPR price for a bottleneck input, therefore, equals the price given by standard ECPR, but will be lower whenever competitive entry constrains the incumbent's ability to recover the level of contribution embodied in the regulated, pre-entry retail prices of services utilizing that input.[45] The second difference between our proposal and the standard ECPR is that we supplement it with an end-user charge in order to allow the incumbent firm to satisfy its break-even constraint and remain

44 *See* Sibley et al., *supra* note 17 (discussing the M-ECPR in the context of a retail price greater than marginal cost). If the initial retail price is less than marginal cost, ECPR and M-ECPR yield equivalent prices, equal to the retail rate less avoided costs.

45 Returning to the example in note 8, *supra*, assume again that the ILEC retail rate for business service is $60, that the incremental cost is $30, and that the cost of other, competitively supplied inputs is $5. As noted before, ECPR results in an UNE price of $55 for the loop. Suppose further, however, that a competing provider is efficient and able to provide service to business customers for only $45 (net of retailing costs). Under M-ECPR, the incumbent's price for an unbundled loop would also fall to $45. Unless the ILEC responds with a corresponding price reduction, customers will migrate to the lower-priced competitor, thus diminishing the ability of the ILEC to recover the level of contribution that had been reflected in pre-entry retail prices. The M-ECPR thus takes into account the presence of market alternatives.

solvent.[46]

For ease of exposition, we will discuss the M-ECPR in a simplified setting often used in ECPR discussions. Assume that the production of a retail input requires a bottleneck input produced by a monopolist at a TELRIC equal to v. Assume also that the bottleneck monopolist is vertically integrated into the retail market; that there are other inputs associated with the retailing function that are produced in competitive input markets; and that the marginal cost of retailing is c to the incumbent. Suppose an entrant can provide the retailing function in competition with the bottleneck monopolist at a marginal cost of g but will need to lease the services of the bottleneck input at a price w from the input monopolist. Suppose also that the market-determined price for the retail product is P.

In this setting, the two pricing proposals discussed in this paper are TELRIC pricing ($w = v$) and ECPR ($w = P - c$), where $P - c$ is the opportunity cost to the incumbent of leasing one unit of the bottleneck input to its retail competitor, and w is constrained to be at least as great as v. As shown below, the allocative efficiency of each of these rules depends on the assumed competitive conditions in the retail market.

Price Competition. First, suppose that both firms produce identical versions of the retail good and that consumers all switch to the firm with the lower price. If the bottleneck monopolist employs TELRIC and sets $w = v$, then the retail price will be the perfectly competitive price at the monopolist's marginal cost ($P = v + c$). If the entrant is more efficient than the incumbent at the retailing function, then it will still set its price at P while retaining the entire retail market. Now, suppose that the input is priced according to the M-ECPR, so that $w = P - c$. Given that consumers are assumed to switch to the firm with the lower price, P is interpreted to be the lower of the incumbent's price and the entrant's price. The entrant's profit when it signs up a customer is now $P - g - w$, which is equal to $c - g$, or the difference between the retail costs of the entrant and the incumbent. Note that a competitor will find entry profitable if, after paying the M-ECPR price to the incumbent, its other costs not associated with the monopoly input (g) are no higher than those of the incumbent. If the entrant is more efficient than the incumbent, then the entrant makes a positive profit on each consumer it attracts. Finally, if the entrant is equally efficient, we assume that the regulator provides the entrant an arbitrarily small subsidy per customer for entering. In either case, the entrant makes a positive profit proportional to the number of customers it serves. In this setting, the entrant's incentive is to maximize the number of customers served, which is done by setting P equal to $v + c$, the incumbent's

46 Continuing the example from the previous note, a competitively neutral end user charge of $10 would need to be added to the M-ECPR price of $45 in order to prevent arbitrage.

marginal cost.[47] In this type of market, the M-ECPR and TELRIC approaches yield the same outcome. The results of this computation are summarized in Table One.

TABLE ONE

A Comparison of TELRIC versus M-ECPR Pricing: Summary of Results

Firm Behavior	Entrant is at Least as Efficient as Incumbent	Entrant is Less Efficient than Incumbent
Price Competition	M-ECPR and TELRIC both result in an equilibrium retail price equal to the incumbent's marginal output cost.	M-ECPR and TELRIC both prevent entry by inefficient competitors.
Quantity Competition	M-ECPR results in an equilibrium retail price equal to the incumbent's marginal output cost. TELRIC results in a retail price above incumbent's marginal output cost.	M-ECPR prevents entry by inefficient competitors, while TELRIC does not. TELRIC leads to lower (higher) welfare if market demand elasticity is sufficiently inelastic (elastic).
Monopolistic Competition	M-ECPR results in lower equilibrium retail prices for both the incumbent and entrant than TELRIC.	M-ECPR prevents entry by inefficient competitors, while TELRIC does not. TELRIC leads to lower (higher) welfare if market demand elasticity is sufficiently inelastic (elastic).

Quantity Competition. Now suppose that the retail market does not lend itself to the perfectly competitive outcome and that some form of non-price difference exists between the output of the incumbent and the output of the entrant. One plausible way to model this is to assume that the two firms are Cournot competitors. In this setting, if the bottleneck input is priced at TELRIC, the standard result of the Cournot model holds true: The equilibrium retail price will be above the marginal cost of either firm.[48] With M-ECPR, however, the entrant's profit per customer is $P - g - w = c - g$, so that total profit is simply equal to this quantity times the

47 Recall that w cannot fall below v.

48 *See generally* JEAN TIROLE, THE THEORY OF INDUSTRIAL ORGANIZATION 209-38 (1989) (providing an overview of Cournot competition).

number of customers served by the entrant. Using technical arguments that are available elsewhere,[49] we prove that as long as the entrant is at least as efficient as the incumbent, the entrant will serve the entire retail market and will produce to the point where the retail price is equal to the incumbent's marginal cost, $v + c$. Because the TELRIC approach yields an equilibrium price higher than this level, M-ECPR is superior to TELRIC in terms of allocative efficiency.

Monopolistic Competition. In the cases of price and quantity competition, it is assumed that the entrant and the incumbent produce homogenous outputs. Even if we relax this assumption, M-ECPR remains more desirable than a TELRIC methodology. This case is more complicated to analyze than the previous cases because the prices of the differentiated products offered by the incumbent and the entrant will be different from one another. As a result, there is some ambiguity in determining the appropriate opportunity cost and defining the M-ECPR. Without going into a detailed analysis underlying the case of monopolistic competition (which we provide elsewhere),[50] we summarize that M-ECPR is still clearly superior to TELRIC-based marginal cost pricing. As long as the entrant is at least as efficient as the incumbent ($g \leq c$), the M-ECPR approach will yield equilibrium retail prices for both the differentiated products that are lower than those given by TELRIC pricing. When $g > c$, M-ECPR prevents market entry, while a TELRIC approach allows entry under certain conditions. Whether or not such entry increases or decreases consumer welfare depends upon a number of factors, including the elasticity of demand for the retail service, the level of pre- and post-entry prices in excess of marginal cost, post-entry market shares, and the magnitude of the entrant's inefficiency.[51]

In each of the three competitive cases outlined above, whenever the entrant is at least as efficient as the incumbent, the M-ECPR approach leads to greater allocative efficiency than does the TELRIC method. When the entrant is less efficient than the incumbent, there are cases in which TELRIC pricing is more efficient than the M-ECPR. The reason for this result is that the M-ECPR makes entry by inefficient competitors unprofitable, whereas TELRIC allows a less efficient competitor to survive in either monopolistic or Cournot competition and bid the retail price down. In this last case, the gain to consumers from entry can outweigh the increase in resource cost due to the entrant's relative productive inefficiency if market demand is sufficiently elastic. Assuming that the

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49 *See* Sibley et al., *supra* note 17, at 7-15.

50 *See id.* at 15-19. For a discussion of monopolistic competition, see OZ SHY, INDUSTRIAL ORGANIZATION: THEORY AND APPLICATIONS 133-67 (1995).

51 *See* SHY, *supra* note 50, at 143-62; Nicholas Economides & Lawrence J. White, *The Inefficiency of the ECPR Yet Again: A Reply to Larson*, 43 ANTITRUST BULL. 429, 431-32 (1998).

incumbent input monopolist has fixed or shared costs that must be covered, the equilibrium prices under either M-ECPR or TELRIC pricing will likely not cover total costs. For this reason, inframarginal costs will need to be covered with an end-user charge.

Conclusion

We agree with Professor Baumol's analysis of ECPR prices and his criticism of uniform access prices. We hope that he will continue to make clear to regulatory agencies throughout the United States and abroad his rejection of uniform access pricing schemes, such as TELRIC, and his advocacy of ECPR prices. As Professor Baumol correctly demonstrates through his "Level Playing Field" theorem, "only by using [ECPR pricing] can we *neutrally* price a monopoly-owned bottleneck service required by both the bottleneck owner and its final product competitors."[52]

The advantages of the M-ECPR approach are threefold. First, it allows entrants to compete in every market in which the bottleneck owner offers retail products, as long as the entrants are at least as efficient as the incumbent. Thus, the "playing field" will be level. Second, it eliminates arbitrage ("cream-skimming") opportunities, so that entrants have no incentive to favor the provision of retail services with relatively high margins over those with relatively low margins. Finally, it facilitates efficient entry into all the bottleneck owners' markets, while at the same time allowing regulators to maintain cross subsidies to further their social goals, such as universal service. As Professor Baumol summarizes, regulators "can have their cake."[53]

52 Baumol, *supra* note 9, at 6.

53 William J. Baumol, Remarks at the American Enterprise Institute, Conference on Stranded Costs, Deregulatory Takings, and the Regulatory Contract: Legal and Economic Issues Spanning the Network Industries (Oct. 22, 1998); *see also* Baumol, *supra* note 9, at 1 (describing differential access pricing to bottleneck inputs as a way to preserve universal-service cross subsidies while facilitating competitive entry, or as a way to have "your cake").