## Index

AASHO road test 104

absolute price data, Armington
- elasticities estimation with 125–6, 128, 129

access
- infrastructure and change in 94
to external knowledge 332–3, 341

access time, trip mode choice 242–3

accessibility
- in commuting and economic milieu
  study 303, 304
- highway projects and enhanced 25
  Herb Gray Parkway 38, 40, 41
  railways and regional growth (study) 10, 11–13, 14
  travel behaviour, Japan 295–6, 297, 298

Acemoglu, D. 334

aeronautical revenue (HKIA) 184, 185, 186, 191

agglomeration economy, in
- transportation model 50, 66–7

aggregate cost function, in
- transportation model 55–6

aggregate demand function, in
- transportation model 53, 60

aggregate economy, infrastructure
- capital and productivity of 63–6

aggregate supply of transportation, in
- transportation model 48–9, 55

aging infrastructure 77, 82

aging population 239, 286, 287, 294–5

air pollution, congestion and 84

air space, and airport capacity 173, 179

air traffic control (ATC) 173

aircraft movement (HKIA) 179, 180, 181–2, 185, 190

aircraft parking charges (HKIA) 176, 179

aircraft rotation (HKIA) 176–7, 184, 185, 186, 190, 191

Airport Authority (AA)
- airport charges
  - cost recovery obligation 178, 193
dispute between airlines and 176, 178
  - effect of increase in 191
effect of reduction on 184–6, 194
Asian financial crisis and revenue
- loss 175
- estimation of HKIA capacity 179
- raising of airport departure tax 179

airport capacity
- air space and 173, 179
- airport services and 173

HKIA 175–6, 179
- and pricing 174
- airport charges
  - balancing of demand and capacity 174
  - early studies 174
  - and infrastructure life cycle (study) 173–96
- benefits of varying 174
- early stage 173–4, 195
- final/later stage 174, 189–92, 195
- future research 195–6

Hong Kong International Airport 174
- background information 175–81
- concluding remarks 194–6
- cost–benefit analysis (CBA) 181–4
discussion 192–4
- illustrative analysis of CBA 184–92
- reductions 177, 178, 181
- low demand and cuts in 175
- airport departure tax (HKIA) 179
- airport infrastructure
  - spatial economic impacts 79
spillover effects on manufacturing cost 79
US national-level investigation study 91, 93
US northeast megaregion 84
contribution to regional development 88, 90, 91, 92, 96
Airport Ordinance (Hong Kong) 178, 194
airport parking 173
airport services, and airport capacity 173
airports, major Asian 175, 176, 182
Akershus 18
Allen, W.B. 168
Almeida, P. 342
Alternative Financing and Procurement model (Ontario) 26–7
Ambassador Bridge (Ontario) 25, 26, 39, 40
American Public Transportation Association 88
Amtrak 84, 88
Anderson, J. 146
Andersson, Å.E. 80, 93, 325, 343, 344
Andersson, M. 303, 340
Annual Survey of State and Local Government Finances and Census of Governments 88
apples and oranges comparison, regional impact of infrastructure 93–4, 97
Armington elasticities 123
in multi-regional trade, Japan conclusion 143–4
estimation methodologies 124–32
with absolute price data 125–6, 128, 129
by cross-sectional data 126, 128, 129, 144
by panel data 127–8, 144
OLS model 129–32
problems and limitations 128
with relative price data 126, 128, 129–32
without price data 125, 127, 128
formulation of CES model 123–4
output of estimation case of 45 prefectures 138
case of 780 cities 138–43
parameter estimation 133–7
TDB data set 132, 133, 137, 144
Aschauer, D.A. 65, 78–9
Asia 87, 326, 345
Asian Financial Crisis (1997–98) 175, 194
Asian Pacific airports 175, 176, 182
Atlantic magazine 321
attitudes, trip mode choice 230
auction system (Norway) 16
Audretsch, D. 333
auto users and congestion 230
and trip cost 230
see also cars
automotive industry, Herb Gray Parkway and 39
availability payments, Herb Gray Parkway 26–7
aviation activities, airport charges and 183–4
Bagley, M.N. 230
balanced budget policy 49, 57
Ballester, C. 205
Baltimore 82, 84, 87
Barnhart, C. 174
Barnstable Town 82, 84
basic equilibrium level of infrastructure 49, 50, 56–7, 74
Basic Survey on Wage Structure (Japan) 151, 158
Basso, L.J. 174
Beijing 326
Bergslagen 18
Berndt, E.R. 79
Berry S. 234, 236
bifurcation, capabilities and innovation dynamics 335–8
blocking effect, correlation of discount points 274–5
BLP methodology 234, 235, 236, 243
Blum, U. 80
Boarnet, M.G. 79
Borins, S.F. 174
Index

Boston 82, 84, 87
break-even requirement (airport) 173, 174, 193–4
Bridgeport (Connecticut) 82
Bröcker, J. 130
Brueckner, J.K. 247
bus markets 230
Bush, V. 321
business travel (Japan) frequency 291, 292, 293
Button, K. 184

Cabrales, A. 205, 206, 221
Calgene 322
Canada–US Automotive Products Agreement (1965) 39
Canadian highway project, see Herb Gray Parkway
Canadian IO accounts 30–31, 33
Cantos, P. 80
Cantwell, J. 332, 342
Cao, X. 230
capital, and growth 95
capital stock, US northeast megaregion 82–4, 87
cargo volume (HKIA) 182, 184, 185, 186, 190, 191
Carlin, A. 174
cars
ESAL calculation of road damage 104
infrastructure development and mileage 230
toll pricing, leading vehicles to durable roads 103–4, 121
see also auto users
Cathay Pacific 182, 186
cattle, genetically modified 322
causality, infrastructure and development 95–6, 97
central business district (CBD), urban spatial structure study 206, 207, 208, 212, 214, 215, 217, 220, 221
centralized market equilibrium price 258–9, 261, 262, 269, 270, 277, 281–2
centralized price determination 249, 261
center–periphery industrial reallocation, Scandinavia 18–20
Cervero, R. 230
Chatman, D.G. 230
Chen, Z. 89, 96
China 326
Chu, C.P. 103, 117
C.I.F. price
Armington elasticities estimation study 124
transport cost analysis study 146
cities
Armington elasticities estimation study 138–43
most productive scientific (2008–10) 327, 328
railways and industrialization, Scandinavia 10, 11–12, 15, 16
see also urban development; urban regions; urban retail study;
urban spatial structure (studies)
city centers
parking prices and spatial allocation 247
revitalization, Japan 245
city ferries 91
clinical medicine, gene therapy 322
closed CRS economies, transportation model, see transportation modeling
club organization see discount point systems
co-authorships (scientific) 325, 326, 329
Cobb–Douglas production function 93, 133
Cohen, J. 79
Cohen, W.M. 331
collaboration (scientific) and access to external knowledge 333
advantages of 322–3
economies of scale in 346
international 326
value of publications 324–5
Combes, P.-P. 146–7
commercial buildings, consumer visits to large 245
commercial development, Herb Gray Parkway 38
commercial districts, consumer choice 245, 247
commercial revenue (HKIA) 184–5, 186, 191
common agency problem 248
commuter rail 84, 87, 94
commuting and the economic milieu (Sweden) 299–313
data 308–9
discussion 312–13
model and method 305–8
results 309–12
spatial interaction theory 300–305
compact city 239
compactification 278
comparative analysis, US infrastructure and development 88–93
conclusion 96–7
discussion 93–6
competition in land, and population distribution 206
multipurpose shopping and 247
transport cost study 149, 150, 154, 155, 157, 163, 167, 168, 169
see also modal competition; price competition; spatial competition; worker competition
complementarity effects, transport mode 80, 94
computable general equilibrium (CGE) models
economic impact studies 89–90, 183
see also Spatial Computable General Equilibrium (CGE) models
Concord (New Hampshire) 82–4
congestion
airport charges and containment of 174
auto users and 230
and flight delays 179, 193
infrastructure capacity and 173
optimal level 59
supply of aggregate transportation 55
toll pricing study 101, 109, 114
transportation and level of 56
US highways 82, 84
conjunction phenomena (knowledge) 342–3
Connecticut 82, 84, 87
consolidated truck services 168
Constant Elasticity of Substitution (CES) model
Armington elasticities for spatial segmentation 123–4
incentives to innovate 328–30
infrastructure and regional development 90, 93
production theory and scientific collaboration 323
construction, and structural transformation, Herb Gray Parkway 39–40
construction employment, Herb Gray Parkway 32, 36
consumer behaviour
discount systems and repetitive 278
urban retail study
spontaneous discount point model 264–5
strategic pricing model 255–6
consumer choice, commercial districts 245, 247
consumer surplus
evaluation, ZIP model 289
strategic pricing model 257–8, 260–61
toll pricing study 105, 109, 117, 120, 121
in transportation model 54, 65, 69
consumption of compound goods, trips for, see demand for
control function method, and residential sorting 231, 233–9, 241–2, 243
Cook, L.M. 78–9
correlation of discount points 263–4, 278
blocking effect 274–5
cost of aggregate transportation, in transportation model 55–6
cost minimization, in transportation model 50, 54, 56, 58, 59, 68, 74
cost recovery obligation, Airport Authority 178, 193
cost savings
increase in flow of transportation and 66
investments in infrastructure and 65
cost–benefit analysis (CBA), airport pricing 174, 181–4, 196
illuminative analysis 184–92
county level, railways and industrialization, Sweden 13–15
Cramér theorem 308
Crick, F. 321
Cross-Border Institute (University of Windsor) 28, 31, 38
cross-border movement
Herb Gray Parkway and 38, 39
utility from commuting, Sweden 303, 311, 313
cross-sectional data, Armington elasticities estimation 126, 128, 129, 144
crowding out, and industrial dispersion, Sweden 20, 21
CRS economies, transportation model, see transportation modeling
CSX 84
cumulative shopping 248, 251
customer enclosure effect 248, 251, 264
czerny, A.I. 174
Daniel, J.I. 174
decentralized equilibrium level of infrastructure 49, 58–9, 60–61, 63, 69
decentralized market equilibrium price 259–60, 262, 281–2, 284–5
decentralized price determination 249, 261, 277
deficits, optimal toll pricing 105, 113
deindustrialization 18, 20
Delaware 84, 87
delays
in convergence of growth and per capita incomes 346
in R&D and innovation 320–22
in travel 38, 40, 82, 174, 179, 193
Delta method 300, 308, 315–16
demand for airport services
Asian financial crisis and low 175
HKIA
capacity constraint 179
price elasticity 175, 181–2, 184, 186, 188–9, 190, 191
matching supply with 174
demand estimation models 236
demand externalities 245
internalization 245–6
multipurpose shopping 247, 248–51
price coordination failure 246
see also discount point systems
demand for \( t_v \), transportation model 48, 49–50, 54–5, 61, 73
density, railway infrastructure (Scandinavia) 11, 13, 14, 16
derived-demand transportation 47, 48;
seeing also demand for \( t_v \)
deterrent effect, discount point systems with right of expulsion 273–4
Detroit River Bridge 25, 27, 38
developing economies, investments in infrastructure 65
developing stage, economic impact of infrastructure 93–4
deviation from price strategy 250, 252, 254, 269–71
assessing 276
deterrent effect of right of expulsion 273–4
direct effects, airport charges 183, 184, 186, 190, 191
direct employment effects, Herb Gray Parkway 28, 29, 30, 33, 34, 35, 36, 37, 41
direct survey method 231
direct utility
from commuting 300, 301
of telecommunications 65
toll pricing study 107, 111, 116, 119
in transportation model 47, 55, 66, 68, 69
discount point model with the right of expulsion 253–4
blocking effect of correlation 274–5
deterrent effect for deviation 273–4
equilibrium solution 272–3
policy implications 275–7
precondition of model 271–2
discount point systems
economic value 278
expulsion
ensuring possibility of 276
penalties 276
internalization of demand externalities 248
price adjustment mechanism 246, 252
price coordination effect 252–4
roles of 251–2
scale effect 246
see also spontaneous discount point model
discrete choice models
endogenous formation of urban structure 233–9
freight value of time 169
discriminatory toll pricing 102, 104, 111, 114–18, 118–20, 121
distance
and knowledge flows 333, 339
overnight travel study 295, 296
and scientific interaction 346
transport cost analysis 146, 147, 148, 149, 150, 152, 156, 157, 161, 165, 166, 167, 169
urban spatial structure study 205, 206, 212–21
distance decay function 302, 344
domestic trade, Armington elasticities estimation 125–6, 128
Dover (Delaware) 84, 87
Dragonair 181–2, 186
drivers’ wage, transport cost study 147, 148, 149, 151, 157, 158, 161, 165, 169
Duffy-Deno, K. T. 79
Duncan, M. 230
East Nippon Express Company 158
Eaton, B. 247
Eberts, R. 79
economic development theories 95
economic growth
general equilibrium approach, assessing infrastructure and 47–70
TDL sector and 40
see also national economic growth; regional economic development
economic impacts
highway projects 24–5
see also Herb Gray Parkway
reduced airport charges 183–4
economic milieu, commuting and, Sweden 299–313
data 308–9
discussion 312–13
model and method 305–8
results 309–12
spatial interaction theory 300–305
economic value, discount point systems 278
economies of scale
infrastructure and generation of demand-side 47
and level of infrastructure 62–3
and public transportation 229, 230, 243
in scientific interaction 325, 346
transport cost study 147, 165, 167, 168
economy of scope 247
education, and travel behaviour 302, 309, 310, 311, 312
efficiency
of capital, knowledge and 319
of toll pricing 101, 103, 113, 115, 116–17, 119, 120, 121
of transport systems 50, 68, 146
Eisner, R. 65
Ejermo, O. 303
elasticity of factor substitution (CGE model) 89–90
elderly people, and travel generation 294–5
EM (expectation-maximization) algorithm 289
emission reductions, Herb Gray Parkway 38
emotional utility, travel mode choice 229, 232, 243
empirical model, commuting and the economic milieu 307–8
employment effects
airport charges, HKIA 181, 183, 184, 185, 186–7, 188–9, 191
highway projects 24, 25
Herb Gray Parkway 27–38, 41, 44–5
enclosure effect of customers 248, 251, 264
endogeneity
in discrete choice models 234–5
OLS estimation, transport costs 155–6
Index

endogeneity bias, in modeling 161, 231–2, 233, 243
endogenous growth 95–6
energy consumption, congestion and 84
Engle, R. 127
equilibrium levels
   social interaction 208–11, 223–8
   see also high equilibrium; low equilibrium
equilibrium solution, price determination 253, 262–71
error correction models (ECM), Armington elasticities estimation 127–8, 129, 144
ESAL 104
estimation bias, in unimodal studies 80
Ethier, W.J. 48, 61
Eurocontrol 196
Europe 21, 87, 325, 326, 345
evolved stage, economic impact of infrastructure 94
exogenous growth 95
expulsion, from discount point systems, see discount point model with the right of expulsion
external knowledge
   conjunction of internal and 339–45
   creation of, in science and industry 326–7
   of firms 331–3
   and innovation capacity 334
face-to-face interaction 1
   urban spatial structure 205–22
   concluding remarks 221–2
   interplay of social and physical distance 212–21
   social interaction model 206–12
Fan, T. 174
Federal Highway Administration (US) 88, 104
Federal Transit Administration (US) 84
feeder services, hub development 193
Feldman, M. 333
Feo-Valero, M. 169
Fernald, J.G. 56
firms
   capabilities and innovation dynamics 335–9
   innovation strategy and capacity 334–5
   internal and external knowledge 229, 331–3
fiscal policy, in transportation model 49, 57
fixed cost, trip mode choice 230
fixed demand, toll pricing under 102, 105, 111–18
flight cancellations 178
flight delays 174, 179, 193
flights, reduced airport charges and 184, 186
F.O.B. price
   Armington elasticities estimation study 125, 126, 130, 134, 137
   transport cost analysis study 146
food industry, gene technology 321–2
freight charges, transport cost study 147, 149, 150, 151, 157, 163, 166
freight transportation model 147–9
fuel consumption/efficiency, transport cost study 148, 150, 154, 159, 163
fuel expenditure/price, transport cost study 149, 151, 158, 165, 169
full-time equivalents (FTE), of employment, Herb Gray Parkway 32, 34, 35, 36
funding shortage, US infrastructure 77–8, 82
Fung, M.K.Y. 183
future traffic conditions, Herb Gray Parkway 38, 41
gateway traffic, HKIA 192–3
GDP
   annual regional growth, US 82–4
   northeast megaregion 82–4
   impact of aircraft charges, Hong Kong 183
   infrastructure and 62–3, 88, 89
   Norway, growth and industry dispersion 19–20
   Sweden
      growth and industry employment allocation 18, 19
      share of railway investments in 10
gender, and travel behaviour 302, 309, 310, 311, 312
gene technology 321–2
general equilibrium analyses
infrastructure and regional development 89–90, 91, 94, 96
transport cost analysis 146
transportation model 47–70
see also computable general equilibrium (CGE) models
generalized method of moments (GMM) approach 95, 235–6
geographic scale of analysis, infrastructure and development 90–93
geographical space, social interaction model 206, 221
geography, restricted railway system, Norway 16
Germany 80, 325
Gilten, D.W. 182
Gingerich, K. 40
global networks, and knowledge flows 341
Goto, T. 247
Granger, C. 127
Granger causality test 95, 96
Gråsjö, U. 303, 340
gravity models
Armington elasticities estimation 125
inter-regional travel 295–6
transport cost analysis 146
growth accounting framework 50, 63–4
GTAP model 125
Gurmu, S. 289
Haab, T.C. 289
Hansen, W. 303
Hansson, B. 79
Hausman test 95–6
Haynes, K.E. 89, 96
Heckman model 230
Heckscher, E.F. 9, 11, 15
hedonic theory 148
Helsley, R.W. 205, 206
Herb Gray Parkway 25–7
accessibility benefits 38, 40, 41
concluding comments 41
employment impacts estimation 27–38, 41
adjustment factors for indirect employment estimates 44–5
Canadian input–output accounts 30–31
input–output approach 28–30
quarterly employment estimates 34–8
supplementary data from PIC 31–3
structural transformation 39–40, 41
Hertel, T. 125, 126, 127, 128
high equilibrium, social interaction 211, 212, 213, 214, 218–20, 222
highway infrastructure
bias of US investment policy towards 79
development and car mileage 230
economic analyses 25
economic impacts 24–5, 80
effect of investment in 65
Herb Gray Parkway 25–7
accessibility benefits 38, 40, 41
concluding comments 41
employment impacts estimation 27–38, 41
adjustment factors for indirect employment estimates 44–5
Canadian input–output accounts 30–31
input–output approach 28–30
quarterly employment estimates 34–8
supplementary data from PIC 31–3
structural transformation 39–40, 41
interaction between port infrastructure and 79
marginal maintenance costs 104
and productivity 79
US northeast megaregion 84
contribution to regional development 88, 89, 90, 91, 92, 96
highway toll pricing (study)
analysis of second best toll pricing
discriminatory pricing 118–20
formulation of problem 118
conclusion 120–21
framework for analysis 105
marginal maintenance cost of the
road 104–5
network equilibrium model 105–11
assumptions 105–6
formulation of model 106–9
formulation of social benefit
109–11
optimal pricing under fixed demand
discriminatory pricing 114–18
network equilibrium model
111–12
problem formulation 113–14
purpose of analysis 111
review of related studies 102–4
studies
congestion 101
maintenance costs 101
highway tolls, transport cost study 147,
148, 149, 150, 152, 157, 158, 163,
166
Highway Trust Fund, purchasing
power 77
Hodne, F. 16
Holtz-Eakin, D. 79
Hong Kong
effect of currency depreciation on
178
impact of airport changes on
national economy 187, 191
scientific interaction 326
Hong Kong Board of Airline
Representatives 177, 178, 196
Hong Kong International Airport
(HKIA)
airport charges 174
(1998 and 2000) 179
background information 175–81
concluding remarks 194–6
cost–benefit analysis (CBA)
181–4, 196
discussion 192–4
illustrative analysis of CBA
184–92
annual aircraft movement 180
ownership 181
traffic volume and capacity
constraint 179
Hong Kong Tourist Association 187
Hordaland 18
Hotelling–Smithies competition 254,
261
Housman test 289
hub development (HKIA) 177, 192–3,
196
hub traffic (HKIA) 193
human capital 319, 340
human genome project 321
hurdle model, zero-inflated data 288
iceberg cost equations
Armington elasticities estimation
study 125
transport cost study 150–54, 155,
157, 159, 160, 162, 163, 164, 169
transportation model 51, 72
import demand, theoretical analysis
123–4
inactive ratio (ZIP model) 289
private purpose travel 292, 294–5,
297–8
incentive scheme, HKIA 179
incentives to innovate 328–30
income
delays in convergence of growth and
per capita 346
highway projects and stimulus in 24
and residential sorting 229
self-reinforcing effect of
transportation 66–7, 69
inconsistent comparison problem, see
apples and oranges comparisons
increasing returns to scale, see IRS
environments
indirect effects, airport charges 183,
187, 188–9, 190, 191
indirect employment effects, Herb Gray
Parkway 28, 29, 30, 33, 34, 35, 36,
37, 41, 44–5
indirect utility
from commuting 300, 301, 306
urban spatial structure study 210–11
individual preferences
travel mode 229, 232
utility maximization 301
individual utility
  commuting and the economic milieu 299–313
  urban spatial structure 207–8, 211–12, 214–15, 217, 220, 221
  induced impacts, airport charges 183, 187, 188–9, 190, 191
  ‘industrial centers on the countryside’ 9, 15
industrial research and development (R&D)
  dynamics of interactions 319, 320–22, 345–6
  knowledge interaction in 322–30, 345
  as a powerful knowledge source 340
industrial sector
  Armington elasticities estimation study 123–44
  specializations arising from Herb Gray Parkway project 41
industrial workforce, railway and growth, Scandinavia 11, 12, 13, 14, 16, 17
industrialization, railways and national economic growth 17–20, 21
  Norway 15–17, 21
  Sweden 9–10, 11–15, 21
industry dispersion, and growth, Scandinavia 18–20, 21
inefficient toll pricing 101, 119, 120
information and communication technologies 1, 168, 221; see also Internet services;
telecommunications
infrastructure capital 47–8, 49, 50, 55, 57, 59, 60, 63–6
Inland line 15
innovation
  capabilities and dynamics of the firm 335–9
  importance of time in 320–23
  incentives 328–30
  internal and external knowledge 331–3
  strategy and capacity 334–5
input–output approach, economic analyses, highway projects 25, 28–30, 44
instrumental variables, in estimation studies 95, 155, 156, 233
integrated transportation 38, 68, 69
inter-enterprise relations data, Armington elasticities study 131–2, 133, 137, 144
inter-regional travel, see private purpose inter-regional travel
interdependency of infrastructure, and regional development 94–5, 97
internal knowledge
  conjunction of external and 339–45
  creation of, in science and industry 326–7
  of firms 331–3
international airports, Asia Pacific 175, 176
international trade policy, spatial CGE model 125, 127
Internet services 221, 321, 324
interregional trade
  Armington elasticities, Japan conclusion 143–4
  estimation methodologies 124–32
  with absolute price data 125–6, 128, 129
  by cross-sectional data 126, 128, 129, 144
  by panel data 127–8, 144
  OLS model 129–32
  problems and limitations 128
  with relative price data 126, 128, 129–32
  without price data 125, 127, 128
formulation of CES model 123–4
output of estimation
  case of 45 prefectures 138
  case of 780 cities 138–43
  parameter estimation 133–7
  TDB data set 132, 133, 137, 144
transport cost analysis 146–69
  conclusion 167–8
  data and empirical results 156–67
  econometric model and methods 149–56
  endogeneity and 2SLS estimation 155–6
  regression specification 149–55
  endogenous regression model 172
Index

171
firm-level and shipment-level costs
147–9
freight transportation model
research question relating to decreasing costs
investment in infrastructure and the economic milieu
effect on aggregate economy
Scandinavia
US northeast megaregion
investment policy, US transport
IRS environments, transportation model in
decentralized market allocation
open economy product variety model
planning equilibrium level of infrastructure
pure technological externalities as a source of

Jacquillat, A. 174
Jaffe, A.B. 333
Japan
Armington elasticities estimation in multi-regional trade
conclusion
data set
estimation methodologies
formulation of CES model
output of estimation
parameter estimation
city center problems
private purpose inter-regional travel
analytical approach
application of POI and ZIP models to STULA data
conclusion

determinants for differences of travel
expected increase in
neglect by planners
service improvements
road deterioration problem
sustainable urban development
transport cost analysis for inter-regional trade
conclusion
data and empirical results
econometric model and methods
freight transportation model
trip mode choice and residential sorting
job creation
Johansson, B. 303, 333, 335, 339, 340, 343
Kapuscinski, C.A. 126
Karlsson, C. 303
Kato, H. 144
Kelejian, H.H. 79
Kingston (New York) 87
Kitamura, R. 230
knowledge
complementary role of transportation and

dynamics of interactions in the creative process
global distribution
interaction in science and industry
R&D
as a multidimensional concept
in regional economic analyses
see also external economic analyses
internal knowledge
knowledge accession strategy
knowledge exchange
knowledge flows
knowledge funds
and innovation capabilities
public nature of
spatial diffusion
knowledge management
Kobayashi, K. 230
Koike, A. 126, 128, 130
Kono, K. 248
Korea
Krantz, O. 10
Krugman, P. 333
labor accumulation, and growth 95
labor productivity
air service and economic development 183
and urban sprawl 50, 67, 69, 75, 76
labour demand, utility from commuting study 299, 300, 303–5, 306, 307, 310, 311, 312
Lafourcade, M. 146–7
Lambert, D. 289
land use transportation and 38, 50, 68, 69
and travel behaviour 229, 230, 243
land values, Herb Gray Parkway 38
landing/take-off fees
in early stage of an airport 173
HKIA 176, 179, 181, 182
language, and scientific interaction 325
Lebanon (Pennsylvania) 87
leisure, and utility maximization 300
length of railway, and regional growth 11, 15, 17, 93
Leonardi, G. 343
Levine, M.E. 174
Lewiston-Auburn 87
lifestyle, trip mode choice 230
light rail 87
Limão, N. 146
linear regression models average frequency of private overnight travel 296–7
endogeneity bias 231–2
see also control function method; multinomial logit model
Lipsey, R.G. 247
Liu, D. 168
living environment, and travel behaviour 239
load-bearing capacity (road) desirability of leading trucks to a durable road 103
differences between highway and local 102
and maintenance costs 104
local construction firms, structural transformation, Windsor region 39–40
local milieu, and knowledge flows 341
local traffic, HKIA 192
local/non-local employment, Herb Gray Parkway 27, 37–8
location choices urban spatial structure 211–12
see also equilibrium levels, social interaction
location equilibrium model, shopping district decline 277–8
location quotients, Herb Gray Parkway study 30, 31, 45–6
locational capital 51, 53, 54
location's knowledge potential 339–40
log linear models commuting and the economic milieu 307
private purpose travel 296
long-haul economies, transport cost study 147, 165, 167
long-haul routes 196
long-term financial break-even 174, 194
Lööf, H. 333, 335, 340
Los Angeles 79
loss of jobs, airport charges and 190, 191
loss of revenue, reduced airport charges 175, 184, 185–6
lot size, transport cost study 147, 148, 151, 157, 158, 165, 166, 167, 169
low equilibrium, social interaction 211, 212, 213, 214, 220–21
lump sum tax in toll pricing studies 103, 105, 110, 113
in transportation model 48, 49, 51, 57, 66, 76
lumpy capacity 173, 174
Lundmark, M. 18
McConnell, K.E. 289
McFadden, D. 306
Maine 87
maintenance, side effects of poor 82
maintenance costs (road) influence of road use on 101
marginal 104–5, 110, 114, 115, 116, 117, 119, 120, 121
toll pricing and reduction in 102, 103, 104, 105, 111, 115, 117, 120, 121
toll pricing studies 101, 102, 103
maintenance service, and marginal cost of a road 104
Malmberg, A. 18
Mamuneas, T.P. 56
Manchester-Nashua 82, 84
Mansfield, E. 328
Mantsinen, J. 343, 344
manufacturing areas, Norway and Sweden 18
manufacturing costs, spillover effects of infrastructure on 79
Maoh, H. 38
marginal cost toll pricing 101, 103
marginal maintenance cost of the road 104–5, 110, 114, 115, 116, 117, 119, 120, 121
market equilibrium solution, price determination 253, 262–71
market forces and Norwegian railways 21 and Swedish railways 11, 13
markets, spatial equilibrium in traditional linear 247
Martín, J.C. 303
Maryland 82
Massachusetts 82, 84, 87
Matsushima, K. 230
mediator game 252
medium-to long-term break even 194
Mendel, G. 321
metro rail 87, 94
Miceli, T.J. 247
Michigan 27
migration, and private purpose travel 286, 294
migrant numbers, and overnight travel 295, 296
Ministry of Land, Infrastructure, Transport and Tourism (MLIT) 157, 159, 286, 287
modal comparative perspective 80–81
modal competition, estimation bias in unimodal studies 80
Modig, H. 10
Mokhtarian, P.L. 230
Monaco, K. 79
MONASH model 125
Monderer, D. 252, 253
Morrison Paul, C.J. 79
Morrison, S.A. 174
Motani, K. 247
Mullahy, J. 288
multi-regional model, knowledge conjunction potential 339–45
multimodal perspective 78, 80, 81, 89, 96–7
multinational groups, knowledge conjunction phenomenon 343
multinomial logit model, commuting and the economic milieu 306–7
multiple equilibria, trip mode choice 230
multiplier effects, airport charges 183, 184, 186, 187, 188–9, 190, 191
multipurpose shopping 245
demand externalities 247, 248–51
Mun, S. 133
municipalities, crossing borders and utility from commuting 303, 311, 313
Munnell, A.H. 78–9
Nadiri, M.I. 56
Nakamura, R. 125–6, 128, 129
Nash equilibrium urban retail study 248, 250, 252–3, 254, 268–9, 271, 273, 274, 283
urban spatial structure study 210, 211, 223
national economic growth, railways and (Scandinavia) 10, 17–20, 21
National integrated Transport Analysis System (NITAS) 156–7, 157–8
National Passenger Rail Corporation (Amtrak) 84, 88
National Swedish Road Administration 308
negative binomial models recreation activity counts data 289
trip frequency and trip mode 230
negative spillover effects, highways and streets 79
neoclassical growth theory 95
nested logit model, residence and trip mode for commuting 230
Net Freight Flow Census (NFFC) micro data 147, 149, 151, 156, 157
Net Inter-regional Trip Survey (NITS) 286, 287, 295
network development, knowledge flows and 341
network equilibrium model (toll pricing) 120
assumptions 105–6
formulation of model 106–9
formulation of social benefit 109–11
optimal pricing under fixed demand 111–12, 113
Neumann, J. von 321
New Hampshire 82, 84
New Haven (Connecticut) 82
New Jersey 87
New York 84
annual growth in GDP 82
annual growth in public transit capital 87
highway investment and development 79
transportation capital stock 82
Newbery, D.M. 103
Nicander, E. 10
non-construction employment, Herb Gray Parkway 32, 36, 37–8
non-innovators 335
Norfolk Southern 84
Norrand 15
North American Free Trade Agreement (NAFTA) 37
Norway
industry dispersion and growth 19–20, 21
manufacturing-industrial core areas 18
metropolitan development 18
railways and industrialization 15–17, 21
Norwich-New London 87
Odoni, A.R. 174
Ohira, Y. 205, 206
Okinawa 159, 293, 295
Okumura, M. 294
Olsson, M. 303
one-stop shopping, see multipurpose shopping
Ontario highway project, see Herb Gray Parkway
open economies, in transportation model 49, 61–2, 65, 68, 69, 70
opportunity costs
transport cost study 148, 154, 163, 167, 171
in transportation model 48–9, 52, 55, 58, 61, 65
urban spatial structure study 208
optimal airport pricing 194
optimal congestion level 59
optimal resource allocation 59
optimal tax price 48, 58, 59, 74–5
optimal toll pricing, under fixed demand 102, 105, 111–18, 119
ordinal Poisson (POI) model 288–9
application to STULA data 290–93
Ordinary Least Squares (OLS) estimation
Armington elasticities 125, 126, 128, 129–32, 144
endogenous growth 95
transport analysis 161
see also two-stage least squares (2SLS) estimation
Oslo 16
Oslo-Eidsvoll railway 15–16
‘other’ employment, Herb Gray Parkway 36
Oum, T.H. 174
overnight travel (Japan)
distribution of 290–93
inter-regional differences 294–7
overpricing (airport charges) 195
Pan Am Railway Line 84
panel data, Armington elasticities estimation 127–8, 144
Pareto improvement, retail profit 246
Pareto inferior price determination 251
Pareto optimal price determination 252
Park, R.E. 174
parking prices, spatial allocation 247
Parkway Infrastructure Constructors (PIC) 26–7, 28, 41
data, employment impacts 31–3
partial equilibrium analyses
economic value of a discount option 278
infrastructure and regional development 90, 96
passenger rail (US northeast) 78, 80, 90, 91, 96, 97
<table>
<thead>
<tr>
<th>Index</th>
<th>363</th>
</tr>
</thead>
<tbody>
<tr>
<td>passenger volume (HKIA)</td>
<td>184, 185, 186, 190, 191</td>
</tr>
<tr>
<td>path dependence, science and research</td>
<td>346</td>
</tr>
<tr>
<td>Pearl River Delta</td>
<td>182, 192</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>84, 87</td>
</tr>
<tr>
<td>per capita</td>
<td></td>
</tr>
<tr>
<td>capital stock</td>
<td>82, 84</td>
</tr>
<tr>
<td>per capita GDP, infrastructure and productivity</td>
<td>88</td>
</tr>
<tr>
<td>perpetual inventory method (PIM), capital stock estimation</td>
<td>82</td>
</tr>
<tr>
<td>person-years of employment, Herb Gray Parkway project</td>
<td>25, 27, 37</td>
</tr>
<tr>
<td>Persson, O.</td>
<td>325</td>
</tr>
<tr>
<td>Petrin, A.</td>
<td>236</td>
</tr>
<tr>
<td>Phene, A.</td>
<td>342</td>
</tr>
<tr>
<td>Philadelphia</td>
<td>82, 84, 87</td>
</tr>
<tr>
<td>physical capacity, infrastructure and productivity</td>
<td>93</td>
</tr>
<tr>
<td>physical proximity, urban spatial structure</td>
<td>205</td>
</tr>
<tr>
<td>planning equilibrium level of infrastructure</td>
<td>49, 57–8, 59, 62–3, 75</td>
</tr>
<tr>
<td>Poisson distribution</td>
<td>288</td>
</tr>
<tr>
<td>policies, sustainable urban development</td>
<td>239</td>
</tr>
<tr>
<td>policy implications</td>
<td></td>
</tr>
<tr>
<td>airport charges</td>
<td>195</td>
</tr>
<tr>
<td>discount point model with the right of expulsion</td>
<td>275–7</td>
</tr>
<tr>
<td>of transportation model</td>
<td>68</td>
</tr>
<tr>
<td>urban structure formation with residential sorting</td>
<td>232, 242–3, 243–4</td>
</tr>
<tr>
<td>port infrastructure</td>
<td></td>
</tr>
<tr>
<td>and manufacturing costs</td>
<td>79</td>
</tr>
<tr>
<td>and regional growth</td>
<td>91–3</td>
</tr>
<tr>
<td>shadow value and interaction between highways and</td>
<td>79</td>
</tr>
<tr>
<td>practical studies, toll pricing</td>
<td>102</td>
</tr>
<tr>
<td>prefectures, Armington elasticities estimation study</td>
<td>138–43</td>
</tr>
<tr>
<td>price adjustment effect</td>
<td>246, 252</td>
</tr>
<tr>
<td>price competition</td>
<td>248, 254, 261</td>
</tr>
<tr>
<td>price coordination</td>
<td>275, 277</td>
</tr>
<tr>
<td>in discount point systems</td>
<td>248, 252–4</td>
</tr>
<tr>
<td>failure</td>
<td>246</td>
</tr>
<tr>
<td>social efficiency</td>
<td>246, 261–2</td>
</tr>
<tr>
<td>price data</td>
<td></td>
</tr>
<tr>
<td>Armington elasticities estimation without</td>
<td>125, 127, 128</td>
</tr>
<tr>
<td>see also absolute price data; relative price data</td>
<td></td>
</tr>
<tr>
<td>price determination, urban retail study</td>
<td>248, 249, 250, 251, 261–2, 265–6</td>
</tr>
<tr>
<td>price elasticity, demand for airport services</td>
<td>175, 181–2, 184, 186, 188–9, 190, 191</td>
</tr>
<tr>
<td>price sensitivity, HKIA</td>
<td>182</td>
</tr>
<tr>
<td>price strategy games</td>
<td>250, 252–3, 261, 262–3, 271</td>
</tr>
<tr>
<td>prisoners’ dilemma game</td>
<td>249, 250, 262</td>
</tr>
<tr>
<td>private purpose inter-regional travel, Japan</td>
<td>286–98</td>
</tr>
<tr>
<td>analytical study</td>
<td></td>
</tr>
<tr>
<td>application of models to the STULA data</td>
<td></td>
</tr>
<tr>
<td>regional difference of the estimated parameter value</td>
<td>292–3</td>
</tr>
<tr>
<td>travel count data for each purpose</td>
<td>290–92</td>
</tr>
<tr>
<td>conclusion</td>
<td>297–8</td>
</tr>
<tr>
<td>data on trip generation</td>
<td>287–8</td>
</tr>
<tr>
<td>determinants of inter-regional differences</td>
<td></td>
</tr>
<tr>
<td>accessibility index for overnight travel</td>
<td>295–6</td>
</tr>
<tr>
<td>average frequency difference</td>
<td>296–7</td>
</tr>
<tr>
<td>inactive ratio of overnight travel</td>
<td>294–5</td>
</tr>
<tr>
<td>need for travel</td>
<td>294</td>
</tr>
<tr>
<td>zero-inflated model</td>
<td>288–9</td>
</tr>
<tr>
<td>zero-inflated Poisson (ZIP) model</td>
<td>289–90</td>
</tr>
<tr>
<td>expected increase in</td>
<td>286</td>
</tr>
<tr>
<td>neglect by planners</td>
<td>286</td>
</tr>
<tr>
<td>service improvements</td>
<td>286–7</td>
</tr>
<tr>
<td>private railroad companies (US)</td>
<td>84</td>
</tr>
<tr>
<td>private visit travel (Japan), frequency</td>
<td>291, 292, 293</td>
</tr>
<tr>
<td>product cycle pattern, and industry dispersion</td>
<td>19, 20</td>
</tr>
<tr>
<td>product variety, IRS environments</td>
<td>48, 49, 61–2, 63, 70</td>
</tr>
</tbody>
</table>
production of compound goods, trips for, see demand for \( t \)
regional dispersion of 19
production function, for aggregate mobility 55
production theory, and scientific collaboration 322–3
productivity
infrastructure and 63–6, 79, 93
innovators’ superiority in 335
scientific interaction and 322
and transport cost 168
profit maximization, urban retail study 247, 249, 250, 269, 270–71, 282
proto-industrialized cities, Sweden 12
Providence 82
proximity
and knowledge flows 333
and urban spatial structure 205
public capital, and economic performance in US 78–9
public knowledge 319
public transport, risk of shrinkage, Japan 298
‘publish or perish’ 322
purchased inputs, and employment effects, Herb Gray Parkway 30, 33
purchasing power, Highway Trust Fund 77
pure technological externalities, as the source of IRS 48, 60–61
railway infrastructure
development cost 229
economic output and 80
passenger numbers and efficiency of 229–30
and regional growth, Scandinavia (study) 9–22
analytical methods 10–11
concluding remarks 20–21
industrialization
and national growth 17–20, 21
Norway 15–17
Sweden 11–15
US northeast meegaregion 84–7
contribution to regional development 90–91, 92, 96
railway mode choice, residential sorting 230
random mode choice
commuting and the economic milieu 306–7
consumer behaviour 255, 256
raw materials 15, 93, 183
rebate, landing charges 179
reciprocity, industry and railways, Scandinavia 17
recreation activity counts data 289
redemption costs (highway) 105, 110
regional demand function, transportation model 53
regional development policy, Swedish railways 11
regional dispersion, of production 19
regional economic analyses 1
regional economic development
and knowledge, see knowledge
public transport infrastructure (study) 77–97
comparative analysis 88–93
conclusion 96–7
discussion 93–6
literature review 78–81
US northeast meegaregion 81–8
and railways, Scandinavia (study) 9–22
analytical methods 10–11
concluding remarks 20–21
industrialization
and national growth 17–20, 21
Norway 15–17
Sweden 11–15
relative price data, Armington elasticities estimation 126, 128, 129–32
repetitive consumer behaviour, discount point systems and 278
representative household, in transportation model 49, 51–3, 58, 59, 62, 69, 72
residential sorting 229, 239–40
analytical methodologies 230–31
travel mode choice 229, 230
see also urban spatial structure (studies)
residual transportation 48, 51, 52, 54, 55, 56, 69, 70
resource allocation
  demand externalities and adjustment problem 248
  road deterioration and inefficient 101
  transportation infrastructure 78
in transportation model 47–8, 49, 51, 53, 57, 59, 60–61, 63, 64, 68, 69, 72–3
retail shop prices, and city center decline, see urban retail study
revenue, airport charges 175, 184–6, 190, 191
Rhode Island 82
Ridout, M. 289
right of expulsion, discount point systems, see discount point model with the right of expulsion
road deterioration
  ESAL calculation of 104
  maintenance costs 105
  and toll pricing 101
  vehicle use and 101, 103
road infrastructure, see highway infrastructure
road structure design
  differences, highways and local roads 101–2
  and marginal cost of a road 104
road use, influence on maintenance costs 101
Robinson, D.P. 79
Romer, P.M. 48, 60
Rosen, S. 148
route choice, toll pricing study 108, 111–12, 117, 120
Rouwendal, J. 106
runways 173
saddle node bifurcation 335–8
sales prices (retail), see urban retail study
sample selection model 231
Sasaki, K. 133
Scandinavia, railways and regional growth (study) 9–22
analytical methods 10–11
industrialization
causes and effects 11–17
concluding remarks 20–21
and national growth 17–20, 21
see also Norway; Sweden
Schwartz, A.E. 79
science
  collaboration, see collaboration
dynamic interactions 319, 320, 345–6
global distribution of 319–20
knowledge interaction in 322–30
most productive city regions 327, 328
spatial allocation of production (2008–10) 325–6
status of activity as measured by publications 345
second best toll pricing (studies)
current analysis 105
discriminatory pricing 118–20
formulation of problem 118
internalization of congestion and maintenance costs 101
parallel road network 102–3
theoretical and practical 102
security surcharge (HKIA) 196
self-financing constraint, toll pricing studies 102, 103, 105, 111–18, 119, 120, 121
self-reinforcing effect, of transportation 66–7, 69
sensitivity analysis, price elasticity, airport charges 188–9, 190–91
shadow value, interaction between highway and port infrastructure 79
shadow value per job, airport charges and 186, 187, 188, 189, 190, 191, 192, 200
Shanghai 326
Shapiro, C. 56
Shatz, H.J. 91
shift-share analysis, transport costs 146–7
shopping districts
decline in 245, 246, 277–8
social efficiency 246
spatial allocation in 247–8
underinvestment 248
see also urban retail study
short-haul routes 181, 182, 196
short-term financial break-even (airport) 173, 174, 194
short-term price competition 248
sightseeing trips (Japan), frequency 291, 292, 293
significance test of zero-inflation 289
simultaneous choice models 231
Small, K.A. 103, 104
social accounting matrix (SAM) 89, 94
social benefit, toll pricing study 105, 109–11, 112, 113, 118
social capital 276
social communication, infrastructure and 81
social cost–benefit analysis (SCBA) 196
social costs
auto users 230
in transportation model 50, 55, 56, 57, 58, 59, 64, 66, 68, 69, 75
social distance, urban spatial structure 205, 206, 221
social efficiency, price coordination 246, 261–2
social interaction model 205–6, 206–12
social linkage formation model 206
social network formation 207
social opportunity cost, in transportation model 48–9, 55, 58, 65
social planner, in transportation model 48, 50, 56, 57, 59, 60, 68, 69
social proximity 205
social welfare
airport pricing and 174, 194
discount point systems 262
factor price changes and 168
transportation infrastructure 77, 89
urban spatial structure study 212, 214, 215, 217, 218, 221, 222
socialization cost, urban spatial structure study 214, 217–21, 222
socialization efforts, urban spatial structure study 207, 209, 210, 221
soft transport policy measures 232
Spanish transportation system 80–81
spatial allocation
parking prices 247
scientific production (2008–10) 325–6
in shopping centers 247–8
spatial boundedness, knowledge flows and spillovers 333
spatial competition 301
Spatial Computable General Equilibrium (CGE) models 123
Armington elasticities estimation 125, 126, 127, 143, 144
spatial dependence, regional factor substitution 89–90
spatial econometric computable general equilibrium (SECGE) model 90
spatial economics
consumer choice behaviour 247
impacts, airport infrastructure 79
knowledge conjunction potential 339–45
model of commuting and the economic milieu 299–313
spatial equilibrium, traditional linear markets 247
spatial impossibility theorem 50, 54, 69
spatial interaction theory 300–305
spatial knowledge diffusion, regional development 343–5
spatial pattern analysis 1
Spatial Price Equilibrium (SPE) model 123
spatial product cycles theory 19, 20
spatial public good, knowledge as a 344
spatial segmentation, Armington elasticities estimation, see Armington elasticities
spillover effects
airport infrastructure 79, 90, 91
highway infrastructure 79, 90
knowledge flows 332–3, 341
port infrastructure on manufacturing costs 79
public rail and transit infrastructure 90–91, 96
spontaneous discount point game 263
spontaneous discount point model 262–71
correlation of discount price 263–4
determination of discount price 265–6
equilibrium solution for discount points 253, 267–9
formulation of consumer behaviour 264–5
incentives to join club organization 266–7
possible deviation from equilibrium solution 269–71
precondition of model 262–3
Springfield (Massachusetts) 82, 87
Starrett, D. 49, 54, 69
state investment, railway infrastructure, Scandinavia 10, 15, 16, 21
station villages 9, 15
statistical management method 231
Statistics Bureau Japan 287, 288
Statistics Sweden 303, 308
stimulus effects
infrastructure projects 24, 27
see also employment effects
strategic complementarity, trip mode choice 230
strategic pricing behaviour model 254–62
strategy
and access to external knowledge 341
and innovation capacity 334–5
structural equation modeling, residential sorting 230, 231
structural estimation, transport costs 168
structural transformation
highway projects 25
Herb Gray Parkway 39–40, 41
STULA data, see Survey on Time Use and Leisure Activities
subcontractor employment, Herb Gray Parkway 32–3
substitute roads
tolls, and reduced maintenance costs 103
tolls leading vehicles to 103–4, 114–18, 118–20, 121
substitution effects, transport mode 80, 94
supply of aggregate transportation 48–9, 55
supply and demand, airport services 174, 179
Survey on Time Use and Leisure Activities (STULA) 287, 288, 295
application of POI and ZIP models to 290–93
sustainable urban development 239
Sweden
average mobility of persons 302
commuting and the economic milieu 299–313
data 308–9
discussion 312–13
model and methods 305–8
results 309–12
spatial interaction theory 300–305
economic output and infrastructure 80
industry dispersion and growth 18–19, 21
manufacturing-industrial core areas 18
metropolitan development 18
railways
regional industrialization 9–10, 21
causes and effects 11–15
research on national economic impact 10
Taiwan 326
tax price of infrastructure 48, 51, 57, 58, 59, 66, 74–5
technical solutions 319, 331, 332, 339, 346
technological development 9, 95, 168
technology, see gene technology; information and communication technologies
Teikoku Data Bank (TDB) data set 132, 133, 137, 144
telecommunications 65–6, 221, 321, 324
tenants, consumer choice and externalities among 247
Tennenholtz, M. 252, 253
terminal building charges (TBC) 176, 177, 179, 182, 184
terminal buildings, airport capacity 173
theoretical analysis, import demand 123–4
theoretical model, commuting and the economic milieu 306–7
theoretical studies, toll pricing 102
time
industrialization and regional
growth, Scandinavia 17–18, 19–20, 21
in R&D and innovation 320–21
see also travel time; value of time
time periods, infrastructure and
development 91
toll pricing, see highway toll pricing
total social surplus
strategic pricing model
formulation 257–8
maximization problem 260–61
tourism employment, airport charges
and 185, 187, 188–9, 191
tourist expenditure, airport charges
and 189, 190, 194–5
trade imbalances, transport cost study
150, 153, 154, 157, 159, 160, 162,
163, 164
traffic conditions, Herb Gray Parkway
and future 38, 41
traffic demand, toll pricing study 105,
106, 107, 111–18, 119–20
traffic jams 245, 247
traffic volume
HKIA 179, 181, 184, 186, 189, 190,
191
toll pricing study 105–6, 107, 110,
112, 116, 117, 119, 120
Train, K. 236
transcritical bifurcation 335, 337
transit, US northeast megaregion
agencies 87
annual growth per capita
(2001–2009) 86
infrastructure 90–91, 92, 97
transport cost(s)
in Armington elasticities estimation
129, 130, 143, 144
reducing 146
understanding for policy-making
146
urban spatial structure 214–17, 222
transport cost analysis, interregional
trade 146–69
conclusion 167–8
data and empirical results 156–67
econometric model and methods
149–56
endogeneity and 2SLS estimation
155–6
regression specification 149–55
endogenous regression model 172
freight transportation model 147–9
quantitative 146–7
relationship, firm-level and
shipment-level costs 171
research question relating to
decreased costs 168
transportation, distribution and
logistics (TDL) sector 40
transportation infrastructure
capacity 173
complementary role of knowledge
and 1
decrease in transport costs 147
improvements and time savings
168
and regional economic development
77–97
comparative analysis 88–93
conclusions 96–7
discussion 93–6
literature review 78–81
US northeast megaregion 81–8
social communication and
knowledge exchange 81
US investment policy 77–8, 79
see also airport infrastructure;
highway infrastructure; port
infrastructure; railway
infrastructure
transportation infrastructure stock
measurement of 80, 81
US northeast megaregion 82–4, 87
transportation modeling 47–70
applications of the basic model
agglomeration economy 66–7
infrastructure capital and
productivity 63–6
integrated transportation and land
use 68
urban sprawl 67, 75–6
basic model framework 50–59
aggregate cost function 55–6
basic equilibrium level of
infrastructure 56–7, 74
Index 369

cost minimization problem 56
decentralized equilibrium 58–9
demand for $t_t$ in a CRS economy 49–50, 54–5
fiscal policy and tax-price 57
optimal congestion level 59
planning equilibrium level of infrastructure 57–8, 75
preference of representative household 51–3
production function for aggregate mobility 55
regional demand function 53
concluding remarks 68–70
derivation from conventional approaches 47–9
in IRS environments 48, 59–63
open economy product variety model 61–2
planning equilibrium level of infrastructure 62–3
pure technological externalities as the source of IRS 60–61
for planning and policy
airport charges and economic impacts 173–96
Armington elasticities estimation 123–44
highway toll pricing 101–21
transport costs analysis 146–69
transportation services 1
Herb Gray Parkway and improved 40
trip cost, auto users 230
trip mode choice
access time 242–3
emotional utility 229, 232, 243
fixed cost and strategic complementarity 230
infrastructure development and 230
multiple equilibria 230
residential sorting 229, 230, 239
trip frequency and 230
Trivedi, P.K. 289
trucks
road damage 101, 103
toll pricing, leading vehicles to durable roads 103, 114–18, 118–20, 121
transport cost analysis truck rent 148, 149, 150, 161
tuck size 150, 151, 158, 163, 166, 169
trucking firm numbers 149, 150, 153, 154, 155, 157, 159, 160, 162, 163, 164, 169
Tsai, J.F. 103, 117
Turing, A. 321
two-stage least squares (2SLS) estimation 169
of growth 95
transport costs 155–6, 161
underinvestment, shopping centers 248
unimodal infrastructure studies 79–80
United Kingdom 21, 325
United States
as a center of science 325–6, 345
infrastructure capital and aggregate output of economy 64–5
marginal maintenance cost of roads 104
northeast transportation infrastructure 81–8
comparative analysis 88–93
conclusion 96–7
discussion 93–6
opposition to new Detroit River bridge 27
transportation investment policy 77–8, 79
university R&D 340
University of Windsor Cross-Border Institute 28, 31, 38
urban development, Scandinavia 18
urban regions, local milieu of firms 341
urban retail study 245–78
conclusion 277–8
discount point model with the right of expulsion 274–5
deterrent effect for deviation 273–4
equilibrium solution 272–3
policy implications and analysis results 275–7
precondition of the model 271–2
discount point systems
effect of price coordination 252–4
role of 251–2
multipurpose shopping, demand externalities 247, 248–51
overview of previous studies 247–8
spontaneous discount point system model
correlation of discount points 263–4
deviation from a discount point equilibrium solution 269–71
formulation of consumer behaviour 264–5
incentives to join club organization 266–7
precondition of the model 262–3
price determination by club organization 265–6
spontaneous equilibrium solution for discount points 267–9
strategic pricing behaviour model
analytical results 261–2
centralized market equilibrium 258–9
consumer behaviour and derivation of a demand function 255–6
decentralized market equilibrium 259–60
formulation of total social surplus 257–8
maximization problem for the total social surplus 260–61
model precondition 254–5
urban spatial structure (studies)
endogenous formation with residential sorting 229–44
case study
background 239–40
control function 241–2
model 240–41
policy implications 242–3
result of estimation 242
target area 240
conclusion 243–4
endogeneity bias 231–2
endogeneity in discrete choice model 233–9
adjustment of standard error with bootstrap method 238–9
control function method 233–4
endogeneity in 234–5
parameter estimation 235–8
endogeneity and sorting 229–31
synergy effects of face-to-face interactions 205–22
concluding remarks 221–2
interplay of social and physical distance 212–21
social interaction model 206–12
urban sprawl 50, 67, 69, 75–6
urbanization 9, 15, 312
utility, see direct utility; emotional utility; individual utility
utility maximization
commuting and the economic milieu 300–302
and location choice 211
utility maximization problem (UMP) 51–2, 61–2
Index

value, scientific research 324–5
value of time
transport cost study 168
Varian, H.R. 56
variety, demand for increased 328–30
Vaze, V. 174
vehicle tax 121
vehicle use, road deterioration 101
vehicle-intensive industries, gain from road transport investment 65
Venables, A.J. 146
Verhoeh, E.T 102, 106, 114
Vestfold 18
Visitor and Tourism Study 187

Walras–Arrow–Debreu theory 94
Warr, P.G. 126
Washington DC 82, 87
Washington Dulles International Airport 184, 187
Watanabe, A. 125–6, 128, 129
water transportation 91, 92
Watson, J. 321
wealth accumulation 77
Wee, B. van 303
weight, transport cost study 147, 148, 149, 150, 151, 153, 158, 159, 161, 166, 169
Westlund, H. 11, 22
Willimantic 84
willingness to pay
for fast delivery (shippers) 166, 167
for residual transportation 51

Wincoop, E. van 146
Windsor-Essex region, and Herb Gray Parkway 26
accessibility benefits 38
employment effects 27–38, 41, 44–5
input–output model 31
structural transformation 39–40
Winston, C. 103, 174
with zero model, zero-inflated data 288
withdrawal problem, shopping districts 254–5
worker competition, utility from commuting 299, 300, 303–5, 306, 307, 310, 311, 312
Yan, J. 174
York-Hanover 84
Zenou, Y. 205, 206
zero inflated model 288–9
zero-inflated negative binomial (ZINB) model 289
zero-inflated Poisson binomial (ZIPB) model 289
zero-inflated Poisson (ZIP) model 288, 289–90
application to STULA data 290–93, 297
Zhang, A. 173, 174, 175, 194
Zhang, F. 332, 342
Zhang, Y. 173, 174, 175, 194
zoning size, Armington elasticities study 137