



Performance from Experience

The Telecoms Business and its Uncertain Future

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Overview

- The worldwide telecommunications industry grew as national natural monopolies: state enterprises or regulated private companies
- This governance framework began to change with FCC- authorised competition in the US (late 1950s: Above 890Mcps)
- Since then industry restructuring grew within the US, and spread overseas
- Governance change further confuses the effects of technology change: three transitions are underway
 - Wireline voice to wireless, narrowband to broadband, circuit switching to packet
 - All part of a broader transition from human-human to machine-machine communications
- The present state of the industry reflects the conflicting policy goals (static vs dynamic market efficiency and market power analyses give different results) and dramatic technical changes
- Plausible scenarios for industry evolution can lead to policy U-turns, but not to dynamic efficiency or short-term allocative efficiency

In the Beginning

- Technical progress in telecom led to continuing and rapid reductions in the cost of long distance services
- If passed through to customers, this would benefit businesses much more than household users (voters), so policy-makers worldwide used the resulting margin to hold down fixed monthly service charges, to make universal service feasible
- Late 1950s microwave technologies developed so that private companies could, if permitted, build their own networks for less than AT&T tariffs would cost them
- AT&T's response (TELPAC) was a discounted service justified as above incremental cost: the resulting controversy led to many advances in applied microeconomics
- In 1977 competition for switched long distance began with 'shared private line' service and FCC-mandated permission to resell AT&T services
- How much MCI et al. must pay in local exchange access rapidly became a key issue: AT&T implicitly paid more than 30c per minute in 'separations' while MCI paid about 75% less

Making the Implicit Explicit

- With the 1984 divestiture equal access to the local exchange for all long distance providers was mandated
- All carriers were to pay equal explicit access charges per minute for equal access
- The FCC planned to increase subscriber line charges to eliminate per minute access charges (rebalancing rates from usage to fixed charges) but was stopped politically
- The number of long distance carriers grew rapidly, but AT&T deregulation waited until after its share fell to 60%
 - Required proof that rivals actually could replace AT&T output within months if AT&T attempted to raise prices to monopoly levels: I.e. high medium term supply elasticity

Price Regulation

- US rate of return regulation was replaced by price caps with productivity offsets for RBOC interstate services intended to promote efficiency
- States' approaches vary widely, but rebalancing has not been a priority
- Business local margins (~100%) cover some residential loss (~ -50%) and toll + vertical services cover the rest
- States prevented entry to sustain this structure, where perhaps 60% of customers are undesirable to the basic network provider (think branch lines and passenger trains in the railroad business)

The 1996 US Telecommunications Act

- Stated competition was to be the industry governance model, not regulation
- Abolished state control of entry
- Required unbundling for BOC plant and wholesale BOC services
- Permitted BOC entry into long distance
- Required the FCC to regulate all the details (!) with no explicit roadmap to unregulation or sunset criteria
- This has led to inefficient policy contortions and attempts at flexibility, not helped by court intervention

Federal and State Regulatory Policies: Unbundling

- Availability required by 1996 Act Sections 251 and 271
- Terms governed by section 252
- Section 251 c 3: Unbundled access: The duty to provide, to any requesting telecommunications carrier for the provision of a telecommunications service, nondiscriminatory access to network elements on an unbundled basis at any technically feasible point on rates, terms, and conditions that are just, reasonable, and nondiscriminatory in accordance with the terms and conditions of the agreement and the requirements of this section and section 252.
 - FCC decisions have set out the minimum set of elements to unbundle, and a pricing/costing standard: TELRIC
 - State commissions set the rates for these elements
 - Litigation has never ended

BOC Entry into Long Distance

- Sec. 271. Bell Operating Company entry into interLATA services.
 - (c) REQUIREMENTS FOR PROVIDING CERTAIN IN-REGION INTERLATA SERVICES.—
 - (B) COMPETITIVE CHECKLIST.--Access or interconnection provided or generally offered by a Bell operating company to other telecommunications carriers meets the requirements of this subparagraph if such access and interconnection includes each of the following:
 - (i) Interconnection in accordance with the requirements of sections 251(c)(2) and 252(d)(1).
 - (ii) Nondiscriminatory access to network elements in accordance with the requirements of sections 251(c)(3) and 252(d)(1).
 - (iii) Nondiscriminatory access to the poles, ducts, conduits, and rights-of-way owned or controlled by the Bell operating company at just and reasonable rates in accordance with the requirements of section 224.
 - (iv) Local loop transmission from the central office to the customer's premises, unbundled from local switching or other services.
 - (v) Local transport from the trunk side of a wireline local exchange carrier switch unbundled from switching or other services.
 - (vi) Local switching unbundled from transport, local loop transmission, or other services.

Broadband Services: Legislative Provisions

- Sec. 706. Advanced Telecommunications Incentives.
 - (a) IN GENERAL- The Commission and each State commission with regulatory jurisdiction over telecommunications services shall encourage the deployment on a reasonable and timely basis of advanced telecommunications capability to all Americans (including, in particular, elementary and secondary schools and classrooms) by utilizing, in a manner consistent with the public interest, convenience, and necessity, price cap regulation, regulatory forbearance, measures that promote competition in the local telecommunications market, or other regulating methods that remove barriers to infrastructure investment.
 - (c) DEFINITIONS- For purposes of this subsection:
 - (1) ADVANCED TELECOMMUNICATIONS CAPABILITY- The term 'advanced telecommunications capability' is defined, without regard to any transmission media or technology, as high-speed, switched, broadband telecommunications capability that enables users to originate and receive high-quality voice, data, graphics, and video telecommunications using any technology.

Federal and State Regulatory Price Control

- The US industry has never formally rebalanced rates between local (fixed line) business and residence rates, intra-LATA toll, and carrier charges
- Price cap regulation has widely replaced rate-of-return methodology
- Explicit cross-subsidy schemes have been introduced and are open to all local service providers
- Unbundled network element availability and pricing offers one way to reconcile conflicting goals:
 - Initial UNE prices were too high for use in residential voice competition
 - But low enough to offer DSL to businesses
 - Entrants grew very quickly before bankruptcy (failures driven by colocation costs and failure to reach needed customer densities)
 - Recently state regulators have reduced ULL pricing to the point where AT&T, MCI and others offer residential voice service bundles in many states (normally at premium prices)
 - Incumbents have launched a major regulatory campaign to deny unbundled access to DSL or new plant designed to support broadband

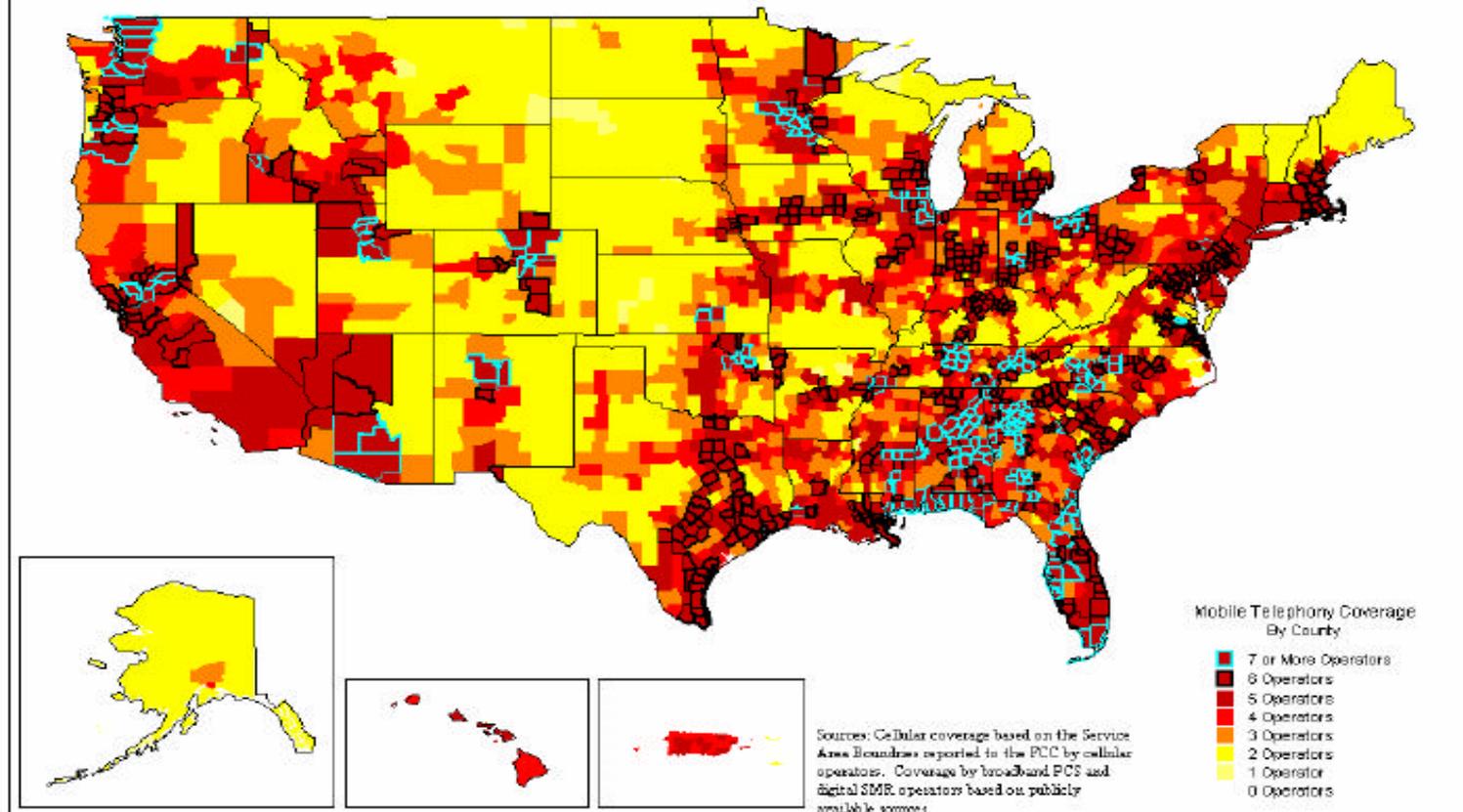
Competitive Offers: End 2002

- AT&T Communications offers business local services to 70% of the market (90 cities)
- AT&T Communications offers residential local services in 8 states with 14-17 planned (does not include DSL)
- MCI offers a residential local/LD package in 40 states (not including DSL because of UNE problems)
- Bell companies offer interLATA long distance in 23 states
- Verizon package includes local, long distance, DSL and mobile

Competition in US Residential Markets

- Overall market:
 - ~95% hh take telephone service, 2000 average ~1.3 lines per household
 - ~58% hh have internet access with dial-up ARPU ~\$20, only ~11% broadband with ARPU \$40-50
 - 88m hh take multi-channel TV service ARPU ~\$44
 - ~130m mobile service users at end 2001 (~1.2 per hh), ARPU ~\$47, cumulative CAPEX per subscriber ~\$800
- Competitive success to date:
 - Wireline:
 - 3m competitor residential lines at end 2001, 2m on cable TV plant;
 - 3% hh (~3m) have mobile service and no wireline service
 - Lines in service falling as DSL/cable modems eliminate second lines used for dial-up; mobile eliminates 'teen-lines'
 - Residential wireline long distance minutes falling: instant messaging and mobile bigger factors than VOIP
 - Wireless: fierce competition has led to massive price reductions and subscriber base expansion
 - Internet access: cable modem beating DSL 2:1
 - TV: direct satellite broadcast now has ~18% of the business

Mobile Telephone Operator Coverage Estimated by County



The US Cellular Market Structure

	Nsubs	POPs	MHz	MHz*POPs	% digital
Verizon	28	241	27	6425	75
Cingular	21	191	24	4680	84
AT&T	18	272	27	7425	96
Sprint PCS	10	281	25	7025	100
Nextel	7	281	20	5620	100
Voicestream	6	243	23	5540	100

Including affiliates

Capture and Promotion

- After the 1996 Act the FCC continued its policies of keeping the internet outside regulation, but promoted internet service availability
 - Universal service program for schools etc.
 - Reciprocal compensation even for ISP-bound calls
 - Maintaining interstate jurisdiction
 - Maintaining that it is not a telecommunications service
 - Seeking equal access to cable modems as part of merger approvals
- The Internet bubble made this policy appear successful: massive market valuations for IP service providers and the DLECs/CLECs serving them, capital availability, real investment
- Bankruptcy has now overtaken many of these providers

The Current US Situation

- ILECs do not passively accept FCC policies promoting entrants and fight them in court
- ILEC revenues and total lines in service are falling
- ILEC capital investment is greatly reduced, cable MSO investment is falling, CLECs are disinvesting, and IXC's are investing much less
- Only one wireless carrier generates net cash: the others are still investing more cash than their current operations produce

Current Controversy

- In the Cable Modem and Broadband Wireline access proceedings the FCC defines broadband internet access as neither a telecommunications nor a cable service but as an information service
- Significance of the information service classification
 - Contrast this FCC position with the more inclusive EU view of telecommunications, based on economic market definitions using substitutability and cross-elasticity measures
 - Contrast the FCC's apparent flexibility with the position the USTR takes abroad
- Do UNE requirements deter or stimulate investment?
 - By ILECs?
 - By CLECs/IXCs?
 - Contrasting expert studies filed by both sides:
 - ILECs' 'prove' investment is deterred
 - CLECs' 'prove' it is stimulated

Competition and Unbundling

- There are two opposing views on local competition:
 1. Facilities-based competition is the only sustainable option: the original view of the UK regulator Oftel
 2. Facilities-based rivals will never serve most of the market so infrastructure sharing is necessary indefinitely
- Unbundling has a role even in the first view
 - Needed as a time-bounded expedient allowing entrants to build their business before investing massively (CRTC)
- Unbundling and collocation terms and conditions play a great part in how burdensome the requirement is to both established operators and entrants
 - Worth examining differences between US, Canada, and European countries in refining policies
- No major regulator explicitly recognises that for voice the bottleneck is gone: wireless dissolved it

An Economic Perspective: Loops

- Local loops are expensive to provide, must be available before service can be offered, and are sunk costs specific to a served address/customer
- Local access networks have strong economies of scale and scope (i.e. adding customers adjacent to ones you serve, and adding services to the same customers using the same infrastructure)
- Competitive infrastructure buildout has been sustainable in special cases:
 - Dense business districts where conduit is unbundled (Manhattan below 59th St, Chicago Loop)
 - Where the entrant's core business uses an upgradeable infrastructure (cable operators in Americas and EU, electricity distributors in some cities)
- Even in these cases the number of operators is small
 - 2 in most markets, 7 in Manhattan but fewer in any particular location
 - Term contracts used to reduce provider risks (1-3 years)
- Low density or low income areas attract no private investment

The Hong Kong Example

- Hong Kong was formerly served by a monopoly Hong Kong Telephone
- All calls within the city were free, subsidised by international calls
- Now there are:
 - 6 mobile operators
 - 8 wireline operators
 - 20 paging companies
 - 24 facilities based international operators (5 satellite, 19 cable)
 - 6,054,415 mobile users and 3.898m telephone lines
 - 234 ISPs

Is Broadband Essential?

- Observations:
 - US market experience suggests most households do not now want broadband enough to buy it when offered
 - Affluent households are much more likely to take broadband, and spend more on telecommunications too
 - Affluent households are more likely to take satellite TV than others: cable modems can win them back to cable
- Broadband access is an attractive component of bundles targeted at the most profitable customers
- Providers unable to offer broadband will be handicapped
- UNEs are the only current US vehicle enabling non-ILEC non-cable operators to provide broadband
- Market definition is crucial to the policy prescription

What lies ahead?

- A normal unregulated industry does not seem likely
- Resocialisation of the business may be necessary if the 'digital divide' matters
- Inadvertent resocialisation may happen:
 - Conrail for infrastructure, NJ Transit or Amtrak for services . .