

Increased Investment, Lower Prices – the Fruits of Past and Future Telecom Competition

by

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Telecom Industry is Critical to U.S. Economic Growth

Roughly 2/3rds of Recent Growth is Traceable to IT

Telecom Plays Essential Role in IT Innovations and Investment

The Roaring 90s Was in Large Part a Telecom Boom

Telecom Industry Has Been Having a Rough Time

Tens of Thousands of Telecom Workers Remain Unemployed

Telecom Investment Remains Low Relative to Its Recent Peak

Large Numbers of CLECs Have Gone Out of Business

Telecom Gross Investment

Year	CLECS	ILECS	Total
1997	5.0	21.5	26.5
1998	9.2	22.2	31.4
1999	16.8	22.8	39.6
2000	21.7	27.8	49.5
2001	12.3	28.1	40.4
2002	10.7	24.2	34.9

But There are Now Signs of Remerging Competition

Some States Are Lowering UNE Rates to TELRIC Levels

CLECs Moving into MI, NY, CA, IL and Other Such States

In those States Local Voice/Data Prices Have Fallen a Lot

CLECs Have 13% of Local Voice Market Versus 8% in 2000

Policy Background

TA96 Is Finally Being Allowed to Work, at Least in Voice

ILECS Have Been Allowed into Long Distance Market

FCC Reaffirmed State PUC Determination of UNE Rates

UNE-P Platform Leasing Will Continue In Impaired Mkts

FCC Limiting TA96's Applicability to Broad Band

FCC is Reviewing TELRIC Pricing Formula

This Study Seeks to

**Understand the Role of Telecom Competition and Policy
in Influencing Telecom Investment, Employment,
Broadband Adoption, and the Pricing of Local Voice and Data**

ILEC View

TA96 is Inhibiting Investment By Lowering ILEC Profits

CLECs Should Build Their Own Facilities

Failed CLECs had Flawed Business Plans

TELRIC Pricing Doesn't Incorporate Options and Risk

UNE-P is Fake Competition

CLEC View

ILECs Have Illegally Blocked TA96's Implementation

ILECs Have Imposed Operational and Cost Impediments

Providing Voice Under UNE-L is Prohibitively Expensive and Operationally Infeasible

UNE-P Type Leasing is Routine in Long Distance

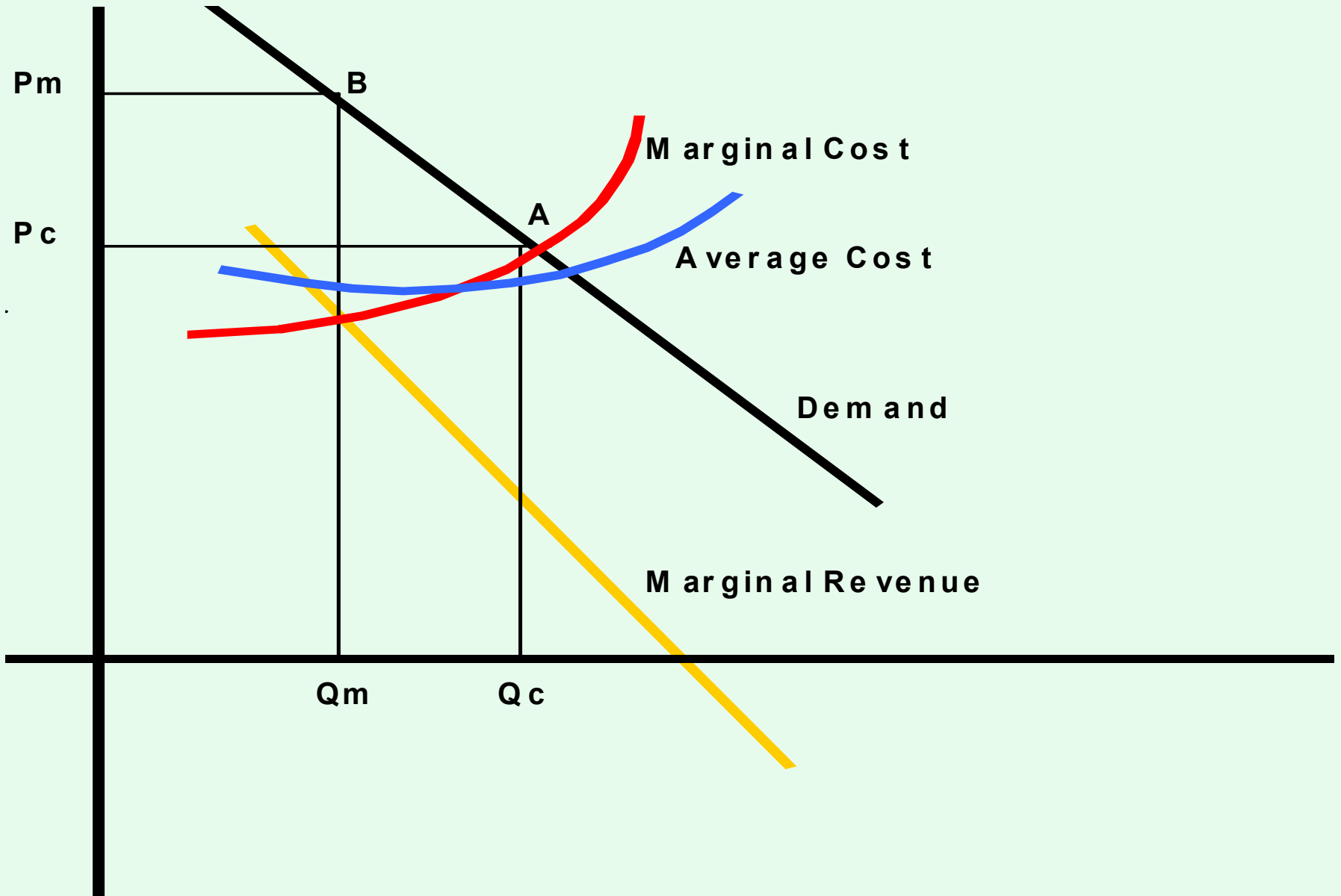
TELRIC Pricing Incorporates Options and Risk

Competition Stimulates Investment, Employment, Lowers Business Costs, and Generates Consumer Savings

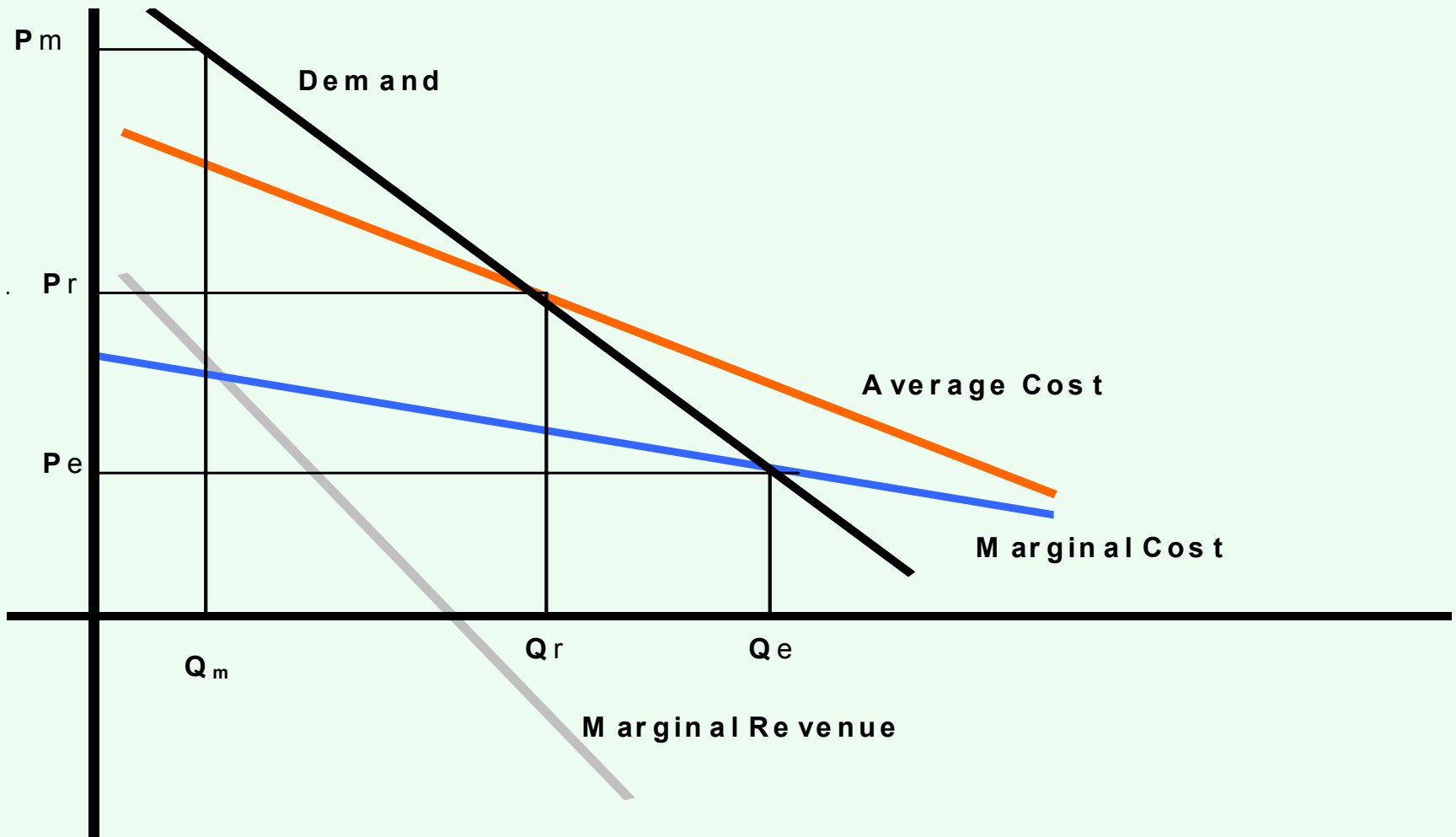
The View of Economic Science

- **For All But ILEC Economists, This Is a *No-Brainer***
 - **Local Telecom Infrastructure is a Natural Monopoly Bottleneck**
 - **Bottleneck Infrastructure, Whether It be Electric Wires, Gas Pipelines, Airport Runways, Railroad Tracks, Public Roads, or Telephone Poles, Conduits, Switches, and Other Local Loop Facilities Must Be Shared.**
 - **Imagine 5 sets of Telephone Poles Running Down America's Streets**
 - **Natural Monopolists Must Be Regulated**
 - **TA96 Shares Bottleneck Infrastructure and Represents an Indirect Form of Regulation**
 - **Regulated Monopolists Produce More and Invest More Because they Can't Jack up Their Price By Restricting Supply**
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Textbook Model of a Monopolist



Textbook Model of a Natural Monopolist



The Economic Literature

Static, Simplistic Frameworks

Ignores the Entry Game

Ignores the Post-Entry Game

Ignores the First-Mover Advantage of ILECs

Makes No Allowance for Local Demand Conditions

Makes No Allowance for Local Supply Conditions

Treats ILECs as Ordinary Competitors With No Market Power

Our TELSIM Model

Dynamic Game of Entry and Post-Entry Competition

Incorporates Economies of Scope in Providing Voice and Broadband

Solution Determined by Dynamic Programming

Incorporates Option Values of ILECs and CLECs

Simulated for 3108 U.S. Counties

Uses Local Demand and Supply Conditions

Results Need to Be Viewed Cautiously.

Model is Highly Stylized.

Calibration and Results are Preliminary

TELSIM Model's Structure

Cable Companies In High-Density Counties

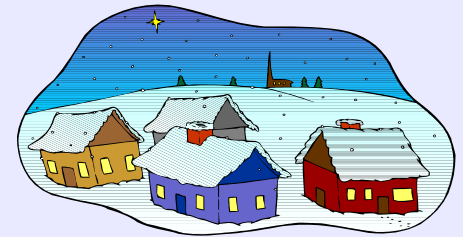
ILECs Have Entered Each County to Provide Voice and Data

ILECs Decide Each Period Whether to Continue of Offer Voice and/or Data in Each County

Two CLECs

Each CLEC Decides Each Period Which Counties to Enter to Provide Either a) Voice Under UNE-P or b) Data Under UNE-L and Voice Under UNE-P

The Telecom Board Game



Illustrating a State of Entry

ILEC CABLE	ILEC CABLE CLEC CLEC	ILEC CLEC CLEC
ILEC CLEC	ILEC CLEC	ILEC CABLE
ILEC CLEC CLEC	ILEC	ILEC CABLE

The Entry and Post-Entry Games

Start at Beginning of Last Period -- Time T

For Each State of Entry, Each Player Determines a Best Entry/Exit Strategy for Each County Given Strategies of the Other Players

Determine Profit Payoffs from Competing in a County and by Assuming Cournot Competition in Voice and Data Mkts

Calculate Nash Equilibria – Combination of Strategies that are Mutually Optimal

For Each State of Entry at T-1, Solve for Nash Equilibria at T-1 Assuming Equal Probability of all Time T Equilibria

Work Back to Time Zero.

General Findings

Move from Current to TELRIC UNE Rates Increases Telecom Investment and Hiring Outlays by \$71 billion over 5 Years and \$155 billion Over 20 Years

Consumers and Business Would Save \$57 per Year on Each Local Voice Line

Aggregate Annual Consumer and Business Savings Total \$15 billion

Significant Savings Accrue to Rural as Well as Urban Counties

Comparing Actual and TELRIC UNE-P Rates

State	Actual UNE-P Rates	TELRIC UNE-P Rates	Absolute Difference	Percentage Difference
All States	\$20.05	\$15.10	\$5.85	25.3%
AZ	\$25.49	\$12.52	\$12.97	50.9%
CA	\$13.30	\$12.29	\$1.01	7.6%
FL	\$24.52	\$13.24	\$11.28	46.0%
NJ	\$14.24	\$12.04	\$2.20	15.4%

Impact on Retail Prices of Moving to TELRIC UNE-P Rates

State	Voice Market			Data Market		
	Monopoly	Actual UNE-P	TELRIC UNE-P	Monopoly	Actual UNE-P	TELRIC UNE-P
All States	\$28.93	\$30.61	\$25.86	\$50.00	\$37.41	\$38.56
Virginia	\$28.78	\$32.14	\$26.60	\$50.00	\$38.26	\$40.07
Texas	\$28.22	\$33.92	\$24.03	\$50.00	\$33.50	\$36.98
Utah	\$29.76	\$32.99	\$22.90	\$50.00	\$34.26	\$39.55

Consumer & Business Voice Savings from Adopting TELRIC Rates

State	Savings (in millions)
All States	\$14,984.5
MA	\$1,067.2
NY	\$1,759.3
WI	\$518.8
OK	\$129.2

Competitive Structure in the Voice Market

Counties	Actual UNE-P (share of households facing)			TELRIC UNE-P (share of households facing)		
	ILEC Only	ILEC and One CLEC	ILEC and Two CLECs	ILEC Only	ILEC and One CLEC	ILEC and Two CLECs
All Counties	36.5%	56.8%	11.6%	19.3%	63.3%	17.4%
High Income/High Density	15.2%	64.6%	20.2%	1.0%	69.9%	29.1%
High Income/Low Density	33.6%	60.0%	6.4%	13.9%	77.9%	7.7%
Low Income/High Density	53.1%	43.7%	2.9%	32.5%	58.2%	9.3%
Low Income/Low Density	55.7%	36.8%	7.4%	37.7%	52.7%	9.5%

CLEC Shares of Voice and Data Markets

Counties	Voice Market		Data Market	
	Actual UNE-P	TELRIC UNE-P	Actual UNE-P	TELRIC UNE-P
All Counties	10.7%	16.5%	13.1%	12.1%
High Income/High Density	14.8%	21.6%	15.7%	11.8%
High Income/Low Density	11.8%	17.6%	9.9%	6.9%
Low Income/High Density	7.4%	13.2%	8.8%	10.1%
Low Income/Low Density	6.7%	11.3%	13.8%	16.0%

PV of Investment and Hiring Outlays by Specified Year

(in billions)

Year	Monopoly	Actual UNE-P	TELRIC UNE-P
1	\$72.5	\$82.9	\$87.9
5	\$296.8	\$349.4	\$367.3
10	\$472.0	\$560.1	\$585.5
20	\$636.6	\$758.6	\$791.8