## Index

<table>
<thead>
<tr>
<th>Page Numbers</th>
<th>Index Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>9/11</td>
<td>11–12, 183</td>
</tr>
<tr>
<td>Abadie, Alberto</td>
<td>12, 29</td>
</tr>
<tr>
<td>Abt, Clark C.</td>
<td>5, 126, 229</td>
</tr>
<tr>
<td>access bridges, ports</td>
<td>265, 269–79, 281, 283–4</td>
</tr>
<tr>
<td>action-based substitutions</td>
<td>26–8</td>
</tr>
<tr>
<td>active defense</td>
<td>121–3</td>
</tr>
<tr>
<td>adaptive resilience</td>
<td>203, 206</td>
</tr>
<tr>
<td>agent-based simulations</td>
<td>92–3</td>
</tr>
<tr>
<td>aggregate price indexes</td>
<td>157–8, 161–2</td>
</tr>
<tr>
<td>air cargo</td>
<td>238</td>
</tr>
<tr>
<td>defense</td>
<td>121–2</td>
</tr>
<tr>
<td>travel</td>
<td>30</td>
</tr>
<tr>
<td>airline baggage screening</td>
<td>see baggage screening</td>
</tr>
<tr>
<td>airport screening</td>
<td>264</td>
</tr>
<tr>
<td>security</td>
<td>129</td>
</tr>
<tr>
<td>al-Qaida</td>
<td>16, 25, 26, 31, 121, 126, 196</td>
</tr>
<tr>
<td>Alameda Corridor</td>
<td>265, 280, 281, 282</td>
</tr>
<tr>
<td>Alexander, Yonah</td>
<td>18</td>
</tr>
<tr>
<td>all-hazards warning systems</td>
<td>139</td>
</tr>
<tr>
<td>Allen, Kenneth</td>
<td>138, 139</td>
</tr>
<tr>
<td>Alston, Julian M.</td>
<td>181</td>
</tr>
<tr>
<td>Amin, Massoud</td>
<td>75</td>
</tr>
<tr>
<td>An, D.</td>
<td>203, 299</td>
</tr>
<tr>
<td>anthrax</td>
<td>18, 125, 126, 127, 129</td>
</tr>
<tr>
<td>antibiotics</td>
<td>122, 123, 128, 129</td>
</tr>
<tr>
<td>Apt, Jay</td>
<td>4</td>
</tr>
<tr>
<td>Arce, M.</td>
<td>15, 23, 25, 31</td>
</tr>
<tr>
<td>Arthur Anderson</td>
<td>37, 53</td>
</tr>
<tr>
<td>assassinations</td>
<td>16, 28</td>
</tr>
<tr>
<td>asymmetric targets</td>
<td>25–6</td>
</tr>
<tr>
<td>Atkinson, Scott E.</td>
<td>16, 20</td>
</tr>
<tr>
<td>attack costs</td>
<td>229</td>
</tr>
<tr>
<td>perceived risk</td>
<td>152–4, 156, 157–8</td>
</tr>
<tr>
<td>predictability</td>
<td>2</td>
</tr>
<tr>
<td>probability</td>
<td>20–21, 155–6, 224–5, 230, 232, 237–8</td>
</tr>
<tr>
<td>protection strategies</td>
<td>41–2</td>
</tr>
<tr>
<td>Automatic Targeting System (CPB)</td>
<td>238, 257</td>
</tr>
<tr>
<td>Azam, Jean-Paul</td>
<td>12</td>
</tr>
<tr>
<td>Badger Rail Bridge</td>
<td>281</td>
</tr>
<tr>
<td>Bae, Chang-Hee Christine</td>
<td>9</td>
</tr>
<tr>
<td>baggage screening, airports</td>
<td>29–30, 38–41, 44–5, 46–7, 48–51</td>
</tr>
<tr>
<td>ballistic missile defense</td>
<td>119, 121, 124</td>
</tr>
<tr>
<td>Baran, P.</td>
<td>196</td>
</tr>
<tr>
<td>Barings Bank</td>
<td>37, 53</td>
</tr>
<tr>
<td>Barnett, A.I.</td>
<td>238</td>
</tr>
<tr>
<td>Bassok, Alon</td>
<td>9</td>
</tr>
<tr>
<td>Baton, Jonathan</td>
<td>52</td>
</tr>
<tr>
<td>Becker, G.</td>
<td>171</td>
</tr>
<tr>
<td>Beenstock, M.</td>
<td>207</td>
</tr>
<tr>
<td>behavioral considerations, investment in security</td>
<td>52</td>
</tr>
<tr>
<td>responses to terrorism</td>
<td>152–4</td>
</tr>
<tr>
<td>benefit transfer</td>
<td>181–2</td>
</tr>
<tr>
<td>Bott, B.</td>
<td>207</td>
</tr>
<tr>
<td>Bernkopf, R.L.</td>
<td>5–6, 140</td>
</tr>
<tr>
<td>Bernoulli random process</td>
<td>227</td>
</tr>
<tr>
<td>Bertekas, D.</td>
<td>228</td>
</tr>
<tr>
<td>bin Laden, Osama</td>
<td>196</td>
</tr>
<tr>
<td>biodefense</td>
<td>119–20</td>
</tr>
<tr>
<td>active vs. passive</td>
<td>121–3</td>
</tr>
<tr>
<td>benefits</td>
<td>127–8</td>
</tr>
<tr>
<td>cost-benefit assessment</td>
<td>123–4, 125</td>
</tr>
<tr>
<td>effectiveness vs. efficiency</td>
<td>120–21</td>
</tr>
<tr>
<td>public health benefits</td>
<td>130–31</td>
</tr>
<tr>
<td>resource allocation</td>
<td>124–5</td>
</tr>
<tr>
<td>short-term strategies</td>
<td>128–9</td>
</tr>
<tr>
<td>bivariate probit model</td>
<td>144–6</td>
</tr>
<tr>
<td>blackouts, electricity system</td>
<td>58–9, 66–7</td>
</tr>
<tr>
<td>barriers to prevention</td>
<td>61–3</td>
</tr>
<tr>
<td>costs of</td>
<td>207–8</td>
</tr>
<tr>
<td>public reactions to</td>
<td>59–60</td>
</tr>
<tr>
<td>Blain, Larry</td>
<td>9</td>
</tr>
<tr>
<td>Boisvert, R.</td>
<td>198</td>
</tr>
</tbody>
</table>
flows 244
losses 252
trade figures 263
container inspections, ports 218–21
cost-benefit analysis 222–34
coverage 256–7
foreign ports 249–51
frequency 264
limitations 235–7
overview 221
policy proposals 221–2
rates 242, 257
research directions 237–8
Container Security Initiative (CSI) 8, 243, 246, 249–51, 256, 257, 258–9
contingent valuation 178–9
continuous variables 158–9
Convention for the Safety of Life at Sea 219
Conybeare, John A. 25
coordinated network power systems 91–2
coordinating mechanisms 50–51
copycat effects, terrorism 18
Cordes, J.J. 184
corporate location decisions 1
cost–benefit analysis
biodefense 123–4, 125
container scanning 220–34
homeland security policies 171–5
terrorist-thwarting policies 30–31
cost-effective policies 2
counter-insurgency defense 121
counterterrorist capabilities 24–6
criminal acts 11
Crist, P. 218, 219
Critical Emergency Operations Communications Link (CEOCOMLINK), Business Roundtable 136
Critical Infrastructure Identification (2003) 75
Critical Infrastructure Protection (1998) 75
Critical Infrastructure Protection/Decision Support System (CIP/DSS) 75
‘cry wolf’ hypothesis 147
customs officials, in foreign ports 246
Customs–Trade Partnership Against Terrorism (C-TPAT) 8, 219, 243, 246, 249, 251–2, 256, 257, 259
cyber
attacks 45, 64
threats 137
cycles, transnational terrorism 17–20
Dade County 184
dams 60
dangerous cargo, interception of 249–50
data
availability 202
land markets 159–60
transnational terrorism 13–20
DataQuick 159
Davis, Bill 269
decentralized power systems 91–3
decision processes 178–9
defense
active vs. passive 121–3
effectiveness vs. efficiency 120–21
DeKay, M.L. 80
delay costs
cargo 228–9, 230, 232–3
road transport 275–9
demand
deferment 282
models 177
shifts 208
Democratic National Convention (2004) 220
Department of Defense 64, 75, 136
Department of Energy 63
Department of Homeland Security 1, 63, 140, 252, 257–8
Department of Transportation 245
deregulation, electric power system 62, 71, 199
detection capabilities, container,
inspection 225
deterrence 20–24
deterrent effects
air defense 121
container scanning 224, 238
differentiated policy, option price 174–5
direct resilience 209–10, 212
‘dirty bombs’ attacks 262–5
economic effects 269–75
transportation effects 275–82
discrete regions of proximity 160, 161–7
disequilibria 208–9
distributed generation (DG) 67–8
distribution hubs 280
domestic facility/vessel security plans 248
Dominion Virginia Power 60
Douglas, J. 207, 210
Drakos, Kostas 29
Duchin, F. 200
dynamic models 51–2

earthquakes
analysis of 76, 289–91
damage 270, 279, 281
engineering 72
mitigation 124
simulations 156, 168, 199, 210, 212
eco-terrorism 60

economic
disequilibria 201
effects of ‘dirty bomb’ attacks 269–75
impacts, spatial diffusion 201
losses 197, 207–8
methodology 12
resilience 200, 203
economy-wide responses, terrorist threats 208–9
economy, Los Angeles/Long Beach ports 263
effectiveness vs. efficiency, biodefense 120–21
Eguchi, R. 213
Ehrlich, I. 171
Electric Power Research Institute (EPRI) 65, 75
electrical dependencies 71
electricity systems 57
blackouts 58–63, 71–9, 80–88, 209–10
distributed generation 67–8
new vulnerabilities 64–5
primer 93–5
system survivability 66–7
electromagnetic pulse (EMP) 64–5
electronic scanning, containers 220, 225
elevated risk condition 133, 134
Elysian Park Fault 229, 279, 299
emergency warning systems 136
empirical insights, terrorist threats 209–13
specifications of resilience 206
strategy, impact of spatial externalities 157–9
Enders, Walter 3, 12, 15, 16, 18, 19, 25, 26, 27, 28, 31
environmental variables 155
equilibrium displacement model 181
schedule of prices 176
equipment
container inspections 236
failure, electricity system 58, 60
ETA (Euskadi ta Askatasuna) 29
expected pay-offs, hostage taking 20–23
expected utility theory 79–80, 147–8, 174–6
exports 263
externalities models 154–9
externally transmitted shocks, modelling effects of 107
extreme events 1–2
mitigation of 70–89

facility plans, ports 247–8, 256
Faria, Joao 18
Farrell, Alex 4
fatalities 13, 30
Federal Bureau of Investigation (FBI) 63, 245
Federal Emergency Management Agency (FEMA) 73, 83, 185, 198
Federal Energy Regulatory Commission (FERC) 63, 91, 96–7
federal port security grants 252
financial damages, averted 225
First American Real Estate Solutions 185
Fischbeck, P.S. 80
Fischhoff, B. 80, 152
Fisher, R. 75
Florida ports, identity cards 248–9
Florida Power and Light Co. 115
Florig, H. Keith 80
Flynn, Stephen E. 219, 220, 242
Force Protection Condition 136
Index

foreign governments/interests 13, 17
foreign ports
  membership of CSI 249–51
  security 246, 248, 256
Fortune 100 228
fossil fuels 68
Fourier series theory 19
Frankle, R.S. 226
freeway access to ports 262, 275–9
freight delays 299–300
French, S. 200
full information maximum likelihood
  method 146
function transfer 182
funding, port security programs 257–8

Galbraith, J.K. 196
Gallagher, R. 228
game theory, hostage taking 20–23
  government responses 23–4
gamma-ray scanning 221, 222, 226
Ganderton, P.T. 5–6, 140
Gardeazabal, Javier 12, 29
Garin-Lowry style model 266, 267, 269
gas transmission system 65
Gellerson, M. 207
general equilibrium effects 207–8, 210, 212
Gerenscer, M. 218
German war machine 196
Gilmore Commission 138–9
Goldin, E. 207
Gonzalez, D.A. 152
Gordon, Peter 8–9, 75, 203, 229, 267, 269, 279, 299
government
  regulations 49–50
  responses, hostage taking 23–4
  safety regulators 63
Graham, Bob 245
Great Northeastern Blackout (1965) 59
Greenberg, M. 154
Gruntfest, Eve 141
Guha, G. 199, 200, 205, 209, 210

Haines, Y.Y. 75
Haitobsky, Y. 207
Hallstrom, Daniel G. 6–7, 171
hand inspection, containers 221, 225, 226–7, 228, 229–30, 232, 234, 257
hand-held radiation detectors 264
Harriges, J. 207
Hartwig, Robert 183
Haveman, Jon D. 8
hazard events 83
hazard loss estimation model
  (HAZUS) 83, 198
Heal, Geoffrey 3–4, 29, 37, 43, 49, 51, 53
healthcare
  benefits 125, 128, 130–31
  expenditures 121
  issues 86
Heckman, J.J. 180
hedonic
  models 176, 187
  pricing 154–5
  regression 157, 162–3
Henrion, Max 80
Hensher, David A. 179
Hershey, John 52
Hewings, G. 203
high-hazard facilities 67
high-profile citizens 173
high-risk
  areas 184, 188
  containers 257
high-traffic ports 234, 237–8
high-value targets 123
highjackings 26, 27, 30
highway network, implications of
  attack 287–8
  issues 296–300
  precursor to research 289–91
  research objectives 288–9
  trip diversion and costs by route 291–7
hoaxes 17, 19
Hoffman, Bruce 16
Holling, C. 203
Hollings, Ernest F. 245
Homeland Security Advisory System
  (HSAS) 5, 133–50
homeland security policies 170–71
  benefit transfer 181–2
  cost–benefit analysis 171–5
  information/methods of evaluation 175–81
natural hazards as natural experiments 183–90
Homestead Air Force Base 184
Hoover Dam 60
hostage-taking 16, 17, 19–20, 27
game theory 20–23
housing markets see land markets
housing sales data 185
Hughes, J. 154
Hurricane Andrew 229
study of 183–90
Hurricane Ivan 229
Husemann, R.C. 221, 226
Hydro-Quebec 110
Hyogoken-Nanbu earthquake (1995) 72–3, 76
I–O modelling 199–203, 208, 210, 213
ice storms 58–9
identification cards, port workers 248–9
Im, Eric I. 28
impact analysis 180–81
CGE models 199–203
IMPLAN input–output model 266
imports 263
incentives, investment in security 35–54
Independent System Operators (ISO) 91, 92, 96, 98, 102, 110, 115–16,
117
indirect economic loss module (Ielmet) 198
individual
behavior 200
decision-making under uncertainty 171–2, 174–6
resilience 204–5, 212
influence diagrams 81
information for policy choice 175–81
infrastructure
container inspections 236
electricity system 60
failures 71–2, 84–8
impacts 200
interdependencies 65, 72–5
restoration 298–9
targets 57, 137
infrastructure failure 70–71
conceptual frameworks 72, 76–9
electrical interdependencies 71
issues 72–5
mitigation ranking exercises 79–84
recent disasters 84–8
structure and specific objectives 71–2
infrastructure failure interactions (IFIs) 72, 76–9, 83, 84, 85–6, 87–8
inherent resilience 203, 205–6
institutional structure, power industry 96–7
insurance 30, 48, 50, 54, 167, 173–5, 185
Insurance Information Institute 183
intelligence information 24, 137
inter-industry models 266, 270
interdependent security (IDS) 29–30, 35–54
International Air Transport Association (IATA) 50
international legislation, maritime shipping 243, 246
International Maritime Organization (IMO) 219, 243
International Port Security Program, USCG 248
International Ship and Port Facilities Security Code (ISPS) 219, 246
international shipping systems, security models 254
International Terrorism: Attributes of Terrorist Events (ITERATE) 15–16, 17
international trade 218
contribution of US ports 243–5
impact of port closures 271–5, 283
maintenance 242–3
international vessel security plans 248
Internet security threats 66
Internet-based systems 64
investment in security 35–7
extension of analysis 51–2
multi-agent case 43–8
research on risk management strategies 52–4
risk management solutions 48–51
two-agent problem 38–43
Islam, Muhammad Q. 20
Martonosi, S.E. 7–8, 224, 238
McDaniel, B. 226
McDaniels, Timothy L. 4
McFadden, Daniel 178
media 15, 17, 87–8, 174
Memphis, Texas 199, 210
mesoeconomic resilience 204
meta-analysis 182
metal detectors 26, 27
Metropolitan Planning Organization (MPO), Seattle 287
microeconomic resilience 204
Mileti, D. 203
military defense 121
Military Traffic Management Command (MTMC) 252
Minnesota Planning Group 266
mitigation
‘dirty bomb’ attacks 283
literature 184
port closures 275
ranking exercises 79–84
terrorist activity 202, 203, 204
monopoly franchise system 61
Monte Carlo simulation model 290
Moore II, J.E. 8–9, 75, 203, 269, 299
Morgan, K.M. 80
Morgan, M. Granger 4
motivations of terrorism 11, 16–17
multi-agent IDS case 43–4
characterization of solutions 44–5
multi-period models 51–2
multi-sector modelling approaches 199–203
Munasinghe, M. 207
Murdoch, James C. 156
Murrah Federal Building 229
Nash equilibrium 3, 46, 49, 175
nation-specific benefits of retaliation 25–6
National Electric Reliability Council (NERC) 96–7
National Flood Insurance Program 185
National Interstate Economic Model (NIEMO) 267, 283
National Laboratories 75
National Opinion Research Center 59
National Science Foundation 70
National Transportation Safety Board 65
natural epidemics 129
experiments 178
natural disasters costs 229
economics 1–2
infrastructure failure
interdependencies 84–8
natural hazards
CGE modelling 198–9
electricity system 58–9
as natural experiments 183–90
as parallel events 183
Navarro-Lozana, S. 180
Navrud, Stale 182
‘near-miss’ natural hazards 183, 184, 188
negative externalities 154, 173
negotiations, hostage takers 20–23
Neil, Roger 50
Netherlands, distributed generation 68
networking advantage of terrorists 24
New York Power Authority 110
New York, electricity system 94–5
Nojima, Nobuoto 72, 76
non-market
goods/services 175–6
impacts 200
non-terrorist actions 28
North American Electricity Reliability Council (NERC) 58, 59, 63, 75
Northridge earthquake (1994) 199, 270, 281
Norton, George W. 181
nuclear materials, container inspection policies 220
power stations 60–61, 67, 249
reactor meltdown 42–3
Nuclear Regulatory Commission (NRC) 61
numerical simulations, power industry 103–14
potential inferences 114–17
Odoni, A.R. 228
Office of Critical Infrastructure
Protection and Emergency Preparedness, Canada 73
Office of Domestic Preparedness (ODP) 252
port security grants 254
Office of Technology Assessment 60
Onculer, Ayse 52
Operation Safe Commerce (OSC) 246, 253–4
operational control, power systems 97–100
costs, container inspections 236
operator error, electricity system 58
organizational performance model 104–7
Ortiz, D. 7–8, 218, 219
Overgaard, Per B. 23

Pacific Northwest case study 80–89
effects of storms 72, 73
Pacific Northwest Economic Region (PNWER) 73
Pan Am 39, 49
Pan, Qisheng 8–9
Panama Canal 281–2
Pardey, Philip G. 181
Pareto improvements 171
Parise, Gerald F. 15, 19, 29
partial equilibrium 207
Partnership for Public Warning (PPW) 138
Partridge, M. 197
passenger car equivalent (PCE) 294, 301
passive defense 121–3
peacetime defense 121
peak commuting periods 291–3
Peerenboom, J.P. 72, 73, 75, 76
Pelosi, Nancy 220
Pena, Charles V. 134, 138
performance, container inspection 226–7
perishable cargo 228
Perrings, C. 203, 204
Persian Gulf 26
personnel requirements, containing inspections 236
Petak, W. 204
Pizam, Abraham 156

Plamondon, Marie-Eve P. 76
Pluchinsky, Dennis 18
pneumonic plague 125, 129
Poisson process 227, 235
policy initiatives 245–6
container inspection 221–2, 225, 229–30
disruption 264–5, 269–75
diversion of trade 281–2
lock-outs 218
political objectives of terrorism 11
port attacks
research needs 282
strategic questions 279
port security 242–3
evaluation of policies 255–8
focus of 219
issues 243–5
measures 245–55
Port Security: A National Planning Guide 245
Porter, M. 206
Portland, Oregon 199, 210, 212
positive externalities 154
power systems, connectivity 91–3
electrical systems primer 93–5
numerical simulation insights 103–14
operation control/reliability 97–100
principles for improvements 114–17
regulatory and institutional structure 96–7
terrorist assaults 100–102
primary inspection, containers 220, 221
prisoners’ dilemma paradigm 15, 25, 36, 41–2, 47–8
private protection 172–4
private sector infrastructure 137
production interruption 196–7, 199, 200
property damage 196, 199, 200
values 183–90
protection policies 172–3
provision points 179
public education 123, 124
pressure 18
protection 172–3
reactions, electricity blackouts 59–60
transport 300
utility commissions 62
warning systems 174
public-private risk management partnerships 54
Puget Sound Region Transportation Model 289
Puget Sound Regional Council 287
Purdum, Todd S. 136
pure information effect 184–5, 188
queuing models 225, 235–6
radiological dispersal devices (RDDs)
see ‘dirty bombs’
rail network, California 280–81
random utility models 142–3, 177–8
rational choice representations of terrorists 26–30
rational model of behavior 12, 52, 147–8
Reagan, Ronald 26
recovery processes 201
recreation demand model 177
Red Cross 133, 140, 144, 149
Redfearn, Christian L. 6
Reed, Dorothy 4
regional economic impacts analysis 197–8
measurement of 266–9
Regional Transmission Organizations (RTO) 91, 92, 96, 98, 102, 115–16, 117
regulatory structure, electricity industry 96–7
reliability institutions 61–2, 63
philosophy, power systems 97–100
religious-based fundamentalist groups 16–17
repeat sales model 187–90
research and development (R&D)
biodefense 123, 124
electricity industry 63
grants 254–5
research directions, container inspections 237–8
resilience 203–6, 209–10, 212–13
resources
biodefense 120–21, 124–5
misallocation of 139
port security 255–6
terrorists 27–8
revealed preference methods 176–8
joint estimation of 180
Revolutionary Organization November, Greece 13, 17
Richardson, Harry W. 8–9, 75, 203, 229, 267, 269, 279, 299
Rickman, D. 197
Ridge, Tom, 133, 138
Rinaldi, S.M. 72, 73, 76
risk assessment 137, 156
aversion 20–21
information 139–42
perception 184
reduction 170–71
risk management, IDS problem 48–51
future research 52–4
risk-taking culture 37
Riverside distribution hub 280–81
road congestion index 287–8
Robert, Benoit 76
Rose, A. 7, 198, 199, 200, 202, 205, 209, 210, 212, 213
route changes, costs 291–6
Sabourin, Jean-Pierre 76
San Bernardino County distribution hub 280–81
San Francisco, housing market 156
Sandler, Todd 3, 12, 15, 16, 18, 19, 20, 23, 25, 26, 27, 28, 31
scanning, containers 221, 222, 226, 227–8
cost–benefit analysis 229–30,
230–34
research directions 237–8
scenario-building 2–3
Schelling, Thomas C. 37, 121
Schiesel, S. 221, 226
Schuler, R. 4–5, 103, 107
Scott, John L. 20
screening, airports 264
Seattle Fault  83
Seattle highway network see highway network
secondary inspection, containers  220, 222
security
electricity system  62
failures  38–9
grants  252–4
perceptions  170
planning  247–8
vulnerabilities  242–3
security policies see homeland security policies
Seligson, H.  213
Senay, Marie-Helene  76
service flows  155–6
severe risk condition  133, 134
Shahin, Wassim N. 20
Shatz, Howard J.  8
Sheffi, Y.  284
Shinozuka, Masanbou  75, 203, 229, 279, 299
Shoven, J.  197
simulated randomness 12
simulation exercises 124
Singh, Harinder  156
single-occupant vehicles (SOVs)  293
Siqueira, Kevin  15, 23
Sloboda, Brian W.  156
Slovic, Paul  52
Small, D.A.  152
smallpox 125, 126–7, 129
Smart and Secure Tradelanes consortium 219
Smith, Ginger  156
Smith, Vernon  6–7, 171, 177
social insurance programs  48
societal effects of contagion  46–8
socio-economic groups, distribution of impacts  201
Software Engineering Institute, Carnegie Mellon University  66
Sohn, J.  203
solar-electric technologies  67–8
Southern California Association of Governments (SCAG)  266
Southern California Planning Model (SCPM)  266–9, 283
Soviet Union  196
Spain, tourist industry  29
spatial
economic impact models  270
externalities  154–9
Special Flood Hazard Area (SFHA)  185, 187, 188
specific targets/threats  136, 137, 138–9, 149, 152, 199–200
Spencer, C.  228–9
spillover effects, natural disasters  72–3, 83
Stana, R.M.  218, 238
Standard Market Design, electricity industry  96–7
State of the Union address (2004)  220
stated preference methods  178–80
joint estimation of  180
Stewart, T.R.  70
strategic ports  252–3
strikes, ports  126, 265
subsidized insurance  173–4, 185
substitution, terrorist attacks  26–9
Suez Canal  281–2
supervisory control and data acquisition (SCADA) systems  64, 65, 68
supply and demand  209
supply chain security  251–2, 253–4, 258–9
survivability of systems  66–7
Sveklar, W.D.  75
symbolic targets  57, 200
system
planners, electricity supply  64–5
resilience  203
survivability, electricity supply  66–7
Taliban  25, 31
taxation  49
technology
barriers  28
container scanning  221–2, 230, 233–4, 237–8
development  254–5
testing  246, 253–4
wish-lists  249
Terminal Island  265, 281, 282
terrorism
motivations  11, 16–17
networks  24
<table>
<thead>
<tr>
<th>Topic</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terrorist threats</td>
<td>196–7</td>
</tr>
<tr>
<td>Computable general equilibrium</td>
<td>197–203</td>
</tr>
<tr>
<td>Economy-wide responses/disequilibria</td>
<td>208–9</td>
</tr>
<tr>
<td>Empirical insights</td>
<td>209–13</td>
</tr>
<tr>
<td>General equilibrium effects</td>
<td>207–8</td>
</tr>
<tr>
<td>Resilience to terrorist-related screening</td>
<td>203–6</td>
</tr>
<tr>
<td>Rational choice representations</td>
<td>26–30</td>
</tr>
<tr>
<td>Texas Transportation Institute</td>
<td>287–8</td>
</tr>
<tr>
<td>Thatcher, Margaret</td>
<td>174</td>
</tr>
<tr>
<td>Thayer, Mark</td>
<td>156</td>
</tr>
<tr>
<td>Third-party inspections</td>
<td>49–50, 54</td>
</tr>
<tr>
<td>Thorp, J.</td>
<td>102</td>
</tr>
<tr>
<td>Threat communication analysis</td>
<td>133–5</td>
</tr>
<tr>
<td>Background</td>
<td>135–9</td>
</tr>
<tr>
<td>Data, analysis and results</td>
<td>141–9</td>
</tr>
<tr>
<td>Experiments</td>
<td>139–41</td>
</tr>
<tr>
<td>Threats</td>
<td>133–7, 138–9</td>
</tr>
<tr>
<td>Perceptions</td>
<td>139–49</td>
</tr>
<tr>
<td>Trends/cycles</td>
<td>147</td>
</tr>
<tr>
<td>Tierney, Kathleen</td>
<td>137, 204, 205, 210</td>
</tr>
<tr>
<td>Time-to-failure model</td>
<td>16, 31</td>
</tr>
<tr>
<td>‘Tipping’ phenomenon</td>
<td>30, 37, 44, 45–6, 51</td>
</tr>
<tr>
<td>Top Officials Exercise of Response to Terrorist Attack (TOPOFF)</td>
<td>124</td>
</tr>
<tr>
<td>Tourism</td>
<td>29, 156</td>
</tr>
<tr>
<td>Trade diversion</td>
<td>281–2</td>
</tr>
<tr>
<td>Trade-offs</td>
<td>175–6</td>
</tr>
<tr>
<td>Traffic</td>
<td>86, 289–91</td>
</tr>
<tr>
<td>Congestion</td>
<td>86, 289–91</td>
</tr>
<tr>
<td>Flows</td>
<td>267–9, 288–9</td>
</tr>
<tr>
<td>Mitigation measures</td>
<td>300</td>
</tr>
<tr>
<td>Signals</td>
<td>66–7, 73, 84, 92</td>
</tr>
<tr>
<td>Traffic analysis zones (TAZs)</td>
<td>290</td>
</tr>
<tr>
<td>Training, system operators</td>
<td>67</td>
</tr>
<tr>
<td>Transference externality</td>
<td>23–4</td>
</tr>
<tr>
<td>Transmission system, electricity</td>
<td>62</td>
</tr>
<tr>
<td>Transnational terrorism</td>
<td>11–13</td>
</tr>
<tr>
<td>Cost-benefit analysis of terrorist-thwarting policies</td>
<td>30–31</td>
</tr>
<tr>
<td>Data</td>
<td>13–20</td>
</tr>
<tr>
<td>Game theory/government responses</td>
<td>23–4</td>
</tr>
<tr>
<td>Game theory/hostage taking</td>
<td>20–23</td>
</tr>
<tr>
<td>Rational choice representations of terrorists</td>
<td>26–30</td>
</tr>
<tr>
<td>Transportation</td>
<td></td>
</tr>
<tr>
<td>Access, ports</td>
<td>269–75, 284–5</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>287–8</td>
</tr>
<tr>
<td>Network models</td>
<td>280</td>
</tr>
<tr>
<td>Security initiatives, goal of</td>
<td>219</td>
</tr>
<tr>
<td>Transportation impacts of ‘dirty bomb’ attacks</td>
<td>275–9, 283</td>
</tr>
<tr>
<td>Qualifications to</td>
<td>280–82</td>
</tr>
<tr>
<td>Transportation Security Administration (TSA)</td>
<td>248</td>
</tr>
<tr>
<td>Port security grants</td>
<td>252–3</td>
</tr>
<tr>
<td>Transportation Worker Identification Credential (TWIC)</td>
<td>248–9</td>
</tr>
<tr>
<td>Travel</td>
<td></td>
</tr>
<tr>
<td>Costs</td>
<td>284–5</td>
</tr>
<tr>
<td>Risks</td>
<td>29, 30</td>
</tr>
<tr>
<td>Times</td>
<td>289–96</td>
</tr>
<tr>
<td>Treaster, J.B.</td>
<td>229</td>
</tr>
<tr>
<td>Trends, transnational terrorism</td>
<td>17–20</td>
</tr>
<tr>
<td>Trip</td>
<td></td>
</tr>
<tr>
<td>Deterrence</td>
<td>298</td>
</tr>
<tr>
<td>Diversion</td>
<td>291–7</td>
</tr>
<tr>
<td>Truckways</td>
<td>280–81</td>
</tr>
<tr>
<td>Tschirhart, John T.</td>
<td>16, 20</td>
</tr>
<tr>
<td>Tversky, Amos</td>
<td>52</td>
</tr>
<tr>
<td>Two-agent problem</td>
<td>38–43</td>
</tr>
<tr>
<td>Unbounded systems</td>
<td>66</td>
</tr>
<tr>
<td>Uncertainty</td>
<td></td>
</tr>
<tr>
<td>Choice under</td>
<td>139–49</td>
</tr>
<tr>
<td>Container inspection model</td>
<td>224</td>
</tr>
<tr>
<td>Unilateral action</td>
<td>25</td>
</tr>
<tr>
<td>Unit value transfer</td>
<td>182</td>
</tr>
<tr>
<td>Urban Areas Security Initiative (UASI)</td>
<td>254</td>
</tr>
<tr>
<td>Urban population centres</td>
<td>125</td>
</tr>
<tr>
<td>US Bank Tower</td>
<td>262</td>
</tr>
<tr>
<td>US Census</td>
<td>159, 167, 293</td>
</tr>
<tr>
<td>US Coast Guard (USCG)</td>
<td>243, 246, 247–8, 249, 256, 257</td>
</tr>
<tr>
<td>International Port Security Program</td>
<td>248</td>
</tr>
<tr>
<td>US Constitution</td>
<td>91</td>
</tr>
<tr>
<td>US Customs and Border Protection (CBP)</td>
<td>8, 219, 221, 224, 238, 243, 249, 256–7</td>
</tr>
<tr>
<td>US Embassies</td>
<td>13, 16, 17, 27, 28, 30</td>
</tr>
</tbody>
</table>
Index

US Maritime Administration (MARAD) 252
US Senate Bill 1214 245
utility
  monopolies, regulation 62
  service disruption, CGE modelling 198, 199, 209, 210–12
vaccines 122, 123, 124, 125, 128, 129
van der Linde, C. 206
vector autoregression (VAR) analysis 27–8, 29
Vehicle and Cargo Inspection System (VACIS) 227
vessel plans 247–8, 256
video surveillance 283
Vilchis, Ernesto 8
Vincent Thomas Bridge 265, 281, 282
Vincent, D. 218
von Winterfeldt, D. 80
vulnerabilities 242–3
  assessments 249
  electricity system 60, 64–5
Waddington, Margaret 156
Wang, H. 102
Wardrop, J.G. 284
warnings, responses 134, 136, 139, 149
Washington Heights, electricity blackout 101–2
water
  supply 92
  systems 75, 86
weakest-link countries 24
wealth 146, 148
weapons arsenals, use of ports 244
web-based experiments 149–50
Weinberg, J. 218
welfare economics 79–80
Whalley, J. 197
Whitfield, R. 75
Wilhelmsson, Mats 154
Wilkinson, Paul 15, 16
willingness-to-pay/willingness-to-sell 79–80
Willis, H. 218, 219
Willis, Henry H. 7–8
Wilson, R. 205
Windle, R. 207
Woo, Gordon 174, 185
World Trade Centre 11, 92, 183, 229
x-ray scanning 221, 222, 226, 264
Y2K 64
Yezer, A.M.J. 184
Zanjani, G.H. 172, 173, 183