Cambridge University Press 0521447925 - Cost-Benefit Analysis of Environmental Change Per-Olov Johansson Index <u>More information</u>

Index

access value, 157 acid rain, 209-13 aggregation, see social welfare function air quality, 47-8, 59, 163-7, 190, 209 altruistic values, 36, 127, 128-32, 162, 188-9 Arrow-Pratt index of absolute risk aversion, 153 of relative risk aversion, 153 Arrow's impossibility theorem, 16 assimilative capacity, 108 Ayer curve, 181, 182 balance of payments, 95, 110 balance of trade, 110 balanced-budget theorem, 85 Bayesian theory, 175 Bellman's technique, 142-5, 175 benefit-cost ratio, 80-1 bequest motives, 36, 127 Bergsonian welfare function, see social welfare function bidding games, see contingent valuation method Boadway paradox, 119-20 bond market, 95 Borel algebra, 144 budget constraint (defined), 8, 12 capital market, 91, 95 closed-ended approach, see contingent valuation method Coase's theorem, 208 comparability of utilities, 16

compensating variation aggregate, 116 and compensation tests, 119–20 and complex changes, 34–6, 37, 41, 77–8 defined, 25–6, 43 and discrete choices, 63–4

and discrete responses, 165, 166 expected, 141 instantaneous, 94 non-contingent, 64, 136, 140, 145, 157, 159, 164, 184 overall or lifetime, 94 path-independence of, 37, 45, 92 and public goods, 25-6 quantity constrained, 35 ranking properties of, 30 compensation actual, 118-19 potential, 118, 121, 122 compensation criteria, 5, 118-21, 122 computable general equilibrium model (CGE), 6, 80, 189-92 congestion, 33 contingent valuation method bid vector, 52, 54 closed-ended, 52, 62, 64, 166, 181 defined, 46 discrete/binary responses, 54 double-bounded, 214 (n. 2 to ch. 4) modified bidding game, 166 open-ended (continuous), 52, 64, 166, 179, 181, 183-4, 194 continuous responses, see contingent valuation method cost-benefit analysis of acid rain, 209-13 and altruism, 126-32 and benefit-cost ratio, 80-1 defined, 1, 21 discounting, 97-8, 100, 122-6, 146 of ethanol as a fuel, 98-101 and inflation, 98 intergenerational aggregation, 122-8 of international pollution, 206-9 intragenerational aggregation, 115-22 irreversible effects, 168-71

Cambridge University Press 0521447925 - Cost-Benefit Analysis of Environmental Change Per-Olov Johansson Index More information

Index

229

and Keynesian unemployment, 85-6 of land reclamation, 178-80 of a large project, 74-7 loss of life, 158-60 and marginal cost of funds, 83-4 and national accounts, 104-10, 197-9 natural resources, 103-4 pollutant (flow and stock), 106-8, 112 of preservation of endangered species, 183--9 ranking properties of, 80 of regulations, 189-92 risk, 145-9, 158, 174-7 of a small project, 71-4, 81-3, 95-8, 130-1, 145-9, 158, 174-7 taxes in, 81-3, 88-9, 97 and time-inconsistency, 171-4 unemployment, 84-6, 88, 97 of virgin forests, 180-3 of water pollution, 79-80 of wetlands, 192-7 cost function, 13, 190 co-state variable, 106, 111-12 covariance, 141, 148, 149 credibility of a policy, 174 critical price, see reservation price CV, see compensating variation CVM, see contingent valuation method defensive expenditure, 73, 109 deforestation, 182-3, 197 demand equations, system of, 56, 58, 61 demand functions (firms'), 9, 22, 68, 70 demand functions, compensated or Hicksian defined, 31 properties of, 41 and quality constraints, 41, 44, 88 demand functions, ordinary, 8, 31, 33, 38 defined, 8 properties of, 40 and public goods, 14-15, 31 demand-side uncertainty, 134 depletion/'destruction' of resources, 103-4, 197 differential equations, 106-11 discounting of future utilities, 109, 122-6 discrete responses, see contingent valuation method distance decay function, 58 distribution function (cumulative), 53 distributional weights, see social welfare function doomsday, 92 dynamic programming, see Bellman's technique

emission charges, 201 emission permits, 201-6 endangered species, 183-9 envelope theorem, 8, 22 environmental assets uncertain access to, 157-8 uncertain supply of, 139-42 equivalent variation aggregate, 117 and compensation tests, 120 and complex changes, 37, 41 defined, 26 and discrete choices, 63-4 instantaneous, 94 overall or lifetime, 94 path-independence of, 37, 45 and public goods, 26 ranking properties of, 30 essential commodity, 29, 30, 70-1, 92, 195 ethanol, 99 EV, see equivalent variation exchange rate, 83, 95 existence value, 36-7, 41 expectation operator, 134 expected consumer surplus, 139, 141, 148 expected costs, 149 expected income, 152 expected price, 167 expected profits, 149 expected utility, 134 expected (indirect) utility function, 143-4, 154-5 expected value, 53 expected value of perfect information, 167-8,170 expenditure function, 43, 44, 45 expenditure share system, 56 externality, 27 fair bet, 137, 139 firms, 9-10, 66-71, 148-9, 174-7 first theorem of welfare economics, 11 free-rider problem, 48 full comparability, 16 full measurability, 16 functional equation, 175 future generations, see intergenerational welfare general equilibrium, 10-11, 17, 72, 97, 119-20, 204 global warming, 209 golden rule, 123, 125 modified, 124 greenhouse gases, 209

Cambridge University Press 0521447925 - Cost-Benefit Analysis of Environmental Change Per-Olov Johansson Index More information

230 Index

Hamiltonian function, 106, 111, 194 Harrod-neutral technical progress, 122 hedonic prices, 46, 55, 59-62 Hicks criterion, 118, 120 homothetic preferences, 56 Hotelling's lemma, 87 Hotelling's rule, 103, 215 (n. 2 to ch. 6) household production function, 32, 58 imports, 83, 110 impure altruism, 127-8 income distribution, 19-20, 121-2 infimum, 159 infinite money measures, 29 information, value of, 167-8, 170, 172, 175 information bias, 49 instrument bias, 49 insurance, 136 interest rate, 91, 94, 95, 96, 100, 103, 105, 108, 123-6, 183 intergenerational welfare, 109, 122-8, 130 intermediate value theorem, 27, 116 irreversible development, 6, 168-9, 183-9, 199 Jensen's inequality, 152, 185 Kaldor criterion, 118, 120 Keynesian unemployment, 85-6 Lagrange multiplier (introduced), 9, 22 land use conflict, 180-3, 192-7 life, loss of, 6, 159-60, 161-2 linear approximation, see Taylor series line integral, 41, 45, 75-6, 116, 117, 215 (n. 1 to ch. 7) local public goods, 33 logit model, 54 Lorenz curve, 19-20, 122 marginal cost of funds, 83-4 marginal rate of substitution, 137-8 marginal social utility of income, 17, 116, 117 marginal utility of income (money), 9, 22, 27 - 8marginal welfare change measure, 21; see also compensating variation and equivalent variation marginal willingness to pay, see compensating variation and equivalent variation Marshallian consumer surplus measure, 32, 41, 58, 62 maximum likelihood estimates, 56 mean value, see expected value

measurability of utilities, 16 median, 54 median voter, 52, 55 mixed public goods, 33 moments about the mean, 143, 154-5 money measure of utility change, ordinary, 12, 14, 31-2, 41, 58, 61-2, 73 moral hazard problem, 148 morbidity, 159 mortality, 59 Nash equilibrium, 210, 211 net welfare measure, 109, 197 Neumann-Morgenstern household, 134 non-essential commodity, 29, 32-3, 43, 70 - 1non-paternalistic (pure) altruism, 130, 131, 162, 188-9 non-rivalry, 11 non-renewable resources in cost-benefit analysis, 103-4 in national accounts, 108 non-stochastic compensation, see compensating variation, non-contingent non-traded goods, 95, 110 non-use values, 36-7, 41, 189 numéraire, 88 open-ended method, see contingent valuation method opportunity cost, 74, 181 optimal control theory, 6, 106-12, 194 optimal provision of a public good, 13-14, 17, 73-74, 107, 129, 176, 206-7 optimal trajectory, 108, 111 optimal-value function, 175 option price, 135; see also compensating variation, non-contingent option value, 139-42 overlapping-generations, 124 Pareto test, 11, 13, 55, 114, 119-21 paternalistic altruism, 131 path of integration, 37, 45 path-independency conditions, 38-41, 45 per capita consumption, 109, 123 permanent income, 91 policy instruments, 6, 200-9 polluter pays' principle, 208, 212 population growth, 122, 124, 125, 190 preference ordering, 15, 114 present value, 91, 110 probability density function, 53 probability distribution cumulative, 53, 63

CAMBRIDGE

Cambridge University Press 0521447925 - Cost-Benefit Analysis of Environmental Change Per-Olov Johansson Index More information

Index

extreme-value (normal), 181 logistic, 54 probability measure, 144 probability space finite, 134, 143 uncountable, 144 producer surplus, 66-71 production function, 9, 66, 122, 174 profit function, 9, 22, 66-71, 149 property values, 59-62 and marginal implicit prices, 60 public bads, 46 public goods, 11-12, 25, 35, 43 quantity constraints, see rationing quasi-option value, 170 questionnaire, see contingent valuation method random (stochastic) variable, 53, 134 ratio vs difference between benefits and costs, 80-1 rationing, 34, 35, 44, 84-6, 88, 100 Rawlsian welfare function, see under social welfare function recycling, 108 referendum, 52, 55 renewable resources in cost-benefit analysis, 103-4 maximum sustainable yield, 102, 196 in national accounts, 108, 197-9 optimal stock of, 103, 194 steady state stock of, 103 threshold level of, 102 reservation price, 82, 83, 84, 88, 100 reversion level, 55 Ricardian equivalence, 127 risk atemporal, 134 aversion, 150, 153 and choice of decision criteria, 139 collective, 5, 137 of death, 6, 161 defined, 134 insurable, 5, 136 lover, 150 neutrality, 150 premium, 146, 176 risk-free interest rate, 146 Samaritan's dilemma, 127 Samuelsonian public goods, see public goods savings, 110, 125, 126-7, 173 small open economy, 95 social welfare function

Bernoulli-Nash, 121 Cobb-Douglas, 121 convex, 18-19 defined, 5, 15-16 Rawlsian, 19, 116, 121 utilitarian, 17, 109, 116, 119, 121 starting point bias, 49 state-dependent preferences, 134 states of nature, 169 states of the world, 136 state variable, 106, 111-12 steady state, 103, 111, 123, 194 stochastic price, 167-8 stock pollutant, 107, 112 strategic bias, 49 subsidies, 81, 88 supply function firm, 9, 22, 66-8 household, 8 supremum, 159 survey, see contingent valuation method sustainable development, 104-5, 109, 126-8 tariffs, 83, 110-11 tax ad valorem, 81 commodity-specific, 81, 89 in cost-benefit analysis, 81-4, 97 income, 81 value-added, 81, 89, 111 tax price, 14-15 Taylor series, 108, 111, 154, 159 tied transfers, 127 timber mining, 182-3 time, opportunity cost of, 74, 82, 84-5 time-inconsistency problem, 172 time preference, marginal rate of, 123, 124 traded goods, 95, 110 transfers in kind, 127 transformation affine, 153 linear, 153 monotonic, 152 travel cost method, 4, 46, 57-9 uncertainty, defined, 134, 175 underemployment, see unemployment unemployment, 84-6, 100, 182 use values consumptive, 33, 41, 92 current, 92 future, 92 indirect, 33-4 non-consumptive, 33-5 utilitarian welfare function, see under social welfare function

231

Cambridge University Press 0521447925 - Cost-Benefit Analysis of Environmental Change Per-Olov Johansson Index More information

232 Index

utility function cardinal, 16, 153 Cobb-Douglas, 16, 55 concave (in income), 152 convex (in income), 152 differentiable, 7 direct, introduced, 7 homothetic, 56 indirect, defined, 8 instantaneous, 92, 105, 110, 143, 193 intertemporal, 91, 110 lifetime, 91 linear (in income), 152 ordinal, 7, 16, 152 and public goods, 12, 22 quantity-constrained, 44, 88 quasi-concave, 42, 152 quasi-linear, 28, 41, 43 and risk and uncertainty, see expected (indirect) utility function separable, 92, 143, 193 translog, 56, 190 well-behaved, 7

utility maximization atemporal, 8 and discrete choices, 63-4 instantaneous, 92 intertemporal, 91, 110 and public goods, 12, 14-15, 22 and quality changes, 34 quantity-constrained, 44, 88 value of life, 161 value of perfect information, 167 variance, 154 'victim pays' principle, 208, 212 water quality, 79, 191-2 waterfowl, 140, 192-7 welfare function, see social welfare function welfarism, 15, 115 willingness-to-pay (WTP), see compensating variation and equivalent variation willingness-to-pay function (locus), 135-6