

Index

- abatement costs 70
- absolute advantage (absolute profitability) 6–8, 27, 42, 45, 187, 308, 338
- absolute-scarcity tax 318
- adaptive capacity 333
- aggregate demand for nature's assets *see* ecological footprint
- allocative efficiency 21–22, 163, 167, 252–255, 326
- Antolin, P. 208
- Argentina 294–295
- Asia-Pacific region: economic transition 174–197, 298
 - contracting threshold hypothesis 183, 185–188, 189–195, 196
 - distributional equity 190
 - efficiency, increased: resource-use intensity of economic activity 191–192
 - foreign aid increase 194–195
 - import-replacement policy 193–194
 - natural capital investment and critical ecosystems preservation 192–193
 - population stabilisation 189–190, 195
 - self-sufficiency 190–191, 197
 - steady-state economy transition 189, 194, 196
- economic welfare assessment 175–178
- environmental costs 178
- export-led growth 190, 193
- Genuine Progress Indicator (GPI) 175, 178–185, 196–197
- gross domestic product 174–175, 196
 - contracting threshold hypothesis 185–190, 192, 194–195
 - economic welfare assessment 176, 177, 178
 - and Genuine Progress Indicator (GPI) 179, 180–181, 182, 183, 184, 185
 - social costs 177, 178, 187
 - uneconomic growth 183
- asset price bubbles 331–332
- assurance bonds 163–164, 166, 167, 197
- Australia 8, 129–169, 177, 197
 - 1788–1901: European settlement 129–130
 - 1901–1945: post-Federation growth, Great Depression and both world wars 130–131
 - 1945–1982: boom followed by stagflation 131
 - 1983–2007: economic reform 132
 - 2008–present: change of government and global financial crisis 132–133
- carbon emissions 134
- consumption-to-GDP ratio 168–169
- contracting threshold hypothesis 186, 188
- Corruption Perception Index 168
- depletion and pollution taxes 168
- ecological footprint and biocapacity 134, 285, 294–295
- ecological tax reform 166, 167
- economic development 133–134
- energy consumption 134
- estuaries 169
- Federal Government 132
- fiscal stimulus package 133
- Genuine Progress Indicator (GPI) 15, 129, 134–162, 168, 179–180, 182, 183–185
 - air pollution, cost of (item *x*) 140, 146, 153

- air pollution, direct disamenity
 - cost of (item *r*) 139, 145–146, 149
- compensation 164
- consumer durables treatment 142
- consumption per capita, weighted 159
- conventional calculation 135–136
- crime, cost of (item *n*) 138, 145, 149, 152, 160
- defensive and rehabilitative expenditures (DRE) (item *l*) 138, 144–145, 149, 150, 152, 158
- definition 134–135
- Distribution Index (DI) (item *e*) 137, 143
- Ecosystem Health Index (EHI) (item *dd*) 141, 147–148, 153, 164
- environmental costs 159–160, 161
- excessive irrigation water use, cost of (item *u*) 139–140, 147, 153
- expenditure on consumer durables (ECD) (item *b*) 137, 142
- family breakdown, cost of (item *o*) 139, 145, 149
- fisheries depletion, cost of (item *w*) 140, 147
- foreign debt, change in (item *q*) 139, 145, 149, 152, 160
- GPI (item *ff*) 141, 148
- gross domestic product 154–162
 - per capita 151, 153, 154–156
 - real 150–153
- income distribution 161
- individual items 148–149, 152–153
- infrastructural services (item *i*) 58, 137, 144, 149, 150, 152, 167
- items and valuation methods 137–141
- land degradation, cost of (item *t*) 139, 146, 153
- long-term environmental damage, cost of (item *bb*) 141, 146, 153
- lost natural capital services (LNCS) (item *cc*) 141, 146–147
- lost natural capital services, weighted (weighted LNCS) (item *ee*) 141, 151, 153, 158, 160
- lost wetlands, mangroves and saltmarshes, cost of (item *aa*) 141, 147, 153
- non-paid household labour, value of (item *j*) 138, 144, 149, 150, 152, 158, 159
- non-renewable resource depletion, cost of (item *s*) 139, 146, 153
- overwork, cost of (item *p*) 139, 145, 149, 152, 160, 164, 169
- per capita GPI (item *hh*) 141, 148, 151, 153–160
- population (item *gg*) 141, 148, 151, 153
- private consumption, adjusted (item *d*) 137, 142
- private consumption expenditure (private CON) (item *a*) 136, 137, 142, 161
- services from consumer durables (SCD) (item *c*) 137, 142
- social costs 145–146, 149, 150, 152, 158, 159–160, 161
- solid-waste pollution, cost of (item *z*) 141, 147
- timber depletion, cost of (item *v*) 140, 146
- total welfare contribution of private and public consumption (total CON) (item *h*) 137, 150, 152, 158, 159
- unemployment and underemployment, cost of (item *m*) 138, 145, 149, 152, 160, 165
- urban waste-water pollution, cost of (item *y*) 140, 146
- volunteer labor, value of (item *k*) 138, 144, 149
- welfare addition 136
- welfare contribution, annual 148
- welfare contribution of private consumption (weighted private CON) (item *f*) 137, 143, 148, 150, 152

- welfare contribution of public sector consumption (public CON) (item *g*) 136, 137, 143, 148, 150, 152
- welfare contribution of total consumption 148–149
- welfare subtraction 136
- welfare threshold 157
- gold 130
- Goods and Services Tax (GST) 132
- gross domestic product 130, 151, 153
 - real 131, 132, 133, 135, 136, 154
 - real and nominal, distinction between 168
- Index of Sustainable Economic Welfare 168
- industrial relations system 165
- investment 131
- Job Guarantee 165–166, 169
- Labor Government 132, 133
- labour market flexibility 165
- Liberal-National coalition Government 132
- manufacturing 133
- material and energy throughput 162–163, 167
- mining 131, 133
- Murray-Darling Basin 147
- Native Vegetation Clearance Act (1990) (South Australia) 324
- policy implications 162–167
 - natural capital and environmental costs reduction 162–164
 - production excellence facilitation policies 166–167
 - social costs reduction policies 164–166
- regenerative and waste-assimilative capacities 162–163
- rent-seeking 169
- swamps and marshes 169
- tariffs and import quotas 131
- taxation system 166
- vegetation clearance and co-ordinated clearance controls 164
- wool production 130
- balanced trade 207, 338, 340
- bancor system 338, 341
- Bangladesh 285
- Bardhan, P. 92
- Barnes, P. 271–272
- Barnosky, A. 51
- Beck, T. 80
- Beckerman, W. 55
- Belgium 285
- Bergstrom production function 15
- bicameralism versus unicameralism 69
- biocapacity 55, 255, 309
 - Asia-Pacific 197
 - ecological footprint 56, 278–280, 282–284, 286–288, 290, 292, 295–296, 298
 - unsustainability 57, 58, 59, 60
- biodiversity 26
 - see also* planetary boundaries
- biomass-based flows 282–283
- biophysical constraints/limits 233, 236–237, 241, 261, 314
- bioproductivity 278–279, 288
- Blum, H. 24–25
- Bolivia 285, 294–295
- Bollen, K. 86
- Booth, D. 218
- bounded capabilities 107, 312
- Brazil 285, 294–295, 298
- Bretton Woods system 6, 40, 308, 341–342
- bribery 77, 310
- Brundtland Report 3, 277
- business-as-usual scenario 206–209
- Cambodia 177, 190
- Cambridge Econometrics MDM-E3 model 118
- Canada 177, 310
 - Corruption Perception Index 168
 - ecological footprint 58–60, 294–295
- Canada: low growth and no growth 202–219, 221–224, 313
 - aggregate demand 204–205, 209
 - balance of trade 207
 - Bank of Canada 205
 - business-as-usual scenario 206–209
 - Canadian Pension Plan (CPP) 219
 - capital 205, 211
 - carbon tax 215

- consumption 210, 212
- debt-to-equity ratio 211
- debt-to-GDP ratio 206, 210, 212, 213
- employment 213, 214
- environmental degradation 208
- exports 206, 210, 211, 214
- Financial Management System (FMS) for consolidated government 219
- fiscal policies 205
- fiscal sub-model 208–209
- government expenditure 205, 206–207, 208–209, 210, 211, 213
- greenhouse gas emissions 207, 209, 210, 211, 213
- gross domestic product 202–204, 206–207, 208, 209, 210, 211, 212, 214
- health care 212–213
- human poverty index (HPI) 208, 210, 213, 219
- income redistribution 212, 213
- investment 205, 206, 207, 210, 211, 212, 214
- labour force growth 206, 211
- leisure 214
- low-growth 216
- low-growth then no-growth with high investment 212–213, 216–217
- low-growth then no-growth with higher net imports 213–214
- low-growth then no-growth with reduced greenhouse gas emissions 214–217
- low-income cut-off (LICO) poverty line 208, 212, 213, 219
- LowGrow main equations 221–224
 - adult literacy 224
 - capacity utilisation 222
 - consumption 221
 - exports 222
 - government net debt 223–224
 - imports 221–222
 - labour force 222
 - mortality 224
 - private investment 221
 - production function 222–223
 - transfer to households 223
- LowGrow model 118, 204–206
- manufactured capital and labour 205
- no growth 211, 216
- population growth 205, 206–207, 211
- poverty 207, 208, 211, 212, 213, 214
- production function 204–205, 211, 218–219
- productivity 205, 206, 211, 212, 213
- Quebec Pension Plan (QPP) 219
- resource throughput limits 217
- scenario results for 2035 210
- Statistics Canada 219
- supply-side variables 209, 211
- tax and expenditure system 212
- unemployment 206, 208, 210, 211, 212–213
- wildlife habitat protection 217
- cap-auction-trade systems 117, 317–320, 336, 342–343
- Asia-Pacific region 194
- Australia 163–167
- depletion tax 323
- ecological tax reform 334
- Environmental Kuznets Curve 253–255
- minimum income for all 328–329
- native vegetation clearance controls 324–325
- capabilities index 122
- capital 44–45
 - flight 310
 - replacement account 164, 323
 - see also* natural capital
- capitalism, varieties of 115
- caps or quotas 23, 27, 116, 163, 253
 - see also* cap-auction-trade systems
- carbon emissions 53, 105, 109–110, 134, 278, 288
- carbon footprint 284, 285–286, 287
- carbon intensity 124
- carbon levy 117
- carbon sink capacity 63
- carbon tax 117, 215
- carrying capacity, importance of 52–55
- Catton, W. 53

- Central African Republic 285
 Central America 177, 298
 Chile 246–247
 China 92, 169, 177, 246–247, 285, 309
 contracting threshold hypothesis
 185–187
 ecological footprint 294–295
 Genuine Progress Indicator (GPI)
 179, 181, 182, 184, 185
 climate change 30, 280, 296, 320
 planetary boundaries 260, 262,
 265–266, 268, 269, 271, 315
 climate-economy models 118
 Coase, R. 42
 Cobb-Douglas production function
 204–205, 218–219
 coevolution 4–5
 coevolutionary paradigm 11
 Colombia 294–295, 298
 common-property resources 335
 comparative advantage 6–7, 44–45,
 308, 336, 338, 340
 compensating tariffs 336–338, 344
 compensation payments 195, 324, 325
 competitive advantage *see* absolute
 advantage
 Congo 294–295
 consumerism 113–114, 115, 123
 ‘iron cage’ 110–111
 contracting threshold hypothesis *see*
 under Asia-Pacific region
 contraction and convergence model
 116
 corruption 68, 69, 91, 92, 168, 330
 bribery 77, 310
 creative destruction 110
 critical ecosystems preservation 27,
 192–193
 critical slowing down 267
 critical transitions (state shifts) 50
 Crutzen, P. 260
 cultural ecosystem service 282–283

 Daly, H. 337
 Damania, R. 72, 93
 de-growth 124, 325
 decoupling 109–110
 Denmark 57
 depletion tax 168, 233, 238, 320–323
 deposit schemes (bottles etc.) 238

 deregulation 52, 115
 Dfbetas 86
 diminishing marginal benefits 17, 183
 diminishing returns 240, 241
 Distribution Index (DI) 137, 143
 distributional equity 21–22, 163, 167,
 190, 255, 334
 see also under economic systems
 double cropping 286
 Durbin-Wu-Hausman (DWH)
 exogeneity tests 81–82
 Dutch disease 133

 Earth Atmospheric Trust 270
 Earth Summit (1992) 3
 ecological footprint accounting 55–56,
 58–60, 197, 228, 255, 276–299,
 309, 315–316
 affluence: consumption per person
 297–298
 Australia 134
 biomass-based flows 282–283
 bioproductivity 278–279, 288
 built-up land 284, 285–286, 287,
 288, 289, 291
 calculation methodology 283–293
 bioproductive areas normalisation
 292–293
 consumption, production and
 trade 287–289
 land area types 289–292
 national assessments 284–287
 world biocapacity and world area
 289
 carbon dioxide emissions 278, 288
 carbon footprint 284, 285–286, 287
 city resource issues 280, 281
 climate change 280
 collective consumption 287
 company level applications 281
 consistency across assessments
 281–282
 consumption footprint 288
 country resource issues 281
 cropland 282–283, 284, 288,
 289–290
Ecological Footprint Standards 2009
 282
 Ecological Footprint Standards
 Committee 282

- embodied footprint 287–288
- equation and formula 286
- equivalence factors 286–287, 288–289, 292–293
- exports footprint 288
- extraction rates 287, 288
- fishing grounds and fish products 283, 284, 288, 289, 291
- forestry land for carbon dioxide uptake 283, 284, 289
- forestry land for timber and fuelwood 283, 284, 288, 289, 290–291
- global context 293–294
- Global Footprint Network 277
 - Guidebook to the National Footprint Accounts 2008* 284
 - Partner Organizations 282
- global hectare (gha) 278–279, 280, 286, 288, 289, 292
- global resource issues 280
- government resource issues 281
- grazing land 282–283, 284, 289
- historical background 280–281
- household consumption 287
- humanity footprint versus world biocapacity 294
- land and water area 278
- livestock 288
- national accounts and ecosystem services linkage 282–283
- National Accounts Review Committee 282
- National Footprint Accounts 277–278, 279, 316
 - National Footprint Accounts 2011* 284, 288
- national resource issues 280, 281
- ocean sequestration capacity 284
- overshoot 276, 279–280, 293–294
- population and consumption 296–297
- primary product equivalents 287
- product level applications 281
- productivity 296
- regional resource issues 280, 281
- resource flow 279, 288, 293
- resource production demand 286
- resource stock 279
- secondary products 288
- Senegal 297
 - shelter and urban structure space 283
 - trade footprint 55–56, 288
 - waste assimilation 286
 - waste emissions 280
 - yield factors 286–287, 288–289, 292–293
 - see also* biocapacity
- ecological investment 118
- ecological limits 116
- ecological macroeconomics 112–113, 118, 312
- ecological sustainability 24–27, 163, 167, 254, 255, 314–316
 - policies 316–325
 - cap-auction-trade systems 317–320
 - depletion tax 320–323
 - native vegetation clearance controls 323–325
- ecological tax reform 117, 166, 167, 333–335
- ecologically sustainable non-accelerating inflation buffer employment ratio (ESNAIBER) 329
- economic activity costs 176
- economic growth *see* growth
- economic model *see under* sustainable economy transition
- economic policies 310
- economic process, linear throughput representation of 11–14
- economic rents 331–332
- economic resilience 108, 312
- economic and social responsibility 108
- economic systems transition policies 325–336
 - distributional equity – foreign aid 332–333
 - distributional equity – maximum income limit 330–332
 - distributional equity – minimum income for all 326–330
 - ecological tax reform 333–335
 - public goods, investment in 335–336
- economic transition 11–24, 311–314
 - growth, economic and uneconomic 16–18

- linear throughput representation of
 - economic process 11–14
 - policy goals and instruments and steady-state economy 20–24
 - steady-state economy 19–20
 - sustainability, weak and strong 14–16
 - technological progress 18–20
 - see also* Asia-Pacific region; economic systems transition policies
 - economic welfare assessment 175–178
 - ecosphere 24–25
 - existing sink capacity 27
 - Ecosystem Health Index (EHI) 141, 147–148, 153, 164
 - ecosystems preservation 195
 - Ecuador 86, 285
 - Ederington, J. 92
 - efficiency, increased 18–19, 191–192
 - Egypt 285
 - Ehrlich, P. 295–296
 - El Serafy user cost formula 146, 147, 164, 256, 320–321, 323
 - elasticity of substitution 15
 - Eliste, P. 93
 - energy inputs 295
 - entropic throughput of matter-energy 12–13, 16, 30
 - entropic waste generation 27
 - Environment-Income Curve (EIC) 230, 240–245, 255
 - environmental costs 178, 185, 187
 - Australia 159–160, 161, 162–164
 - environmental degradation 208, 228–230, 310, 314
 - environmental deregulation 52
 - environmental growth speed limit 218
 - Environmental Kuznets Curve (EKC) 78, 227–256, 314
 - adolescent phase of development 236, 240–243
 - biophysical limits 233, 236, 237, 241, 314
 - efficiency-increasing technological progress 233–237, 240, 243, 255
 - Environment-Income Curve (EIC) 240–245, 255
 - environment-income relationship 245–252
 - GDP and energy consumption 246, 247, 248, 249, 250, 251
 - GDP and environmental degradation relationship (U-shape) 228–230, 314
 - immature phase of development 236, 240–242
 - marginal benefits and costs of environmental improvements 230–240, 252
 - marginal benefit 237–240
 - marginal cost 232–237
 - mature phase of development 237, 241, 243
 - N-shaped curve 245, 249, 252, 254, 314–315
 - policy implications 252–254
 - thermodynamic limits 232–233, 235, 237, 241, 256, 314
 - throughput-increasing technological progress 236, 253, 255–256
- environmental policies 67–69, 71, 310
 - environmental regulations 68, 188, 310–311
 - environmental speed limit 317
 - environmental spillover costs 117, 233
 - environmental stringency 93
 - environmental trust funds 324–325, 332
 - equilibrium tax policy 93
 - equity
 - conditions 116
 - principles 28
 - see also* distributional equity
 - Ethiopia 285
 - Europe 177, 183
 - European Union Emissions Trading Scheme 117
 - European Union TEEB study 118
 - extinction 26
 - F*-tests 79, 82, 83, 85, 94, 100
 - feedback effects 69
 - Fiji 177
 - financial and fiscal prudence, increase in 119–120
 - Finland 219, 285
 - first-best pollution tax 74
 - fiscal reform for sustainability 117
 - Fisher, I. 169

- flourishing within limits 113–115
 food stamps 330
 foreign aid 194–195, 325, 332–333
 foreign direct investment (FDI) 6,
 67–69, 71, 76–77, 310–311
 competition effect 67–68, 93
 first-stage equations 100
 influence effect 67–68, 76, 93
 pollution-haven hypothesis 66
 stocks and flows 101
 foreign exchange management
 338–341
 fractional reserve system 120
 France 121, 246–247, 294–295
 free riding 335
 free trade 7
 ‘full’ world 186, 188, 197, 313
- Gabon 298
 game played through agents (GPTA)
 72
 Gawande, K. 92
 genetic diversity 283
 Genuine Progress Indicator (GPI) 10,
 30, 169, 227, 309
 Asia-Pacific region 175, 178–185,
 196–197
 see also Australia
 Germany 285
 Gini coefficient 143, 169
 glacial-interglacial transition 51
 Global Environmental Facility (GEF)
 117, 124
 ‘Global Fibre Supply Model’ (FAO)
 290
 global financial crisis (2008) 106, 120,
 132
 global temperatures 53
 global-scale state shift 62
 globalisation 5–10, 27–28, 52, 308–311
 degenerative forces 336–342
 see also globalisation and
 internationalisation
 globalisation and internationalisation
 39–49
 comparative advantage and global
 integration 44–45
 competitive structure of national
 market 42
 distinction between 39–41
 growth as compensator 46–48
 knowledge commons and trade-
 related intellectual property
 rights (TRIPS) 43–44
 national specialisation, excessive
 42–43
 standards-lowering competition 41
 governance 115, 312–313
 Greece 246–247
 green new deal (stimulus) 111–112
 greenhouse gas emissions 319–320
 Canada 207, 209, 210, 211, 213
 see also carbon emissions
 greenhouse gas index 207
 gross domestic product (GDP) 10,
 46–47, 48–49, 105, 108, 277
 affluence: consumption per person
 297–298
 Canada 60, 202–204, 206–207, 208,
 209, 210, 211, 212, 214
 consumerism reduction 123
 decoupling 109
 -employment nexus 329
 energy consumption 247, 248, 249,
 250, 251
 foreign aid 332
 Keynesianism and the green new
 deal 111
 national accounts revision 120
 prosperity governance 115
 real 27, 255, 330
 selected countries and world regions
 177
 sustained 52
 see also Asia-Pacific region;
 Australia
 Grossman, G. 92
 growth
 economic 18, 20, 46–48, 325
 exponential 53
 uneconomic 17, 46, 47–48, 183, 313
- Hardin, G. 23–24, 52
 harvesting quotas 253
 Hellman, J. 92
 Helpman, E. 92
 Henisz, W. 80
 Holdren, J. 295–296
 human poverty index (HPI) 208, 210,
 213, 219

- human well-being 19, 261, 283
human-made capital 11, 14, 15, 19, 176
- Iceland 249
IMPEX system 338–341, 342
implicit function theorem 70
import quotas 131
import-replacement policy 9, 193–194
income gap 21, 41, 309, 342
income redistribution 212, 213
increasing marginal costs principle 17, 183
- Index of Sustainable Economic Welfare (ISEW) 46–49, 120, 196–197
- India 92, 177, 246–247, 285, 294–295
contracting threshold hypothesis 185–186, 190
Genuine Progress Indicator (GPI) 179, 181, 182, 184
- Indonesia 92, 177, 190, 246–247, 294–295
- industrial flight 5, 8, 9–10, 28, 187–188, 338
- Industrial Revolution 260
- integration 40–41
- intentional communities 114
- Inter-Tropical Convergence Zone 265
- interdependence 40–41
- Intergovernmental Panel on Climate Change (IPCC) 290
- International Clearing Unit (ICU) 338
- International Country Risk Guide 81
- international dollar 197
- International Monetary Fund (IMF) 8, 47–48, 308, 341–342
- internationalisation 6–7, 48, 336–342
- investment 113, 131
Canada 205, 206, 207, 210, 211, 212, 214
in critical infrastructure 313
ecological 118
in jobs, assets and infrastructures 119
in natural capital 333
unproductive 331–332
see also foreign direct investment
- IPAT identity (Impact, Population, Affluence, Technology) 266, 296
- Iraq 285
‘iron cage’ of consumerism 110–111, 312
irresponsibility, age of 106–107
- Jackman, R. 86
- James, W. 92
- Japan 57, 177, 188, 197, 246–247, 249
Corruption Perception Index 168
ecological footprint and biocapacity 58, 285
Environmental Plan 280
Genuine Progress Indicator (GPI) 179–180, 182, 183–185
- Jefferson, T. 43
- jet stream 265
- ‘Jevons Paradox’ 22, 162–163, 253, 296, 317, 334
- Jevons, S. 296
- Job Guarantee scheme 165–166, 169, 326–329, 334, 343
- Katsoulacos, Y. 70
- Keefer, P. 80, 81
- Kennedy, S. 92
- Keynes, J.M. 44, 202, 338
- Keynesianism 111–112, 312
- Kingsbury, D. 174
- Kissinger, M. 59
- Knack, S. 81
- knowledge commons 43–44
- Kuwait 285
- Kuznets, S. 229
- Kyoto Protocol: flexibility mechanisms 117
- Lawn, P. 4
- life-support environment for human well-being 261
- limits, establishment of 116–117
- Lovelock, J. 25–26
- Luxembourg 249
- macroallocation 344
- macroecological trends 50
- macroeconomic stability 115, 312
- Malaysia 177, 190
- Malthus, T. 52–53
- management practice 296
- marginal abatement costs 70

- marginal benefits 186–187, 237–240
- marginal cost 232–237
- market equilibrium, symmetric 69
- market failures 245
- market liberalisation 52
- market mechanism 253
- market prices 316–317
- material goods 108, 110–111
- material opulence 108
- maximum income limit 330–332
- maximum sustainable scale 17, 21
- Measure of Economic Welfare (MEW) 46–47, 48–49, 120, 196–197
- Measurement of Economic Performance and Social Progress 120–121
- Mexico 246–247, 285
- Middle East 176, 177
- Millennium Ecosystem Assessment 54, 118, 282
- Millimet, D. 92
- Minier, J. 92
- minimum hourly wage 327
- minimum income for all 326–330
- Mitchell, W. 328
- Monbiot, G. 51
- Moore, D. 280
- Morocco 86
- Munasinghe, M. 230
- mutual coercion mutually agreed upon 23–24
- Muysken, J. 328
- Narain, S. 92
- Nash equilibrium 70
- nation state 6
- national accounts, revision of 120–121
- National Park system 193
- national specialisation, excessive 42–43
- native vegetation 27
 - clearance controls 323–325
 - refuges and vegetation corridors 324
- natural capital 11, 14–16, 20, 24–27, 162–164, 299
 - accounts 277
 - cultivated 335
 - depletion costs 176–177
 - investment 192–193, 195, 333
 - overexploited and degraded 335–336
 - renewable 27
 - services 18
 - stocks 27, 195
- needs hierarchy (Maslow) 3–4
- negative income tax 165–166, 343
- neo-classical production function 15, 31
- Netherlands 58, 122
- New Zealand 57, 177, 197, 219, 298
 - contracting threshold hypothesis 186, 188
 - Genuine Progress Indicator (GPI) 179–180, 182, 183–184, 185
- Nigeria 285
- non-accelerating inflation buffer employment ratio (NAIBER) 328–329
- non-accelerating inflation rate of unemployment (NAIRU) 327–328, 343
- non-excludability 335
- non-renewable resources 27
 - conversion into sustainable renewable resources 322
 - depletion 139, 146, 153
- non-rivalry 335
- Nordhaus, W. 46, 120, 196–197, 203
- North Africa 176, 177, 298
- Norway 219, 249
- novelty 110–112
- Oceania 176, 177
- open-access resources 335–336
- opportunity costs 29, 30–31, 144
- optimal macroeconomic scale 17, 21, 252
- optimal pollution tax 70
- ordinary least squares (OLS) 81–82, 89–90, 101, 221–223
- Organisation for Economic Co-operation and Development (OECD) 79
 - Beyond GDP* initiative 120
 - countries 105
 - over-exploitation 298–299
 - overshoot 50, 56–57, 58, 61, 276, 279–280, 293–294
- Pakistan 177, 190
- Panagariya, A. 330

- Papua New Guinea 177
 paradigm shift 61, 63
 Pareto efficient allocation 245
 Pareto optimal outcome 252
 payment for ecosystem services 325, 332–333
 Perrings, C. 13
 Philippines 177, 190, 285
 physical scale of economy 21
 Pigouvian taxes 22, 31, 162–163
 planetary boundaries 26, 259–272, 315–316
 adaptive capacity 269
 atmospheric aerosol loading 262, 263, 271, 315
 atmospheric carbon dioxide 265
 biodiversity boundary/loss 262, 264, 268, 315
 biophysical boundary/constraint 261, 270
 cascading impacts 265
 chemical pollution 262, 263, 271, 315
 climate change 262, 265–266, 268, 269, 271, 315
 complex dynamics 315
 concept 260–263
 counter-cycling mechanisms 269
 early-warning systems 267
 end goal acknowledgement 269–270
 fine-grained land architecture
 concept 264
 freshwater availability 262, 315
 human actions 261, 263
 including current status and pre-industrial value 262
 and inner boundary of elements of sustainable well-being 270
 interactions among boundaries 264–266
 land use change 262, 264, 266, 315
 life-support environment for human well-being 261
 multi-level governance 268–269
 multiple basins of attraction 263
 new information assimilation 269
 nitrogen/phosphorus cycle 262, 315
 ocean acidification 262, 265, 315
 resilience framework 263, 315
 resource use, affluence and human population size 266–267
 scale 263–264, 315
 social boundaries 270
 stratospheric ozone depletion 262, 315
 threshold effects 263
 zone of uncertainty 267–268, 271
 political equilibrium 72–77
 pollution 187
 damage function 70
 tax 168, 233, 238
 first-best 74
 optimal 70
 see also pollution-haven hypothesis
 pollution-haven hypothesis 9–10, 66–94, 97–101, 197, 308, 310–311
 AGG.HONESTY_1 (government honesty x by CHECKS) 81, 82, 86, 88, 89, 90, 98, 100, 101
 AGG.HONESTY_2 (government honesty x POLCON) 81, 82, 86, 88, 89, 90, 98, 100, 101
 Asia-Pacific region 187–188
 CHECKS (checks and balances in government) 80–81, 82, 83, 85, 86, 87, 90, 98, 99, 100, 101
 data definitions and sources 98
 ECON.ACT.POP. (economically active population) 79, 81, 90, 98, 100
 empirical analysis 77–89
 data considerations 79–81
 methodology 77–79
 results 81–86
 sensitivity analysis 86–89
 ENVPOL (lead content of gasoline) 77, 80–81, 82, 83, 86, 89, 90, 91, 93, 98
 sensitivity analysis 87, 88
 time-series variability 99
 foreign direct investment (FDI) 92
 first-stage equations 100
 inward stocks and flows 77–79, 81–84, 86–91, 98, 100–101
 marginal effect on ENVPOL conditional upon AGG.HONESTY_1 85
 marginal effect on ENVPOL conditional upon AGG.HONESTY_2 85

- marginal effect on ENVPOL
 - conditional upon CHECKS 84
 - marginal effect on ENVPOL
 - conditional upon POLCON 84
 - scaling by gross domestic product 94
- gross domestic product 78, 79, 81, 82, 86, 87, 88, 90, 98, 100
- INFLATION (inflation rate) 81, 86, 90, 98
- legislative units (LUs) 67–74, 76–81, 83–85, 89, 93
- MANsh (manufacturing value) 78, 81, 82, 86, 87, 88, 90, 98, 100
- model 69–77
 - political equilibrium 72–77
 - three-stage game 71–72
- PHONE (telephone mainlines) 79, 81, 90, 98, 100
- POLCON (political constraints)
 - 80–81, 82, 83, 85, 86, 87, 89, 98, 100, 101
 - time-series variability 99
- testing in presence of endogeneity 89–91
- time-series variability of CHECKS, POLCON and ENVPOL 99
- TOTAL/POP. (total population) 81, 86, 98
- TV (television sets) 79, 81, 90, 98, 100
- URBsh (share of population living in urban areas) 78, 81, 82, 86, 87, 88, 90, 98, 100
- pollution-reducing technology 333
- population
 - Australia 141, 148, 151, 153
 - Canada 205, 206–207, 211
 - and consumption 296–297
 - stabilisation 189–190, 195
- Portugal 57, 246–247
- Prat, A. 71, 72
- precautionary principle 197, 343
- premiums 318
- price-determining parameters 7–8, 29–30
- primary production requirement (PPR) 291
- product market competition 76
- production excellence facilitation
 - policies 166–167
- production function 15, 31, 204–205, 211, 218–219
- prosperity without growth 105–124, 312
 - decoupling myth 109–110
 - dilemma of growth 108–109
 - ecological macroeconomics 112–113
 - flourishing within limits 113–115
 - governance for prosperity 115
 - ‘iron cage’ of consumerism 110–111
 - irresponsibility, age of 106–107
 - Keynesianism and the green new deal 111–112
 - redefinition of prosperity 107–108
 - see also* sustainable economy transition
- provisioning (ecosystem service) 282–283
- psychic income 12–13
 - net 13, 16, 18, 19
- psychic outgo 13
- public goods 335–336
- public spending 111
- pure strategy equilibrium 72
- quadratic terms 78
- quantitative restrictions 24, 256, 317
 - see also* caps or quotas
- quotas *see* caps or quotas
- ‘race to the bottom’ 8, 27, 41
- Ramstetter, E. 92
- rebound effect *see* ‘Jevons Paradox’
- reduction targets 116
- regeneration rate of renewable
 - resources 27
- regenerative capacities 162–163
- regulating (ecosystem service) 282–283
- reinforcing feedback loop 265
- relative prices 23
- relative profitability *see* comparative advantage
- relative scarcity of resources 22
- renewable resource extraction and substitution 27
- resource depletion 187

- resource dynamics 298
 resource inputs 295
 resource throughput 20, 28, 109, 194, 317
 limits 217
 resource-use, permits 166
 resource-saving technology 333
 resource-use 191–192, 266–267
 revealed preferences 283
 reverse-causation (endogeneity)
 problem 69, 91
 Ricardo, D. 7, 44, 45, 308
 Rio+20 Earth Summit 51
 risk assessment tools 299
 Ruggiero, R. 40
 Russian Federation 294–295
 Rustichini, A. 71, 72
 Rwanda 285
- Sargan test 79, 82, 85, 87, 88, 94, 100
 Sarkozy, N. 120–121, 298
 Schulze, G. 71–72, 92
 Schumpeter, J. 110
 second-best tax policy 68
 self-evaluated happiness 47
 self-sufficiency 30, 62, 190–191, 197
 Sen, A. 107
 Senegal 296, 297
 sensitivity analysis 79, 86–89
 Shleifer, A. 92
 Singapore 177
 single-principal, multi-agent model 67
 social costs 28
 Asia-Pacific 177, 178, 187
 Australia 145–146, 149–150, 152, 158–161, 164–166
 social logic, changing 121–123
 social movements 114
 solid-waste pollution 141, 147
 South America 177
 South Korea 177
 species rarity and species richness 283
 Stasavage, D. 80
 stated or hypothetical preferences 283
 steady-state economy 19–20, 28, 31, 62, 112, 194, 313–314
 Asia-Pacific region 189, 196
 qualitatively-improving 20–24, 227, 325
 see also Australia
- Stern, N. 110
 Sub-Saharan Africa 177
 subsidies 28, 192
 substitute industries, establishment of 195
 Summers, L. 54
 surface energy balance 265
 sustainability
 ecological *see* ecological sustainability
 principles 28, 316
 weak and strong 14–16
 sustainable development 3–4
 policies 28
 Sustainable Economic Welfare Index 168
 sustainable economy transition (12 steps) 116–123
 economic model, fixing 118–121
 ecological macroeconomics development 118
 financial and fiscal prudence 119–120
 investment in jobs, assets and infrastructures 119
 national accounts 120–121
 limits, establishment of 116–117
 ecological transition in developing countries 117
 fiscal reform 117
 resource and emissions caps and reduction targets 116
 social logic, changing 121–123
 capabilities and flourishing 122
 consumerism culture 123
 social capital strengthening 122–123
 systemic inequality 121–122
 working time policies improvement 121
 sustainable scale 21–22
 sustainable yields 116
 Sweden 168, 219, 285
 Switzerland 249, 280, 285
 synthesis 308–316
 economic transition 311–314
 globalisation 308–311
 natural environment and ecological sustainability 314–316

- System of Integrated Environmental and Economic Accounting (SEEA) 283
- systemic inequality 121–122
- systems theory 203
- systems-based rules of the game 317
- Talwak, D. 92
- tariffs 131
- compensating 336–338, 344
- tax 28, 166, 212
- absolute-scarcity 318
- carbon 117, 215
- cuts 111
- depletion 168, 233, 238, 320–323
- negative income 165–166, 343
- Pigouvian 22, 31, 162–163
- policy, equilibrium 93
- pollution 70, 74, 168, 233, 238
- rebates 192
- reform, ecological 117, 166, 167, 333–335
- revenue neutrality 334
- second-best policy 68
- Tobin 117, 119–120
- technological inputs 295
- technological progress 14–15, 31
- efficiency-increasing 18–19, 233–237, 240, 241, 255
- limits 19–20
- throughput-increasing 16, 236, 253, 255–256
- technology 296
- gap 342
- ‘Temperate and Boreal Forest Resource Assessment’ (UNEC and FAO) 290
- Thailand 92, 177, 246–247, 309
- contracting threshold hypothesis 185–186, 190
- Genuine Progress Indicator (GPI) 179, 181, 182, 184, 185
- The Economics of Ecosystems and Biodiversity (TEEB) synthesis report 283
- thermodynamic limits 232–233, 235, 237, 241, 256, 314
- thermodynamics, first and second laws of 15, 30–31, 169, 183, 233, 256, 319
- three-stage game 71–72
- 3 least-squares (3LS) equations 81–82, 87–88, 89, 90
- Tibet 265
- tipping point 50
- Tobin, J. 46, 120, 196–197
- Tobin tax 117, 119–120
- trade-related intellectual property rights (TRIPS) 43–44, 309
- tradeable resource-use permit system *see* cap-auction-trade system
- transfer programmes/systems 23, 195
- Turkey 285
- 2 stage least squares (2sls) equations 78, 221, 222
- uncancelled costs 14, 30–31
- see also* natural capital services
- undervaluation 298–299
- United Arab Emirates 57–58, 280, 291
- United Kingdom 58, 246–247, 280, 285
- United Nations 281
- Agenda 21 3
- COMTRADE database 288
- Food and Agriculture Organization (FAO) 286
- Framework Convention on Climate Change (UNFCCC) 117
- Human Development Index (HDI) 212, 297
- statistical system 284
- United States 41, 46–47, 69, 218, 246–247, 249
- Corruption Perception Index 168
- ecological footprint and biocapacity 57–59, 285, 294–295
- Genuine Progress Indicator (GPI) 183
- gross domestic product 309
- maximum income limit 330
- pollution-haven hypothesis 91, 92
- Sonoma County ‘Time to Lighten Up’ Footprint project 280
- unsustainability of nations 57–61
- Ursprung, H. 71–72, 92
- Uruguay 42
- use value 13, 142
- user cost formula *see* El Serafy
- utility 12

- vegetation clearance restrictions 164, 324
- Vietnam 177
 - contracting threshold hypothesis 185–186, 190
 - Genuine Progress Indicator (GPI) 179, 181, 182, 184
- Vishny, R. 92
- waste assimilative capacity 27, 162–163
- waste charges, municipal 238
- waste generation, entropic 27
- waste-water pollution 140, 146
- welfare 46–47
 - effects 68, 76
 - impact of income distribution 177
 - Index of Sustainable Economic Welfare (ISEW) 46–49, 120, 196–197
 - Measure of Economic Welfare (MEW) 46–47, 48–49, 120, 196–197
- measures 47
- wildlife habitat protection 217
- willingness to pay or accept 238, 283
- Wolfensohn, J. 40
- work-life choices 313
- working time policies improvement 121
- World Bank 40, 47–48, 308, 341–342
 - Adjusted Net Savings index 120
- World Development Report 1992* 229
- World Scientists' Warning to Humanity* 53–54
- World Trade Organization (WTO) 47–48, 308
 - Articles 8
 - compensating tariffs 336–338, 341
- worst-case scenario 163
- WWF International: One Planet programmes 280–281
- Xepapadeas, A. 70

