

The Unfashionable Service Provider

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What's old is likely to become new. While much has changed in the service provider world, the fundamentals—scale economies in particular—remain the same.

What goes around comes around. Two years ago, the conventional wisdom was that competitive local exchange carriers (CLECs) had infinite growth potential and that they would own the world. Today, conventional wisdom is that telecom service providers (CLECs included) are toast—just ask Hicks Muse about its investment in ICG.

Despite the fact that the stereotypical VC bears more than a passing resemblance to a lemming, and that Wall Street's focus seems to be 6–18 months out, we don't believe in investing just because something is fashionable. Two years ago, in the midst of the CLEC euphoria, we suggested that the hype was overdone and that there were limits to growth—if you have multiple players all selling to the same business customers in the same downtown markets, high annual growth quickly brings you up against total served market potential (see “Are the CLECs' Best Days Behind Them?” in *BCR*, November 1998, pp. 32–36).

Having established our contrarian credentials, what do we think about the current downmarket for telecom service providers? Is it permanent? Or is it a temporary industry restructuring, to be followed by some new service provider Golden Age? Is the right answer the deconstruction that we see at AT&T and WorldCom, or should we expect to see renewed consolidation?

Our approach to the question is to ignore short-term issues and to focus on long-term economic fundamentals. For any business to thrive, two condi-

tions must exist: First, sufficiently *large and growing market demand* (relative to the size of an economically efficient competitor) and, second, a *favorable industry structure* that permits efficient competitors to earn a good return on investment. Let's talk about each of these.

Market Demand: No Problem Here

For telecom service providers to thrive, they need a large and growing revenue base. When you look at the macroeconomic data you find that countries with high per capita GDP spend a higher share of GDP on telecom than countries with low per capita GDP. Not surprisingly, therefore, as shown in Figure 1, the total share of total U.S. GDP being spent on telecom historically has been increasing, and extrapolating forward, the overall pie seems secure. If there is 5.54 percent nominal GDP growth and telecom percent of GDP grows 1.45 percent per year (the past decade averages), the total pie should grow at 7.1 percent (Table 1). This doesn't include Web hosting/caching, which will add even more CAGR.

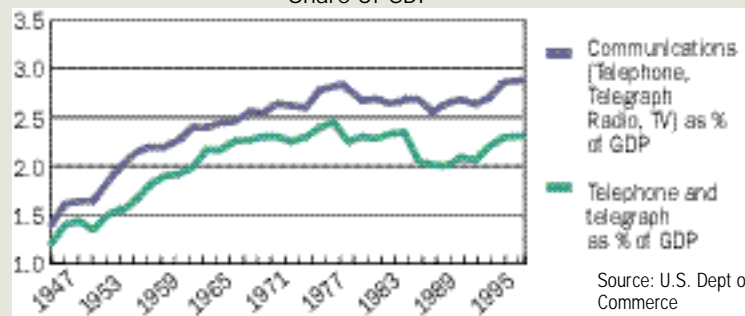
The macroeconomic data are supported by tangible market trends. Thirty years ago, telecom meant voice POTS. We then added a whole series of next-generation functionality, starting with fax lines. Net-net, there's plenty of demand for more telecom services, so the pie will continue to be large and growing.

Industry Structure: What Is It, And What's A Good One, Anyway?

Industry structure refers to a set of observable factors that help define the nature of industry competition. For our purposes, the critical factor is the number of competitors in any key segment,

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FIGURE 1 Telephone/Telegraph and Communications Sectors Share Of GDP



because the number of competitors is an important driver of industry pricing levels. Remember your Econ 101: In perfect, free markets with zero barriers to entry, prices drop to marginal costs. Attempts by incumbents to keep prices above marginal cost will be defeated by new entrants deciding that price cuts to levels even slightly above marginal cost will generate profits. As a result, industry prices inexorably fall to marginal cost.

In this context, from a supplier standpoint, a “good” industry structure is one with relatively few competitors, selling at prices substantially above marginal cost. While businesspeople like to talk about government non-interference, the last thing any of us really wants is a true economist’s free market—because we wouldn’t make any money.

What determines how many competitors there are in any industry segment? The key driver is the extent to which there are *barriers to entry* (legal or economic). When the barriers are low, there will be a large number of competitors; when they’re high, there will be few competitors.

Service Provider Industry Structure: A History Lesson

So consider the industry structure of the telecom service provider business. In the U.S., it started off as a pure monopoly and more or less stayed that way until the mid-1970s (and until 1996 for local switched telephony). From an incumbent supplier standpoint, this was nice. You built a network with high fixed costs but low marginal costs, and got to charge high minutes-of-use-based prices for a nice guaranteed profit. Economists liked to talk about telephony being a natural monopoly, and regulators limited profits to a fixed percentage rate of return.

Then along came new entrants, originally in long distance (read: MCI and Sprint), then competitive access providers (read: MFS and TCG), then CLECs (read: WorldCom-MFS, AT&T-TCG, Nextlink, McLeod, ICG, Intermedia *et al*).

All of these new entrants suffered from the same disadvantage: Low market share and therefore diseconomies of scale versus the incumbent. In an industry characterized by high fixed costs and low marginal costs, the lack of scale could have been a crippling disadvantage. This handicap, however, was offset by some combination of three factors:

TABLE 1 Extrapolated U.S. Telecom Market Growth

	GDP \$ Index	Telecom %	Telecom \$ Index
Yr 1	100	2.30%	2.30
Yr 2	106	2.34%	2.46
Yr 3	111	2.37%	2.64
Yr 4	118	2.41%	2.83
Yr 5	124	2.44%	3.03
Yr 6	131	2.48%	3.24
Yr 7	138	2.51%	3.47
Yr 8	146	2.55%	3.72
Yr 9	154	2.58%	3.98
Yr 10	162	2.62%	4.25
Compound Annual Growth Rate %	5.54%	1.45%	7.07%

n Regulation-based access to incumbent network elements at affordable prices. For example, Covad, Northpoint and Rhythms *could not have existed* without the ability to rent copper loop and co-location facilities in ILEC end offices.

n The ability to exploit regulator-based incumbent market price distortions by cherry-picking the high profit segments while avoiding the low profit areas. As the result of a century of regulation, toll service subsidizes local,

business service subsidizes residential, urban service subsidizes rural and now POTS subsidizes Internet access. So it was natural for CLECs to focus on businesses in urban markets with lots of toll calls, while ignoring the others. That strategy is particularly fun when regulators don’t allow incumbents to respond.

n The willingness to adopt new disruptive technologies that provide substantially better functionality than incumbents at substantially lower prices. The Internet and packet switching are good examples of this.

As a result, being an early adopter CLEC fighting against a sluggish incumbent hamstrung with lots of regulatory constraints was a great way to deceive yourself into thinking that you were smarter than the rest of the world.

So Where Are We Today?

Obviously, things are not nearly so good in the CLEC industry today. In broad terms, the original CLEC business model is showing its age, and is being hurt by the following factors:

n Success breeds imitators. If it is so easy to attack the incumbents, others will follow. At a certain point, CLECs weren’t just competing with sluggish incumbent service providers with Bell-shaped heads, they were competing against other CLECs. With enough new entrants, prices had to drop. (Parenthetically, at our venture-capital firm, we’re seeing a lot of proposals for funding from people who want to build fiber rings in downtown areas and sell converged services to businesses. How original!)

n Cherry-picking is good as a start, but what happens when the high-profit segment is fully exploited, as we discussed in our November 1998 *BCR* article cited above? And what happens when regulators shift prices toward a level that reflects the true activity cost base, as recently happened in long-distance access?

CLECs convinced themselves they were smarter than the rest of the world

n What happens if/when the incumbents are freed from regulatory constraints? As one example, attacking high toll costs was a very interesting game when total per-call access rates were 17 cents or more per minute. However, since the access rate restructuring, prices are now 2 cents or less and retail prices are a nickel or less. This makes the long-distance game much less exciting.

A second example: It was fun to be a CLEC exploiting 1–2 cent reciprocal interconnection tariffs by signing up lots of switched dial-up ISPs in order to have a disproportionate mix of incoming calls. But as the interconnection rates dropped to a mil or two, that game became less exciting, and companies depending on reciprocal compensation got into trouble. Going forward, if you really want to dream up the ultimate CLEC nightmare, just think about what would happen if business telecom stopped subsidizing residential service.

n What happens if/when the incumbents adopt the new disruptive technologies? After all, anyone with the cash can buy the same equipment with the same functionality from Cisco, Juniper, Nortel and Sycamore. Here's a second CLEC nightmare: What happens when/if incumbents apply the new equipment to networks with higher traffic (read: economies of scale)? The answer? If you're a CLEC, look out. While CLEC executives like to believe that executives at the incumbents are Bell-heads who are incapable of reacting to new, nimble competitors, what if that's no longer true?

n The importance of scale economics is increasing, making it harder for small CLECs to compete. In the old days, telcos depreciated their networks over 15 years or more. With modern optical equipment improving at perhaps 2×Moore's Law, carriers need to depreciate their plants much faster—accentuating the importance of scale economics (see our article "Rethinking Depreciation," in *BCR*, October 1998, pp. 63–68). Also, anyone looking at how one gets those Moore's Law improvements quickly learns that unit box costs don't go down, they go up. *What goes down is the cost per bit*—and even here, only if you have the market share to push enough bits through the box.

Some Prognostications

So what's in the cards? The answer will be substantially affected by the degree to which regulators continue to distort industry structures and the extent to which new disruptive technologies emerge that facilitate new business models. If we're looking 10 years out, we need to make some assumptions that may not occur. The answer also will vary by market segment.

That said, there will be a fundamental revamping of service provider business models by prod-

uct, resulting in a merger of what, until now, have been separate businesses:

n The standalone ISP function will be rendered superfluous when ILECs/CLECs use packet switches instead of circuit switches, and route their traffic onto intercity data transport backbones (we suggested this in our article "Has High Tide Come for ISPs?" in *BCR*, September 1997, pp. 37–41). As this occurs, ISPs will be bought out by LECs, migrate to owners of portal websites or go out of business.

n We have a similar negative view about IXC. In the future, we envision local and long distance communications being replaced by "any-distance" service providers, much the way the Internet operates. In this environment, we won't need Class 4 switching functionality. Edge packet switches will route/switch all calls, and any intercity traffic will be routed onto wholesale intercity transport providers.

n Absorbing these businesses, we see ILEC/CLEC functionality expanding to become integrated telecom service providers to end-user customers, with service offerings including all-distance telephony, ISP service and CATV. Since these firms will provide a full suite of end-customer telecom services including ISP, many of them also will offer Web hosting and caching services, particularly to smaller

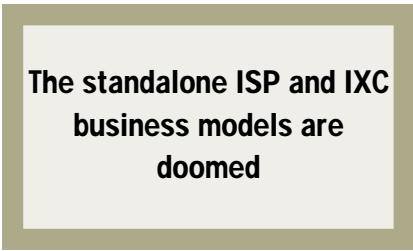
users who prefer a bundled offer.

The economic rationale for integrated service providers is that by providing multiple services over a common network architecture and customer service platform, the marginal cost per incremental service will be very low. This will enable very low prices per service to customers buying services in a bundle from an integrated supplier.

To supply these common services, end-customer service providers will rely on several alternative local-loop delivery vehicles: CATV networks, fiber to the pedestal/VDSL to the home/office, fiber to the building/VDSL to the home/office, fixed wireless and free-space optics. The right answers will depend on local topology and embedded assets.

n In this context, CATV is an interesting case. As the second wire to each home, CATV has the potential to be an integrated service provider. However, while cable MSOs have rolled out cable modem service, they have de-emphasized the roll-out of telephony services. At some point, this will need to change, particularly when ILECs build out fiber closer to the home and provide VDSL service that offers full interactive multichannel video capability.

n This also makes us somewhat skeptical about the long-term future of direct broadcast satellite. It



The standalone ISP and IXC
business models are
doomed

exists today because it delivers more channels at higher quality than CATV. In the long term, however, if it does not transmit two-way voice and interactive broadband with low latency, and if customers can use the Web to access an infinite variety of video sources, will a service provider offering a single product be able to be competitive against providers who enjoy the economic benefits of delivering multiple services?

▫ Moving to intercity transport, we see similar product-line consolidation.

What now are three separate businesses—IXC services to end customers, Internet backbone providers and dark fiber providers—will merge into a single, intercity function that provides a range of wholesale services sold to integrated end-service providers. That said, however, we don't see why intercity transport needs to be integrated with end-access provision. The customers are different, and end-access players will be able to obtain dark fiber/*lambdas* from multiple intercity specialists at attractive rates.

▫ We see wireless as an interesting hybrid. In the next few years, 3G data/voice capability will supplant today's largely voice-only cellular/PCS services, although delay is possible because of the extraordinary auction prices paid for spectrum. However, we don't see wireless competing with wireline directly, (fixed wireless being an obvious exception). While some people will use wireless phones in place of wireline, we think that most people will want both, since the upside speed of 3G data will be slow, compared to next-generation wireline. That said, the mobile access devices will work particularly well in wireless LANs, where they will interface with the wireline network for "on-campus" or "at home" calls.

The implication is that wireless carriers can be kept separate from wireline, at least for now. The delivery systems are largely separable, and (for now) almost no customers are served via common service platforms. Someday this may change, but not in the foreseeable future.

Net-net, the world will move toward three product-driven models: Wireline access, wireless access and intercity transport, with ISPs, IXCs and CATV folding into one of these businesses.

In this context, let's consider the recent AT&T and WorldCom deconstructions. WorldCom's approach, which separates the company into business and residential pieces, is consistent with our belief that products sold to common customers need to be kept in a single entity. Although the business/residential separation could result in switching/transport diseconomies due to differential business versus residential peak busy hours, this can be resolved via sharing agreements.

In contrast, we have difficulty understanding why AT&T is keeping AT&T Consumer (LD) sep-

TABLE 2: Local Service Providers By Segment (Pre-Consolidation)

Rural/ Suburban	ILEC 2-3 Business CLECs 3-4 Total	ILEC CATV 1-2 Fixed Wireless Providers 3-4 Total
	ILEC 5-10 Business CLECs 2-3 Building Service Providers 8-14 Total	ILEC CATV 2-3 Fixed Wireless Providers 4-5 Total
Urban	Business	Residential

arate from AT&T Broadband (CATV). This violates our *dictum* that services provided over a common wire to common customers should be one business.

In any case assuming we're right on industry product segment consolidation, what does this imply with respect to the number of players? Again, the forecasts below assume relatively free market economics with minimal regulatory intervention:

▫ In the long run, none of our surviving telecom markets (integrated service provider; intercity backbone provider; mobile wireless provider) will have more than 4-5 serious competitors. The reason is general microeconomics: In an industry with substantial economies of scale and substantially similar prices for all players, only a limited number of players can make a profit over the long term. Typically, the largest player will generate a substantial profit (i.e., industry prices will be well above its marginal costs), while smaller players with higher marginal costs will operate much closer to breakeven. The players who rank fifth or sixth will operate with marginal costs that are higher than prices, so they will lose money and go out of business.

▫ In some market segments, as shown in Table 2, there clearly are more than 4-5 aspiring players. In the emerging pre-consolidation local service provider space, the urban business market is particularly crowded, with more than 10 different players in each geography (we have not conducted a detailed census of players in each market, but we think the numbers are illustrative). By contrast, in rural markets, the number is much closer to 3-4, and in residential markets aside from multiple dwelling units, the number may be closer to one ILEC and one CATV, although there could be some competition from fixed wireless providers (see our article, "Fixed Wireless: Do the Numbers Really Work?", in *BCR*, June 2000, pp. 32-43). This brings up the fascinating possibility that in a totally free market environment without artificial price controls, residential service could become the high-profit segment!

▫ Where there is a surplus of competitors, the affected market segments will experience a consolidation in which the excess players will be

The world will move toward three business models: wireline access, wireless access and intercity transport

bought out by the survivors or die. FYI, we don't necessarily assume that the incumbents will be the winners. If they don't shift their business models to be next-generation providers, they will be absorbed by aggressive new players. Witness the Qwest acquisition of US West and WorldCom buying MCI (and trying to buy Sprint).

▫ Moving on to intercity service providers, we expect to experience similar overcrowding. There are probably 10–15 different providers: AT&T, WorldCom, Sprint, C&W, Level 3, Qwest, Verizon/GTE, SBC (once the LD restriction is eliminated), Williams, Enron, Aerie and others. The prospect of bandwidth brokering will only accentuate the push to marginal cost pricing.

▫ In wireless, the FCC tried to set up nine players in each market (two cellular players, six PCS spectrum allocations and Nextel). But we appear to be sorting out into 4–5 national footprint players (AT&T, AirTouch/Verizon, SBC and Nextel, with Voicestream as a GSM-specialty player for Europeans traveling in the U.S.). While wireless conceivably could compete directly with wireline, mobile wireless will retain a price premium that keeps it separate. Conversely, wireline will retain a bandwidth advantage that makes separate service desirable. That said, however, the two will have merged functionality in LANs.

What could stop this? Possibly regulation. Forcing the ILECs to provide unbundled network elements at very low TELRIC rates could facilitate the continuing existence of small players who live off the ILECs' scale economics.

But since we don't see a lot of major CLECs going down this path, this isn't likely to be a major play. One reason we shouldn't lose sight of: ILEC end-customer prices are based on a modest return on depreciated capital. Since TELRIC is based on *undepreciated return* on capital for an efficient network, there isn't a lot of margin left for resellers. Even the DLECs that rely on UNEs in part for copper loop and colocated facilities (e.g., Covad, Northpoint and Rhythms) aren't doing very well, reinforcing our skepticism about the long term viability of resellers.

Conclusion

Industry economic forces are driving toward consolidation, both with respect to product lines and the number of players. The telecom industry involves high barriers to entry due to high required investment cost, high fixed costs and common wire economics. Industries with these characteristics typically can support 3–4 major players, not the feeding frenzy of the past five years. This is why we have seen the large number of megamergers in this industry.

As a result, a number of the current CLECs and intercity service providers will not survive. However, others clearly will become the MCIs and Sprints of the future. It will be interesting picking the survivors, and our advice is to look at the CLECs who adopt new disruptive technologies—in essence, the CLECs who adopt John McQuillan's dictum: "You can expect to see more next-generation network service providers competing on the basis of delivering best-of-breed capabilities to much narrower target segments."

These first-mover strategies probably will work near-term. However, since everyone has access to the same technologies, the advantage may not be sustainable if they violate basic principles of economies of

scale. In short, we're at the beginning of the end of an era. It was fun seeing the new upstarts beat up on the old guard in the initial post-Telecom Act period. But at the end of the day, scale economics don't go away. The iron laws of Economics 101 eventually will win out □

The laws of scale economics haven't been repealed

Companies Mentioned In This Article

Aerie (www.aerienetworks.com)
 Airtouch/Verizon (www.verizonwireless.com)
 AT&T (www.att.com)
 Cisco (www.cisco.com)
 Covad (www.covad.com)
 C&W (www.cw.com)
 Enron (www.enron.net)
 Hicks Muse
 ICG (www.icg.net)
 Intermedia (www.intermedia.com)
 Juniper (www.juniper.net)
 Level 3 (www.level3.com)
 McLeod (www.mcleod.net)
 Nextel (www.nextel.com)
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