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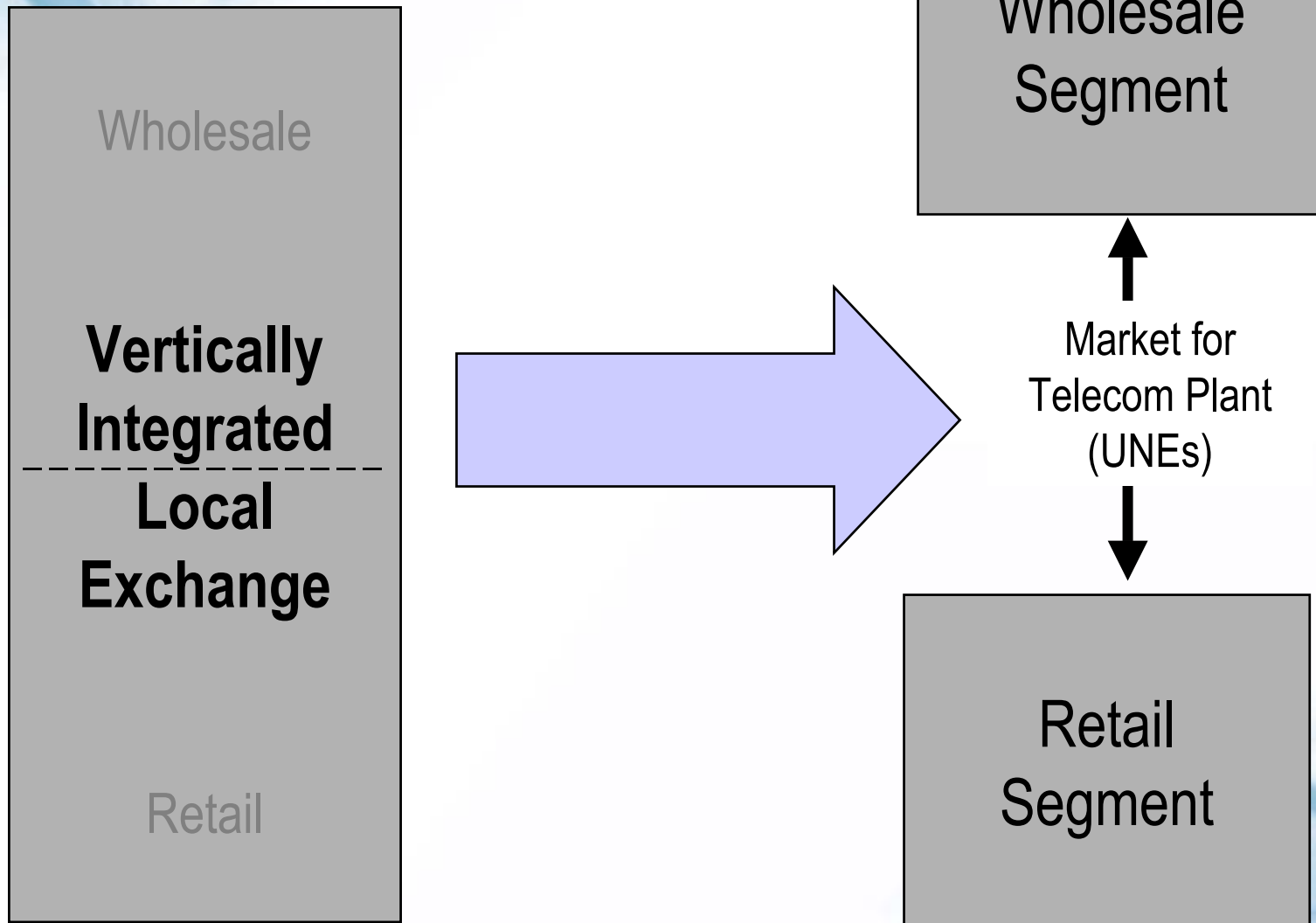
Goal of the Telecom Act of 1996

Change industry structure in local telecommunications markets

“to eliminate the monopolies” (Verizon v. FCC)

“reorganize markets deliberately” Is an “end in itself” (Verizon v. FCC)

The Act's Strategy



Economic Tool #1:

Equilibrium Industry Structure

$$N^* = \sqrt{\frac{\phi S}{E}}$$

If changing industry structure is goal, then think about the economics of industry structure.

N^* = Equilibrium Number of Firms

S = Market Size (+)

ϕ = Index of Weakness of Price Competition (+)

E = Sunk Entry Costs (-)

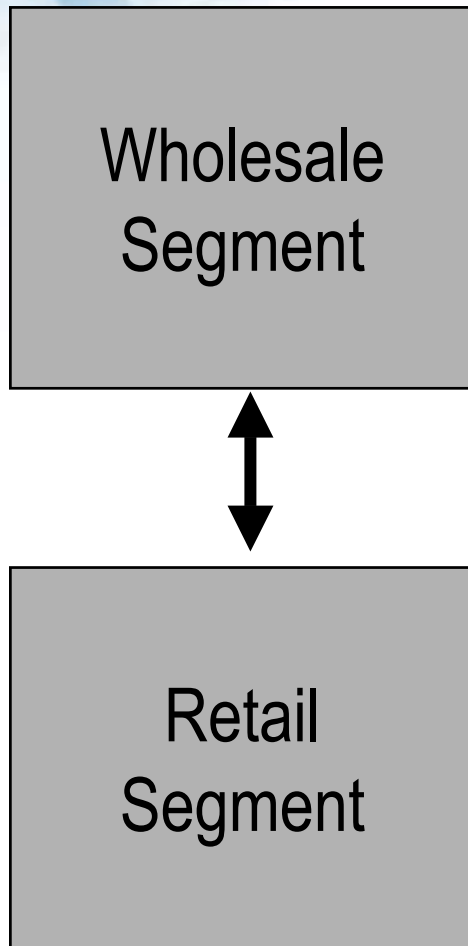
ϕ is 1 for Cournot, 0 for Bertrand

See Beard, Ford, Spiwak: "Why ADCo? Why Now? An Economic Exploration into the Future of Industry Structure for the "Last Mile" in Local Telecommunications Markets (FCBJ May 2002, phoenix-center.org; telepolicy.com)

Why do we need an Act?

- Industry Structure in the Local Exchange Markets tends toward monopoly
 - Economies of Density
 - Sunk Costs (risk)
 - First-mover advantages (i.e., municipal barriers to entry)
 - Timing of entry expenditures and realization of revenues
 - Product Differentiation (i.e., incumbent already has all the customers)
 - Vertical Integration (entry must occur at retail and wholesale level)

The Act's Strategy



$N^* > 0$, Hmmm?

Entry economics of retail have changed dramatically. Entry economics of wholesale have improved, but the change is more subtle.

$N^* > 0$, Relatively Easy

Where did they get this idea? ...

Background Information

- Number of Toll Carriers in Year 2001 = 805
 - *Trends* Report, IXCs plus resellers
- Number of Nationwide Toll Networks in Year 2001
 - AT&T
 - MCI-Worldcom
 - Sprint
 - Global Crossing (Ret. MS < 1%)
 - Williams (Ret. MS < 1%)
 - Qwest (Ret. MS < 3%)
 - Broadwing (Ret. MS < 1%)
 - Level 3 (Ret. MS < 1%)

About 100:1 Ratio of
Retail to Wholesale
Firms in Long Distance

About half of the
wholesale firms are
bankrupt ($N > N^*$)

Non-Incumbent Demand for Network

- Retail LECs (RLECs) accumulate market share for the Wholesale LECs (WLEC or ADCo).
 - RLECs want multi-firm supply
 - ILECs (today) are reluctant suppliers (full price is higher than wholesale price)
- Facilities-based entry on a meaningful scale is made more possible with successful RLECs
- RLECs cannot all be expected to deploy their own facilities
 - Consider market structure in long distance (100:1 Retail/wholesale)

What is Impairment?

- Section 251(d)(2)(B) of the 1996 Telecommunications Act specifically requires the FCC in determining what network elements should be made available to consider, at a minimum, whether “the failure to provide access to such network elements would impair the ability of the telecommunications carrier seeking access to provide the services that it seeks to offer.”

$$Q^U - Q^F > mQ^U$$

Q^U : CLEC output with the unbundled element
 Q^F : CLEC output without the unbundled element
 m : materiality and significance factor ($0 < m < 1$)

See Beard, Ekelund, Ford: Pursuing Competition in Local Exchange Telephony: The Law and Economics of Unbundling and Impairment (www.telepolicy.com)

Duplication

- The costs of telecom network will always impair some CLEC due to sunk costs and scale economies
- With sunk costs (and/or scale economies), only so many firms can profitably duplicate (N^*)
 - Once N^* has deployed, entry is precluded⁺
 - The fact that one firm has deployed network tells us nothing about the ability of the second firm to do so

⁺Firms can be replaced, but additional firms cannot serve the market

What is Impairment?

- What is the only way we can ensure that “the failure to provide access to [a] network elements would [not] impair the ability of the telecommunications carrier seeking access to provide the services that it seeks to offer.”

$$Q^U - Q^F > mQ^U$$

Q^U : CLEC output with the unbundled element
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Wholesale Markets

- The only way to conclude that *any and all* CLECs are not impaired in their ability to provide service is to observe an active wholesale market for the element in question
 - If the CLEC can buy a (near perfect) substitute for the unbundled element, then its ability to provide service is not impaired
 - No CLEC suffers because of a lack of scale or adequate access to capital
 - No CLEC is required to vertically integrate

Transition Plans

- Current debate over transitions plans must focus on a wholesale market, not the possibility of a few firms duplicating network that is sunk and subject to scale economies
 - The fact that one can says nothing about the others
- Not all CLECs can transition, just like not all IXCs can transition
- Elimination of *Impairment* requires a wholesale market

Why is a Wholesale Market Key?

- Act requires unbundling until:
 - 271 is “fully implemented”
 - No CLEC is “impaired in its ability to provide the services it seeks to offer” without access to the element
- Impairment satisfied under 2 conditions:
 - Duplication is easy and cheap
 - There is a wholesale market where CLECs can buy a substitute for the “unbundled element”

Why these two conditions? ...

Benefits of Transition?

- Why is it desirable to have CLEC move from buying *loop-switching-transport* to having them buy *loop-colocation-transport*?
 - CLECs waste millions on buying TDM switches that do nothing different than the ILECs (i.e., no consumer benefit)
 - Leverage softens price competition
 - CLECs become committed to analog loops (i.e., sink costs in the old technology), raising the cost of transitioning from buying loop-switching-transport to buying nothing from the ILEC
 - Increase incentive to sabotage CLECs when you strand ILEC switching plant

Policy Implications

- What is a realistic expectation of industry structure?
 - High concentration in facilities, lower concentration in retail
- Is it desirable to require vertically-integrated entry?
 - Eliminates non-incumbent demand, reducing FB entry
 - Transfers poor entry conditions of wholesale segment to retail
 - Eliminates opportunity for retail rate deregulation
- Can every RLEC transition to its own facilities?
 - An unrealistic expectation (do we expect all 800 LD providers to “transition”? – even the BOCs are resellers)
 - “Transition” never appears in the Act
 - A preference for Facilities-based entry never appears in the Act

Are We Done Implementing the Act?

Ohio UNE-P NRC

Pre Oct-01 = \$111

Post Oct-01 = \$0.74

Arizona Loop

Old \approx \$25

New \approx \$12

UNE-P

NY Old \approx \$37

NY New \approx \$24

Switch Port + Features

BS Louisiana (now) = \$10.83

BS Louisiana (new) = \$1.36

BS Georgia (now) = 1.79

BS Mississippi (now) = 6.07

Intraswitch Call

WV = 1.5 cpm

VA = 0.62cpm

Is UNE-P Revenue Below Cost?

- SBC Chief Financial Officer Randall Stephenson
 - “at a UNE-P of \$20 to \$21” ... SBC can “earn money” and is not “disinclined to invest”
- The full cost, including an acceptable return on investment, cannot, therefore, be more than about \$19-20.

Is UNE-P Revenue Below Cost?

Summary of Findings:

Phoenix Center Policy Paper No. 17

	UNE-P Revenues	ILEC Costs	EBITDA	EBIT
VZ	24.43	10.42	14.00	9.42
BLS	32.80	9.46	23.33	18.75
SBC	20.57	9.91	10.67	6.08
Qwest	26.43	9.93	14.70	10.12
BOC	24.43	9.99	14.43	9.85

Have State Commissions Ignored TELRIC?

- If you evaluate the determinants of UNE-P element prices using multiple regression, you find:
 - 1:1 movement of prices with Forward-Looking Cost
 - 2:1 movement of prices with BOC Retail Margins
- Empirically, TELRIC is halfway between Forward-looking cost and the Efficient Component Pricing Rule (“ECPR”)
 - TELRIC, in practice, equals FL Cost plus one-half of BOC retail margin

Have State Commissions Ignored TELRIC?

**Dependent Variable:
UNE-P Price**

**Estimation:
Least Squares**

See Phoenix Center Policy Paper No. 16.

Model 1 (Eq. 3a)	
Variable	Coefficients
Constant	-8.08
	(--1.33)*
FL Cost	1.028
	(4.31)*
Retail Price	-0.364
	(-1.34)
Retail Margin	0.462
	(2.05)*
Embedded Cost	0.122
	-0.59
DBLS	8.56
	(3.50)*
DVZ	10.708
	(3.88)*
DQWST	3.981
	(2.06)*
R ²	0.73
Adj. R ²	0.68
F-Statistic	14.45*
RESET F	0.1

UNE-P and CLEC Investment

Harold Ware (NERA) Study		
	Low UNE-P CLECs	High UNE-P CLECs
CLEC Switches Deployed (12/99 to 12/01)	1	4
E911 Listings Added	0	114,739

The Ware study is exceedingly bad, and the use of the study here in no way suggests I believe the study has any credibility. The point here is that even the BOC-sponsored stuff shows a positive relationship between UNE-P use and CLEC investment.

Facilities-based Entry and UNE Prices: *Ford and Pelcovits (2002)*

Table 1. Least Squares Results

Variable	Coef. (White t-stat)	Mean (St. Dev.)
<i>Constant</i>	9.84 -16.38	
<i>SIZE</i>	0.27 -11.45	2.39 -2.1
<i>DENSE</i>	0.003 -1.45	21.27 -25.87
<i>METPOP</i>	2.35 -3.85	0.75 -0.15
<i>PLOOP</i>	-0.032 (-2.31)	12.55 -4.22
<i>PSWITCH</i>	-0.035 (-3.13)	13.73 -6.14
<i>FBE</i>		154,018
		-173,971
R^2	0.82	
RESET F	1.64	

Table 2. Probit Results for RCN Entry

Variable	Coef. (t?stat)	Coef. (t?stat)	Mean (St. Dev.)
<i>Constant</i>	-6.03 -1.15	-10.52 -1.8	
<i>SIZE</i>	0.54 -2.83	0.32 -2.44	1.79 -1.95
<i>DENSE</i>	0.001 -5.05		96.06 -521
<i>METPOP</i>	8.49 -1.29	14.48 -2.02	0.68 -0.21
<i>PLOOP</i>	-0.42 (-2.28)	-0.39 (-3.06)	13.47 -4.87
<i>DRCN</i>			0.125 -0.33
McFadden R^2	0.75	0.68	

Facilities-based Entry and UNE Prices:

Beard, Ford, and Koutsky (2002)

	Variable	Coefficient (t-Stat)
Dependent Variable: CLEC Switches deployed in state	Constant	-10.169 (-3.60) ^a
	$\ln(P_L)$	-0.953 (-2.64) ^a
Estimation: Negative Binomial	$\ln(P_S)$	-0.487 (-2.18) ^a
	$\ln(LINES)$	0.49 (3.68) ^a
	$\ln(ARPL)$	1.917 (2.59) ^a
	<i>RESTRICT</i>	-0.798 (-1.96) ^a
	α	0.268 (5.43) ^a
	Pseudo R ²	0.76

UNE-P and UNE-L Substitution:

Beard and Ford (PCPP 14, 2002), Beard, Ekelund, Ford (2002)

Table 2. Summary of Regression Results

Variable	Equation (5)	Equation (6)
Constant (α_0, β_0)	2.126 (2.39)*	6.108 (3.72)*
r (α_1, β_1)	0.118 0.83	-0.995 (-3.79)*
P_L (α_2, β_2)	-1.627 (-5.57)*	-1.763 (-3.27)*
SIZE (α_3, β_3)	0.555 (6.00)*	0.389 (2.27)*
DNYTX (α_4, β_4)	0.557 (1.65)**	2.563 (4.11)**
D271 (α_5, β_5)	-0.42 (-2.05)*	0.411 -1.09
DNRC (α_6, β_6)	-0.792 (2.14)*	-1.451 (2.12)*
METPOP (α_7, β_7)	2.939 (-5.82)*	-0.657 (-0.70)
PERIOD (α_8, β_8)	0.274 (2.14)*	0.142 -0.6
R^2	0.85	0.66
RESET F	0.78	1.19

Dependent Variable:
Eq. 5 (UNEL lines)
Eq. 6 (UNEP lines)
 r = switching price

Estimation:
Least Squares

Other Papers on UNE Competition

- www.telepolicy.com
- www.phoenix-center.org