concept of 419–20
project 229
social 97, 230
use with equity 419–20, 423–4
cost function analysis 9, 13–14, 30
averaged costs (AC) 15, 32
Box–Cox metric 12, 16–17, 24
Box–Tidwell cost function 12
Cobb–Douglas 15, 29
concept of 11
cost elasticity 13
econometric function 15
frontier approaches in 26–7
marginal costs (MC) 15, 32
measurement of productive efficiency 25–6
firm/time effect models 25
non-parametric methods 49, 62
data envelopment analysis (DEA) 27, 49
total factor productivity (TFP) 49
parametric methods 49, 62
deterministic frontier (DF) 49
least squares (LS) 49
stochastic frontier (SF) 49
Probit model 30–31
renewal cost 31–2
research 14–15
Tobit model 31
translog cost function 11, 17
credit 390
data envelopment analysis (DEA) 27–8, 33, 49, 55, 57, 62, 368
decision-making units (DMUs) 27, 49
Denmark 345
car ownership in 178
Copenhagen 348
PETRA model 186
discrete choice model
use in valuation of transport externalities 100–101
DP World 339
duality theory 11, 43
Dublin, L.L., *Money Value of Man, The* (1930) 154
economies of density 41, 43, 55–7, 59, 63–4, 66, 395
concept of 2
definitions of 46
exploitation of 40
impact of output heterogeneity on 47
loss of 361
potential exploitation of 66
economies of scale 2, 4, 11, 21, 39, 41, 43, 46, 55–7, 63, 66, 81, 218, 227, 276, 332, 395, 403
definitions of 46
impact of output heterogeneity on 47
loss of 361
road work 17, 26
user 192
economies of scope 2, 41, 63–4
diseconomies of scope 26
loss of 360–61
equity 430–31, 434–5
CBA in 419–20
aggregate social welfare differences 420
equity over time 423–4
social time preference rate (STPR) 424
concepts of 425–8
market 426
opportunity 426
output 426
in transport economics 418–19
income 426
needs definition 428–30
high level social goals 428
rationale (need) 428–9
process 433
weights 420–22
distributional equity 422
European Commission 390
CGEurope model 227
rail policy of 360
White Paper on ‘Fair Payment for Infrastructure Use’ (1998) 408
European Court of Justice 38
European Economic Community (EEC) Regulation No. 95/93 141
European Railway Agency (ERA) 414
European Union (EU) 21, 266, 332, 416
car ownership in 173, 176
Cohesion Fund (CF) 414
Directive 2001/14/EC 139–40, 146
Directive 2003/96/EC 412
Directive 91/440/EC 345
Emissions Trading Scheme (ETS) 413
European Investment Bank (EIB) 414
European Regional Development Fund (ERDF) 414
Regulation 1370/2007 38
Single European Sky ATM Research 413
SOFTICE project 71
Trans-European Core Network 410
Trans-European Networks for Transportation (TEN-T) 414–15
Connecting Europe Facility (CEF) 414
European Rail Traffic Management System (ERTMS) 415
Index  439

transport policy programme of 412
White Paper on ‘Competitive and Sustainable Transport’ (2011) 412
external economies/diseconomies 403
definitions of 403–5
internalisation of 403, 405–7
Baumol–Oates pricing 407
bundle of pricing/non-pricing instruments 408, 410–11
High Level Group on Transport
   Infrastructure Pricing concept 410
target-based 411

Finland 26
France 345
car ownership in 176
public transport contracts in 348
union of transport operators (UTP) 353
freight transport 71
agents involved in 213–14, 216–17
air 71
   use of passenger transport planes 220
carriers
   fourth party logistics (4PL) 213
   third party logistics (3PL) 213
charges 72
port 72
cost 71–2, 74–7, 88
   backloading 85–7
drivers 71, 73
sunk 73
demand 212
   built to store (BTS) 217–18
   definitions of 212–13
drivers of choices in 217–18
just-in-time (JIT) 217
origin–destination (OD) flows 215–16, 223–5, 227
production–consumption (PC) flows 215–16, 223–5
typology of choices 214–15
interactive decision-making in 230
modelling 221, 225–6
   ADA model 223–4, 227–8
   CGE models 227
components 225
data 221
   SCGE models 227
   structure 222–4
pipeline mode 71, 75–6
policy development 230–32
logistics 231
spatial planning 231
rail 40–41, 81, 219–20
components of rail journey 82–3
costs 80–81, 83–5
networks 218–19
South and West Yorkshire Multi-Model Study (SWYMMS) 80, 82
traffic 81
road 72, 219
costs 76–8
lorry monetary cost function 78–9
sea 71
twenty-foot equivalent units (TEUs) 220
value of transport time savings (VTTS) 228–30
varying attributes 228–9
Freight Transport Association (FTA) 78
generalised cost function 228, 243
   average 245
Geographic Information System (GIS) 202
Germany 60, 249, 325, 348, 367, 395
   competitive tendering in
   bus services 350
   of TOCs 59
Deutsche Bahn AG 413
Frankfurt 324
Ministry of Transport 413
transport operators (VDV) 353
Gini coefficient 377–8
Global Financial Crisis (2007–9) 339
   impact on car ownership 176–7
greenhouse gases 219
   emissions 399, 429, 435
Hasselstrom, D.
   Random Departure Time (RDT) algorithms 205
heavy goods vehicles (HGV) 81
   charges targeting 413–14
hedonic cost function 47
Hensher, D.A.
   role in development of IACE and MIGI 230
Herfindhal–Hirshman Index (HHI) 376–7
High Level Group on Transport Infrastructure Charging
   Final Report (1999) 408
Hutchison 339
Iceland
   car ownership in 178
India 61
infrastructure costs 1–2, 9–10, 24, 33, 45, 55, 81, 261, 362, 365, 410
   analysis 38
   examples of 10
   output definition 12

Chris Nash - 9780857937933
Downloaded from Elgar Online at 12/29/2018 08:31:43PM
via free access
ports 329
rail 14, 31, 43
studies 21
renewal costs 30
road 14, 16, 21, 31–2, 43
highway construction 26
maintenance/renewal costs 17
interactive decision-making
interactive agency choice experiments
(IACE) 230
minimum information group inference
(MIGI) 230
Intergovernmental Panel on Climate Change
(IPCC) 411, 416
International Association of Public Transport
(UITP) 356
International Business Machines (IBM)
Corporation
Liberalisation Index 369
investment 1, 3–5, 42, 71, 134, 145, 151–2,
229–31, 237, 248–50, 254, 262, 266, 276,
312, 322, 325, 350
airport 309–11, 313–14, 316–17
costs 313
inappropriate 41
infrastructure 220, 222
over- 145
ports 337
public 155, 161, 322
railway 219, 231, 322–3
return on 314
road infrastructure 112, 244–8
transport 6, 304
underinvestment 315
Italy 205–6
car ownership in 178
freight transport models in 226
Milan 4, 252–3
Japan
bus market of 347
car ownership in 173
passenger railway of 367
Khaled, M.S.
Box–Cox metric 12
labour 62, 64
impact of journey time on 392–3
market 164
measurement of 41
value of 154
least squares (LS) 49
light commercial vehicles (LCVs) 189
London School of Economics (LSE) 431
Lotka, A.
Money Value of Man, The (1930) 154
Luxembourg
car ownership in 176, 178
macroeconomics 390, 395
Malaysia 75
marginal rate of substitution (MRS) 158,
160
Marshall, Alfred 405
Meade, James 404
microeconomics 389, 397
hedonic pricing 103–4
concept of 103
mixed logit (ML)
constrained estimator 12
estimates 52
use in valuation of transport externalities
102, 105
multinomial logit (MNL) model
use in public transport activity models
204
use in valuation of transport externalities
101–2, 105
neoclassical economics 47
neoliberalism 345
Netherlands 178, 227, 345
Amsterdam 145
car ownership in 176
National Travel Survey (OVG) 179, 181
Landelijk Model Systeem (LMS)
181–4
New Economic Geography 251
New Public Management 345
New Zealand 28
local/regional bus transport sector of 347
rail infrastructure of
privatisation of 359
nitrogen dioxide (NO2)
emissions of 96
North, Douglas C.
definition of dynamic efficiency 405
Norway
economy of 227
national freight model of 228
Norway’s National Transport Plan 2010–19
428
ordinary least squares (OLS)
modelling 52
Organisation for Economic Co-operation and
Development (OECD) 159
member states of 166, 367
VSL transfer within 166–7
Index

Petty, Sir William 154
Pigou, Arthur C. 403
concept of externalities 403
Economics of Welfare (1920) 404
tax theory 6, 93–4, 98, 106, 319, 321, 326, 405–6
port pricing 329–33, 338–40
cost-based pricing 332
cost-plus pricing 338
freight price 334–5
landlord ports 333
models 337
port-calling costs 329, 333
principles 331–2
structure of 332–5, 337
surcharges 338
terminal-handling cost (THC) 332–4
transport costs 331–2
fluctuation of 337
privatisation 1, 5, 55, 59, 66, 310, 346–9, 356, 364
airports 324
declining efficiency due to 65
of bus services 396
of rail infrastructure 219, 359, 366–8
public transport 40, 65, 192, 266–7, 300, 345–6, 354–5
accessibility of 183
choice models 204–5
competitive regulation 347–9
yardstick competition 348
competitive tendering 347–8
cost structure of companies 63–4
fixed costs 64
demand 196, 206
features 192
deregulation of 346–7
efficiency variation 64–5
elasticity 193–4, 197, 200–201
conditional 201
estimation of 195
long-run 199
of demand 194
price 195–6, 198, 200
publication of 197
season tickets 201
short-run 199
flow level models 202–3
Geographically Weighted Regression (GWR) 202–4
use in direct demand models 203
heterogeneity 65–6
impact measurement 349–51
efficiency studies 351–2
quantitative research 349, 354–6
studies on functioning of regulatory regime 352–4
inter-urban 294–5, 299–300, 305
Long Distance Model 205
market 196, 199–200
shares 193
networks 205–6
EMME/2 model 205–6
secondary road 295
VIPS model 205–6
non-car ownership (NC) 198
non-urban 295
output variables 61–2
PLANET Long Distance Model 205–6
pricing 260, 262–5, 271, 275–6, 278–81, 296–9, 304–5
average social cost (AC) 260, 293, 297, 304
boarding/alighting 287–8
door-to-door trip costs 260–61
fare differentiation 300–301
fare prices 272–8
generalized cost (GC) 260, 263, 266, 293, 296, 299, 304
joint products 299
marginal social cost (MC) 260, 263, 265–6, 304–5
occupancy charge 286, 301–2
off-peak fares 288–90
open tariffs 303
peak-load 282–5
policy 280–81
price-relevant cost 271–2
social surplus maximization 303–4
reform 347, 349, 353
rural 61
trip end models 201–2
urban 61–2, 262, 267
buses 272–6, 285–7, 289–91, 293
commuter traffic 281–2
network designs 268
optimization/pricing reform 292–4
producer costs 269
user costs 269–71
use of MNL models 204
PSA 339
Puckett, S.M.
role in development of IACE and MIGI 230
rail/railways 152, 182, 218, 322–3, 359
congestion 134–6, 142–4
capacity 145–8
capacity charges 140, 146
infrastructure manager (IM) 142, 146
slot allocation 142–4
timetabling 139–42
track capacity 136
freight 40–41, 218–19
high-speed (HSR) 261, 322–3
ownership 360–61
holding company model 360
passenger transport 40–41
potential impact of reform on 361–3, 367, 369–70
investment incentives 362–3
measurement of 364–7
vertical separation 361–2, 367–9
privatisation of 219, 359, 366–8
surface 41
Reagan, Ronald 345
returns to density (RtD) 45–6, 57
definitions of 55, 57
in TOCs 57
returns to scale (RTS) 46, 57
definitions of 55, 57
measurement of 15
revealed preference (RP) 93, 98–9, 104
road congestion 112, 121–2, 129–31, 134–5, 137–8
definitions of 113
efficiency 138
hypercongestion 119–20
networks
speed–flow curve 123–5
supply curve 122–3, 125–6, 129–30
traffic flow 118–19
traffic level prediction 114, 116–17
supply–demand analysis 112–14, 120
Road Haulage Association (RHA) 78
road infrastructure 237, 249, 254
external costs 248–50
accidents 248
air pollution 248, 253
climate change 248
noise 248
tolling 249
investment 112, 244–6, 248
capacity 245, 247–8
congestion issues 245–6
costs 247
models 250–51
pricing 241, 248, 253–4
bottlenecks 237–8, 240–42
congestion charge 252
equilibrium generalised cost 238–9, 243–4
generalised 242
urban road 251–2
road transport demand 173–4, 182–4
Automatic Number Plate Recognition (ANPR) 185
car ownership 173, 179, 185, 294
estimation of 178–9
impact of Global Financial Crisis on 176–7
variations in 174–8
car traffic 186–7, 189–90
growth 187–8
car travel 179–80
home-based (HB) purposes 179
mode and destination choice (MDC) models 183
non-home-based (NHB) purposes 179
tour frequency (TF) model 181
Russian Federation

car ownership in 173
secrecy 134–5, 138–9
en route 137
nodes 137
seemingly unrelated regression (SUR) model 11–12, 44
Singapore 130, 251
Society of Actuaries 163
South Korea
passenger railway of 367
Spain
Las Palmas de Gran Canaria 107
stated choice (SC) 99
advantages of 99–100
issues of 99
models
use in estimation of WTP 106–7
stated intention (SI) 204
stated preference (SP) 93, 98–9, 105, 204
panel nature of 102
Stiglitz, Joseph E.
definition of dynamic efficiency 405
stochastic frontier (SF) measurement of DMUs 49
stochastic frontier analysis (SFA) 29, 33
concept of 28–9
sulphur dioxide (SO2) emissions of 96
Sweden 60, 293, 325, 345, 360, 367
car ownership in 176
competitive tendering of TOCs in 59
Lerum 106
national freight model of 228
rail market of
use of PRAISE model 206
SAMPERS model 186
Stockholm 4, 237, 250, 252–3, 298
Switzerland 249, 325
car ownership in 176
Zurich 106
terminal operating companies (TOCs) 57, 59, 338–9
competitive tendering 59
costs 54–5
franchising 60–61
failure 59–60
performance 59
studies of 55
RtD in 57
transformation function 55
Thatcher, Margaret 345
administration of 390
total factor productivity (TFP) 48–9
growth 25–6
causes of 48
decomposition of 25
measurement of DMUs 49
translog hedonic cost function 55
transport externalities 97–8, 109
air pollution 96–7, 105–6
case studies 104–7
concept of 93–4
fuel consumption 95
noise 97, 105–6
road accidents 95–6
spatial segregation/community severance (CS) 97, 105, 107
concept of 107
tavel delays 94–5
valuation of 98–9
data types 98–9
use of discrete choice model 100–101
use of ML model 102, 105
use of MNL model 101–2, 105
transport policy impact 389–90, 395–6, 400–401
Land Use Transport Interaction (LUTI) model 394, 401
macroeconomic model 390–94
accessibility indicators 391–2
productivity 391–3
microeconomic models 397–9
technical changes 399–400
use of SCGE models 394
transportation operations 38–9
cost function estimation 43–4
efficiency methods 47–9
heterogeneity issues 50–53
technical efficiency 48–9
environment 42
government intervention in 42
outputs 39–40, 44–7
heterogeneity 46
passenger train 53–4
data issues 53–4
methods 54–5
structure of 55, 57
rail 40–41, 53
Turkey
passenger railway of 367

Union Internationale des Chemins de Fer (UIC) 365, 368
International Railway Statistics database 365
United Kingdom (UK) 28, 73, 83, 87, 178–9, 189–90, 201, 325, 330, 345, 367, 390, 395–6, 435
Annual Road Traffic Statistics 187
Annual Average Daily Flow (AADF) 187
Automatic Traffic Counters (ATC) 187
Birmingham 401
British Railways 72
bus market of
QBM model 206
Cambridge 122–4
car ownership in 174
Central Electricity Generating Board 72
Department for Transport (DfT) 61, 76, 88, 174, 176–7, 179–80, 392, 401
National Travel Surveys (NTS) 179, 181–2, 184–5, 188–9, 192–3, 400
National Trip End Model (NTEM) 179–80, 182
WebTAG 392–3, 401, 422
goVERNMENT OF 76
High Speed 2 (HS2) 205, 392, 401
Leeds 40, 401
Local Transport Act (2000) 419
London 4, 40, 57, 145, 237, 252–3, 348, 352, 396
congestion charge 252, 397
Crossrail 401
long-distance coach market of 347, 352
Manchester 40, 401
motorway system of 184–5
National Express 396
National Transport Model 185
Network Rail 362–3
Office of Rail and Road (ORR) 28–9, 33, 60–61
Ordinance Survey 202
rail industry of 51, 61, 83–4
capacity charges 140
franchise failure 59–60
use of PRAISE model 206
vertical separation in 368
Railtrack 367
Transport and Road Research Laboratory
Black Book (1980) 197
White Book (2003) 197
Transport for London (TfL) 206
Business Case Development Manual 197
Treasury 424
support for distributional equity weights 422
York 122–3
United Nations (UN)
    Brundtland Report (1987) 415
United States of America (USA) 5, 28, 63, 150, 154, 201, 345, 359
Airline Deregulatory Act (1978) 371
Airlines for America (A4A) 383–4
    Airline Cost Index 383
    formerly Air Transport Association 382
American Public Transportation Association 352
Amtrak 359
Boston, MA 186
car ownership in 173
Chicago, IL 423
Civil Aeronautics Board (CAB) 149, 371, 381
    standard industry fare level (SIFL) 381–2
Department of Labor
    Bureau of Labor Statistics 163
Department of Transport (DOT) 352, 372
    Federal Transit Administration 352
    Federal Aviation Administration (FAA) 149
government of 72, 371
Portland, OR 186
rail infrastructure of 365
San Francisco, CA 186
Seattle, WA 186
Staggers Act (1980) 359
University of California
    Telecommunications and Travel Research
        Behaviour Program 400
Vickrey, William
    bottleneck model for pricing road links 237
willingness to accept (WTA) 99
willingness to pay (WTP) 108, 165
    estimation of 98–9, 104–5
        use of SC models in 106–7
        measures 101
    survival probability 162
        increased 158
        private product for aiding 164
        reduction 160
World Bank 331
    support for distributional equity weights 422
World Health Organization (WHO) 416