Index

access charges 140–43, 186–7
access regulation, see broadband
Internet access regulation
accounting rates, and International Telecommunication Regulations (ITRs) 215, 216–17
Advanced Research Projects Agency (ARPA) 28, 29–31
agent–principal relationship 189
al-Borai, N. 283
Al-Jazeera 296
Algeria
government control, media and telecommunications 290–91
Internet access/regulation 291
market liberalization, equipment supply 294
Almeida, M.W. 325
America Online 94, 180
American Bell 16
Anatel (Agência Nacional de Telecomunicações) 330–31
antitrust cases 182
Apstar 357
Arabsat 295
Armstrong, M. 135
ARPANET 29–31
Asiasat 356, 357
Atlas Telecommunications 86–7
AT&T
China 350, 354–5
and Concert 85–6, 89–90
divestiture of 20, 138, 141–2, 143
future prospects 135
and GTE 137
market share 48
Modified Final Judgment (MFJ), terms 143
and open access 179–80
and packet switching, development of 30–31
R&D 22, 23
regulation, easing of 392
and settlements process 142
TCI/MediaOne acquisitions 135
wireless interests 91
AT&T-Unisource 88–90, 424
Australia
regulation 303–4
US WEST in 130–32
see also organizational change,
Australasian telecommunications companies
Banerjee, A. 330
Bangemann report (1994) 157
Banker, R.D. 328
Baran, P. 29
basic telecommunications, definition of 266, 268, 272
Berners Lee, T. 31
Bhatnagar, P. 276, 277
Bonfield, P. 107
brand names 145
Brazil 319–20, 341–2
competition, current state/future prospects 338–40
efficiency measurement, local telephone companies 327–9
fibre optic cable deployment 325–6
interconnection charges 341
penetration rates 322, 323–5, 334
post-privatization 331–42
pre-privatization 320–29
quality targets/indicators 335–8, 339
R&D, telecommunications carriers 326–7
regulation 320–22, 330–31, 340–42
selected indicators 322–5
transition to privatization 329–31
universal access 334–5
broadband Internet access regulation 173–5, 194–5
federal vs. local government 178–81, 189–95
legal cases 173–4, 179–80
local governments, authority of 174–5, 189–95
open access policy issues 185–8
broadband Internet services 173
definition 175
penetration 177–8
technology 176–7
Brophy, T. 142, 143, 144
BT 97
alliance formation 97–8, 100, 103, 423
catalysts for change 103–7
competition faced by 122–3, 422–3
and Concert 84–6
duopoly review (1991) 103, 105
employee reductions 108
evolution of 98–9, 100–103
future prospects 112–14
and Internet 111–12
joint ventures 84–6
licence conditions 105, 109
and MCI 85
organizational structure/culture 105–8, 113–14
performance 107, 112
R&D 22, 23
regulation 99–100, 105, 109–12, 113
strategic behavior 97–8
strategic goals 100–103
wireless interests 91
Burgelman, R.A. 415
Bush, G. 125
cable
companies, growth in UK 105, 119, 120, 121, 123
fibre optic, capacity/costs 53, 55, 56, 61
industry, characteristics of 132–3
international connections 53, 55, 56, 126–7
modems 61, 63, 64
stocks 134
technology 123–4, 127, 130–31, 176
see also broadband Internet access
regulation; broadband Internet services; cable television networks
Cable & Wireless 100, 423
Cable & Wireless Optus 130–31, 301–2, 309–10, 311, 312, 313–14
Cable Act (1984) 178, 184, 194
Cable Television Consumer Protection and Competition Act (1992) 184
cable television networks
China 355–6
EU (European Union) policy 158–9
regulation of 184
California Retail Liquor Dealers Assn v. Midcal Aluminum Inc. 182
Cantor v. Detroit Edison 182
capacity provision, and International Telecommunication Regulations (ITRs) 208–9
capitalization, telecommunications companies 26–7
Cerf, V. 19–20, 31, 177
charges, and International Telecommunication Regulations (ITRs) 214–17
Charnes, A. 328
Chile, universal access scheme 260
China 346–8, 358–9
digital divide 354–6
Internet/e-commerce 351–3, 354
mobile communications 349, 350–51, 355
policy conflicts 348–9
space industry 356–7
telecommunications sector, overview 349–50
and World Trade Organization (WTO) 357–8
China Telecom 349, 355
China Unicom 349, 351, 355
circuit switching 29
Cisco 351
City of Lafayette v. Louisiana Power and Light 182
Clear Communications 302–3, 305, 310, 311, 312, 314
Colbertism 418–19
competition 2–3, 226
above 890 case, effects of 139
areas of 35–6
basic telecommunications markets 46–50
Brazil 331–4, 338–40
contestable networks 394
and costs 4
and direct network access 56, 60
Germany, long-distance telecommunications markets 395
mobile communications 50–52
nature of 147–8, 420–21
and penetration rates 319
and quality of service 213–14
and regulation 7–9, 110–11
competition policy 234
Anglo-American liberal model 418
federalism controversies in 181–5
France 364
and International Telecommunications Regulations (ITRs) 204
mercantilism 418–19
see also EU (European Union), regulation/telecommunications policy; market liberalization; privatization; World Trade Organization (WTO), agreement on basic telecommunications services
competitiveness, benefits of new technology 26
Concert 84–6, 89–90, 92, 203
Conner, J. 312
Consent Decree (GTE) 143–5
Constitution (US) 181–2
content regulation 9–10
contestable networks 394
Continental Cablevision 129, 130
convergence
international telecommunications policy 234–8
technology 68, 71, 258–9, 276–7
Convergence Communications, Inc. (CCI) 262
Cook, J. 146
corruption 194
Crossetti, P. 325
cultural change, incumbent operators 6–7
data protection, EU (European Union) policy 159, 166
Davies, D. 29
decision-making, central v. local 188–91
deregulation, see market liberalization
Dertouzos, M.L. 306
Deutsche Telekom 86–7, 88, 90, 91, 424
developing countries
and anti-globalization 246
and development divide 242, 243
ICT, benefits of 244
and intermediate technologies 259
mobile communications, advantages of 269
reform in 246
see also World Bank Group (WBG)
development agencies, benefits of ICT 245
development divide 242, 243
digital divide 241–2, 243–4, 259–60
and anti-globalization 246
China 354–6
G-8, role of 246–9
ICT, benefits of 244–5
Middle East 297
see also World Bank Group (WBG)
Digital Opportunity Task (DOT) Force 247–9
Direction of Traffic 218–19
downsizing 306–7
Drake, W.J. 272, 277
DSL 61, 176, 181, 186
penetration 61, 62, 64, 177
dynamic allocation 29–30
e-commerce
China 352–3
regulation of 8
e-Europe 68, 72, 74, 154
e-mail, monitoring of 282–3
e-policy 68, 72–3, 73–4, 76
economies of scale/scope, and company strategy 3–4, 5
efficiency measurement model 327–8
efficient component pricing rule (ECPR) 366–7
electricity industry regulation, federalism issues 182–3
electricity industry regulation, France 361, 370–71, 373–4, 381
organizational structures 361–4
and public service obligations 379–80
and state ownership 380–81
Embratel 321, 322
Energis
employment by function 25
growth of 25
R&D 22–3
Equot 91
equipment supply 16–19
India 401–6
and market liberalization 20–21, 155, 227, 292–4, 402–5
North Africa 292–4
R&D 18, 22–4
Ericsson 33, 34, 350–51
essential facilities, concept of 394–5, 396
EU (European Union), regulation/telecommunications policy 153–4, 168, 228, 233
1987 Green Paper 154, 155
from 1998 160–67, 413
to 1998 154–60
asymmetric market power regulation 390–91
competition cases/sector inquiries 162–3
directives, legal status of 393
e-Europe 68, 72, 74, 154
‘horizontal’ approach to regulation 165
implementation process 160–61
infrastructure/network liberalization 155, 156–8, 386–8
interconnection/pricing 164–5, 167, 388, 390–91
interpretation issues 161–2
mergers 161, 163
‘new framework’ (2000– ) 165–7
Open Network Provision (ONP) policy 387, 388
regulations, legal status of 393
role of 372
standards 156
and sustainability/information society 73, 74
universal service 159, 164, 166–7, 379
voice telephony, definition of 161–2
European Commission 70, 71
1999 Review (sector-specific market power regulation) 392–3
powers 154
and universal service costs, France 377–8
European Court of Justice 154
European telecommunications industry, recent trends 425–6
European Telecommunications Standards Institute (ETSI) 156
externalities 188, 189–90, 192–3
‘F4 firms’ 25
Federal Communications Commission (FCC) 137
and access charges 142–3
and AT&T 392
broadband Internet access regulation 173–4, 180–81
and cable television 184
judicial limitations on authority 183–4
Federal Energy Regulatory Commission (FERC) 183
federalism, and competition policy 181–5
fibre optic cable, capacity/costs 53, 55, 56, 61
financial forecasts 27–8
financial markets, role of 26–8
‘first-mover’ advantage 83–4, 422–3
foreign investment in China 347, 348, 352, 354–5
in India 404–5, 406, 410
reasons for 4
and regulation 9
and World Trade Organization (WTO) agreement on basic telecommunications services 273

see also World Bank Group (WBG)
France, regulation, see electricity industry regulation, France; regulation, France
France Télécom 86–7, 88, 369, 376–7, 378, 380, 424
Fransman, M. 17, 22
G-8, and digital divide 246–9
Gates, B. 31
General Agreement on Trade in Services (GATS) 201, 229, 272, 413
Germany, regulation, see regulation, Germany
global alliances 4, 81–2, 92–5, 424
BT 97–8, 100, 103, 423
fixed-wire/wireless issues 90–91, 93–4
forms of 4, 84, 94
and International Telecommunications Regulations (ITRs) 204
main examples 84–90
motivations for 82–4
and one-stop shopping 81–2, 90–92
takeovers, popularity of 95
Global One 86–8, 91
globalization 242–4
opposition to 246
and regulation 9–10
see also global alliances
globalization strategy, European PTOs (public telecommunications operators) 413–15, 426–7
alliance formation 424
catch-up 423–4
and domestic protection 421–2
domestic rivalry/first-mover strategy 422–3
and innovation 420–21
and national governance regimes 417–20
recent trends 425–6
and transition from monopoly systems 415–17
see also global alliances
governance regimes, and telecommunications restructuring 417–20
government/political control, media and telecommunications 281–2, 296
Algeria 290–91
authoritarian model 282–3
China 352
Morocco 288–9
Tunisia 287
see also Internet regulation, North Africa
Gowen, W. 119
Gravina, P. 340
Grove, A.S. 415
growth
global telecommunications industry 2, 268–71
sustainability issues 72, 74–6
Grumberg, M. 118
GTE 137, 138
and United Telecommunications 139
GTE, acquisition of SPC 138, 147–8
and access charges 140–43
and Consent Decree limitations 143–5
development plans 144
long-distance service, commoditization of 145
management problems 145
valuation of SPC/terms of sale 145–7
GTE Sprint 138, 139
Hamel, G. 307, 314
Hart, G. 125–6
HFC networks 130, 131
Hong Kong, US WEST in 124–5
human resource management, and organizational transformation 306, 307–8, 312–14, 315–16
incumbent companies 11, 134–5
and global alliances 82, 83
market shares 46–50
monopoly, arguments used in defence of 227
possible strategies 3–7
see also globalization strategy, European PTOs (public telecommunications operators)
independence, regulators 235–6
India
customs duties 404
equipment supply 401–6
infrastructure/ICT development, future prospects 411
India (continued)

Internet 407, 408
market liberalization 402–5, 406–8, 409–11
new technology, legal responses to 409–10
penetration rates 410–11
R&D 404, 405–6
regulation, current institutional organization of 408–9
social objectives 401–2
state monopoly period (1947–91) 400–402
individuals, and decision-making 188–9
industrial change, economics of 15–16
industrial policy, continental European 418–19
info-communications industry 31–2
competition in 35–6
learning/technological regimes in 33
infoDev 250, 252, 255, 256
information society, sustainable 72, 74–6
Information Technology Agreement (ITA, 1996) 277
infrastructure development 39–40, 65, 67
and competition 46–52
and global alliances 83
higher speed network access options 56, 60–65
and Internet 52, 55–67
network access/service growth 43–6
network investment/capacity 52–5
stages of/ transformation process 40–42, 52
innovation 18–19, 33, 414–15
and globalization 420–21
see also technological change
Intelsat 294–5
interconnection
and EU (European Union) 164–5, 167, 388, 390–91
and International Telecommunication Regulations (ITRs) 205
and local monopolies 48, 50
pricing/charges 140–43, 164–5, 236, 341, 366–9
regulation 8–9, 48, 50, 164–5, 236, 364–9
international alliances, see global alliances
International Bank for Reconstruction and Development (IBRD) 250
International Development Association (IDA) 250
International Finance Corporation (IFC) 250, 254–5, 262–3
International Telecommunication Regulations (ITRs) 200–202
and competition policy 204
economic context of 203–4
future prospects 223–5
individual provisions of 205–23
charging and accounting 214–17
definitions 206–7
dissemination of information 218–19
final provisions 222–3
international network 207–11
international telecommunications service 211–14
preamble 205
purpose and scope of regulations 205–6
safety of life and priority of telecommunications 214
special arrangements 219–22
suspension of services 217–18
and World Trade Organization (WTO) agreement 202–3, 206
International Telegraph Union (ITU), role of 232–3; see also International Telecommunication Regulations (ITRs)
internationalization, see globalization;
globalization strategy, European PTOs (public telecommunications operators)
Internet 5
broadband 173, 175–8
China 351–3, 354
development of 28–31, 55–6, 57–9
EU (European Union) regulation 164
higher speed network access options 56, 60–61
India 407, 408
and info-communications industry, development of 31–3
and infrastructure development 52, 55–67
mobile access 35, 65
regulation 261
UK, development in 111–12
universal access 67
World Bank Group (WBG) programs 254, 256, 261
see also broadband Internet access regulation; Internet Service Providers (ISPs); penetration rates, Internet

Internet regulation, North Africa 281–2
access to network services 286–91
Algeria 291
and authoritarian model of press 282–3
Morocco 288, 289–90
oversight committees 285–6
Tunisia 283–5, 287–8
Internet Service Providers (ISPs) 185–6, 187–8
India 407
North Africa 284, 287, 288, 289
investment
   global telecommunications industry 266, 267
   network, trends 53, 54
   restrictions 237–8
see also foreign investment
ISDN 60, 64, 175
Italy, protectionism/restructuring 421–2
ITU Internet Reports 219
ITU Operational Bulletin 218

Japan
   equipment supply 17
   market liberalization 20
   mobile communications 34
   telecommunications policy research 70
Jaques, E. 308
Jayakar, K.P. 319
joint ventures
   examples 84–90
preference for 84
see also global alliances

Kahn, R. 31, 177
Kano, S. 34
Kennard, W. 180–81, 192
Khoo, A. 124
Kochan, T.A. 306
Langenbur, E. 123
learning regime, telecommunications industry 19–20, 24–6, 33
Lemley, M. 185–6, 187–8
Lessig, L. 185–6, 187–8
Li, R. 359
Li Ka Shing 124, 125
liberal market model, Anglo-American 418
liberalization, see market liberalization
licence issuing 236–7
and EU (European Union) 233
and global alliances 83, 90–91
Licklider, C. 28
Lillis, C. 128, 129, 130
local access/service markets, competition in 35, 48, 50
Long, R. 146
long-run average incremental cost (LRAIC) methodology, interconnection pricing 236, 368
Louisiana Public Service Commission v. FCC 183–4
Lounaichi, M. 286
Lyonnaise des Eaux 119

Mabrouk, C. 285
MacAllister, J. 118
market access, and World Trade Organization (WTO) agreement on basic telecommunications services 272, 274, 275
market failure 188, 189–90
market liberalization 20, 46, 226–8, 234
Australia 303–4
China 348
electricity industry 370
and equipment supply 20–21, 155, 227, 292–4, 402–5
Europe 413–14, 415–18, 419–20, 425
market liberalization (continued)
General Agreement on Trade in Services (GATS) 201, 229, 272, 413
Germany 383, 385–6, 395, 396
and global alliances 82, 83
India 402–5, 406–8, 409–11
and market shares, former monopoly incumbent operators 46–50
New Zealand 304, 305
North Africa 292–4
policy tools 417
UK 20, 98–9, 103–5, 119–20, 418, 422
and World Bank Group (WBG) 252–3
World Trade Organization (WTO), agreement on basic telecommunications services 230–32
see also EU (European Union), regulation/telecommunications policy; organizational change, Australasian telecommunications companies; privatization; reform, telecommunications sector; regulation; regulation, France
market power
disaggregated regulatory approach 393–6
and EU (European Union) policy 167, 392–3
and open access 185, 186, 190, 192 and regulation 9
Martinez, J.P. 340
MCI 163, 421, 423 and Concert 84–5
MCI WorldCom 87–8, 91, 92–3, 163
MediaOne 132–3, 134, 135
Menard, R. 283
mercantilism, continental European 418–20
Mercury Communications (MCL) 110, 121, 122, 422
mergers
and competition policy 204
and EU (European Union) 161, 163 and local governments 194–5
see also global alliances
Microsoft 31
Middle East
freedom of expression in 283, 296
pan-Arabism 296–7
satellite services 295–6
see also Internet regulation, North Africa
mobile communications 33–5
advantages for developing countries 269
Brazil 332–4, 335, 337–8, 340
China 349, 350–51, 355
competition 50–52
and EU (European Union) 155–6, 158, 162–3, 165
global, growth of 268–9, 270–71
market shares 50–51
penetration rates 34–5, 43–6, 65–6, 201, 268–9, 270–71
and World Trade Organization (WTO) agreement on basic telecommunications services 274
modems 61, 63, 64, 175
monopolistic bottlenecks
concept of 394–5
local networks as 396
Morocco
government control, media and telecommunications 288–9
Internet access 289–90
market liberalization, equipment supply 293–4
Mosaic Communications 30, 31
most favored nation principle, and World Trade Organization (WTO) agreement on basic telecommunications services 273
Motorola 350
Multilateral Investment Guarantee Agency (MIGA) 250, 255
network development, see infrastructure development
new deal union model (ND), organizational transformation 306
New Zealand, regulation 304–5; see also organizational change,
Australasian telecommunications companies
Noam, E. 272, 277
Nokia 34
non-union human resource model (NUHR), organizational transformation 306, 307
non-union personnel management model (NUPM), organizational transformation 306
Nortel, and market liberalization 20–21
North Africa, see Algeria; Internet regulation, North Africa; Morocco; Tunisia
Novaes, A. 320
NTT 35
and global alliances 84
R&D 22, 23
OECD (Organization for Economic Cooperation and Development), role of 233
OFTEL 99–100, 105, 109–12, 113, 392
Omnipoint Communications v. Newtown Township et al. 185
one-stop shopping, and global alliances 81–2, 90–92
One2One 122
Optus Vision 130–31, 302, 309
organizational change, Australasian telecommunications companies 300–301, 314–16
employee involvement 311–12, 315
organizational design 308–10, 314–15
overview of companies 301–3
regulatory framework 303–5
strategic human resource management (SHRM) 312–14, 315–16
work organization 310–11, 315
organizational transformation, models of 305–8
Ortiz, R. 118–19, 124–5
outsourcing 6
Pacific Century Cyber Works (PCCW) 359
packet switching 19–20, 29, 30–31, 33
pan-Arabism 296–7
Parker v. Brown 182
PCS (Personal Communications Services) 122
penetration rates 201
Brazil 322, 323–5, 334
China 347, 349, 354, 355
competition, effects of 319
fixed-line 43, 44, 66
global 268, 269
India 410–11
and market liberalization 253, 254
mobile communications 34–5, 43–6, 65–6, 201, 268–9, 270–71
penetration rates, Internet 55–6, 57–9, 61, 65, 66, 201
broadband 177
cable modems 63, 64
China 354
DSL 61, 62, 64, 177
ISDN 60, 64
North Africa 291
People of California v. FCC 184
Peru, privatization in 253, 254
political control, see government/political control, media and telecommunications
politics, importance in business plans 124–5
Portland open access case 173, 179, 180
postal services 259, 261–2
Prahalad, C.K. 307, 314
press control, authoritarian model of 282–3
pricing
efficient component pricing rule (ECPR) 366–7
interconnection 140–43, 164–5, 236, 341, 366–9
international calls 277
principal–agent relationship 189
Prior, J. 119
privacy, protection of 10
privatization 237–8, 257–8, 417
Brazil 319, 321, 330, 331–42
BT 98, 109
effects of 319
France 380
and World Bank Group (WBG) 252–3, 254, 257
Index

productivity gains 41
protectionism 418–19, 421–2

quality of service/quality standards 10
Brazil 335–8, 339
and International Telecommunication Regulations (ITRs) 207–8, 213–14
Qwest 23–4

radio, importance in developing countries 259
Rand Corporation 29
R&D 18, 22–4
Brazil, telecommunications carriers 326–7
India 404, 405–6
reform, telecommunications sector 39–40
institutional, stages of 40–42
and World Bank Group (WBG) 252–3, 257–8, 260–62
see also market liberalization
Regional Telecommunication Indicators 219
regulation
access charges 141–3
Australia 303–4
Brazil 320–22, 330–31, 340–42
BT 99–100, 105, 109–12, 113
cable operators v. local telephone companies 133
change process 71
competition, effect on 110–11
Consent Decree (GTE) 143–5
consumers, effect on 111
cost allocation, optimal 367–8
cost determination 141–2
differentiated sector-specific 392
disaggregated approach (market power) 393–6
efficiency criteria 372
efficient component pricing rule (ECPR) 366–7
Europe 419–20, 425
federalism issues 181–5
future of 7–9
independence of regulators 235–6
India, institutional organization 408–9
interconnection 8–9, 48, 50, 164–5, 236, 364–9
international convergence/coordination 10, 234–9
Internet 261
line of business restrictions 120
local networks 396
nature of 371, 417
new global telecommunications, impact of 9–10
New Zealand 304–5
powers of regulators 235, 425
price cap 109, 340–41
symmetry principle 394
and technology convergence 258–9
and World Bank Group (WBG) 252
and World Trade Organization (WTO) 276
see also broadband Internet access regulation; electricity industry regulation, France; EU (European Union), regulation/telecommunications policy; Federal Communications Commission (FCC); International Telecommunication Regulations (ITRs); Internet regulation, North Africa; market liberalization; regulation, France; regulation, Germany; telecommunications policy
regulation, France 361, 381–2
forward planning 380
interconnection/network access 364–9
organizational structures 361–4
powers of regulators 372–4
public service obligations, types of 375
and state ownership 380–81
universal service 363, 365, 375–80
regulation, Germany 383–4, 396–7
asymmetric market power regulation 388–90
deregulation 385–6
global entry deregulation 385–6
global legal entry barriers/monopoly period 384–5
long-distance telecommunications markets, competition in 395
Monopoly Commission review (1999) 391–2
partial entry deregulation 385
and universal service 386
restructuring, telecommunications markets 1–3, 203–4
and governance regimes 417–20
incumbent companies, possible strategies 3–7
see also market liberalization; organizational change, Australasian telecommunications companies; privatization; reform, telecommunications sector
revenue, global telecommunications industry 266, 267
Roberts, L.G. 29–31
Ros, A.J. 319, 330
routing, and International Telecommunication Regulations (ITRs) 209–11
rural telecommunications development, and World Bank Group (WBG) 262–4
safety of life telecommunications, and International Telecommunication Regulations (ITRs) 214
satellite communications
China 356–7
EU (European Union) policy 157
Middle East/North Africa 295–6
technology 61, 65, 176, 294–5, 356–7
and World Trade Organization (WTO) agreement on basic telecommunications services 273, 274
Scandinavia, development of mobile communications 33–4
Schumpeter, J.A. 36
secure servers, numbers of 56, 59
settlements
process 142
rates 277
Smith v. Illinois Bell 141, 183
Southern Pacific Railroad (SPR) 139, 146, 147
space industry, China 356–7
SPC (Southern Pacific Communications) 138–9; see also GTE, acquisition of SPC
Sprint 86–7, 88, 91, 144, 163
evolution of 138, 139
see also GTE, acquisition of SPC
standardization 33
and EU (European Union) 156
mobile communications 33, 34–5, 350
state control, see government/political control, media and telecommunications
stocks, cable/telephone 134
strategic human resource management (SHRM), and organizational transformation 307–8, 312–14, 315–16
sunk costs 394, 395
suspension of telecommunications services, and International Telecommunication Regulations (ITRs) 217–18
sustainable information society (SIS) 72, 74–6
Sweden, telecommunications policy 71, 72
switching market, China 350
Switzerland, regulation 392
taxation 216
TCI 135, 173
TCP/IP (Transmission Control Protocol/Internet Protocol) 31
technological change 1–2
forces driving 41
learning regime 19–20, 24, 26, 33
and market liberalization 416
technological regime 15–16, 18–19, 22, 33
see also innovation; R&D
technology convergence 68, 71, 258–9, 276–7
Telebrás
creation of 321
efficiency measurement 327–9
Telebrás (continued)
fibre-optic cable deployment 325–6
post-privatization 331–8
R&D 326–7
selected indicators 322–5
transition to privatization 329–31
Telecom Italia 87, 89
Telecom New Zealand (TNZ) 302, 315
employee involvement 311–12
human resources function 313
organizational design 308–9
regulation 304–5
work organization 310
Telecommunications Act (1984, UK)
99, 105
Telecommunications Act (1991, Australia) 303
Telecommunications Act (1996, US)
68, 184, 185, 193
telecommunications industry,
evolution of 1–3, 15, 36–7
competition 35–6
from early 1990s 21–4
and economics of industrial change
15–16
financial markets, role of 26–8
info-communications industry
31–3
and International Telecommunication
Regulations (ITRs) 203–4
and Internet 28–33
late entrants, success of 21, 24, 25, 26
learning regime 19–20, 24–6, 33
and market liberalization 20–21
to mid-1980s 16–19, 137
mobile communications 33–5
technological regime 15–16, 18–19,
22, 33
telecommunications policy 68–9, 76
convergence, international 234–8
federalism in 183–5
international co-operation 226,
228–4
multi-level governance, dangers of
232–4
relevance of 72–3
research 68–70, 73–6
sustainable information society (SIS)
72, 74–6
and technology convergence 71
and wider policy goals 72, 73–4
see also EU (European Union),
regulation/telecommunications
policy; International
Telecommunication Regulations
(ITRs)
teledensity, see penetration rates
Telefónica 89
telephone stocks 134
Televerket 415
television, digital, standards 156
Telstra 301, 308, 310, 311, 312–13,
315–16
Thatcher, M. 124–5
Time Warner 128, 180
traffic forecasting 208
transatlantic cable 53, 55, 56
transformed union model (TUM),
organizational transformation
306
Trends in Telecommunication Reform
219
Tunisia
access to network services 287–8
government control, media and
telecommunications 287
Internet regulation 283–5, 287–8
market liberalization, equipment
supply 292–3
oversight committees 285–6
UK
cable companies, growth of 105, 119,
120, 121, 123
equipment supply 17
Internet development 111–12
market liberalization 20, 98–9,
103–5, 119–20, 418, 422
Ulrich, D. 312
unbundling
EU (European Union) policy 166
France 369
uncertainty, and financial forecasts
27–8
unions, and organizational
transformation 306, 307, 311,
312
Unisource 88–90, 424
United Telecommunications 138, 139
Unitel 122
universal access 260
Brazil 334–5
India 406, 408, 410
Internet 67
and World Bank Group (WBG) 262–4
universal service 8, 43, 67, 191, 192–3
China 348–9, 355–6
EU (European Union) policy 159, 164, 166–7, 379
France 363, 365, 375–80
funding mechanisms 378–9, 386
Germany 386
and International Telecommunication Regulations (ITRs) 212
Uniworld 89
US Constitution 181–2
US WEST 117
in Australia 130–32
breaking up of 134
diversification strategy 118
and domestic market 122–4, 127–9, 132–3
early development of 117–22
in Eastern/Central Europe 127
in Georgia (US) 132–3
in Hong Kong 124–5
lessons learned from experiences 134–5
public policy conflict within 129–30
in USSR 125–7
Vallance, I. 100, 102
value-added network services (VANS), and market liberalization 226–8, 387
value-added telecommunications, definition of 268
Vanderslice, T. 142, 146
Venus Project 358–9
vertical integration
electricity industry 370–71
history of 16–17
vertical separation/specialization 22, 24, 31–2, 186–7
Vivendi 94
Vodafone 35, 91, 94
Walker, L. 125
Wellenius, B. 251, 253, 260
Wharfgroup 124, 125
wireless technology 177
and global alliances 90–91, 93–4
PCS (Personal Communications Services) 122
Woo, P. 124, 125
World Bank Group (WBG) 250–51, 264
1990s 252–5
early history 251
future challenges 257–60
information/advisory role, increasing importance of 253–4
investment focus, new 262–4
policy focus, new 260–62
and sector reform 252–3, 257–8, 260–62
and state enterprises 251
strategy, need for new 256–7
World Conference on International Telecommunications (WCIT) 202
World Telecommunication Development Report 218
World Telecommunication Indicators Database 219
World Trade Organization (WTO) (358
and China 357–8
importance of 232
World Trade Organization (WTO), agreement on basic telecommunications services 230–32, 236, 271–2
commitments, by region 273–4
and International Telecommunication Regulations (ITRs) 202–3, 206
reference paper 230–32, 236, 275
shortcomings of 276–7
specific provisions 272–4
World Wide Web, development of 31
WorldCom 21, 85, 93, 163, 421; see also MCI WorldCom
Yearbook of Statistics 218
Zhao, Y. 349
Ziang, Z. 351–2