The Arbitrage Mirage: Regulated Access Prices with Free Entry in Local Telecommunications Markets

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Abstract

Incumbent telecommunications carriers have been mandated to share their networks with new retail service providers at regulated wholesale rates. This regulatory structure creates options which incumbent systems must write and which all potential entrants are awarded at a price of zero. Intense debate revolves around the effect of the policy in promoting investment in network infrastructure or retarding it. Rival viewpoints in the policy discussion, however, appear to share the fundamental position that the options issued entrants by incumbent network owners are a transfer of wealth. This paper notes that, to the extent that the regulations actually achieve their purpose in eliminating entry barriers, the assumption is incorrect. Eliminating the sunk costs associated with providing network services can result in regulatory arbitrage that reduces the value of the option to enter to zero. The U.S. market for local telecommunications has witnessed characteristic elements of this rent seeking competition, and financial markets suggest that investors have begun to incorporate the view that the regulated wholesale access regime results in zero long-term profits for entrants.

1 Introduction

To encourage the creation of competitive networks, the 1996 Telecommunications Act (96TA) eliminated state-issued franchise monopolies for local telephone service, and attempted to jumpstart competitive rivalry by mandating rules allowing entrants to lease incumbents' networks at regulated wholesale rates. The rationale was to stimulate complementary investments by entrants which would, in turn, prompt incumbents to improve their performance.[1] Over time rival networks would be established and a rich

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[1] "The original idea behind unbundling is that because there are high entry barriers into the local access market, unbundling – that is, a weak form of divestiture – would permit new firms to 'leapfrog' those barriers to accelerate the pace of competition. In its most simple form, unbundling should lead to new network-based competition by providing new entrants initially with the appearance of 'ubiquity' and economies of scope necessary to enter a very costly business – that is, the entrant would first develop its

array of innovative services offered. Market forces would then protect consumer interests, obviating the need for regulation, the explicit long-term goal of the 96TA.

This policy departs from traditional utility regulation of local carriers. That approach assumes monopoly market structure will capture productive efficiencies, while retail rate controls will constrain monopoly power. Mandated access rules move the rate control regime up to the wholesale level (although retail price caps are not yet abandoned) in an attempt to create incentives for investment in competing networks. A healthy debate has arisen over the implementation of specific rules.[2] These rules focus on two aspects of network sharing. The first is the list of network elements that entrants can rent from incumbents at regulated rates, and are commonly called "UNEs" (unbundled network elements).[3] The second key dimension is the price at which the UNEs are made available. In the United States the framework created to establish what Congress directed to be "cost-based" rates is known as TELRIC, for total element long-run incremental cost.[4] This standard attempts to impose prices equal to a pro rata share of what a new, state-of-the-art, efficiently sized system would cost to construct. Because technology improves over time, the cost of network elements should predictably decline under TELRIC rules, which do not reflect the investment or technology decisions embedded in the incumbent's actual network.[5]

The controversy over network sharing mandates, then, involves questions about how extensive is the list of available UNEs and the level of TELRIC rates. In general, advocates of network sharing mandates (pro-unbundling) propose extensive UNE lists and low TELRIC rates, while critics of such mandates (anti-unbundling) take the opposite view. The economic debate is somewhat analogous to a disagreement over income and substitution effects. The "pro-unbundling" position focuses on the financial boost supplied competitive entrants into local telecommunications markets. This comes in the economies of scale and scope realized through resale of existing facilities, and in the cost-savings associated with lower input prices. (Beard *et al*., 2001; de Fountenay *et al*., 2003) Advantageous entry rules are seen as "stepping stones" which offset the otherwise overwhelming advantages of incumbency (Rosston and Noll, 2002). Once established, new competitors will then build facilities to rival existing networks, and network sharing obligations will be eliminated. Incumbents will react by improving performance. New investment (in alternative facilities or upgrades of existing facilities) is, hence, positively associated with network sharing mandates.

The alternative view focuses on substitution effects. When entrants face advantageous opportunities to resell incumbents' network services, the relative price of owning an actual network rises. This effect induces the competitive entrant to substitute UNEs for facilities it might build. The same price signal also induces investors in incumbent networks to reallocate capital. Given the lower valuation of telecommunications infrastructure,

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customer base, and (because it has no desire to purchase its primary inputs of production from its rivals) would then build-out as conditions warrant." (Beard *et al*., 2001, 15)

[2] See, for example, Alleman and Noam (2002). The economics literature on wholesale rate regulation in telecommunications is reviewed in Mitchell and Vogelsang (1997) and Armstrong (2002).

[3] An entrant may purchase the complete set of UNEs to resell the incumbent's service, a policy called "UNE-P" (or UNE-platform).

[4] In May 2002 the U.S. Supreme Court upheld the use of the TELRIC framework. See *Verizon v. F*CC, 535 U.S. (2002). See Weisman (2002).

[5] The one exception is that the geographical pattern of central offices in the incumbent's existing network is employed in estimating TELRIC prices.

alternative projects become relatively more attractive. In May 2002, the D.C. Circuit Court of Appeals found that such incentives could undermine the creation of rival networks and advanced services, the stated goals of the Telecommunications Act. The appellate court overturned UNE rules crafted by the Federal Communications Commission as overly broad.[6]

This paper enters the above debate by analyzing a paradox seemingly overlooked by either side. In mandating network sharing rules, regulators may ease entry barriers by reducing input costs (including those associated with the assumption of risk). The options to use incumbents' facilities will impose costly liabilities on the owners of these facilities. But the incumbents' costs are not transferred to entrants, who enjoy non-exclusive option rights. Instead, a rivalry to capture profit opportunities is triggered due to minimal barriers to entry – precisely the intention of the policy. This competition is based on regulatory arbitrage, reselling at retail what is offered at regulated wholesale rates. In fact, the entire suite of wholesale service can be purchased from the incumbent and resold to the retail customer, with the entrant providing one key component: the customer. Hence, the relevant competitive margin becomes marketing. Incremental customer acquisition costs rise until, at the margin, profits are zero.

This rent seeking rivalry dissipates profits until the marginal profit opportunity vanishes. Since economies of scale have been rendered inconsequential by the regulatory effort to induce entry by small players utilizing incumbents' large, efficient networks, the market equilibrium does not accommodate inframarginal profits. The result is that the options redistributed from incumbents to entrants lose their value in transit. Favorable resale terms do not allow entrants to capture the financial advantages of economies of scale and scope when rising customer acquisition costs eliminate profit margins. With free entry, the resale opportunity is self-limiting.

The brief history of the competitive local telecommunications sector suggests that this analysis describes an important aspect of the market. From 1996 through 2002, some $71 billion was invested in competitive local exchange carriers (CLECs), including both those firms building new networks and firms entirely focused on reselling incumbent local exchange carrier (ILEC) network services (ALTS 2003, 10). Yet, by the end of this period, total capitalization of the publicly traded firms amounted to just $1.4 billion (ALTS 2003, 17). This pattern is consistent with rent seeking induced by regulatory arbitrage. This, in turn, is supported by the extraordinary financial importance of customer acquisition costs (CAC) in the sector. For a sample of nine CLECs, Beard *et al*. (2001, 14) find that "*for every dollar of investment in plant and equipment, an additional $2 of entry costs are incurred on average"* (italics in original).[7] The rent seeking promoted by favorable resale terms is suggested by the following advertisement:

> 50% to 70% Net Profit Available to Competitive Telephone Companies
>
> American Discount Telecom has assisted one hundred telephone companies to become *profitable* "Competitive Telephone Companies" nationwide! These companies are known as "CLECs". They offer local telephone service, in direct competition with Bell [sic] & Verizon, with 40 features as standard service, plus a Free Toll-Free telephone number, Dial-up Internet Service, Discount Long Distance Service, and Deluxe Voice Mail – all from one source, with one easy to read bill!

[6] *United States Telecom Ass'n v. FCC*, 290 F.3d 415, 425 (D.C. Cir. 2002) [*U.S.T.A.* 2002].

[7] The nine CLECs were XO, RCN, Allegiance, Covad, McLeod, Talk.com, Northpoint, ITC^DeltaCom, and US LEC.

> No Equipment Investment is required! All technical services such as billing, are outsourced to leading providers of telecom services, who provide the best services available! You only need to be able to operate your own sales organization, and provide your own customer service. We train your personnel to perform these functions.[8]

In this paper we examine resale rent dissipation in a simple theoretical model in Section 2. In Section 3, we review some recent financial market evidence illuminating investor forecasts as to the magnitude of dissipation. A conclusion follows in Section 4.

2 A simple economic model of resale competition

In this preliminary model we attempt to formalize market results ensuing from a system in which telecommunications competition is achieved solely by the resale option.[9] This approach encompasses UNE-P, but does not consider the substitution, or complementarity, between this mode of entry and facilities-based alternatives. At *t=1*, the regulatory regime establishes free entry for CLECs to both enter local telecommunications markets and to resell service provided by an ILEC at the FCC's TELRIC prices. There are a large number of CLECs which decide whether to enter the market. If the CLEC decides to enter, it must have a positive number of customers, $q_i > 0$. Through the future the CLEC expects to pay the ILEC $\omega \cdot q_i$, where ω is the present value of the stream of TELRIC payments for use of the network (per subscriber). The investment necessary to enlist an additional subscriber (customer acquisition cost) is the present value of the cost stream for the marginal customer, $CAC_i(q_i, N)$, where N is the number of competing firms in the market. It is assumed that more competition increases the CAC for all firms, so $\frac{\partial CAC_i}{\partial N} > 0$. We assume that entrants are price takers. A firm enters if

$$E(\pi_i) = (P^R - \omega) \cdot q_i - E\int CAC_i(q_i, \hat{N}) dq_i \geq 0$$

for some positive q_i, where π_i is the discounted profit of the i^{th} firm and P^R is the present value of the regulated retail price. Customer acquisition costs increase in N. Firms do not know how many other firms will also be entering. Thus, each firm estimates $CAC_i(q_i, N)$ based on their conjecture about N, which we call $\hat{N}$.

Over-entry occurs if firms under-estimate CAC, resulting in negative profits for the marginal firm. For cookie-cutter rivals reselling services delivered over the incumbent's network, the only way to increase expected profit is to increase the number of customers, subject to customer acquisition costs. Entry by new firms or expansion by existing retailers shifts up $CAC_i(q_i, N)$ for all firms (including the incumbent network owner). With less than perfect mobility, given sunk advertising and marketing expenses, entrants discover that their customer acquisition costs are higher than expected.

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[8] American Discount Telecom web page, http://www.a-adt.com/une-p-clec.html (visited May 1, 2003).

[9] "Resale" is used here to refer to the situation where an entrant sells at retail, using an existing network to supply services to customers at regulated wholesale rates. This applies both to the "resale" policy mandated in the 96TA, and to UNE-P, which now typically offers entrants substantially lower prices.

At *t=2*, firms exit. The market will stabilize at N^* firms, where N^* is such that for *i=1,2,...,N,*

$\pi_i = (P^R - \omega) \cdot q_i - \int CAC_i(q_i, N) dq_i \geq 0$, when $N \leq N^*$, and

$\pi_i = (P^R - \omega) \cdot q_i - \int CAC_i(q_i, N) dq_i < 0$, when $N > N^*$.

With scale economies, the marginal customer acquisition cost initially decreases over some range, and then increases after economies of scale have been depleted. Scale economies constitute a barrier to free entry and would allow some firms positive profits in equilibrium.

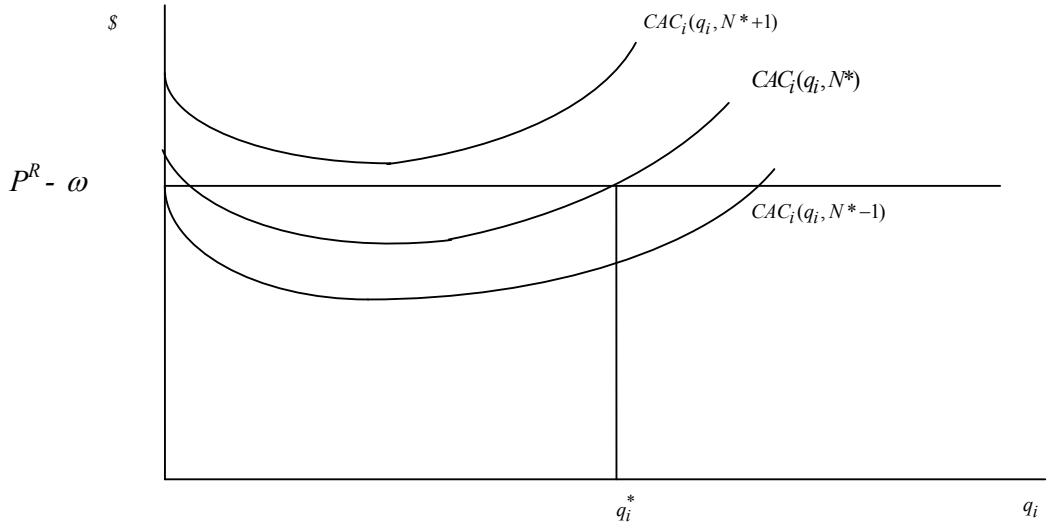

Figure 1: Economies of scale in customer acquisition

As firms enter, the *CAC* (the present value of the cost of acquiring the marginal customer) for any given firm *i* shifts upward, as depicted in Figure 1. This cost is incurred in addition to the network charges associated with serving the marginal customer. The equilibrium number of customers is q_i^*, which equates the acquisition cost of the last customer with the present value of the retail customer, $P^R - T$. In disequilibrium, an entrant can realize positive profits if it becomes large enough to exploit scale economies not available to other firms. In equilibrium, some firms may enjoy positive profits, but an entrant cannot gain sufficient market share to benefit from economies of scale.

If size is no advantage in customer acquisition, the *CAC* function will be upward sloping for any number of customers. Thus, entry is entirely free in the sense that *de novo* entrants enjoy no cost disadvantage. Positive profits are unsustainable in equilibrium due to entry by smaller firms. Entrants will raise *CACs* for all firms until there is zero profit. See Figure 2.

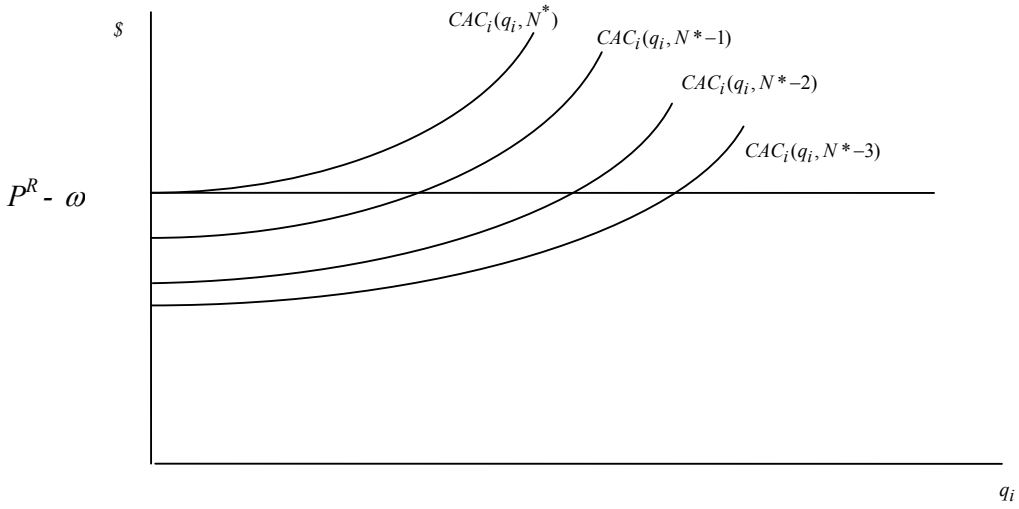

Figure 2: Decreasing returns in customer acquisition

The ironic conclusion is that, as free entry is facilitated by regulation, the value of the network sharing option issued to the entrant is eliminated. The incumbent's liability for options issued, on the other hand, truncates their anticipated distribution of returns, lowering the present value of network investment. Even if retail prices decline with CLEC entry, the capital expense incurred must be accounted for in appraising economic efficiency. So must the cost of the rent-seeking to acquire customers receiving identical services from retail rivals.

3 Valuation changes and regulatory events

Two regulatory events have recently surprised capital markets, providing some evidence of the views investors hold regarding network sharing policies in the United States. The first event was triggered by the appearance of a front page article in the *Wall Street Journal* on Jan. 6, 2003.[10] This news story startled telecom industry watchers by announcing that the upcoming FCC meeting to reconsider UNE-P rules would go far beyond what had previously been expected in deregulating ILEC unbundling obligations. Specifically, the article reported that "Federal regulators are preparing to stop making local phone companies rent their networks to rivals at cheap rates, a move that could reduce competition and price-cutting in the local phone market." On this news, the stocks of all four Regional Bell Operating Companies (RBOCs) rallied sharply; for three of the four it was among the best four trading days of the entire year. See Table 1.

[10] Yochi J. Dreazen and Shawn Young, "FCC Plans to Erase a Key Rule Aiding Local Phone Competition," *Wall Street Journal* (Jan 6, 2003, A1).

	RBOCs				*UNE-P CLECs*		*IXCs*			*VOICE EQUIPMT*	
Date	BLS	VZ	SBC	Q	ZTEL	TALK	T	MCWEQ	FON	LU	NT
1/3/2003	0.0%	0.7%	-0.1%	0.6%	7.7%	2.9%	2.5%	4.0%	-0.1%	2.2%	-0.5%
1/6/2003	**5.6%**	**6.7%**	**5.8%**	**8.0%**	**-10.7%**	**-24.9%**	**-2.9%**	**-15.7%**	**5.4%**	**4.0%**	**6.9%**
1/7/2003	-0.5%	-0.4%	-2.3%	0.7%	4.7%	-7.2%	-1.1%	9.5%	1.4%	9.7%	3.6%
2/19/2003	-3.2%	-2.7%	-2.1%	-6.6%	24.7%	17.4%	5.3%	-1.5%	-0.6%	-0.4%	-1.4%
2/20/2003	**-6.0%**	**-4.1%**	**-6.6%**	**-13.1%**	**22.5%**	**27.8%**	**-0.8%**	**-2.5%**	**2.1%**	**-5.8%**	**-3.7%**
2/21/2003	3.0%	1.2%	-4.0%	-0.5%	-9.7%	2.7%	0.5%	1.6%	2.2%	-9.2%	-4.4%
1-yr max	10.2%	9.5%	9.1%	52.4%	44.6%	38.5%	8.2%	52.1%	18.4%	30.5%	22.1%
1-yr min	-14.8%	-8.6%	-6.9%	-57.0%	-19.0%	-32.8%	-20.1%	-83.6%	-23.4%	-24.0%	-20.9%
1-yr mean	0.0%	0.0%	-0.1%	0.3%	0.4%	0.9%	-0.2%	0.0%	0.1%	0.0%	0.2%
1-yr median	-0.1%	0.0%	0.0%	-0.4%	-0.1%	0.4%	-0.1%	-0.8%	0.0%	-0.3%	-0.6%
Daily variance	0.1%	0.0%	0.1%	0.8%	0.6%	0.6%	0.1%	1.9%	0.2%	0.5%	0.5%
Rank among 253 trading days for the year (unless noted below):											
1/3/2003	122	79	130	103	34	74	33	66	133	76	125
1/6/2003	**4**	**4**	**4**	**27**	**240**	**251**	**221**	**237**	**18**	**54**	**33**
1/7/2003	145	144	216	100	56	231	171	35	79	13	62
2/19/2003	240	235	213	230	5	7	6	131	152	131	144
2/20/2003	**251**	**248**	**252**	**246**	**6**	**3**	**159**	**150**	**60**	**227**	**189**
2/21/2003	20	61	241	129	234	76	98	89	58	239	200

Table 1: Abnormal U.S. telecommunications returns around two regulatory events

Notes: 1-year data from 4/10/02 - 4/9/03. MCI did not trade 6/26/02 - 6/28/02. Rank is out of 250 observations. The variance uses the formula $(n\Sigma x^2 - (\Sigma x)^2)/(n(n-1))$.

The story's prediction was a false alarm. The market was, in fact, surprised from the opposite direction when the FCC actually met to decide its UNE policy. On Feb. 20, 2003, Commission Chairman Michael Powell took the unusual step (as Chairman) to write a dissenting opinion, being in the minority of the Commission's 3-2 vote.[11] UNE rules were not narrowed; as the *New York Times* reported, "A deeply divided Federal Communications Commission today largely left in place rules that are meant to foster local telephone competition by requiring the four regional Bell companies to lease their local networks to their rivals at low prices set by state regulators."[12] In a confusing twist, however, broadband sharing obligations for incumbent phone companies (giving rivals

[11] The decision on Feb 20, 2003 appeared to contain a substantial element of surprise. On the day of the FCC meeting, the *New York Times* reported that the UNE rules would be significantly pared back. Stephen Labaton, "F.C.C. Ruling is Expected to Favor Baby Bells," *New York Times* (Feb 20, 2003, A1). After the event, however, the *Times* reported the decision was decidedly mixed. Stephen Labaton, "Communications Compromise: The Overview; Local Phone Rules to Stay in Place," *New York Times* (Feb 21, 2003, A1).
[12] Stephen Labaton, "Communications Compromise: The Overview; Local Phone Rules to Stay in Place," *New York Times* (Feb 21, 2003, A1).

low-price access to network elements providing digital subscriber lines) were reduced by the Commission ruling.[13]

Financial reactions observed over just two event windows are not determinative. Nonetheless, the evidence suggested by the abnormal returns associated with four important sectors – ILECs, CLECs, IXCs (long distance carriers), and Equipment Manufacturers – is potentially revealing. Four observations are made regarding share returns over the January and February events. First, shares of the Bell Companies, Qwest, SBC, Verizon and BellSouth, reacted sharply to both events (positively to news of unbundling deregulation, negatively to the opposite). Transferring property rights from firms tends to reduce their equity values, regardless of whether the change promotes efficiency, and it is uncontroversial that RBOC shares would be impacted in the directions observed. But the price movements allow us to infer that potentially important regulatory news was released during either event window.

Second, both leading suppliers of narrowband (voice) infrastructure, Nortel and Lucent, exhibit a pattern of returns similar to the ILECs. This suggests that enhanced UNE-P rules are not only a negative for incumbent carriers but also for equipment manufacturers supplying switches and other network infrastructure. This evidence is consistent either with the theory that generous UNE-P opportunities lead incumbent and competitive carriers to substitute out of network infrastructure, or the rent seeking explanation of resale competition developed above, or both. It is inconsistent, however, with the view that UNE-P helps facilitate competitive entry that will result in increased network investment.

Third, the firms that rely wholly on UNE-P rules, Z-TEL and Talk America, rise and fall in value with the unbundling obligations. These firms' business models depend on rules providing favorable terms of resale. Whatever limitations are associated with this market niche should have been previously capitalized into share prices.

Fourth, the evidence provided by the returns of AT&T (T) and WorldCom (MCWEQ), firms which together account for 54% of the ten million residential UNE-P lines (Pace 2003, 4), is mixed. While both shares react negatively to the January announcement that UNE-P rules will be substantially eliminated, they do not enjoy positive returns when such rules are actually extended in February. The firms were not expected to receive much if any profit from the FCC's pro-unbundling ruling.[14] As a financial analyst summarized:

> AT&T Without UNE-P: Valuation Impact Is Minimal.
>
> From a valuation perspective, we believe the market has assigned little value to AT&T's Consumer unit as a whole. Thus, in the final analysis, even if AT&T were to stop offering local service altogether… the impact on the stock should be minimal (Bear Stearns, 2003, 1).

Other investment analysts have extended this logic, identifying the futile quest for profits under generous network sharing rules. Referring to UNE-P as "a bit of a catch 22," Morgan Stanley Equity Research writes:

> UNE-P conversion for many of these carriers requires significant marketing and advertising expense, as well as promotional giveaways (for example, MCI/WorldCom's Blockbuster giveaway in New Jersey and AT&T's rebate in New York and New Jersey). With those fees, in addition to the wholesale rates for the service, we question the profitability of the offering… [W]e question if there

[13] Saul Hansell, "Communications Compromise: High-Speed Access May Cost More," *New York Times* (Feb 21, 2003).

[14] This contrasts with the negative returns to Bell shares during the window, suggesting that the loss incurred by ILECs would not be transferred to the leading CLECs.

> are any long-term winners in this game. The FCC may simply have perpetuated a reseller bubble with no profitability that will ultimately burst (Morgan Stanley, 2003, 14).

The corporate strategy of Sprint, a firm with some incumbent local exchanges and the third largest long-distance telephone carrier, is instructive. Despite having a national brand in retail telephone service, Sprint has been reluctant to allocate advertising budgets to pursue local customers served by UNE-P. Sprint does, however, resell RBOC local service via UNE-P "when its [long distance] customers call in to call centers for customer service" (Ibid.). The firm constrains incremental customer acquisition cost to, virtually, zero. Given this, it is notable that investors treated Sprint (FON) shares distinctly from those of AT&T and WorldCom during the two event windows.

Financial event studies are consistent with this interpretation of the share returns data. Ingraham & Sidak (2003) examine the Jan. 6, 2003 *Wall Street Journal* news event, finding that "positive abnormal returns to JDS Uniphase, Lucent, Nortel, and Tellabs reflected an expectation of the capital markets that these firms would have increased net cash flows, which would result from greater (not lesser) sales of telecommunications equipment" (p. 15). A footnote comments that analysis of the FCC's Feb. 20 event revealed negative (if statistically insignificant) returns in the equipment sector. In contrast, Ekelund & Ford (2003) find that equipment manufacturing shares had no statistically significant reaction during the Feb. 20th event window, but this result is clearly explained by their portfolio selection. Instead of focusing on U.S. firms concentrating on sales to the regulated (narrowband) sector directly impacted by UNE rules, the study reviewed returns from international firms with relatively modest U.S. sales (for example, Alcatel) and domestic firms primarily supplying inputs for broadband infrastructure (for example, Cisco). Because the FCC ruling eliminated some unbundling requirements for ILEC-provided DSL rivals, the policy change in this sector was *de*regulatory.

4 Conclusion

> While the outcome of this [unbundling] experiment is uncertain, two outcomes are likely to be good for consumers. One is that facilities-based competition… emerges from UNE-based entrants. The second is that wireless services make local telephone access competitive even if wire-line competition remains very limited. In either case, local access regulation can be replaced by competition.
>
> The third possible outcome is that when the dust settles, most local access competition will take the form of resale of the incumbent's facilities. In this case, consumers are not likely to benefit, and regulation will, if anything, grow as regulators are called upon to resolve disputes between incumbents and resellers. (Rosston and Noll, 2002; 88-89).

It is generally understood that pure resale, at regulated wholesale rates, is not a favorable outcome for mandatory network sharing policies. That is why the debate over these rules focuses largely on investment incentives and the relationship between entry-by-resale and facilities-based competition. Yet, this debate has largely overlooked the possibility that the investment incentives stimulated by unbundling policies could be associated with unproductive rent seeking.

The opportunity for regulatory arbitrage in telecommunications incurs social costs and systematically alters the process by which competition evolves. These social costs should be included in the evaluation of policy alternatives. Moreover, economists should incorporate the effect of such rent seeking in limiting opportunities for entrants to sustain

long-term profitability. To the extent that regulation succeeds in providing a pure resale model that eliminates barriers to entry, profits will prove elusive to entrants. The transfer of network service options to new rivals does not effectively transfer wealth as intended.

This result fundamentally impacts the telecommunications regulation debate. The dissipation of profits reduces or eliminates the income effect (boosting competitors' financial opportunities) while leaving substitution effects (increasing the relative price of facilities construction) intact. This unambiguously reduces investment incentives. The extent to which competition for regulatory arbitrage undercuts entrants' ability to gain from the use of UNEs, should be incorporated into future research on the efficiency of network sharing rules.

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