
Index

- access
 - developing countries 504–5
 - EU and the issue of 360
 - gas network in Russia 459
 - liberalization in telecoms sector 116–17
- access pricing 339
- access regulation 30, 35–6, 41, 42, 43, 47
- accountability 446
- accounting separation 41
- actors, individual 75–6, 81–2
- adaptation 17, 21–3
 - challenges and failures in the USA 378–9
 - continuous and electricity reform in Europe 165–6
- address resources, IP 157–8
- Administered Pricing Mechanism (APM) 440, 442–3
- administration fees 132–3, 137
- administrative operation 17, 18
- ADSL (asymmetrical-DSL) 147
- adverse selection 496
- advertising of airline tickets 239–40
- Agency for the Cooperation of Energy Regulators (ACER) 165, 351
- Air California 234
- air services agreements 236–7
- air traffic control (ATC) 357
- air transport 6, 60, 93, 95, 234–51
 - Australia 476, 485, 487
 - benefits of liberalization 243–5
 - EU 235–7, 238–9, 240, 241, 242, 243, 244–5, 356–8, 359, 360, 361
 - industry structure 241–3
 - international liberalization 237
 - liberalization of the supporting industry 238–41
 - USA 234–5, 236, 237, 238, 239, 240–41, 242–3, 244, 245
- airline ticket advertising 239–40
- airport slot allocation 238–9, 357
- allocation of frequency/spectrum 129, 130, 138, 141
 - processes and standards 130–32
- alternative technologies 505
- Amadeus reservation system 241
- American Airlines 240–41, 242–3
- American Registry for Internet Numbers (ARIN) 145, 152
- AMR Corporation 242–3
- Amsterdam 303
- Amsterdam Internet Exchange (AMS-IX) Association 148
- ancillary services 238–41, 294, 298, 356
- Anglo-Persian Oil Company (later British Petroleum) 204–5
- Anglo-Saxon approach to economic policy 348
- Anglo-Saxon tradition 56–7
- Ansett Airlines 485
- antitrust policy, *see* competition law/policy
- Aoki, M. 80, 81–3
- APIs 306–7
- Aramco 205
- Argentina 182, 306, 396–7
- Arndt, R.H. 260
- Asia 303–4, 499, 500; *see also* under individual countries
- asset indivisibilities 217, 218
- asset specificity, degree of 17, 18, 79, 80
- assignment of spectrum/frequencies 129, 130, 138, 141
 - by price auctions 138–40, 141
 - processes and methods 132–3
- Associated British Ports (ABP) 303
- asymmetric information 29, 31, 34–5
- AT&T 96, 104–13, 116, 369, 370, 371, 372, 377–8
 - breakup of 108–9, 371
- Atlanta waterworks contract 23
- auctions 62, 117
 - assigning frequencies by price auctions 138–40, 141
- AusLink National Network (ANN) 473
- Australia 2, 8, 270, 285, 471–90
 - air transport 476, 485, 487
 - AusLink (National Land Transport) Act (2005) 473, 474
 - electricity 476–7, 485–6, 487
 - funding mechanisms 478–81
 - gas 182, 184–5, 477, 486
 - impact of liberalization 481–6
 - National Competition Policy (NCP) agenda 471–2, 475, 477
 - impact of reforms 481–6
 - National Reform Agenda (NRA) 472, 473, 474
 - policy reform 471–7

- railways 270, 472–3, 482–3, 487
- roads 255, 260, 264, 473–4, 483, 487
- seaports 304, 475–6, 484, 487
- Telecommunications Act (1997) 474
- telecoms 474–5, 484, 487
- unresolved issues 487
- water 477, 486, 487
- Australian Energy Regulator (AER) 486
- Australian Loan Council 480, 481
- Australian Rail Track Corporation (ARTC) 473, 483
- Austrian Post Office 333
- Aziz, A.M.A. 261

- Babbar, S. 258–9
- Baldwin, C. 167
- Bangemann Report 151
- banking 97
- barriers to market entry 30–32, 348
- baseload equipment 172
- Baumol, W. 111, 112
- Bayliss, D. 271
- Bekken, J. 280–81
- Belgium 303
- Bell, A.G. 369
- Bell Labs 104, 105, 109, 372
- Benitez, D. 396–7
- berthing services 293, 294, 298–9
- bidding for contracts 24, 392
 - competitive tendering and public transport 271–2, 273–9, 280–82, 286–8
 - developing countries 494–5, 496
 - renewable energy 173–4
- bilateral air services agreements 236–7
- biogas 179, 186, 191–2
- Body of European Regulators for Electronic Communication (BEREC) 117
- Bogart, D. 88
- Boitani, A. 276
- Bolivia 182
- Bombay High offshore field 429
- Bonneville Power Administration (BPA) 375
- bottlenecks 4, 30–32, 36
 - application of the regulatory assessment framework 37–48
 - Australia 471, 487
 - EU 360–61
- boundaries of market activities 167–8
- bounded rationality 76
- Brass v. Stoeser* 367–8
- Brazil 182
- British Airways 243
- broadband 116, 155, 378–9, 487
- Brown, C. 255
- budget constraints 315

- Budin, K.J. 297
- Buenos Aires 300, 306, 495
- build, operate and own (BOO) 297
- build, operate and transfer (BOT) 297
- Building Australia Fund 481
- bus transport 6, 269–89, 399
 - competitive tendering 271–2, 273–9, 280–82, 286–8
 - conceptual framework 271–3
 - future directions 286–8
 - impacts of liberalization 280–84
 - negotiated contracts 271–2, 273, 279–80
 - rationale for liberalization 270
 - regulatory cycle 284–6

- cable television networks 151, 153
- California 252, 376–7
- Cambini, C. 276
- capacity, electricity sector 172
- capitalism 88–9
- carbon dioxide capture and storage (CCS) 191
- carbon dioxide emissions 190, 358
- cargo handling services 293, 294
- Caribbean, the 384–406, 498–9
- cartels 199
 - OPEC 200, 206–7, 208, 209–10, 212
 - Seven Sisters 199, 205, 212
- Carterfone 106, 370
- Central European Gas Hub 188
- chemical industry 186
- cherry-picking (cream-skimming) 57
- Chicago regime 237
- Chicago School 14
- Chile 2, 7, 182, 397–9
 - seaports 305–6
- China 2, 7, 407–26
 - Company Law 418
 - energy 407, 408–11, 415–19, 423–4
 - sustainable development of resources 419–20
 - gas 186, 188–9, 409, 410
 - governance structures 423–4
 - reform of the state-owned enterprises 415–19
 - seaports 303–4
 - telecoms 407, 411–14, 423, 424
 - development of the information infrastructure in rural areas 420–22
- China Mobile 413–14, 423
- China National Offshore Oil Corporation (CNOOC) 410
- China National Petroleum Corporation (CNPC) 410
- China Netcom Corporation 413–14, 416

- China Petrochemical Corporation (Sinopec) 410
- China Telecom 411, 412–14, 416, 418
- China United Communications Corporation (China Unicom) 411, 413–14, 416
- City Challenge Fund 444
- CityMail 335
- Civil Aeronautics Board (CAB) 234–5, 240
- Clark, J.M. 171
- climate change 179, 190–92, 193
- coal 408, 409–10, 419
- Coalition of Australian Governments (COAG) 472, 477, 480
- COAG Reform Fund 481
- cognitive radio 135
- collective action 83–4
- collective goods 66–7
- commerce 97
- commercial freedom 328, 339
- balancing with USO and liberalization 338
- commercialization 333, 334–5
- Commons, J.R. 83
- Commonwealth Grants Commission (CGC) 478, 479
- community involvement 503–4
- compensation fund 63
- competition
- for-the-market 219, 228, 271–2, 494–6
- gas and globalization of 179, 185–90, 192–3
- in-the-market 219, 228, 271–2
- increased in air transport 245
- India 443
- ISP markets 152–3
- oil sector 204–5
- public transport 271–2
- railways 217–19, 228–9
- seaports 300–301
- selection through 81
- telecoms in the USA 106–7, 113–14
- unbundling between competitive and regulated activities in the electricity sector 166–7
- water services 317–19
- Competition and Infrastructure Regulation Agreement (CIRA) 472, 473, 475
- competition law/policy 29, 30, 40, 173, 201
- vs sector-specific regulation 40
- telecoms in the USA 109, 113–14
- Competition Policy Agreement (CPA) 472
- competitive bidding/tendering, *see* bidding for contracts
- competitive neutrality 44
- competitive products 337
- competitors, fund financed by 63
- computer reservation systems (CRSs) 240–41
- concentration, industry 242, 245–6, 496
- concession contracts 24, 392, 494–6
- and distribution 395
- as privatization instruments 21–3
- seaports 299–307
- concession period 256
- condominial systems 505
- conflicting policy priorities 350–51
- congestion charging 265
- consignees 293, 294
- consumer councils 317
- consumer payments for USOs 63
- consumption, widespread 12–13
- content and application providers 148–9
- content regulation 156–7
- contestable market theory 112
- contracts/contracting 11–12, 15–18, 19–20
- bidding for contracts, *see* bidding for contracts
- concession contracts, *see* concession contracts
- credible contracting 15, 16
- developing countries 494–6
- gross cost and net cost contracts 272, 273
- incomplete contracts 278–9
- lease contracts 298, 319, 494
- long-term contracts 81, 172–3
- management contracts 298, 494, 496
- negotiated contracts 271–2, 273, 279–80
- relational contracting 16–17, 278–9, 287
- renegotiation of contracts 21–3, 24, 402, 495
- simple contracting scheme 17–18, 79–80
- termination of contracts 22–3
- conventions 72, 73, 80–83
- convergence, technological 133–4
- Coombs, G. 482
- cooperative marketing arrangements 237
- coordination
- EU and coordination between competitive and non-competitive elements 361
- mechanisms in the oil sector 199–200, 205, 212
- of seaports' activities 294–6
- corporatization
- China 418–19
- postal sector 333, 334–5
- water sector 312, 313, 319–20, 322, 324
- cost-plus price regulation 41
- cost reductions
- air transport 244
- public transport 270, 280–82
- costs of regulation 45
- cream-skimming (cherry-picking) 57
- credible contracting 15, 16
- Crew, M.A. 28

- critical transactions 78
 Cross-City Tunnel (Sydney) 265
 cross-subsidies 61, 505
 telecoms 109, 110–11
 CTC 398
 Cultural Revolution 408
- Dal Bó, E. 16
 Dalrymple Bay Terminal 471, 487
 data processing services 107–8, 113, 150
 Data Transmission Company (DATRAN)
 107, 108, 109–10
 Debande, O. 260
 decentralization 301–7, 318
 decision rights 76–9
 deep packet inspection (DPI) 157
 default service regulations 32–4
 delegated public management 313, 320
 demand
 derived 198–9
 safeguarding 34
 density effects 217, 218
 Department of Telecommunications (DoT)
 (India) 434, 438
 deregulation 8, 26, 27, 28, 312
 electricity in the USA 376–7, 378
 derived demand 198–9
 design, build, finance and operate (DBFO)
 256–8, 261
 interfaces of the model 259
 types of in road transport 261–4
 Deutsche Post World Net (DPWN) 336
 developing countries 8, 491–512
 characteristics of infrastructure sectors
 393–4
 difficulties of private sector infrastructure
 provision 492–6
 governance 496–502, 507
 infrastructure provision and sustainable
 development 502–6
 modelling regulation and FDI 506–8
 telecoms 118–19, 500
 water 310, 312, 315, 500, 502, 505–6
 Di Pietrantonio, L. 216, 218
 Di Tella, R. 16
 dial-up access 147
 diesel 204
 Digital Dividend 136
 direct public management 313, 320
 distribution 395, 402–3
 domain name system (DNS) 146
 domain names, multilingual 158
 drinking water, *see* water
 DSL (digital subscriber line) 147, 153
 dynamic effects of regulation 37, 45–6, 49
 East Asia 499, 500
 Easterly, W. 395–6
 economic analysis and comparison 37, 38,
 43–5, 49
 economic development indicators 386, 387–8
 economic policy 348
 economic preconditions for regulation 36–7,
 38, 49
 economic principles, basic 4, 11–25
 concession contracts, *see* concession
 contracts
 governmental opportunism 12, 13–15, 20,
 22, 23–4, 316
 key features of infrastructure projects 12–20
 liberalization as an institutional choice
 11–12
 public contracting 11–12, 15–18, 19–20
 third-party opportunism 12, 15–20, 22, 23–4
 economic sectors, externalities between 33–4
 economies of scale 12–13, 109, 110, 241–2
 economies of scope 12–13
 Ecorys 354
 efficiency
 air transport 244
 designing efficient institutions 76–7
 efficient evolution of institutions 80–83
 incentives and regulation 45
 and ownership of seaports 295–6
 railway reforms and 226
 efficient component pricing rule (ECPR) 112
 electricity 5, 58, 60, 66–7, 162–78, 493
 Australia 476–7, 485–6, 487
 China 410–11, 420
 developing countries 502
 empirical evaluation of reforms 162–5
 EU 164, 165–6, 172–3, 351–2, 359, 360–61
 gas and production of 186
 India 428–9, 431–2, 436–7, 438–9, 442,
 444–5
 introducing competition ‘where feasible’
 166–71
 Latin America 389, 390–91, 399
 power shortages 377, 407, 419–20
 research and policy-making agenda 171–4
 Russia 453–7, 464, 465–6
 ‘textbook model for reforms’ 163, 164
 USA 168–9, 375–7, 378, 379
 electronic substitution (e-substitution) 329,
 330, 354–5
 Emissions Trading Scheme (ETS) 358
 Emporchi (Empresa Portuaria Chilena) 305
 end-use price regulation 203
 energos 453, 454, 455
 energy 66–7
 China 407, 408–11, 415–20, 423–4

- developing countries 500
- EU 358
- Latin America 384, 385
- renewable 173–4, 191, 379
- Russia 449, 452–9, 464–5
- see also* electricity; gas; oil
- Energy Reform Implementation Group (ERIG) 486
- Engel, E. 395
- enhanced (value-added) services 107–8, 113, 150
- ENTEL 398
- Environmental Agency (UK) 317
- environmental externalities 66–7
- environmental issues 379, 419
 - climate change 179, 190–92, 193
- equilibrium 81–3
- Estache, A. 401–2, 502
- Eurlings, C. 253
- Europe 205
 - nineteenth century 90–92
 - twentieth century 93, 95, 96–7
- European Aviation Safety Agency (EASA) 357, 358
- European Bank for Reconstruction and Development (EBRD) 461, 465
 - composite index of infrastructure reforms 450–52
- European Commission 361
- European Common Aviation Area (ECAA) 236, 237
- European Conference of Postal and Telecommunications Administrations (CEPT) 135–6
- European Neighbourhood Policy (ENP) 237
- European Radiocommunications Committee (ERC) 136
- European Rail Traffic Management System (ERTMS) 348
- European Railway Agency (ERA) 229, 356
- European railway model 460–61
- European Telecom Market Authority 117
- European Union (EU) 2, 4, 7, 345–65
 - air transport 235–7, 238–9, 240, 241, 242, 243, 244–5, 356–8, 359, 360, 361
 - climate change 191–2
 - Common Transport Policy (CTP) 349–50
 - conflicting priorities 350–51
 - electricity 164, 165–6, 172–3, 351–2, 359, 360–61
 - emergence of the USO 59–60
 - Energy Policy (EP) 349–50
 - evolution and analysis of infrastructure policy issues 359–61
 - evolution of liberalization 351–9
 - historical background 346–9
 - gas 181, 184–5, 188–9, 190, 191–2
 - infrastructures and European public policy 349–50
 - postal sector 331, 333–6, 348–9, 353–5, 359, 360, 361
 - radio spectrum management 135–6
 - railways 215, 221, 222–5, 226, 228, 229, 348, 355–6, 359, 360, 361
 - seaports 301–3
 - stability pact 315
 - sustainable development and environmental protection 67
 - telecoms 115, 116–17, 150–51, 347, 352–3, 358, 359, 360, 361
 - water 323
- evolutionary game theory 70, 80–83
- ex ante* regulation 40, 42, 43, 44
- ex post* regulation 40, 42, 43, 44
- exchange traded funds (ETFs) 491
- exchangeable quotas 173–4
- exclusive use of assets 299–301
- expedience 44
- express postal segment 353–4
- expropriation of sunk costs 13–15
- externalities 29, 31, 32–4
 - energy sector 66–7
- farsightedness 81
- fascism 88–9
- Federal Agency for Hydrology (Germany) 323
- Federal Communications Commission (FCC) (USA) 105, 106–7, 108, 109, 110, 111–12, 114, 139, 369, 370, 372
- Above 890 Decision* 370
- Computer Inquiries 107–8, 150
- Federal Energy Regulatory Commission (FERC) (USA) 181, 369, 374–5, 376, 377
- Federal Grid Company (Russia) 456
- Federal Power Commission (FPC) (USA) 373–4, 375
- Federal Power Commission v. Hope Natural Gas* 368
- Federal Radio Commission (FRC) 126
- Federal Railway Transport Agency (FTRA) (Russia) 461
- Federal Tariff Service (Russia) 456, 457, 459, 460
- feed-in tariffs 173–4
- Finland 2
- fire-alarm oversight policy 15–16
- First International Radiotelegraph Conference 126
- fiscal deficits 96, 395–6, 434
- fiscal equalization system 478–81

- Fishbein, G. 258–9
 fixed line telecommunications 116–17, 119, 369–72; *see also* telecommunications (telecoms)
 flanking measures 32–5
 for-the-market competition 219, 228, 271–2
 developing countries 494–6
 foreign direct investment (FDI)
 developing countries and private sector investment 491–512
 modelling regulation and FDI 506–8
 India 431, 432
 and institutional quality 501–2
 Latin America 384, 385, 389–90, 392–4, 396
 Russia 455, 464, 466
 formal institutions 72, 73–4, 75, 76
 fossil fuels 190–91; *see also* coal; gas; oil
 France 94, 97, 276
 water 318–19, 321, 323
 freight transport
 railways 216, 219, 220, 223
 Russia 459, 460, 461
 frequency licence trading 140
 Friebel, G. 226, 460
 fuel oil 203, 204
 functional separation 41, 42, 43
 funding mechanisms
 Australia 478–81
 PFI 260–61, 491
 PPPs, *see* public–private partnerships
 USOs 62–3, 64
 Galileo reservation system 241
 gas 5, 60, 179–96, 493
 Australia 182, 184–5, 477, 486
 China 186, 188–9, 409, 410
 climate change and green gases 190–92
 global production 186–7
 globalization of competition 179, 185–90, 192–3
 India 186, 429–30, 433, 437, 439–40, 442–3, 445–6
 liberalization 180–83
 politicization 179, 180, 183–5, 192
 prospects 192–4
 regulatory gas market models 193–4
 Russia 183, 188–90, 193, 457–9, 464–5
 USA 180–81, 184–5, 188, 190, 373–5, 378
 Gas Authority of India Limited (GAIL) 429–30, 433
 Gas Exporting Countries Forum 189–90
 gas hubs 188
 gas oil 204
 gasoline 204
 Gassner, K. 310
 Gazprom 183, 455, 457–9, 464–5, 466
 general equilibrium approach 396–7
 general interest 55, 56–7
 services of 59–60, 61, 63
 general revenue assistance 478–80
 geopolitics 88–90, 192–3
 German tradition 57
 Germany 252
 postal sector 333, 335–6, 340
 water 319–20, 321, 322, 323
 Global System for Mobile Communication (GSM) standard 115, 136
 globalization of competition 179, 185–90, 192–3
 Golden Telecom 462
 Google 154
 governance 279
 developing countries 496–502, 507
 Kaufmann indicators 501, 507
 postal sector 339–40
 governance structures 72, 73–4, 75, 77–80, 81
 improving in China 423–4
 government/state
 intervention in the oil market 199–203
 politicization and gas reforms 179, 180, 183–5, 192
 as a system manager 84
 government borrowing 480–81
 government-industrial-university complex 149
 governmental monopoly 42, 43
 governmental opportunism 12, 13–15, 20, 22, 23–4, 316
 gravity models 501–2
 Gray, H. 367
 Great Leap Forward 408
 green gases 179, 190–92
 grid companies 456
 gross cost contracts 272, 273
 ground handling 238
 GTE 371
 Guasch, J.L. 24, 322, 402
 Gulf Oil 204
 Gwilliam, K. 285, 286
 Hall, D. 463
 Harris, C. 394–5
 Hemming, R. 255
 Hensher, D.A. 271–2, 278, 280, 281
 Herfindahl–Hirschman Index (HHI) 245
 High Density Rule 239
 high-power incentives 18–19
 Highways Agency 264, 265
 Hill, Sir R. 328, 330
 historical perspective 4–5, 87–99

- early twentieth century 92–5
- ideology, geopolitics and technological change 88–90
- nineteenth century 90–92
- privatization 95–7
- Hodgson, G.M. 72
- homogeneous actors 82
- Hong Kong 295, 303
- horizontal air services agreements 236–7
- Huaneng Power International Company 416
- Human Development Index 386, 387–8
- Hush-A-Phone 106, 370
- hydrogen 179, 191

- ICLEI Local Governments for Sustainability 283
- ideology 88–90
- imposition of USOs 62
- in-the-market competition 219, 228, 271–2
- incentives 14
 - high-power and low-power 18–19
 - incentive neutrality 44
 - Latin American incentive systems 401–2
- income per capita 386, 387–8
- incomplete contracts 278–9
- independent oil companies 205–6
- independent regulators, *see* regulatory bodies
- Independent Regulators Group (IRG) 115
- independent system operator (ISO) 168–9
- India 2, 7, 427–47
 - chronology of reforms 433–4
 - current infrastructure scenario 430–33
 - electricity 428–9, 431–2, 436–7, 438–9, 442, 444–5
 - Electricity Act 2003 439, 445
 - evolution of infrastructure 427–33
 - gas 186, 429–30, 433, 437, 439–40, 442–3, 445–6
 - key achievements and further challenges 441–4
 - National Telecommunications Policy (NTP) 431
 - National Water Policy 440–41
 - New Economic Policy (NEP) 438
 - New Exploration and Licensing Policy (NELP) 433, 440, 443
 - New Telecom Policy 1999 (NTP'99) 431, 441
 - oil 429–30, 432–3, 437, 439–40, 442–3, 445–6
 - Sector Reforms programme 440, 441, 443
 - suggestions for further action 444–6
 - telecoms 427–8, 431, 432, 434–8, 441–2, 444
 - water and sanitation 430, 433, 438, 440–41, 443–4, 446
- Indian Oil Corporation (IOC) 433
- indirect expropriation 13
- indivisibilities 217, 218
- Indonesia 182–3, 184
- industry restructuring
 - China 416–18
 - Russia 452–64
- inequality 402–3
- informal institutions 72, 73, 74, 75, 80–83
- information asymmetry 29, 31, 34–5
- information society 154
- Infrastructure Australia (IA) 472, 481
- innovation incentives 45–6
- institutional economics 70–71, 83–4, 368
 - new, *see* new institutional economics (NIE)
- institutional infrastructure 450
- institutions 4, 70–86
 - designing efficient institutions 76–7
 - efficient evolution 80–83
 - formal 72, 73–4, 75, 76
 - four-layer model 75–6
 - hierarchy of 72–4
 - informal 72, 73, 74, 75, 80–83
 - institutional quality in developing countries 501–2
- Internet logical infrastructure 145–6
- Latin America 391–2
- liberalization as an institutional choice 11–12
 - new institutional economics 70, 74–83
 - as products of collective action 83–4
 - railways and institutional constraints 229
 - types of 71–4
 - weak in India 446
- institutions-as-an-equilibrium approach 81–3
- instrumental valuation 83–4
- integrated transport networks 277–8
- interactions, regulatory 47
- inter-city connectivity 244
- interconnection 32–4, 348
 - ISPs 148
 - telecoms 105–6
- interest groups 15–16
- Intergovernmental Panel on Climate Change (IPCC) 190
- International Air Transport Association (IATA) 93, 239
- International Energy Agency 207
- International Energy Exchange (IEA) 200
- International Monetary Fund (IMF) 118
- international oil companies (IOCs) 199, 204–5, 206, 207, 208–9, 211
 - Seven Sisters cartel 199, 205, 212
- International Telecommunications Union (ITU) 128, 129

- internationalized domain names (IDNs) 158
- Internet 5, 65, 113, 144–61
- air transport reservations 241
 - broadband 116, 155, 378–9, 487
 - China 421
 - definition and distinctive features 144
 - infrastructure components for Internet services 145–9
 - liberalization and 149–54
 - origin 149
 - and the postal sector 330
 - reactions against Internet liberalism 156–8
 - recent developments and trends 154–8
 - telecoms liberalization and 115–16, 118, 119, 120, 150–52, 153, 154
- Internet Architecture Board (IAB) 145
- Internet Corporation for Assigned Names and Numbers (ICANN) 145–6, 152, 157, 158
- WSIS debate over US control of 155–6
- Internet Engineering Steering Group (IESG) 145
- Internet Engineering Task Force (IETF) 145
- Internet protocols (TCP/IP) 144, 148
- Internet service providers (ISPs) 146–8, 152
- competition in ISP markets 152–3
 - deep packet inspection 157
- Internet Society (ISOC) 145
- Internet standards 145–6
- interoperability 32–4, 229
- technical barriers 348
- interstate commerce clause 367
- Interstate Commerce Commission 370
- investment 64–5
- Australia 482
 - in electricity markets 171–2
 - FDI, *see* foreign direct investment
 - incentives and regulation 45
 - India 430, 433
 - private investment in developing countries 491–512
 - railways 215
 - under-investment in oil 207–9
 - USA 379
 - water sector 314–15
- investment risks 35–6
- IPv4 address space 157–8
- IPv6 address space 157, 158
- Iran 189–90, 193, 207
- Iraq 207, 209, 210, 211
- Ireland 92–3
- Islam, R. 503
- Italy 276, 333–4
- Japan 89, 91, 96, 303, 334
- railways 221, 225, 226
- Ji Tong Communications Corporation 411, 413, 416
- joint ventures 298
- Joskow, P. 163, 164
- Kahn, A.E. 234–5, 368
- Kain, P. 273–5, 276, 287
- Kaufmann governance indicators 501, 507
- Kennedy Hearings 235
- kerosene 203, 204
- Kessides, I.N. 505
- key performance indicators (KPIs) 277
- Kirkpatrick, C. 394
- Kleindorfer, P.R. 28
- Knieps, G. 39, 216, 228
- Kosec, K. 321
- KPN 335
- Laffont, J.-J. 393, 394, 402
- landlord port model 294–5, 297, 301–7
- large-scale consumption 12–13
- Latin America 7, 22, 384–406, 498–9
- economic and infrastructure development indicators 386–90
 - gas 181–2, 184–5
 - institutional and political indicators 391–2
 - liberalization and privatization 390–91
 - rationale for and drivers of industry reform 392–9
 - regulation 394–5, 400–403
 - seaports 304–7
- Latin tradition 56
- laws/legislation 72, 73
- EU legislation and the member states 348
- lease contracts 298, 319, 494
- legal barriers to entry 30
- Leipziger, Z. 395
- levies 200
- Levine, M.E. 246
- licensing 298
- life expectancy at birth 386, 387–8
- lightness 44
- liquefied natural gas (LNG) 185, 187–90
- LNG trains 188
- liquefied petroleum gas (LPG) 186, 433
- Lisbon Treaty 59
- Littlechild, S. 163, 164, 166
- local loop unbundling 153
- Lockwood, S. 259
- long-run incremental cost (LRIC) 110–11
- long-term contracts (LTCs) 81, 172–3
- lorry road users charging (LRUC) scheme 252
- low-power incentives 18–19

- MacNeil, I.R. 17
 mail/letter postal segment 353–4
 Majone, G. 361
 management contracts 298, 494, 496
 manufacturing 97
 Marconi, G. 124, 125
 maritime ports, *see* seaports
 market creation paradigm 345–6, 359, 360, 362
 market entry 63, 228–9, 242, 244, 416
 barriers to 30–32, 348
 market failures 3, 26–7, 28, 29, 36, 49
 oil 198
 radio spectrum management 125
 market imperfections 200
 market management paradigm 345–6, 359, 360, 362
 market power 29, 30–32
 market regulation, *see* regulation
 market sides, externalities between 33
 markets and institutions model 189
 Martimort, D. 394
 Mathiesen, T.A. 276
 McCubbins, M.D. 15–16
 Melbourne 270, 278, 281–2
 Melbourne Citylink (MCL) 260
 Memorandums of Understanding (MoUs) 432, 438–9
 mergers and acquisitions 208–9, 242, 245–6, 496
 ‘mesh’ networks 135
 Metlink 278
 Mexico 306–7
 Microwave Communications Inc. (MCI) 106, 107, 108, 109–10, 113, 370
 Millennium Declaration 502
 Mills, G. 260
 Ministry of Information Industry (MII) (China) 412, 418
 Ministry of Post and Telecommunications (MPT) (China) 411–12, 417–18
 mobile phones 115, 115–16
 China 421, 422
 developing countries 118, 119
 India 431
 Internet access 153
 Latin America 386–9
 oligopoly policy 117–18
 price auctions for 3G licences 139–40
 Russia 461–2
 spectrum allocation to 3G services 131–2
 USA 113, 372
 modularity 166, 167–71
 and boundaries of market activities 167–8
 imperfect in electricity industries 168–9
 imperfect in electricity regulation 170–71
 timing and order of modularity decisions 171
 monopolies 35–6, 184
 end of in the postal sector 328
 EU and monopolistic elements 360–61
 natural, *see* natural monopolies
 telecoms 104, 105, 109–10
 theoretical justifications 111–12
 monopolistic bottlenecks, *see* bottlenecks
 Montoya, M.A. 400–401
 moral hazard 496
 Morrison, S.A. 247
 MTT 462
 multilingual domain names 158
 municipal ownership 93
 municipal public services 57
Mum v. Illinois 367

 Nash, A. 228
 Nash, C. 216–17, 230, 285
 nation building funds 481
 National Broadband Network (NBN) (Australia) 487
 National Electricity Market (NEM) (Australia) 476–7, 485, 487
 national oil companies (NOCs) 206, 207, 209, 211–12
 National Rivers Authority (NRA) (UK) 317
 National Road Transport Commission (NRTC) (Australia) 473
 national spectrum authorities 128–30
 National Water Initiative (NWI) (Australia) 477, 486
 nationalization 88, 94, 215
 natural (structural) barriers to entry 30–32
 natural gas, *see* gas
 natural monopolies 54, 493, 494
 railways 216, 218
 telecoms 104, 105
 policy protection for 109–10
 water 312
 see also monopolies
 natural states 20
 negotiated contracts 271–2, 273, 279–80
 neoclassical economics 368
 net cost contracts 272, 273
 Netherlands, The 253, 302–3, 333, 335
 network layers 39–40
 network neutrality (NN) 155
 new institutional economics (NIE) 70, 74–83
 evolutionary game theory 70, 80–83
 transaction cost economics 70, 74–80
 new market entrants 63, 228–9, 242, 244, 416
 new public management 270
 New Zealand 2, 333, 334

- Newbery, D.M. 171
 nodal pricing 169
 normative criteria 36–7, 38, 43–6, 49
 norms 72, 73, 80–83, 200, 201
 North, D. 20
 North American railway model 460
 Norway 2
- Office of Water Services (OFWAT) 317, 322
 oil 5–6, 197–214
 China 409, 410, 419
 India 429–30, 432–3, 437, 439–40, 442–3, 445–6
 organization and regulation 201, 204–10
 outlook 210–12
 state intervention 199–203
 value chain 198–200, 201–3
 oil crises 206–7, 210, 234
 oil prices 206–7, 208, 209–11, 449
 oil refineries 203
 oligopoly policy 117–18
 one-sided networks 39
 open access states 20
 Open Aviation Area (OAA) 237
 open skies agreements 235, 236, 237, 247–8
 operating licences 21
 operational performance regime 277
 operational policy/level 271
 operator opportunism 14–15
 operators, externalities between 33
 opportunism 11, 76
 governmental 12, 13–15, 20, 22, 23–4, 316
 third-party 12, 15–20, 22, 23–4
 ‘vanilla’ 12, 13
 water sector 315–16, 324
 Oregon 253
 Organisation for Economic Co-operation and Development (OECD) 186
 Competition Committee 217–19
 Organization of Petroleum Exporting Countries (OPEC) 200, 206–7, 208, 209–10, 212
 organizational dynamics 46
 over-supply of oil 207–9
 ownership regulation 42, 43
 ownership type
 and efficiency of seaports 295–6
 and performance of water utilities 321–2
 public ownership, *see* state ownership
 ownership regulation 42, 43
- Pacific region 303–4, 499, 500
 packet switching 147–8
 parcel segment 353–4
 Parker, D. 394
- passenger transport
 railways 216, 219, 220, 223, 356
 Russia 460, 461
 patronage growth 277, 280, 282–4
 pay-or-play regulation 62
 payment mechanisms 257, 258, 261
 peering interconnection agreements 148
 Pelkmans, J. 216, 218
 penetration rate of telephones 411, 412, 414, 421
 Pennsylvania, New Jersey and Maryland (PJM) power pool 377
 Penny Post 328
 Pérard, E. 321
 perfect markets 27–9
 performance
 implications of governmental opportunism 14
 key performance indicators 277
 radio spectrum management 130–33
 railway sector reforms and 226–7
 water utilities 321–2
 performance-based contracts 279–80
 performance-based payment system 261
 personal infrastructure 450
 Petchey, J. 480
 Petroleum and Natural Gas Regulatory Board (PNGRB) 443
 pilotage services 293, 298–9
 platforms 33
 political capture 15
 political contestability 20
 political stability 392
 political structure 89
 politicization 179, 180, 183–5, 192
 pooled-finance mechanism 444
 Popov, V. 463
 port authorities 290, 294–6, 297, 298
 ports, *see* seaports
 Post Danmark 333
 postal sector 6, 57–8, 60, 328–42
 country case studies 333–7
 EU 331, 333–6, 348–9, 353–5, 359, 360, 361
 open research questions 337–40
 origins of liberalization 328–9
 reform worldwide 329–33
 regulation 47, 331, 332, 339–40
 Russia 462–3, 465
 poverty alleviation programmes 503–4
 poverty reduction 502–6
 power shortages 377, 407, 419–20
 predatory pricing 242–3
 price auctions 138–40, 141
 price-cap regulation 41, 43, 339
 price regulation 41, 42, 43

- prices/pricing 36
 - air transport 242–3, 244–5
 - China energy sector 420
 - nodal 169
 - oil 206–7, 208, 209–11, 449
 - politicization of 13
 - postal sector 339
 - railways 227–8
 - roads 252–68
 - Russia
 - gas 458–9, 465
 - water 463–4, 465
 - telecoms 110–11
 - universal prices 94
 - wellhead gas prices 374
- private coordination 199, 205
- private finance initiative (PFI) 260–61, 491
- private firm/operator opportunism 14–15
- private gas companies 184, 192, 193, 194
- private governance structures 75, 79–80
- private non-profit organizations 323
- private sector participation
 - difficulties in developing countries 492–6
 - financing roads 252, 258–61, 264–6
 - seaports 296–7, 298
 - water sector 310, 312–13, 322–3
- private tolling 253, 254–5, 258–60
- privatization 8, 88, 95–7, 492–3
 - air transport 243
 - China 418–19
 - concession contracts as instruments of 21–3
 - Internet functions 152
 - Latin America 390–91, 392–3
 - oil 209
 - postal sector 333–4, 335–6
 - railways 220, 221, 224, 461
 - Russia 453, 458, 461
 - seaports 297, 301–7
 - water 310, 312, 313, 316–18, 321–2, 324
- production risk 273, 274
- productive efficiency 45
- Productivity Commission 481–2, 483, 484, 485, 486
- property rights 76–9
- pro-poor regulatory policies 504
- proportionality 43–4
- Prussia 91
- 'pseudo' balanced risk–benefit sharing DBFOs 261–4
- public contract scrutiny 15–16
- public contracting, *see* contracts/contracting
- public funding for USOs 62, 63
- public governance 75, 77–8
- public interest 56, 367–8
- public management 313, 320
- public ownership, *see* state ownership
- public policy 55–6, 64, 279
 - EU 349–50
- public–private partnerships (PPPs) 77, 78, 403, 491
 - roads 255–66
 - water 313–14, 318–19, 322, 324
- public services 4, 54–69
 - before liberalization 55–7
 - future for 66–7
 - impact of liberalization 57–8
 - railways and public service obligations 58, 217, 218
 - seaports and public service obligations 298–9
 - USOs, *see* universal service obligations
- public transport 6, 269–89
 - competitive tendering 271–2, 273–9, 280–82, 286–8
 - conceptual framework 271–3
 - future directions 286–8
 - impacts of liberalization 280–84
 - negotiated contracts 271–2, 273, 279–80
 - rationale for liberalization 270
 - regulatory cycle 284–6
 - risk allocation 272–3, 274
 - see also* railways
- Public Utility Commissioners (PUCs) 95, 96
- Qantas 476, 485
- Qatar 189–90, 193
- qualitative criteria 37, 38, 43–4, 49
- qualitative performance regime 277
- quantitative criteria 37, 38, 45–6, 49
- radio microwave technology 105, 106
- radio spectrum management 5, 123–43, 372
 - economic criteria 137–40
 - evolution and structure 125–30
 - international level 128, 129
 - management responsibilities 127–8
 - national level 128–30
 - performance 130–33
 - proposals to improve efficiency 133–6
 - regional level 128, 129
 - spectrum characteristics and growth in applications 124–5
 - USA 379
- railways 6, 58, 60, 66, 90–92, 215–33, 493
 - Australia 270, 472–3, 482–3, 487
 - cost savings 281–2
 - EU 215, 221, 222–5, 226, 228, 229, 348, 355–6, 359, 360, 361
 - Japan 221, 225, 226
 - key issues for future reforms 227–9

- patronage growth 284
- rationale for liberalization 270
- reform models 217–19
- reform practice 220–21
- reforms across the world 219–20
- reforms and performance 226–7
- regulation 48, 220, 356
 - regulatory cycle 285–6
- Russia 460–61, 465
- specificities of the sector 216–17, 218
- Sweden 222, 224, 225, 226
- UK 221, 222, 224–5, 226, 228, 282, 284, 285–6
- USA 215, 219, 221–2, 226
 - see also* public transport
- Ramsey pricing 111
- real-toll programme 264
- Red Line Agreement 199
- redistribution 28–9
- regional Bell operating companies (RBOCs) 108–9, 113–14, 116, 371
- regional energy commissions 456–7
- regional harmonization 135–6
- regional Internet address registries (RIRs) 145–6
- regions and empire model 189
- regulated integrated system 391
- regulation 4, 26–53
 - analytical framework to assess the need for 27–37, 38
 - economic foundations 27–9
 - normative criteria 36–7, 38, 43–6, 49
 - role of liberalization 35–6
 - sources for regulation 30–35
 - benefits from 45
 - of bottlenecks 30–32
 - application of the framework 37–48
 - China 423
 - contrasting operator and governmental opportunism 14–15
 - developing countries 497–8
 - modelling regulation and FDI 506–8
 - and poverty reduction 502–6
 - regulatory capacity 497–8
 - dynamic effects 37, 45–6, 49
 - electricity
 - imperfect modularity 170–71
 - unbundling between competitive and regulated activities 166–7
 - gas 179, 180–85, 193, 194
 - regulatory gas market models 193–4
 - India
 - electricity 439, 442
 - oil and gas 440, 443
 - Internet content 156–7
 - Latin America 394–5, 400–403
 - new institutional economics 77, 78–9
 - oil 201, 204–10
 - postal sector 47, 331, 332, 339–40
 - radio spectrum management 125–6
 - railways 48, 220, 285–6, 356
 - seaports 296–301
 - static effects 37, 45, 49
 - telecoms 47–8, 116–17, 119–20, 353, 400–401
 - transaction cost economics 77, 78–9
 - USA 366–83
 - models and approaches 369–77
 - USOs 63
 - water sector 312, 314, 317–18
 - regulations 72, 73
 - regulatory bodies 35
 - developing countries 498, 507–8
 - India 439, 440, 442, 443, 444–5
 - need for in the water sector 446
 - Latin America 400–401
 - railways 223
 - USA 369
 - water 317
 - regulatory capture 498, 502
 - regulatory cycle 284–6
 - regulatory dynamics 46
 - regulatory failures 27, 28, 29, 36, 49
 - regulatory governance 14
 - regulatory instruments 37, 40–42, 49
 - regulatory models 37, 38, 42–3, 49
 - regulatory risk 497
 - rehabilitate, operate and transfer (ROT) 297
 - relational contracting 16–17, 278–9, 287
 - remediableness test 19
 - renegotiation of contracts 21–3, 24, 402, 495
 - renewable energy 173–4, 191, 379
 - rents, struggle for in the oil sector 199–200, 211
 - re-regulation 8, 26, 27, 28
 - air transport 246–7
 - reserved areas 35, 330
 - resistance 315–16, 323
 - resource issues, Internet 157–8
 - resource nationalism 183
 - restricted-entry system 61
 - return-guaranteed DBFOs 261–4
 - revenue risk 273, 274
 - Rhineland model of economic policy 348
 - right-to-toll DBFOs 261–4
 - risk 46
 - investment risks 35–6
 - production 273, 274
 - regulatory 497
 - revenue 273, 274

- risk allocation 272–3, 274
 risk sharing 270
 roads 256–64
 water sector 318–19
 Rivera-Trujillo, C. 230
 road user charging 252, 253, 254, 261, 264, 265
 roads 6, 252–68, 493
 Australia 255, 260, 264, 473–4, 483, 487
 Chile 399
 DBFOs 256–8, 261
 types of 261–4
 drivers of liberalization 264–6
 overview of road-pricing measures and
 linked objectives 254
 PPPs 255–66
 private tolling 253, 254–5, 258–60
 Roberts, C. 482
 root servers 146
 Rossijskie Zhelesnye Dorogi (RZhD) 461
 Rostelecom 462, 465
 Rotterdam 302–3
 route moratorium 235
 Royal Dutch Shell 204
 rural areas
 China 420–22
 India 441–2
 Russia 2, 7–8, 448–70
 EBRD infrastructure index 450–52
 economy 449
 electricity 453–7, 464, 465–6
 energy 449, 452–9, 464–5
 Federal Law on Communication 462
 future perspectives 464–6
 gas 183, 188–90, 193, 457–9, 464–5
 liberalization and restructuring 452–64
 railways 460–61, 465
 telecoms 461–3, 465, 466
 transport 459–61, 465
 water and sanitation 463–4, 465
 Rutherford, M. 74
 safeguards 79, 79–80
 sales companies, energy 456
 sanitation
 developing countries 505–6
 India 430, 433, 438, 440–41, 443–4, 446
 Latin America 386, 387–8
 Russia 463–4, 465
 Santhakumar, S. 394
 Santiago 285, 399
 satellite-based road user charging 252, 253
 Saudi Arabia 208
 SBC 116
 scale, economies of 12–13, 109, 110, 241–2
 Scandinavian tradition 57
 Schwartz, T. 15–16
 scope, economies of 12–13
 seaports 6, 290–309
 Australia 304, 475–6, 484, 487
 economic analysis of activities 291
 infrastructure 292–3
 port authorities 290, 294–6, 297, 298
 port services 293–4
 privatization and liberalization 297, 301–7
 regulation 296–301
 sector-specific regulation, *see* regulation
 security
 issues and the Internet 156
 of supply 66
 selection criteria 275
 separation 41–2, 43
 technological separability 167
 vertical separation of China Telecom
 412–13
 vertical separation in the rail sector 216–17,
 220, 224, 230
 sequencing of reforms 171, 498
 Servén, L. 395–6
 services-based DBFOs 261–4
 services port model 295
 Seven Sisters 199, 205, 212
 shadow toll programme 264, 265
 Shaoul, J. 260–61
 Shapiro, P. 480
 shipping 91
 simple contracting scheme 17–18, 79, 80
 simplicity 44
 Singapore 295, 304
 single buyer scheme 390, 391
 Single Sky project 357
 slot allocation, airport 238–9, 357
 slot co-ordinators 239
 slot trading 239
 ‘smart’ antennae 134
 smart cards 445
 Smith, A. 284
Smyth v. Ames 368
 social infrastructure 450
 social rules 72–4
 social tariffs 504, 505
 socialism 88–9
 socio-political specificities 348–9
 software-defined radio (SDR) 134–5
 Solvoll, G. 276
 South Africa 2, 285
 Southwest Airlines 234, 246
 spam emails 156
 special purpose vehicles (SPVs) 258, 259
 specific purpose payments (SPPs) 480
 spectrum licence trading 140

- spectrum management, *see* radio spectrum management
- spectrum markets 137–8
- spread spectrum technologies 134
- Sprint 113
- stable monopolistic bottlenecks 32
- Standard Oil 199, 204, 212
- standards 200, 201
- Stanley, J.K. 273, 274, 278, 279
- state, *see* government/state
- state electricity boards (SEBs) 428–9, 438–9
- state oil companies 206, 207, 209, 211–12
- state ownership 54, 56, 90–92, 94, 491
- gas 184
 - oil 201
 - reform of state-owned enterprises in China 415–19
 - water 320, 321
- State Power Corporation of China (SPC) 416–17
- static effects of regulation 37, 45, 49
- Stern, J. 183, 184
- Stigler, G.J. 30
- strategic barriers to entry 30
- strategic policy/level 271
- Straub, S. 394
- structural (natural) barriers to entry 30–32
- structural separation 42, 43
- subsidiarity 44
- subsidies 243
- cross-subsidies, *see* cross-subsidies
- SUBTEL 398
- sunk investments 12, 12–13
- expropriation of sunk costs 13–15
- supporting industries 238–41, 294, 298, 356
- ‘sustainability of natural monopoly’ theory 112
- sustainable development 502–6
- Sweden 333, 334–5
- railways 222, 224, 225, 226
- Sweden Post 333, 334–5
- Sydney Cross-City Tunnel 265
- Sydney Harbour Tunnel (SHT) 260
- symmetry 44
- system manager, government as 84
- system-wide charging 252, 253, 254, 261, 264, 265
- Szyazinvest 462
- tactical policy/level 271
- taxes 200, 203
- TCP/IP protocol 144, 148
- technical barriers 348
- technical infrastructure 450
- technological leapfrogging 414
- technological separability 167
- technology
- alternative technologies 505
 - developments in radio spectrum management 133–5
 - gas sector 185
 - ICT convergence 133–4
 - institutional history and technological change 88–90, 95–6
 - mix in the electricity sector 172
 - and the postal sector 328, 329, 330
- Telecom Disputes and Settlement and Appellate Tribunal (TDSAT) 438, 441
- Telecom Regulatory Authority of India (TRAI) 438, 441
- telecommunications (telecoms) 5, 58, 60, 65, 90, 92, 103–22
- Australia 474–5, 484, 487
 - China 407, 411–14, 420–22, 423, 424
 - developing countries 118–19, 500
 - EU 115, 116–17, 150–51, 347, 352–3, 358, 359, 360, 361
 - global liberalization 115–18
 - growth in applications and use of the radio spectrum 124–5
 - ICT convergence 133–4
 - India 427–8, 431, 432, 434–8, 441–2, 444
 - Latin America 384, 385, 386–9, 390, 398–9, 400–401
 - liberalization and the Internet 115–16, 118, 119, 120, 150–52, 153, 154
 - mobile phones, *see* mobile phones
 - privatization 95–6
 - radio spectrum management, *see* radio spectrum management
 - regulation 47–8, 116–17, 119–20, 353, 400–401
 - Russia 461–3, 465, 466
 - USA 104–14, 116, 150, 369–72, 377–9
- Telstra 474–5, 484
- temporality 44
- tendered contracts 271–2, 273–9, 280–82, 286–8; *see also* bidding for contracts
- Tennessee Valley Authority (TVA) 375
- terminal interconnection 105–6, 151, 370
- terminals (seaports) 293, 299–301
- Ter-Minassian, T. 255
- termination of contracts 22–3
- territorial generating companies (TGCs) 455
- terrorism 210
- Texaco 204
- Thailand 303
- third party opportunism 12, 15–20, 22, 23–4
- basic framework of 18–20
- Thompson, L.S. 297

- Thredbo Conference Series 269, 275
Titanic 126
 TNT 335
 tolling 252–68
 tool port model 295
 top level domains (TLDs) 157, 158
 towing services 293, 299
 township and village enterprise (TVE) mines 409–10
 train operating companies 228
 transaction cost economics (TCE) 70, 74–80
 TransContainer 461, 465
 transit interconnection agreements 148
 transmission and distribution (T&D) losses 428–9, 432
 transmission system operators (TSOs) 168, 169
 transparency 44
 transport
 EU 358
 gas and 186
 Latin America 384, 385, 389, 399
 Russia 459–61, 465
 see also air transport; bus transport; railways; roads
 travel agents 240–41
 Trillas, F. 400–401
 Troesken, W. 15
 trust 279
 Turkish Petroleum Company 204–5
 turnpike roads 493
 Two-Airline policy (TAP) 476
 two-sided networks 39
- Ukraine 189
 ultra wide-band technology 134
 unbundling 66
 between competitive and regulated activities in the electricity sector 166–7
 Internet and telecoms liberalization 151, 153
 railways 220, 221, 222, 225
 under-investment in oil 207–9
 unemployment 506
 Unified Energy System of Russia Limited (RAO UES) 453, 454
 unions 316
 United Airlines 240–41
 United Kingdom (UK) 2, 89, 92, 94, 97, 347, 493
 bus transport 282–4, 285
 electricity 168, 169
 gas 181
 railways 221, 222, 224–5, 226, 228, 282, 284, 285–6
 roads 260, 264, 265
 seaports 303
 telecoms 114–15
 water sector 316–18, 321, 322, 323, 491
 United Nations
 Internet Governance Forum 156, 158
 Millennium Declaration 502
 United Nations Conference on Trade and Development (UNCTAD) 290
 United States of America (USA) 2, 7, 89, 91–2, 93, 95, 366–83
 air transport 234–5, 236, 237, 238, 239–40, 240–41, 242–3, 244, 245
 California 252, 376–7
 current challenges and opportunities 377–9
 Deregulation Act (1978) 234
 economic and legal context 366–9
 electricity 168–9, 375–7, 378, 379
 Energy Policy Act (1992) (EPAct) 376
 Federal Power Act (FPA) 375
 gas 180–81, 184–5, 188, 190, 373–5, 378
 Internet 145, 149, 152
 WSIS debate over US control of ICANN 155–6
 National Rural Electrification Act (REA) 375
 Natural Gas Act (1938) (NGA) 373
 Natural Gas Policy Act (1978) (NGPA) 374
 Natural Gas Wellhead Decontrol Act (1989) (NGWDA) 374
 oil 204, 205–6, 209, 210
 Oregon 253
 postal sector 334, 337, 340
 public contract scrutiny 15–16
 Public Utilities Holding Company Act (PUHCA) 375
 Public Utility Regulatory Policies Act (1978) (PURPA) 376
 Radio Act (1912) 126
 Radio Act (1927) 126
 railways 215, 219, 221–2, 226
 regulatory models and approaches 369–77
 Staggers Rail Act (1980) 222
 telecommunications 104–14, 116, 150, 369–72, 377–9
 economic debates 109–12
 liberalization 1984–98 113–14
 natural monopoly heritage 104
 reforms 1968–84 105–9
 Telecommunications Act (1996) 114, 115, 371
 water 22–3
 universal prices 94
 Universal Service Obligation (USO) Fund 441–2, 444
 universal service obligations (USOs) 32–4, 47, 59–63

- attributing in a liberalized market 61–2
- China 422
- criticism of the universal service concept 64–5
- designing 61–3
- emergence of 59–60
- funding mechanisms 62–3, 64
- and the future of public services 66–7
- Latin America 402
- postal sector 329, 330–31, 332, 338, 339–40, 354–5
- unofficial settlements (shanty towns) 504
- Urban Reform Incentive Fund 444
- urban/rural digital divide 420–22
- user-generated content 148–9
- users, externalities among 33

- valuation, instrumental 83–4
- value-added services (data processing) 107–8, 113, 150
- value chain
 - oil industry
 - activities and state intervention 201–3
 - and the struggle for rents 198–200
 - transformation and gas 180–85
 - values 72, 73, 80–83
 - Van de Velde, D.M. 271, 273, 274, 279
 - ‘vanilla opportunism’ 12, 12–13
 - Venezuela 182
 - Verizon 378
- vertical integration 19, 80–81
 - breakdown in the oil sector 206–7
 - disallowed in electricity reform 171–2
 - gas industry 180–81, 182
 - water 323
- vertical separation, *see* separation
- vertical tying 155
- Village Access Project (VAP) 422
- Virgin Blue 476, 485

- Wallis, I.P. 271–2, 280, 281
- Wallsten, S. 88, 321
- Washington Consensus 118, 312, 315
- Washington Radio Conference 126

- water sector 6, 22–3, 58, 60, 310–27, 493
 - Australia 477, 486, 487
 - characteristics 311–14
 - developing countries 310, 312, 315, 500, 502, 505–6
 - drivers towards reform 315–16
 - expectations of liberalization 322–3
 - India 430, 433, 438, 440–41, 443–4, 446
 - Latin America 386, 387–8, 398
 - mixed impact of changes 321–2
 - models of liberalization 316–20
 - organization 312–14
 - resistance 315–16, 323
 - Russia 463–4, 465
 - UK 316–18, 321, 322, 323, 491
- Weidman, U. 228
- welfare economics
 - impact of reforms in Latin America 396–7
 - theorems of 27–9
- wellhead gas prices 374
- Western Union 105, 369
- wholesale generation companies (OGCs) 454, 455
- wholesale market 455–6
- widespread consumption 12–13
- Williamson, O.E. 11, 17–18, 19, 74–5, 79, 166, 167
- winner’s curse 495
- wireless telecommunications, *see* mobile phones
- working conditions 34–5
- World Bank 118, 312
 - Private Participation in Infrastructure (PPI) database 492, 507
- World Summit on the Information Society (WSIS) 155–6
- World Trade Organization (WTO) 115, 118, 407, 414
- Worldcom 113

- Yvrande-Billon, A. 276

- Zeebrugge gas hub 188
- Zumwinkel, K. 336