Contents

1	Intr	oductio	on to Network Economics	1
	1.1	The S	ystem Character of Networks	1
	1.2	The D	Disaggregated Approach of Network Economics	2
		1.2.1	Network Levels	3
		1.2.2	Horizontal and Vertical Network Interconnection	3
	1.3	Econo	omic Characteristics of Networks	4
		1.3.1	Network Externalities	4
		1.3.2	Economies of Scale and Economies of Scope	4
	1.4	Basic Questions of Network Economics		
		1.4.1	The Role of Markets	5
		1.4.2	Decision-Relevant Costing	6
		1.4.3	Pricing Strategies in Networks	7
		1.4.4	Competition Policy and Market Power Regulation	7
		1.4.5	Universal Service Under Competition	8
		1.4.6	Compatibility Standards and Technical Regulatory	
			Functions	9
	Refe	erences		10
2	Dec	ision-R	elevant Costs	11
	2.1	Basic	Principles of Determining Cost of Capital	11
		2.1.1	User Cost of Capital	11
		2.1.2	The Deprival Value Concept	13
		2.1.3	Implementation	17
	2.2	Decis	ion-Relevant Cost Allocation	22
		2.2.1	Short-Run Versus Long-Run Marginal Costs	22
		2.2.2	Long-Run Incremental Costs	23
		2.2.3	Long-Run Incremental Costs Versus Long-Run Avoidable	
			Costs	23
		2.2.4	The Traditional Concept of Overhead Costs	24
		2.2.5	Product-Group Specific Common Costs and Firm-Specific	
			Common Costs	25
	2.3	Cost S	Strategies in Networks	27
		2.3.1	Network Evolution	27
		232	Strategies for Building a Network	27

		2.3.3	Decision-Relevant Costs of New Networks	29
		2.3.4	Long-Run Incremental Costs of Novel	
			Network Services	30
	2.4 Questions			31
	Refe	rences		31
3	Con		Entamolitica	35
3			Externalities	35
	3.1		(Path-Based) Externalities	
		3.1.1	Congestion Externalities and Congestion Fees	35
		3.1.2	Optimal Congestion Fees	36
		3.1.3	Socially Optimal Congestion Fees and Investment	40
			Decisions	40
		3.1.4	Efficient Congestion Fees and Financing Objectives	43
		3.1.5	Congestion Externalities and Quality Differentiation in	
			Infrastructure Networks	49
		3.1.6	Congestion Fees in a Monopoly	54
		3.1.7	Congestion Fees in Traffic Practice	57
	3.2	-	m Network Externalities (in Electricity Transmission	
			orks)	61
		3.2.1	Basic Characteristics of Electricity Transmission	
			Networks	61
		3.2.2	Wind Energy and Efficient Electricity Transmission	
			Networks	68
	3.3	Quest	ions	70
	Refe	erences		70
_				
4	Stra	ntegies :	for Price Differentiation	73
4			for Price Differentiation	73 73
4	Stra 4.1	Basic	Principles	73
4		Basic 4.1.1	Principles	
4		Basic	Principles	73 75
4	4.1	Basic 4.1.1 4.1.2	Principles	73 75 79
4		Basic 4.1.1 4.1.2 Price	Principles	73 75 79 81
4	4.1	Basic 4.1.1 4.1.2 Price 4.2.1	Principles	73 75 79 81 81
4	4.1	Basic 4.1.1 4.1.2 Price 4.2.1 4.2.2	Principles	73 75 79 81 81 82
4	4.1	Basic 4.1.1 4.1.2 Price 4.2.1 4.2.2 4.2.3	Principles	73 75 79 81 81 82 83
4	4.1	Basic 4.1.1 4.1.2 Price 4.2.1 4.2.2 4.2.3 Quest	Principles	73 75 79 81 81 82 83 85
	4.1 4.2 4.3 Refe	Basic 4.1.1 4.1.2 Price 4.2.1 4.2.2 4.2.3 Quest erences	Principles	73 75 79 81 81 82 83 85 85
5	4.1 4.2 4.3 Refe	Price 4.2.1 4.2.2 4.2.3 Quest erences extions .	Principles	73 75 79 81 81 82 83 85 85
	4.1 4.2 4.3 Refe	Price 4.2.1 4.2.2 4.2.3 Quest erences extions .	Principles	73 75 79 81 81 82 83 85 85 87
	4.1 4.2 4.3 Refe	Price 4.2.1 4.2.2 4.2.3 Quest erences 2tions . Basic 5.1.1	Principles	73 75 79 81 81 82 83 85 85
	4.1 4.2 4.3 Refe	Price 4.2.1 4.2.2 4.2.3 Quest erences 2tions . Basic 5.1.1 5.1.2	Principles	73 75 79 81 81 82 83 85 85 87
	4.1 4.2 4.3 Refe	Price 4.2.1 4.2.2 4.2.3 Quest erences 2tions . Basic 5.1.1 5.1.2	Principles	73 75 79 81 81 82 83 85 85 87 87
	4.1 4.2 4.3 Refe Aud 5.1	Price 4.2.1 4.2.2 4.2.3 Quest erences 5.1.1 5.1.2 Aucti 5.2.1	Principles	73 75 79 81 82 83 85 85 87 87 88 91
	4.1 4.2 4.3 Refe Aud 5.1	Price 4.2.1 4.2.2 4.2.3 Quest erences 5.1.1 5.1.2 Aucti 5.2.1 Disag	Principles Price Differentiation Through Peak Load Pricing Price Differentiation Through Optional Two-Part Tariffs Differentiation in Network Sectors Price Differentiation for Network Services Price Differentiation for Railway Tracks Price Differentiation for Airport Slots ions Principles Elements of Auction Design Fundamental Problems of Auction Theory ons in Network Industries Network-Specific Particularities gregated Invitations to Tender and Auctions	73 75 79 81 81 82 83 85 85 87 87 87 88 91 93
	4.1 4.2 4.3 Refe 5.1 5.2	Price 4.2.1 4.2.2 4.2.3 Quest erences 5.1.1 5.1.2 Aucti 5.2.1 Disag	Principles	73 75 79 81 81 82 83 85 85 87 87 87 88 91 93

		5.3.1	Invitations to Tender in Public Transport	96
		5.3.2	Auctions of Frequencies	97
	5.4		ions	98
	Refe	rences		99
6	Con	npatibil	lity Standards in Networks	101
	6.1		Elements	101
		6.1.1	Direct and Indirect Network Externalities	101
		6.1.2	Standards as Public Goods, Private Goods,	
			and Club Goods	102
		6.1.3	Network Externalities Between Network Variety and	
			the Search for New Technologies	104
		6.1.4	Standards for Goods, Complementary Components	
			and Large Technical Systems	105
	6.2	The C	oordination Problem	106
		6.2.1	Spontaneous Switching to a Superior Technology	106
		6.2.2	The Phenomenon of Critical Mass	108
		6.2.3	Path Dependency	109
	6.3	Confli	cts of Interest	110
		6.3.1	Producers	110
		6.3.2	Consumers	111
	6.4	Standa	ard-Setting Institutions	112
		6.4.1	Government Intervention	112
		6.4.2	Market Solutions	114
		6.4.3	Committee Solutions	115
	6.5		ardisation of Technical Regulatory Functions	117
	6.6	-	ions	118
	Refe	rences.		118
7	Univ	versal S	Service	121
	7.1	Comp	rehensive Network Opening and Universal Service	
		Object	tives	121
		7.1.1	Services of General Economic Interest	122
		7.1.2	Defining the Scope of Non-profitable Universal	
			Services	122
	7.2	The In	stability of Internal Subsidisation Under Competition	123
	7.3		oncept of the Universal Service Fund	125
	7.4		rsal Services in Telecommunications Markets	127
	7.5	Unive	rsal Services in Postal Markets	129
	7.6	Questi	ons	130
	Refe	rences.		131
8	Mar	ket Po	wer Regulation	133
-	8.1		sation of Network-Specific Market Power	133
		8.1.1	Competition Versus Market Power	133
		8.1.2	Market Power Due to Economies of Scale?	134
		8.1.3	Network-Specific Market Power	135

	8.2	Disaggregated Identification of Competitive Potentials			
		in Net	work Industries	137	
		8.2.1	Competition on the Network Service Level	137	
		8.2.2	Competition on the Infrastructure Management Level	139	
		8.2.3	Competition on the Network Infrastructure Level	141	
		8.2.4	Monopolistic Bottlenecks on the Network Infrastructure		
			Level	143	
	8.3	Disagg	gregated Market Power Regulation	144	
		8.3.1	Monopolistic Bottlenecks and the Concept of the Essential		
			Facility	144	
		8.3.2	Case Study: Newspaper Delivery Service	145	
		8.3.3	Limiting Regulation to Monopolistic Bottlenecks	147	
		8.3.4	Anticompetitive Price Structure Regulation	147	
		8.3.5	Price Level Regulation of Access Tariffs	150	
		8.3.6	Implementation of Price-Cap Regulation	153	
	8.4	Quest	ions	154	
	Refe	erences		154	
9	The	Positiv	ve Theory of Regulation	157	
	9.1	•			
	9.2		ositive Theory of the Behaviour of Regulatory		
		Agend	cies	158	
		9.2.1	The Cornerstones of the Regulatory Process	158	
		9.2.2	The Legal Framework of Regulation	158	
		9.2.3	The Regulatory Agency's Discretionary Freedom		
			of Action	160	
		9.2.4	The Influence of Interest Groups	16	
		9.2.5	The Disaggregated Regulatory Mandate	160	
	9.3	0.3 Questions			
	Refe	References			