

Index

- adaptation, 12, 20, 30, 58, 62, 64, 123, 144, 272, 373, 377
- adaptive capacity, 21, 79
- adverse selection, 96, 147, 148, 159, 162, 333, 335, 353, 359, 368, 378, 379, 384
- affective feelings, 18, 275
- alternative risk transfer instruments, 85, 122, 151, 153, 156, 379, *see* risk transfer and catastrophe bonds
- ambiguity of risk, 13, 146, 251
- ambiguity premium, 46
- Amsterdam, 23
- analytical system, 274
- Antarctic Ice Sheet, 8, 11, 49
- Atlantic thermohaline circulation, 11
- Attention for Safety, 190
- Australia, 4, 93, 95, 128
- Austria, 313
- autocorrelation, 106
- availability heuristic, 17, 275

- Bangladesh, 9, 29, 314, 315
- basis risk, 81
- Bayesian learning, 275, 325
- behavioural economics, 4, 16–19, 201, 211–213, 253–255, 257–266, 325, 327
- Bolivia, 80
- bounded rationality, 29, 269, *see* prospect theory
- building codes, 23, 40, 46, 145, 157, 164, 189, 191, 192, 197
- business interruption, 76

- Caisse Centrale de Réassurance, 158
- Calamities and Compensation Act, 54, 55, 140, 220, 307, 343
- California, 76

- Canada, 68
- capital markets, 30, 44, 55, 85, 122, 123, 143, 163, 375
- catastrophe bonds, 86, 151, 152, *see* alternative risk transfer instruments
- catastrophe models, 14, 15, 17, 49, 82, 147, 148, 191, 373, 378
- insurance premium, 14, 147
- uncertainty, 15
- certainty effect, 201
- certainty equivalent, 257–263
- charity hazard, 25, 307, 308–314, 321, 334, 343, 367, 383, 384
- China, 12, 125
- choice experiment, 29, 315, 342, 344–346, 350
- climate change, 7–11, 39, 59, 117, 170–172, 179, 186, 255, 373
- impacts, 15, 16, 26–29, 40–41, 44–46, 56, 64, 69, 76, 117–120, 125–128, 217, 374, 375
- insurance premium, 27, 45, 144
- perceptions, 37, 83, 203, 331, 359
- resilience, 20, 37, 139, 188, 387
- the Netherlands, 46–49
- uncertainty, 13, 23, 41, 85, 91, 219, 250, 376
- climate model, 8, 38, 68, 82, 93–95, 387
- climate policy, 7, 12, 90, *see* greenhouse gas mitigation
- climate tipping points, 10, 28, 45
- climate variability, 9, 14, 27, 28, 40, 45, 250, 376
- CO₂ emissions, 12, 255
- China, 12
- India, 12
- Japan, 12
- USA, 12
- Western Europe, 12

- co-insurance, 149, 379
- Community Rating System, 156, 312
- contingent valuation, 29, 225, 306, 313, 314, 319, 321, 342
- coping capacity, 21
- correlated risks, 96, 150–153, 163, 253
- cost–benefit analysis, 22, 23, 90, 165, 168, 234
- crop damage, 55, 57, 58, 61, 64, 76, 82, 97
- crop insurance, 29, 57, 61, 65, 68, 76, 80, 94, 96–98, 314
- cycle of poverty, 79
- damage functions, 14, 288
- damage mitigation, 21, 23, 65, 86–87, 123, 144, 181, 208, 224–228, 380
 - demand, 206, 211–213, 228
 - effectiveness, 23, 191–196, 230–236
 - Germany, 195
 - non-structural, 194
 - structural, 194
 - the Netherlands, 196–198
 - United Kingdom, 193, 212
 - USA, 193
- decision making under risk, 19, 252, 254, 266, 269, 305, 320, 382, *see* expected utility theory, prospect theory and rank dependent utility theory
- deductible, 57, 61, 83, 86, 121, 149, 158, 160, 313, 379
- Deltaworks, 22, 23, 138, 168
- developing countries, 4, 78–82, 314–315, 377, 387
- dike-ring, 167, 168, 177, 230, 255, 256, 283
- disaster loss trends, 27, 37, 40–41, 70, 373
- disaster relief, 55, 82, 140, 142, 154, 160, 237, 311, 313, 315, 321, 330, 345, 359, 362, 364, 383, *see* government compensation
- discount of premium, 123, 145, 155, 157, 214, 215, 227–228, *see* incentives
 - long-term insurance, 216
- diversification, 25–26, 44, 167, 173, 175, 185, 186, 380
- drought insurance, 45, 61–62
- drought risk, 49, 60–63, 76
- dual-process theory, 274, 276
- dummy variable, 106, 239, 249, 291
- earthquake risk, 4, 23, 159
 - perceptions, 270
- El Niño–Southern Oscillation, 11
- elasticity, 100, 106, 328, 334, 355
- elevation of structures, 155, 193, 197, 198
 - demand, 201–206
- emergency planning, 14
- EU Flood Directive, 15
- evacuation, 18, 170, 239, 275, 289, 295, 297, 298
- exceedance probability curves, 15
- expected utility theory, 19, 29, 251–255, 257–259, 264, 315, 330, 335, 382
- experiential system, 274
- experimental design, 346
- exposure, 7, 13, 14, 22, 38, 41, 44, 50, 69, 79, 124, 147, 159, 169, 287
- externality, 11
- fat tails, 27, 44
- Federal Emergency Management Agency, 70, 154, 193
- fire risk, 4, 45, 63, 147
 - perceptions, 279
- flood insurance, 53, 138
 - damage mitigation, 213–215, 230
 - demand, 253–266, 308–316, 322–325, 326–334, 353–364, *see* insurance demand
 - France, 159
 - Germany, 160
 - market share, 155, 158, 159, 253, 312, 360
 - premium, 146, 155, 158, 215, 217
 - price elasticity, 355
 - the Netherlands, 140–142, 220
 - United Kingdom, 158
 - USA, 156
- flood map, 15, 154, 219, 270
- flood-proofing, 23, 156, 181, 183, 189, 191, 193, 215, 219, 300

- flood risk, 16, 49, 53, 54, 69, 125–128
 Australia, 128
 Germany, 128
 perceptions, 204, 270, 273,
 278–285, 359
 projections, 16, 50, 69, 125, 128
 Spain, 128
 the Netherlands, 32, 49, 125, 128,
 219, 272
 United Kingdom, 69, 125
 Florida, 6, 23, 28, 78, 191, 312, 313
 forecast test, 108
 forecasting, 110
 forward-looking maps, 15
 France, 5, 64, 92, 94, 148, 158–159
 free riding, 11
 frost risk, 65, 67
- general circulation model, 46, 124, 125
 geographical information systems, 14,
 148, 205, 240, 271, 287, 332
 Germany, 5, 19, 24, 94, 125, 128,
 159–160, 195, 196, 214, 313
 government compensation, 140, 142,
 220, 222, 244, 266, 273, 324,
 331, 343, 360, 367, *see* disaster
 relief
 great natural disaster losses, 3–5, 39–40
 Greece, 4
 greenhouse gas mitigation, 12, 86, 91,
see climate policy
 greenhouse insurance, 96
 Greenland ice, 8, 11, 49
- hailstorm activity, 93
 hailstorm risk, 63–65, 93–96, 101–
 103, 110–117, 119, 375
 Australia, 95
 France, 64, 94
 Germany, 94
 Italy, 95
 model, 105, 106, 117
 projections, 125
 seasonality, 101
 Switzerland, 64, 94
- Haiti, 4
 heat wave, 8, 9, 36, 39, 60, 63, 76
 heuristics, 17, 275
 Ho Chi Minh City, 79
 household survey, 198, 211, 220, 276,
 319–322, 344–346
- Germany, 211
 pre-test, 199, 223
 sample, 199, 223, 278
- hurricane activity, 9, 10, 28, 45, 375
 Hurricane Ike, 5
 Hurricane Irene, 5
 Hurricane Katrina, 5, 36, 209
 hurricane risk, 6, 23, 41, 76, 191
 Florida, 191
 New York, 191
 perceptions, 270
 South Carolina, 191
 Texas, 191
- Hurricane Rita, 5
 Hurricane Wilma, 5
 hybrid approach, 124
- ice storm, 67, 70
- incentives, 21, 24, 30, 139, 141,
 144–145, 148, 209, 213–215,
 374
 France, 158
 Germany, 160, 214
 long-term insurance, 216
 micro-insurance, 82
 the Netherlands, 220
 United Kingdom, 157
 USA, 156, 214
- index-based insurance, 80
- India, 12, 80
- Indian summer monsoon, 11
- insurance
 adaptation, 82–87, 121–123
 availability, 76, 81, 88
 loss data, 91, 98
 premium, 15, 18, 28, 30, 37, 45, 69,
 84, 88, 96, 122, 142, 143, 213,
 217, 374
 regulation, 28, 69, 84, 88, 149, 152
- insurance demand, 17, 18–19, 29,
 253–255, 381–386
 Austria, 313
 Bangladesh, 314–315
 climate change, 306, 360
 demand curve, 359
 Florida, 312
 Germany, 253, 313–314
 socio-economic developments, 360
 the Netherlands, 322–325, 326–334,
 350–364
 USA, 216, 253, 308

- integrated assessment model, 124
international donor, 80, 81
IPCC, 7–11, 36, 39, 46, 49, 90, 255
Italy, 95
- Japan, 4, 12, 22, 125
- land use model, 16, 50
learned hand, 213
liability insurance, 77, 78
life insurance, 52, 63, 77
lightning risk, 70
 USA, 94
logit model, 347, 348, 355
long-term insurance, 215
- Malawi, 80, 82
market failure, 21
micro-insurance, 80, 82, 315, 377
minimum temperature, 64, 93, 94,
 104, 105, 110
minimum variance portfolio, 175
mixed logit model, 348, 354, 355, 360
modern portfolio theory, 166, 173, 380
monitoring, 145, 149, 162, 379
moral hazard, 24, 61, 81, 96, 148, 149,
 153, 163, 251, 378, 379
multifunctional land use, 197
- National Flood Insurance Program,
 18, 70, 153, 192, 209, 214, 254,
 308, 362
natural disaster insurance
 Canada, 67–68
 developing countries, 78–82
 the Netherlands, 50–65
 United Kingdom, 68–70
 USA, 70–78
natural hazard, 15, *see* drought risk,
 earthquake risk, fire risk, flood
 risk, frost risk, hailstorm risk, heat
 wave, hurricane risk, ice storm,
 lightning risk, storm risk, storm
 surge and tropical cyclones
normalization, 41, 99
- OLS regression, 107, 286, 294
ordered categorical variable, 286, 349
ordered probit model, 286, 291
ordinal qualitative variable, 203, 246,
 328, 349
- Pakistan, 4
portfolio, 25, 166, 173, 177, 181,
 184–187, 380
positive feedback mechanisms, 8
power utility function, 257
precautionary approach, 84
precautionary principle, 91
precipitation, 8, 47, 48, 56, 95, 103,
 117, 255
 risk, 53–59, 77, 95, 138
prevention, 21–23, 168, 170, 177–181,
 213
price elasticity, 355
price signal, 18, 30, 86, 213, 215, 242,
 374
probability weighting, 19, 252, 256,
 264, 305, 306, 330
probability weighting function, 253,
 255, 259, 261, 263
probit model, 237, 246, 286, 291
properties at risk, 14, 16, 50
prospect theory, 19, 252, 254, 258,
 261–264, 305, 330, 382
public good, 11, 21
public–private partnership, 31, 38, 55,
 57, 76, 86, 139, 153, 154, 158,
 220, 379
- random utility model, 347
rank-dependent utility theory, 19, 252,
 254, 260, 382
reinsurance, 30, 81, 83, 84, 122, 143,
 150
 premium, 151
 public, 152, 158
residual risk, 23, 189, 190, 210
resilience, 20, 21, 24, 26, 27, 62, 373
risk approach, 124
risk assessment, 27, 46, 81, 386
 uncertainty, 46, 146, 165
risk aversion, 205, 252, 254, 264–266,
 268, 290, 332
risk awareness, 14, 18, 242, 244, 290,
 300, 302, 312, 336, 385, 388
risk communication, 300, 302, 307,
 317–319, 326, 388
risk definition, 13
risk ladder, 307, 318, 326, 330, 336,
 384
risk management, 20, 166, 167–170,
 180–181, 219

- risk perceptions, 16, 203, 204, 239, 269, 331, 359, 384
 - determinants, 270, 274–276, 287–299
 - Slovenia, 270
 - Switzerland, 270
 - the Netherlands, 273, 278–285
 - USA, 282
- risk premium, 256, 383
- risk prevention plans, 158
- risk segregation, 143
- risk spreading, 30, 143, 250
- risk transfer, 84, 121, 122, *see* alternative risk transfer instruments
- road safety, 58, 64, 77
 - perceptions, 279
- root mean squared error, 108
- Rotterdam, 23, 79
- Russia, 5
- safety net, 79, 377
- safety premium, 202
- safety standard, 22, 157, 168, 169, 171, 283
- scatter plot, 104
- scenarios, 7, 13, 16, 47, 50, 69, 118, 172, 178, 179, 216, 217, 234, 235, 255, 256, 319, 360, 364
- sea level rise, 8, 22, 23, 49, 50, 217
- seasonal correction, 106
- Slovenia, 270
- socio-economic characteristics, 205, 241, 301, 333, 358
- socio-economic developments, 6–7, 13, 15, 26, 41, 44, 68, 71, 79, 128, 373
 - insurance premium, 26
- solidarity, 141, 161
- solvency, 15, 28, 44, 77, 84, 150
- Solvency II regulation, 69
- spatial planning, 14, 170, 197
- statistical model, 236, 286, 325, *see* logit model, mixed logit model, OLS regression, probit model and Tobit model
- storm risk, 21, 47, 59–60, 125, 128
 - China, 125
 - climate change, 8, 49, 59, 70, 125
 - Germany, 125
 - Japan, 125
 - perceptions, 279
 - projections, 125, 128
 - the Netherlands, 125, 128
 - United Kingdom, 125
 - USA, 94, 125, 128
- storm surge, 9, 22, 53, 54, 168, 170, 195
- Storm Xynthia, 5
- Switzerland, 64, 92, 94, 270
- systemic risks, 96
- temperature
 - increase, 7, 47, 48, 90
 - indicator, 103, 109
- Thailand, 4
- the Netherlands, 6, 9, 22, 32, 46, 49, 50–67, 167–172, 197
- thunderstorm activity, 94, 116
- timing risk, 151
- Tobit model, 64, 107, 131, 327
 - marginal effect, 107
- transaction costs, 80, 81, 149
- tropical cyclones, 9, 10
- United Kingdom, 5, 68–70, 125, 156–158, 193
- USA, 5, 10, 12, 18, 36, 41, 70–78, 94, 153–156, 190, 192, 201, 214, 308–313
- utility function, 252, 257, 258, 261, 262, 264, 265, 350, 353
- Vietnam, 9
- vulnerability, 13, 14, 21, 22, 46, 122, 209
- Western Europe, 12
- wet bulb potential temperature, 93
- White–Huber estimator, 286
- willingness-to-pay, 29, 202, 225, 255, 305, 322, 363, 382, 385
- wind speed, 10, 49, 54, 59