

Cambridge University Press

978-0-521-67386-0 - Networks in Telecommunications: Economics and Law

Daniel F. Spulber and Christopher S. Yoo

Table of Contents

[More information](#)

Contents

<i>Preface</i>	<i>page</i> xiii
<i>Acknowledgments</i>	xv
Introduction	1
A. The Changing Network Economy	1
B. A Fundamental Shift in Regulatory Policy	2
C. The Limits of Existing Scholarship	4
D. Network Law and Economics	5
E. Distinguishing among Different Types of Access to Networks	7
F. Toward a Market-Based Approach to Access Prices	8
PART I. THE ECONOMICS OF NETWORKS	
1. The Structure and Functions of Networks	13
A. Types of Networks	13
1. Communications, Transportation, and Distribution Networks	14
2. Social and Business Networks	16
B. The Structure of Networks	18
1. Describing Networks	19
2. The Shapes of Networks	24
C. The Output of Networks	27
D. Access to Networks	29
1. Retail Access	31
2. Wholesale Access	33
3. Interconnection Access	33
4. Platform Access	34
5. Unbundled Access	35
E. A Coasian Theory of Networks	36

2. The Design and Costs of Networks	39
A. The Optimal Design of Networks	41
1. Choosing the Network Configuration	41
2. Cost-Minimizing Network Design	43
3. Cost-Minimizing Design of a Cycle Network	44
4. Network Configurations with Economies of Scale in Links	45
5. The Max-Flow/Min-Cut of a Network	47
B. Production Functions of Networks	50
1. Production Functions and Engineering	51
2. Production Functions for a Single-Output Network	53
3. Production Functions for a Multioutput Network	58
C. Cost Functions of Networks	60
1. Derivation of the Cost Function	61
2. Economies of Scale	64
3. Multiproduct Cost Functions	66
D. The Cost of Unbundled Access to Networks	68
1. Allocating Multiproduct Costs	69
2. Long-Run versus Short-Run Costs	71
3. Pricing Network Services	77
A. Network Capacity and Pricing	78
1. The Basics of Pricing with Scarce Capacity	78
2. Pricing Capacity under Uncertainty	83
3. Time-of-Use Pricing of Capacity	84
B. Network Capacity Pricing under Asymmetric Information	88
1. Vickrey Auctions of Capacity	88
2. Reliability Pricing of Capacity	90
3. Priority Pricing of Capacity	93
C. Network Capacity Pricing with Congestion and Quality of Service	94
1. Blocked Calls	95
2. Information Loss	100
D. Demand for Capacity: Substitutes and Complements	106
1. Substitutes and Network Capacity	107
2. Complements and Network Capacity	112
PART II. THE REGULATION OF NETWORKS	
4. Network Regulation Basics	119
A. Economic Justifications for Regulating Networks	119
1. Natural Monopoly	119
2. Network Economic Effects	120

<i>Contents</i>	ix
3. Vertical Exclusion	122
4. Ruinous/Managed Competition	125
B. Basic Regulatory Instruments	126
1. Tariffing	126
2. Structural Separation	130
3. Unbundling	132
C. Analyzing the Rationales and Regulatory Instruments	135
1. Natural Monopoly	135
2. Network Economic Effects	138
3. Vertical Exclusion	143
5. Economic Effects of Regulating Access to Networks	152
A. Classifying Types of Access to Networks	153
1. Retail Access	153
2. Wholesale Access	154
3. Interconnection Access	155
4. Platform Access	156
5. Unbundled Access	158
B. Capacity and Configuration Effects of Access Regulation	159
1. Retail Access	160
2. Wholesale Access	163
3. Interconnection Access	168
4. Platform Access	169
5. Unbundled Access	171
C. Transaction Cost Effects of Access Regulation	173
1. Retail Access	173
2. Wholesale Access	174
3. Interconnection Access	181
4. Platform Access	181
5. Unbundled Access	182
D. The Possibility of Regulatory Arbitrage	184
E. Markets and the Design of Networks	186
6. Pricing of Access to Networks	190
A. The Economic Case for Market-Based Pricing of Network Access	192
1. Market Prices, Regulated Prices, and Efficiency	192
2. The Difference between Market Prices and Unit Costs	194
B. Determining Market Price	195
1. Pricing Based on External Market Transactions	195
2. The Second-Best Solution in the Absence of External Markets	196
3. The Efficient Component Pricing Rule	198

C.	The Consistency between Network Costs and Market Pricing	200
1.	Economies of Scale and Scope	201
2.	Sunk Costs	203
D.	Regulatory Approaches to Setting Rates in Regulated Industries	205
1.	Direct Cost	205
2.	Excess Capacity and Zero Opportunity Costs	207
7.	Constitutional Limits on the Pricing of Access to Networks	210
A.	The Distinction between Physical and Nonpossessory Takings	210
1.	The Emergence of the Nonpossessory Takings Doctrine	210
2.	<i>Loretto</i> and the Distinction between Physical and Regulatory Takings	214
3.	<i>Florida Power</i> and the Distinction between Physical Takings and Confiscatory Ratemaking	216
4.	Toward a Possible Synthesis of Regulatory Takings and Confiscatory Ratemaking Doctrine	217
5.	The Importance of the Shift to Access Regulation	219
B.	Physical Takings Jurisprudence Applied to Network Access	220
1.	Determining Whether a Taking Has Occurred	221
2.	Determining Just Compensation	221
3.	Partial Takings of Utility Property	227
PART III. POLICY APPLICATIONS		
8.	The Regulation of Local Telephone Networks	233
A.	The History of the Regulation of Local Telephony	233
1.	Early State and Federal Regulation and the Communications Act of 1934	233
2.	The Emergence of Competition in Complementary Services	234
3.	The Emergence of Competition in Local Telephony	237
4.	The Telecommunications Act of 1996	238
B.	The Rationales for Regulating Local Telephone Networks	241
1.	Natural Monopoly	241
2.	Network Economic Effects	244
3.	Vertical Exclusion	246
4.	Managed Competition	248
C.	The Different Types of Access to Local Telephone Networks	254
1.	Retail Access	255
2.	Wholesale Access	257
3.	Interconnection Access	260
4.	Platform Access	268
5.	Unbundled Access	272
6.	Regulatory Arbitrage	276

<i>Contents</i>	xi
D. Constitutional Arguments in Favor of Market-Based Pricing	277
1. Physical Collocation	277
2. Virtual Collocation	280
3. Wireless Interconnection	281
9. Antitrust as Applied to Network Industries	282
A. The Origins of the Essential Facilities Doctrine	283
B. A Critique of the Essential Facilities Doctrine	288
1. The Economics of Vertical Exclusion	289
2. The Allocation of Authority between Antitrust Courts and Regulatory Agencies	299
C. The Impact of <i>Trinko</i>	308
1. The Economics of Vertical Exclusion	309
2. The Allocation of Authority between Antitrust Courts and Regulatory Agencies	311
3. <i>Trinko</i> 's Implications	312
4. The Impact of <i>Trinko</i> 's Varying Interpretations	314
D. The Different Types of Access under Antitrust Law	315
1. Retail Access	316
2. Wholesale Access	319
3. Interconnection Access	322
4. Platform Access	327
5. Unbundled Access	331
10. The Regulation of Last-Mile Broadband Networks	334
A. The History of Last-Mile Broadband Regulation	334
1. Regulation of Cable Modem Systems	335
2. Regulation of Digital Subscriber Lines	339
3. The Debate over Network Neutrality	343
B. The Rationales for Regulating Last-Mile Broadband Networks	348
1. Natural Monopoly	348
2. Network Economic Effects	351
3. Vertical Exclusion	352
4. Managed Competition	354
C. The Different Types of Access to Broadband Networks	356
1. Retail Access	357
2. Wholesale Access	358
3. Interconnection Access	360
4. Platform Access	362
5. Unbundled Access	367
D. Arguments in Favor of Market-Based Pricing	369

Cambridge University Press

978-0-521-67386-0 - Networks in Telecommunications: Economics and Law

Daniel F. Spulber and Christopher S. Yoo

Table of Contents

[More information](#)

xii

Contents

11. The Regulation of Broadband Networks and the Internet: Network Neutrality versus Network Diversity	373
A. The Economic Case for Network Diversity	376
1. Vertical Exclusion and Network Neutrality	378
2. Network Diversity and Static Efficiency	382
3. Network Diversity and Dynamic Efficiency	390
B. Noneconomic Justifications for Network Diversity	394
C. Institutional Considerations	397
12. The Regulation of Broadband Networks and the Internet: Network Neutrality versus Network Capacity	405
A. Sources of Congestion on the Internet	409
B. The Economics of Congestion	412
1. Congestion and the Choice between Flat-Rate and Usage-Sensitive Pricing	412
2. The Impact of Transaction Costs on the Choice between Flat-Rate and Usage-Sensitive Pricing	413
3. Coasian Proxies as an Alternative Solution to Congestion	419
C. Implications of Congestion Economics for Network Neutrality	420
1. Prohibitions on Reselling Bandwidth or Acting as an Internet Service Provider	422
2. Restrictions on Home Networking	422
3. Restrictions on Attaching Devices	423
4. Restrictions on Operating File Servers	424
5. Discrimination against Particular Applications	425
6. Discrimination against Particular Content	425
7. The Potential Insufficiency of Capacity Expansion and Metered Pricing as Alternatives	427
D. A Broader Perspective on Consumer Welfare	429
Conclusion	433
<i>Bibliography</i>	439
<i>Index</i>	473
<i>Table of Cases</i>	487