Baily, Klinger, 35
Baltic countries, 30–32, 31; convergence to high performance level, 33–34
Bayh-Dole Act, 54, 433, 439
Bayraktar, Nihal, 403
belief systems and social constructs, 460–63; beliefs versus reality, 62; biased perceptions, 70–71; capitalism and selective framing of evidence, 71; cognitive frames, 61–62, 72–74; The Entrepreneurial State: Debunking Public vs. Private Sector Myths, 445; equilibrium fiction, 71, 73, 75, 471, 481; invisible hand notion, 18–19; mindsets, 9, 48, 57, 61–63, 73, 457–59, 472; persisting beliefs, 465–66
benefit tax, 450
Berners-Lee, Timothy, 136
Bertrand equilibria, 195–96, 234, 236; asymmetric Bertrand equilibria and nonexclusivity, 200–202, 201; Cournot competition compared to, 191–96; distinct features of, 191; marginal return to increased investment in R & D, 208, 208–9, 209; multiple potential entrants: contestability, 198–200, 199; stochastic research and, 207–10, 208, 209; symmetric equilibrium, 198
Bertrand price-competition model, 103, 110–12, 116, 119
best practices: catching up to, 38–39; cross-border knowledge flows, 93; failing to learn, 32; gap between average and, 18, 44, 81–82; gap between productivity and, 29–30, 80; microscopic perspectives, 34; model farms, 54; productivity growth total versus hours paid, 39
biased perceptions, 70–71
BlackBerry, 435
Bloom, Nicholas, 506
BNDES. See Brazilian Development Bank
Boyle, James, 433
BRAC genes, 145
Brazil, 500; development banks, 395; industrial policies and, 390–91; infant aircraft industry, 502–3; sugar-based ethanol development, 388
Brazilian Development Bank (BNDES), 395
Britain: aggressive protection and subsidies, 389; factor endowments in, 24; financial market liberalization example, 403–4; terms of trade, 4. See also United Kingdom
broad tariff protection, 4–5, 500–501
bureaucracy, innovation and, 84–85, 85
Burns, Arthur, 504
Canada, 39
capital: 2008 global financial crisis, 42, 96, 151, 372, 405, 418, 491, 495; access, 401; controls, 405; Frontier moved out by investing in, 40–43, 92; improved allocation of, 42; for R & D, 79, 408
capitalism: aftermath of 2008 crisis, 42, 96, 151, 372, 405, 418, 491, 495; capital flows: failure of standard theory, 407–15; China’s state-directed, 389; crony, and corruption, 375; innovation as heart of, 57, 101; managerial, 478; recessions and depressions, 40; Schumpeter’s optimistic
closed economy (continued)
distortionary tax on agricultural sector, 277–79; elasticity of demand, 277; elasticity of substitution, 279; infant-economy argument for protection, 265, 476; learning sector subsidy, 282; lower societal innovation, 266; lump sum taxation in, 267, 273–74, 277, 279, 282; market imperfections, 267–68; market structure and innovation, 279–81, 280; monopoly and welfare calculations, 281–82; monopoly power and wages, 266; optimal industrial subsidy, 276–77; optimal interventions in, 274–79; optimal tax intervention, 275; productivity growth, 270–71, 490–91; rate of technological progress, 271; with separable demand, 276; two-period discrete time, 271; two-period utility, 273–74; unfettered markets inefficiency, 272–73; value of research and level of production, 285. See also learning by doing

Coase, Ronald, 28, 474
cognitive frames, 61–62, 72–74
cognitive impediments, 73. See also belief systems and social constructs
Colbertist policy, 509
Columbia University, 500
Commission on Growth and Development, 500, 521
common pool problem, 144–45
common resources problem, 240–46; better regulation, 246; effect of increased competition, 244; equilibrium fish extraction as function of fishing population, 241; equilibrium fishing stocks, 242; rate of increase in fishing stocks as function of fishing population, 240. See also natural resources commons, enclosure of, 145–46, 238, 433, 451

communist countries, quality of life, 30–32, 31

Communist Manifesto, 14
comparative advantage: absolute advantage versus, 338; in catching-up countries, 500, 502; changes in, 362–63; China’s, 355; dynamic, 385; Korea’s industrial protection, 338–39, 338–40, 363, 489; in learning economy, 49; redefined theory of, 24–28; static, 385
compensation systems, 123
competition: behavior of monopolist, 312–13; business cycle and, 520–21; China’s state subsidies, 497–98; common resources problem, 244; Cournot, 191–96, 195, 202–6, 204, 212–13, 234, 235–36; creative destruction, 191–95, 198, 207–10, 208, 209, 212–13; cutthroat, 364–65; example of Myriad Genetics, 145; government intervention two-sector model, 316–17; imperfections of, 138–41; innovation efficiency and, 110–13; innovation linked to, 103, 478; intensity and innovation efficiency, 110–13; intervention in monopolistic, 316–17; labor supply elasticity, 314–15, 318; laws and policies, 171; link with innovation, 103, 478; lump sum tax subsidy and, 315–16; market...
distortion in monopolistic, 313; monopoly outcome versus competitive outcome, 313–15; multiple rational expectations equilibria, 317–18, 318; myopic versus nonmyopic monopolist, 314; pace of innovation and, 127–29; perfect, compared to monopolistic, 139–40, 140; private rewards and social returns, 143–44; relationship between innovation, consumer welfare, and, 123–24; welfare-enhancing government intervention, 311. See also Schumpeterian competition


contacts (people learning from other people), 60–61

countercyclicality, 520–21

Cournot competition, 212–13, 234; Bertrand competition compared to, 191–96; decrease in marginal returns with number of firms, 235–36; duopolist, 191–95; equilibrium, 195; equilibrium and exclusivity, 206; equilibrium and free entry, 205–6; equilibrium and nonexclusivity, 202–5, 204; formulas, 192–95; symmetric equilibrium, 195


contacts (people learning from other people), 60–61

countercyclicality, 520–21

Cournot competition, 212–13, 234; Bertrand competition compared to, 191–96; decrease in marginal returns with number of firms, 235–36; duopolist, 191–95; equilibrium, 195; equilibrium and exclusivity, 206; equilibrium and free entry, 205–6; equilibrium and nonexclusivity, 202–5, 204; formulas, 192–95; symmetric equilibrium, 195


contacts (people learning from other people), 60–61

countercyclicality, 520–21

Cournot competition, 212–13, 234; Bertrand competition compared to, 191–96; decrease in marginal returns with number of firms, 235–36; duopolist, 191–95; equilibrium, 195; equilibrium and exclusivity, 206; equilibrium and free entry, 205–6; equilibrium and nonexclusivity, 202–5, 204; formulas, 192–95; symmetric equilibrium, 195
Cournot equilibrium, 107, 310; free entry and, 205–6; nonexclusivity and, 202–5, 204
Cournot-Nash equilibrium, 110, 116, 193, 194–95, 195
Court of Federal Claims, U. S., 441
creative destruction, 163–64; alternative formulation: patent races, 144–45, 223–32; asymmetric Bertrand equilibria and nonexclusivity, 200–202, 201; barriers to entry, 213–14; Bertrand competition and symmetric equilibrium, 198; Bertrand competition with stochastic research outcomes, 207–10, 208, 209; Bertrand equilibria and multiple potential entrants, 198–200, 199; Bertrand equilibrium, 195–96; comparison with persistent monopolist, 225–28; competitive entry and entry deterrence, 215, 215–16, 228–29, 229; Cournot duopolist, 191–95; Cournot equilibrium, 195; Cournot equilibrium and exclusivity, 206; Cournot equilibrium and free entry, 205–6; Cournot equilibrium and nonexclusivity, 202–3, 204; ex post competition, 191–95; government as deliverer of, 171; incumbent’s discouraging investment in R & D, 229; intertemporal linkages, 178–79; monopoly innovator, 219–23; multiple local optimum, 187–88; multiple potential innovators, 197–98; myopic monopolist, 188–90, 189, 196–97, 200, 314; optimal timing and size of innovation, 230–32; random cost reductions, 210–12; R & D subsidies, 197; relationship of incumbent and innovator, 180–83; sequential and persistent monopolists, 183, 183–84; sequential monopoly, 224–25, 225; sequential monopoly equilibrium with large innovations, 186–87, 187; sequential monopoly equilibrium with small innovations, 184–86, 185, 186; socially optimal innovation, 222–23; social welfare maximization, 190–91; social welfare optimization, 232–33; strategic behavior as deterrence to competitiveness, 214–19, 215
Crick, Francis, 136
crony capitalism, 375
cross-border knowledge flows, 93
cultural and geographic localization, 65–66
cumulative learning from output, 330
currencies, overvalued, 382
Curtis, Glenn H., 434
cutthroat competition, 364–65
Czech Republic, 30–32, 31

Darwinian survival of fittest, 96–98
Dasgupta, Partha, 117, 364
data exclusivity, 436–37, 440
Debreu, Gerard, 2; Arrow-Debreu model, 16–17, 19–20, 52, 102, 142, 161–62, 490, 500
deindustrialization, 360–61, 388
demand for labor: innovation and, 172–73; productivity and, 154–55
Detragiache, Enrica, 403
developing countries. See catching-up countries
development banks, 395, 411, 412
Dewatripont, Mathias, 520
Diamond, Peter A., 363–64
Diamond-Mirrlees model, 363–64
differential knowledge, 47–48
dirty technologies, 517–21; societal learning about new products, 49
Index 635

disclosure requirements, patent application, 59–60, 75–76
discount rate, effects of: in entry deterrence, 217, 222; in monopoly model, 221; in N-good model, 287, 292
diseconomies of scale, innovation and, 4, 111, 138–39, 478, 507
distortionary tax on agricultural sector, 277–79
distortion of consumption, 277
distribution of income, 158

Dixit, Avinash, 24, 311, 512
Dixit-Stiglitz model, 512
Dosi, Giovanni, 429

duopolistic competition: consumer welfare under, 107–8; duopoly equilibrium, 106–7; innovation: monopoly versus duopoly, 106–7; under monopoly versus duopoly, 107–8; Proposition 2: second-period welfare under monopoly versus duopoly, 108; Proposition 3: welfare is higher under monopoly than under duopoly, 108
dynamic comparative advantage, 25
dynamic development, 343–44
dynamic sectors learning benefit, 334–35
dynamics of adjustment, 176
dynamics of change and learning, 73–74

East Asia, 14, 18, 66; capital flows, 406; China’s dominance in world market, 498; convergence to high performance level, 34; crisis in, 96, 405, 418, 491; exchange rate policy, 420, 488–89, 509; export-led strategies, 27; favoring broad barriers to trade, 396; financial restraint, 409–10; growth after commercial reforms, 33–34; India, 34, 71, 391, 493; industrial policies, 387, 392–94, 399–400, 408, 509; institutional designs and, 395; Japan, 26, 38, 39, 66, 351, 396, 493, 509; learning and government, 388; learning potential firms, 333; learning-related trade restrictions, 389–90; Myanmar, 389–90; outward-bound investment, 423–24; quality of life, 30–32, 31; restricted capital outflow, 407; state subsidies and product market competition, 497–98; Taiwan, 30–32, 31, 396; tariffs and nontariff barriers, 509; Thailand, 30–32, 31, 406–7; Vietnam, 32, 34; Washington Consensus policies, 481. See also specific country

The East Asian Miracle (World Bank), 394

Eastern Europe, 33–34

eBay Inc. v. MercExchange, L.L.C., 434, 435

economics of information, 131–32

Edison, Thomas, 84

education: cross-border knowledge flows, 93; as distinguishing feature of modern era, 13–28; economics of information, 131–32; as investment, 79; learning mindset, 9, 48, 57, 61–63, 457–59, 472; learning to learn, 50–51, 53, 66; net learning with foreign direct investment, 42; one-size-fits-all, 375–76; optimal learning with lump sum taxation, 301–4; optimal resource allocation for, 137; private and social value of, 137; productivity growth rate from improved, 37–38; regulations impacting, 50; strategies, 68–70; underinvestment in, 55, 104, 438
Index

EEC. See European Economic Community
Emran, Shahe, 411
endogenous growth theory, 1–3, 15–16
endogenous labor supply: two-period, N-good model with, 289–95; two-period, N-good model with, lump sum taxation, 301–4; two-period, N-good model with, no lump sum taxes, 306–7; two-period, N-good model with, price interpretation, 295–97; two-period, N-good model with, symmetric equilibrium case, 297–301
endogenous learning analysis, 473, 481
endogenous technology, 16–17, 131–32; rationale for, 2–5
the Enlightenment, 62, 70, 73–74; learning economy and, 62, 70, 73–74
entertainment industry, 429–30
entrant versus incumbent, in R & D, 121–22; multiple potential entrants, 198–200
The Entrepreneurial State: Debunking Public vs. Private Sector Myths (Mazzucato), 445
entrepreneurship, 411–12, 513–14
entry: Cournot equilibrium and free entry, 205–6; creative destruction, 213–14; effect on innovation, 254–59, 255, 298; limiting impact of, 217–19; multiple potential entrants, 198–200; Stiglitz on free entry and market equilibrium, 311
entry deterrence: formulas for, 215, 215–16, 228–29, 229; intellectual property rights and, 432, 437; limits on, 216–17; market structure and, 120; strategic behavior as deterrence to competitiveness, 214–19, 215
evelope theorem, 358
equilibrium fiction, 71, 73, 75, 460, 465–66, 471, 481; monopoly equilibrium formulation, 105–6
Estonia, 30–32, 31
ethanol development, 388
E. U. See European Union
eureka moment, 52
Europe: dense infrastructure, 7; early standard of living, 13–14; Everything But Arms initiative, 383; G7 countries, 37–38, 39; government-funded research, 444–45; infant–industry argument, 332; laissez-faire policies, 495; patent opposition, 442–43; protectionism, 508; quality of life, 30–32, 31; social mobility, 469–70; trade policy structure, 8; U. S. productivity growth rate compared to, 38; WTO restrictions in, 384. See also specific country
European Economic Community (EEC), 396
European Union (E. U.), 8
evergreening and data exclusivity, 436–37, 440
evergreen patents, 440
Everything But Arms initiative, 383
evolutionary dynamics, 86, 86
evolutionary selection: creative destruction, 163–64; Darwinian survival of fittest, 96–98; inefficiencies inherent in, 161–64
excessive unemployment, 151–59, 152, 154, 155
exchange rates: in Africa, 418; Asian countries’ export promotion, 509; changes in, 359–60, 362, 476; China’s, 420, 488–89;
export-import bank, 408
ex post competition: creative destruction and, 191–95; incentives and, 235–36
externalities: entrepreneurship and learning, 411–12, 513–14; information, 402–3, 475; knowledge, as central to learning society, 238–39; learning, 135–36; negative and positive, 20–21
factor endowments, 24–26, 66
FDI. See foreign direct investment
fiber optics, 71
financial policy: broader financial sector policies and, 412, 476; capital access, 401; capital controls, 405; capital outflows, 407; capital standard theory failure, 406; development banks, 395, 411, 412; The East Asian Miracle, 394; entrepreneurship and learning externalities, 411–12, 513–14; export-import bank, 408; finance and industrial policy, 402, 408–12; financial market, 402–5, 407, 414–17, 475, 477; foreign banks advantage, 404; foreign financial services restrictions and, 412; funds diversion, 405–6; government and industrial policy, 408; government-run institutions, 412; government’s key objective, 402; IMF rescue package, 406–7; infant-economy argument for protection, 404, 476; information externalities, 402–3, 475; International Monetary Fund and, 405; labor movement restrictions, 402, 412–13; learning sectors and, 408; macro-instability and, 401; migration and, 413; mixed systems in, 411; regulatory banking, 409; regulatory policies and flow of funds, 410–11; Thailand’s adverse effects, 406–7; U. S. banking and, 404–5; venture capital firms and, 408; World Bank, 394, 447, 489, 491, 500, 510 financial restraint, 409–10
Financial Services Agreement, 23
Fink, Carsten, 429
Finland, 30–32, 31
firms: ability to support R & D, 93; concentration and diffusion of knowledge across, 91; concentration and diffusion of knowledge across firms, 92; decrease in marginal returns with number of, 235–36; design of, 89–90; East Asian learning potential firms, 333; entrepreneurship, 411–12, 513–14; geographical localization, 95–99; industrial firms as source of innovation, 90–93; innovative, 89–90; profit-maximization, 249–50; spillovers to rest of economy, 93–95; stability promoting dissemination of knowledge, 91, 319–32; venture capital, 408
First Annual Arrow Lecture, 488–87
fixed labor supply, no lump sum taxation, two sectors, 324–26
Florida, 404–5
follow-on innovation, 432–33, 451
Ford, Henry, 82
foreign banks’ advantage, 404; restrictions on, 412
foreign direct investment (FDI), 40–41, 66, 420, 477; Africa’s, 422; China’s, 507; government subsidies to promote, 423; Japan and, 421; Korea’s, 421; Malaysia and, 423
France: Colbertist policy, 509; G7 countries productivity growth comparison, 39; opposing government intervention, 510
Frankel, Jeffrey A., 493
free trade: equilibrium, 339, 342; financial market liberalization, 402–5, 407, 414–17, 475, 477; knowledge as free good, 507; learning and, 54–55; in learning economy, 54–55; possibilities curve, 339, 342; Schumpeter on, 101–2; utility value and autarky, 340, 340–41, 345; Washington Consensus, 23, 80, 374–75, 402, 405, 481, 493, 509–10. See also liberalization; trade policies the Frontier, 40–43, 92
funds diversion, 405–6
G7 countries, 37–38; productivity growth comparison, 39
Gates Foundation, 447
GDP. See gross domestic product geographic and cultural localization, 65–66
Georgia, 404–5
Germany: factor endowments, 24; G7 countries productivity growth comparison, 39; industrialization strategy, 27; manufacturing value chain, 495; opposing government intervention, 510
GNP. See gross national product
Google, 71
government intervention, 4–5, 9, 98–99, 481; aggressive protection and subsidies, 389, 511; arguments for, 42–43; banking and financial policy, 404–5; Brazil’s aircraft industry, 502–3; Brazil’s ethanol industry, 388; carbon tax, 517–21; in catching-up countries, 333–34, 509–21; clean innovation subsidy, 517–21; climate change, 495, 517–21; closed economy, 265, 476; countercyclicality and, 320–21; to create learning economy, 87, 479; to create learning society, 404, 476; criticisms of, 489, 511–12; delayed intervention impacting consumption, 518; development banks, 395, 411, 412; economy during World War II, 37–38; encouragement of learning sector, 272; evidence-based general theory of growth and employment, 160–61; in financial policy, 404, 476; -funded research, 444–45;
Index

funding R & D, 334, 444–45, 453; incentives, 335–36; in industrial policy, 494–95; intellectual property rights, 444, 444–45; international trade agreements, 354–55; key objective: learning society, 402; Korea’s, 338–39, 338–40; macro-instability requiring, 96–97; Office of Science and Technology Policy, 430; policy, 408; to promote learning society, 6, 15–16, 20–22; R & D funding, 334, 444–45, 453; redirecting technical change, 516–19, 518; responsibility in learning revolution, 21–22; role in learning revolution, 20–24; social benefits from, 336; support of industrial sector, 362–63; two-sector model, 316–17; value of learning, 357–58, 479; welfare-enhancing intervention, 311; welfare policies, 311, 318. See also financial policy; industrial policy; infant-industry/economy argument

government policies on innovation: competition laws and policies, 171; complementarity between private sector and, 517; as deliverer of Schumpeterian creative destruction, 171; -funded R & D, 444–45; investment in learning, 424–26; patents use by, 441; responsibility for learning society, 21

Grandstrand, Ove, 429

Great Depression: capitalism’s recessions and depressions, 40; role of innovation in precipitating, 150; Schumpeter on, 98; Schumpeter’s writings following, 101–2; Smoot-Hawley Tariff and, 508. See also capitalism

Great Recession, 392
Greenwald, Bruce, 486, 499, 503, 504, 505, 506, 507
Greenwald-Stiglitz program, 501, 511
Griliches, Zvi, 507
gross domestic product (GDP), 406, 470; industry-level tariff-skill interaction, 512; influence of investment in capital and people, 40; innovation’s contribution to, 136; movement toward frontier impacting, 40; Nunn and Trefler’s regression results, 512; in Schumpeterian competition, 169–72; three ways of increasing, 40–41

Grossman, Sanford, 78
gross national product (GNP), 41
guaranteed purchase fund, 447

Gupta, Poonam, 403

Habakkuk, H. J., 158
Hamilton, Alexander, 508
Harberger, Arnold C., 40
Harbergerian analysis., 346
Hausmann, Ricardo, 513, 515–16
Heckscher, Eli, 503
Hemous, David, 520
Henry, Claude, 429
Hidalgo, Cesar A., 65
history, localized technical, 67–68, 68, 391

Hoff, Karla, 71, 457, 459–60
holdups: patent trolls and, 435–36, 451, 454; in Schumpeterian competition, 146

homotheticity, constant elasticity and, 358
Hoover, Herbert, 98
horizontal linkages, 387

Howitt, Peter, 179–80, 227, 234

hybrid corn, 507
ideological commitment, 73
IMF. See International Monetary Fund
import-export bank, 408
import restrictions, 511
incentives to innovation, 335–36; advancement of knowledge, 136, 444–45, 448; ex post competition and, 235–36; IPR and distorted, 436; knowledge and peer recognition, 448; for learning’s sake, 75–76; mispricing and perverse, 438; to motivate managers, 123; nonpecuniary intrinsic, 48; patents distortion of, 451; patent system versus incentive for innovation, 437, 451; prize system, 445–47; R & D and increased, 443–44. See also government intervention
India: commercial reforms, 34; fiber optics investment, 71; industrial policy, 391; trade liberalization, 493
industrial niches, 512–16
industrial policy: 2008 global financial crisis, 42, 96, 151, 372, 405, 418, 491, 495; African countries’, 399–400; aftermath of WWII, 492–93; based on correcting market failures and creating learning society, 393–94; China’s, 391, 495; climate change and, 495, 517–21; closing of knowledge gaps, 44–46, 70, 360–61, 372–73, 481, 501; counterarguments to interventionism, 495–96; countercyclicality and, 520–21; design and governance of, 496–98; distinctive circumstances of catching-up countries, 376–78; East Asian countries, 393–94, 399–400, 408; finance and government, 402, 408–12; focus of, 337, 480; governance and institutional reform, 394–96; government support of, 362–63; Great Recession, 392; historical experiences with trade interventions, 389–90; history as proof of workability of, 67–68, 68, 391; India’s, 391; inequality, 380–83; inevitability of, 371–72; infant-economy argument for protection, 494–95; infant-industry argument for catching-up countries, 510, 511; instruments of, 372; Japan’s, 493; Korea’s, 340, 388–89, 398–400; Latin American, 390–91; liberalization, 397; making most of natural resources, 371, 385–87; methodological response to political economy critique, 396–97; need for, 369–70; neighboring sectors’ experimentation, 513–16; objectives of, 378–79; one-size-fits-all policies, 375–76; optimal subsidy, 276–77; political economy and, 391–97; reasons why markets by themselves do not create learning economy, 370; redirecting technical change, 516–19, 518; Romer’s product-variety model, 512–13; sectoral intervention, 510–16; shift in focus of, 509–10; of special importance for catching-up countries, 372–78; strategies, 398–99; structural adjustment policies stifling growth, 373–74; structural transformation, 379; tariff-skill interaction term, 512; theory
of Second Best, 397–98; trade policy, 381–85; unemployment from, 151–59, 152, 154, 155, 379; U. S., 387–88, 493; in war time, 390; Washington Consensus, 23, 80, 374–75, 402, 405, 481, 493, 509–10 industrial sector, size of, 343–44 industrial subsidy, optimal, 276–77 industry-level tariff-skill interaction term, 512 infant-economy argument, 265, 476 infant-industry/economy argument: aggressive protection and subsidies, 389, 511; Brazil's aircraft industry, 502–3; catching-up countries and, 333–34, 500–501, 510–11; closed economy, 265, 476; criticisms of, 489, 511–12; Europe and, 332; in financial policy, 404, 476; in industrial policy, 494–95; as infant-economy argument, 4–5, 9, 336, 336–37, 337, 341; Korea's example, 338–39, 338–40; in learning society, 404, 476; never growing up as criticism of, 332; rate of learning, 350–51; recent empirical findings, 510–16; summation of, 511–12 information externalities, 402–3, 475 innovation: adverse effect on future innovation, 237; alternative systems comparison of, 449; Arrow-Debreu assuming away of, 19–20; bureaucracy and, 84–85, 87; capitalism's emphasis on, 57; as central to modern economy, 2; clean innovation subsidy, 517–21; compensation systems, 123; competition intensity, 110–13; competition link, 103, 478; conditions which lower demand curve for labor, 172–73; demand for labor, 172–73; determinants in pace of, 438–39; economics of information, 131–32; effect of entry on, 254–59, 255, 258; -efficiency in learning revolution, 19; endogenous market structure, 125–26, 481; endogenous technology, 2–5, 16–17, 131–32; enhancement of individual and societal well-being, 169–72; eureka moment, 52; excessive unemployment and, 151–59, 152, 154, 155; finite term models, 319; follow-on, 432–33, 451; industrial firms as source of, 90–93; inefficient processes of, 143–49, 230–32; knowledge dissemination and, 453; labor-augmenting versus labor-saving, 164–65; labor scarcity as inducement to, 159; learning society's system for, 428; long-run dynamics and factor-biased technological progress, 173–78, 176; market structure and, 104–5, 279–81, 280; market structure impacting consumer welfare and, 279–81, 280; Microsoft's predatory behavior, 116–17, 432–33; monopoly and competitive structures, 475; monopoly innovator, 219–23; in monopoly versus duopoly, 106–7; nature of society and, 164–65; new knowledge as public good, 135–37; patent law impedes, 59, 75, 433–36, 476; patent races and limited innovation, 120–21, 124, 430; patent system versus incentive for, 437, 451; patent thickets obstacles to, 434; portfolio approach to, 448–53, 449;
innovation (continued)
pro-innovation regimes for IPR, 259–61, 260; returns from, 438;
second-period consumer welfare, 79, 107–8; selection attribute, 448;
sequential monopoly equilibrium: large innovations, 186–87, 187;
sequential monopoly equilibrium: small innovations, 184–86, 185,
186; socially optimal, 222–23; socially unproductive, 149–61;
social value of, 112; successive monopolist, small innovations, 183,
183–84; underinvestment in, 438; welfare results from, 126,
430. See also rents; Schumpeterian competition; technology/
technological progress
innovation process, inefficient, 143–49, 230–32
innovators and inventors, 82–84, 83, 219–20
intellectual property rights (IPR): adverse effects of, 456;
alternative systems comparison, 449; ambiguous boundaries of,
433–34; analysis implications of, 456; better (pro-innovation)
regimes for, 259–61, 260;
BlackBerry suit, 435; changes in, 440; channels of learning
and, 455–56; circumventing patents, 437; common resources
problem, 240, 240–46, 241, 242, 243, 244, 246; compulsory licenses
for, 442–43, 455; development-oriented, 454; diagrammatic
exposition of tighter, 254–57, 255; distorted incentives in, 436;
distortions in, 430–31; eBay
Inc. v. MercExchange, L.L.C., 435; economic development
and, 454–56; effect of entry on innovation, 254–59, 255, 257;
effect of tighter, 251–54, 252; enclosure of commons, 145–46, 433,
451; as enclosure of intangible commons of mind, 238;
equilibrium knowledge pool, 252; evergreening and data exclusivity,
436–37, 440; finance and, 450–51; fishing from renewable common
resource pool, 238; government, 441; government-funded research
alternative, 444–45; guaranteed purchase fund, 447; holdups
and patent trolls, 435–36, 451, 454; impact on R & D, 254–59,
255, 258; innovation and welfare results, 430–31; International
Trade Commission and, 435–36; knowledge dissemination and,
453; knowledge externalities as central to learning society,
238–39; knowledge pool and, 438–39; learning and, 429–31;
learning design promotion, 443–44; in learning economy,
48, 54, 59, 75; liability system and, 455; limitations on,
442; litigation risks, 433–34; mathematical advances without,
444; mispricing and perverse incentives, 438; monopoly
pricing impact on poor, 450–51; monopoly profits and power,
446; national innovation system, 444–53, 476; open-
source movement alternative, 445; ownership issues, 30;
patent system, 440–41; patent thickets, 434, 454; prize system
alternative to, 445–47, 453;
regime details, 439–40; restricted
access and knowledge, 59, 75, 431, 446; secrecy, 433; social and private returns, 430–31; socially unproductive patent races, 438; system reformation of, 439–44, 476; trade-offs in, 454; trade secrets and first-mover advantage, 444, 447; traditional knowledge patents, 437; transaction costs, 452–53; in U. S., 430; World Intellectual Property Organization, 59, 454

International Commission on the Measurement of Economic Performance and Social Progress, 470–71

International Monetary Fund (IMF), 403, 489; industrial policy and inequality, 380–83; rescue package, 406–7; structural adjustment policies stifling growth, 373–74

international trade agreements, 354–55

International Trade Commission, 435–36

Internet, 54, 445; Google, 71; information relevance, 55; Internet Explorer, 117; Mozilla Firefox, 117; Netscape, 117

investment climate, 509–10

invisible hand notion, 18–19

IPR. See intellectual property rights

Italy: G7 countries productivity growth comparison, 39; no trade barriers, 383

Jaffe, Adam, 429

Japan: automobile productivity, 351; changing demographics, 58; dense infrastructure, 7; dynamic comparative advantage, 26;

export promotion, 493, 509; favoring broad barriers to trade, 396; FDI and, 421; G7 countries productivity growth comparison, 39; industrial development strategies, 423; industrial policy, 493, 495; learning how to learn, 66; production possibility frontier, 34; trade policy structure, 8; U. S. productivity growth compared to, 38

Jobs, Steve, 84

Kaldor, Nicholas, 43

Keller, Wolfgang, 493

Kharrouri, Enisse, 520

Klinger, Bailey, 513, 515–16

knife-edge equilibrium, 116

Knight, Frank, 71

knowledge: access, 58–59; capital, 17, 79; as catalyst, 48; concentration and diffusion across firms, 91; cross-border knowledge flows, 93; dissemination structure, 267; distinctive properties of, 135–41; economics of information, 131–32; as free good, 507; impediments to transmission, 74–75; as incentive for R & D, 448; inflows and outflows, 248–49; localization of, 6; long-run dynamics and factor-biased technological progress, 173–78, 176; new, as public good, 135–37; patents: restricted access and, 59, 75, 431, 446, 476; private rewards and social returns, 143–44; as public good and learning externalities, 135–36; trade-offs, 78–79; transmission, 48. See also learning; research and development; technology
knowledge dissemination, 490; firms’ stability promoting, 91, 319–32; impediments to transmission, 74–75; innovation and, 453; intellectual property rights and, 453; structure in closed economy, 267
knowledge gaps: equilibrium, 45–46; between industrialized and catching-up countries, 44–45, 70, 360–61, 372–73, 481; performance gaps and, 501
knowledge pools: equilibrium, 252; government- and university-funded research adding to, 246–47, 247; profit-maximizing R & D, 249–50; solving for steady-state value of, 251; steady state: knowledge inflows and outflows, 248–49
knowledge trade-offs, 78–79
knowledge transmission: in closed economy, 267; in dynamic learning society, 48; impediments to, 74–75; intellectual property rights and, 48, 453
Krueger, Anne O., 508
Krugman, Paul, 24
Krugman-Dixit-Stiglitz model, 24
Kuznets, Simon, 504
labor: basic intuitions and results, 287–89; conditions in which innovation lowers demand curve for labor, 172–73; conditions which lower demand curve for, 287–89; demand curve for labor, 172–73; elasticity of, 287, 289; fixed labor supply, no lump sum taxation, two sectors, 324–26; impact on equilibrium unemployment, 154, 154–55; labor scarcity as inducement to innovation, 159; labor supply elasticity, 314–15, 316; learning by trade, 54–55; monopoly power and wages, 266; movement restrictions, 402, 412–13; scarcity of, as inducement to innovation, 159; in Shapiro-Stiglitz model, 154–56, 155; unemployment and, 151–59, 152, 154, 155, 379. See also learning by doing
labor-augmenting innovation: Shapiro-Stiglitz model, 154–56, 155
labor-augmenting versus labor-saving innovation, 164–65
labor movement restrictions, 402, 412–13
Latin America: convergence to high performance level, 34; financial market liberalization, 403–4; immigration laws and growth, 413; import substitution policies, 493, 509; industrial policy, 390–91; lending example, 123; macroeconomic policies failure, 392; production possibility frontier, 3. See also specific country
Learning: capabilities, 57–58, 65, 474; channels of, 455–56; concentration and diffusion of knowledge across firms, 92; costs of, 274; cross-border knowledge flows, 93; cumulative learning from output, 330; determinants of, 56–57; as distinguishing feature of modern era, 13–28; economics of information, 131–32; elasticity of, 267, 277, 282, 288, 290, 292, 296, 302, 307–8, 324, 330; elasticity of demand, 277; elasticity of substitution, 279; exogenous, 39; free trade and, 54–55; as investment, 79; to learn, 50–51, 53, 66; lifetime education, 56–57; market distortions, 312; mindset, 9, 48, 57, 61–63, 457–59, 472; natural resource production, 385; negative and positive externalities, 20–21; net, with foreign direct investment, 42; one-size-fits-all policies, 375–76; optimal learning with lump sum taxation, 301–4; optimal resource allocations with, 137; from others, 53–54; patents impeding, 59, 75, 433–36, 476; private and social value of, 137; productivity growth rate from improved, 37–38; rate of, 350–51; regulations impacting, 50; social value and private value of, 137; societal, 49, 57, 459; spillovers, 63–65, 76, 323–28, 335–36; strategies, 68–70; through trade, 361; two aspects of, 29–30; underinvestment in, 55, 104, 438. See also learning firms

Learning architecture, 57

Learning by doing: advantages of incumbency and deterrence, 214; Arrow’s paper on, 2–3; costly for catching-up countries, 511; extended concept of, 6; future versus today’s costs of production and, 108; labor supply elasticity and, 289; learning by trade, 54–55; learning from others, 53–54; learning to learn by learning, 50–51, 53, 66; technology and learning processes, 55–56; today’s production as benefits for future, 265–66. See also catching-up countries; infant-industry/economy argument

Learning economy: age structure and, 58; appropriability in, 76–77; belief systems and social constructs, 71–72, 74, 481; biased perceptions, 70–71; bureaucracy and innovation, 84–85, 8; catalysts in, 59–60; for catching-up countries, 51; cognitive frames for, 61–62, 72–74; cognitive impediments to, 73; comparative advantages of, 49; contacts in, 60–61; conventional economic theory implications, 66–67; determinants of learning, 56–57; differential knowledge in, 47–48; dynamics of, 73–74; economic systems mobility, 61, 99–100; the Enlightenment and, 62, 70, 73–74; equilibrium fiction, 71, 73, 75, 481; evolutionary dynamics, 86, 86; foreign direct investment, 66, 477; free trade and learning, 54–55; geographic and cultural localization, 65–66; globalization
learning architecture (continued)
benefits, 61; government intervention, 87, 479; history as proof of workability, 67–68, 68, 391; ideological commitment and, 73; innovators and inventors, 82–84, 83, 219–220; institutional and societal rigidities, 72–73; institutional spillovers, 64–65; intellectual property rights and, 48; knowledge transmission, 48; knowledge transmission impediments, 74–75; learning and regulations, 50; learning architecture, 57; learning capabilities, 57–58, 65, 474; learning from others, 53–54; learning spillovers, 65; learning strategies, 68–70; learning to learn, 50–51, 53, 66; lifetime education of, 56, 57; localized learning theory, 64–65, 69; modern growth policy and theory, 80; motivation for, 75–76; new production methods as catalyst for, 52–53; new technologies in, 55–56; nonpecuniary intrinsic incentives, 48; openness and mobility, 54, 61, 99–100, 468–70, 472; open-source movement, 59, 74; patent law impedes, 59, 75, 433–36, 476; production methods spillovers, 64; resource allocation, 67; savings rate case, 79; secrecy and, 75, 77; short-run versus long-run trade-offs, 80, 479–80; societal learning, 49, 57, 459; spillovers, 63–65, 76; standard of living and, 482; static inefficiencies versus dynamic gains, 79–81; structure of, 53–54; technology and, 55–56; trade restrictions and, 55. See also learning by doing
learning environment, 62–63, 322, 336–41, 360, 476
learning firms: ability to support R & D, 93; concentration across firms, 92; design of, 89–90; development of robust financial sector from, 94–95; entrepreneurship, 411–12, 513–14; geographical localization, 95–99; industrial firms as source of innovation, 90–93; innovative, 89–90; learning and boundaries of, 88–89; role of stability and continuity, 91, 319–32; spillovers to rest of economy, 93–95; venture capital, 408
learning instruments, 488–89
learning revolution, 474; advances in, 17; analyzing inefficiencies, 20; Arrow-Debreu model, 16–17, 19–20, 52, 102, 104, 401, 473, 490, 500; capital accumulation versus learning, 17; classical policy prescriptions, 22; dynamic comparative advantage, 25; economics of learning processes, 16–17; endogenous growth theory, 1–3, 15–16; factor endowments, 24–26, 66; governmental responsibility, 21–22; governmental role, 20–24; history of, 13–14; innovation efficiency, 19; interventions, 21, 23–24; invisible
hand notion of, 18–19; knowledge capital, 17, 79; learning perspective, 27–28; learning societies and, 18; market inefficiency, 18–20; objective of economic policy, 15; pace of, 15; policy reassessment, 22–23; property rights institutions role, 23; redefined comparative advantage theory, 24–28; Schumpeterian competition, 22; significance of transformations, 14; source of transformations, 14; standard economic analysis, 26–27; successful economies, 17–18; tacit knowledge, 25–26

learning sector subsidy, 282

learning society, 9; broader financial sector policies and, 412, 476; capital access in, 401; capital controls in, 405; capital market liberalization, 402–5, 407, 414–17, 475, 477; capital outflows, 407; capital standard theory failure, 406; changes in perceptions and beliefs, 404–66; cumulative learning from output, 330; democracy and creation of, 466–70; development banks, 395, 411, 412; economic policy to create, 15–16; education and social protection, 427; entrepreneurship and learning externalities, 411–12, 513–14; exchange rate policy, 417–20; finance and industrial policy, 402, 408–12; financial restraint, 409–10; foreign banks advantage, 404; foreign direct investment, 420–23; foreign financial services restrictions and, 412; funds diversion in, 405–6; general approach to societal evolution, 459; geographical localization, 95–99; government and industrial policy creating, 408; government investment in, 424–26; government policy key objective for, 402; government subsidies for FDI to promote, 423; IMF rescue package, 406–7; infant-economy argument for protection, 404, 476; information externalities, 402–3, 475; innovation system, 428; International Monetary Fund and, 405; investment policies, 420–23; labor movement restrictions, 402, 412–13; learning sectors and, 408; legal frameworks, 427–28; macro-instability versus, 401; migration and, 413; mixed systems in, 411; need for inclusive growth, 467–68; outward-bound investment, 423–24; persistence of socially dysfunctional beliefs, 462–63; political economy of inclusiveness and openness, 54, 61, 99–100, 468–70, 472; reasons why markets by themselves do not create, 370; regulatory banking, 409; regulatory policies and flow of funds, 410–11; social transformation into, 457–59; Thailand’s adverse effects, 406–7; theory of equilibrium beliefs, 459–62; U. S. banking and, 404–5; venture capital firms and, 408

learning theory, localized, 64–65, 69

Legros, Patrick, 520

Lerner, Josh, 429

liberalization: financial market, 402–5, 407, 414–17, 475, 477; industrial policy, 397; trade policy, 361; Washington Consensus, 23, 80, 374–75, 402, 405, 481, 493, 509–10
life insurance companies, 35, 35
lifetime learning, 56–57
limiting impact of entry, 217–19
Lin, Justin, 24
Lincoln, Abraham, 503
List, Friedrich, 508
Lithuania, 30–32, 31
localized learning, 64–65, 69
logarithmic utility function, 293, 295–96, 299, 319, 321–24, 327–28, 348; properties of, 319
long-run dynamics and factor-biased technological progress, 173–77, 176
long-term growth learning models:
  asymmetric equilibria and advantages of specialization, 328–30, 329; cumulative experience, 326–28; cumulative learning from output, 330; fixed labor supply, no lump sum taxation, two sectors, 324–26
Louisiana, 404–5
Lucas, Robert E, Jr., 513
lump sum taxation: closed economy, 267, 273–74, 277, 279, 282; fixed labor supply, two sectors, 324–26; subsidy and, 315–16; two-period, N-good model with endogenous labor supply, 301–4, 306–7
lump sum tax subsidy, 315–16
Lundvall, Bengt-Åke, 429

MacCready, Paul, 51
macroeconomic environment: 2008 global financial crisis, 42, 96, 151, 372, 405, 418, 491, 495; episodes of rapid productivity increases, 37–38; investment climate, 509–10; learning impacted by, 63; perspectives on, 30–34
macroeconomic growth models, 16–17
Malaysia: electronics industry, 503; FDI in, 423; resource extraction, 387
managerial capitalism, 478
market efficiency: Arrow and Sokolo on understanding, 1–3, 8, 10; financial restraint, 409–10; human well-being from learning society versus, 18–20; market mobility versus, 99–100
market equilibrium: Arrow on, 1–2, 19–20; Pareto inefficiency, 41, 126, 141–42, 161, 266, 311, 474, 480
market imperfections, 267–68
market investment, 166–67; model of, 283–84
market mobility, inefficiency of, 99–100
market structure: alternative technology, 122; analytics for, 117–19; Bertrand price-competition model, 103, 110–12, 116, 119; compensation systems, 123; competition and innovation link, 103, 124; competition and pace of innovation (parametric model), 127–29, 130; competition intensity and innovation efficiency, 110–13; contestability and, 119–20; contest problems in, 120–21, 124; Cournot competition versus Bertrand, 112–13; duopoly equilibrium, 106–7; endogenous, 125–26, 481; entrant versus incumbent in R & D, 121–22; entry deterrence, 120; innovation and, 279–81, 280; innovation with monopoly and duopoly, 106–7; knife-edge equilibrium, 116; level of innovation and, 103–5; monopolies, 102, 124–25; monopoly equilibrium, 105–6;
monopoly power as temporary, 116–17; monopoly versus duopoly, 104–5, 108, 117–18, 124; Nalebuff-Stiglitz analysis, 120–21, 123; Nash-Cournot equilibrium, 110, 116, 193, 194–95, 195; patent races and limited innovation, 120–21, 124; patent races competition and innovation rate, 113–15; perfect spillovers, 108–9; relationship between competition, innovation, and welfare, 123–24; Sah-Stiglitz invariance theorem, 110; Schumpeterian competition, 101–3, 115; Stackleberg equilibrium, 117–18; standard competitive theory, 102; standard innovation (patent) race, 103; standard learning model, 103; welfare and innovation results, 126; welfare under monopoly and duopoly, 107–8; X-inefficiency among, 122, 125

Marshall, Alfred, 507

Marxism, naive, 73

Maskus, Keith E., 429

Mazzucato, Mariana, 445

McKinsey Global Institute, 501–2

Medicare, 450

Mellon, Andrew, 98

me-too innovations, 143–44

Mian, Atif, 403

Micco, Alejandro, 403

microeconomic environment, 34–36

Microsoft, 91, 116–17, 432–33; patent use, 432, 433, 437, 442

middle Europe, 30–32, 31

migration, 413

mindset: ideological commitment, 73; learning, 9, 48, 57, 61–63, 457–59; valuing transparency and openness, 54, 61, 99–100, 468–70, 472

Mirrlees, James, 363–64

Mississippi, 404–5

Mitchell, Wesley Clair, 504

mobility: as catalyst for learning, 78, 92; openness and, 54, 61, 468–70, 472

model farms, 54

modern growth policy and theory, 80

monopolist demand and marginal revenue schedule, 183

monopolistic competition: absence of learning effects, 311; behavior of monopolist, 312–13; duopolist versus, 109–10; elasticity of demand, 312, 318; elasticity of productivity, 312; enclosure of commons, 145–46, 238, 433, 451; example of Myriad Genetics, 145; government intervention two-sector model, 316–17; labor supply elasticity, 314–15, 318; lump sum tax subsidy and, 315–16; market distortion, 313; market structure, 102, 124–25; monopoly outcome versus competitive outcome, 313–15; monopoly power as temporary, 116–17; monopoly versus duopoly, 104–5, 108, 117–18, 124; multiple rational expectations equilibria, 317–18, 318; myopic monopolist, 188–90, 189, 196–97, 200, 314; myopic versus nonmyopic, 314; oligopolistic versus, 138–41; perfect competition compared to, 139–40, 140; persistent myopic monopolist, 188–90, 189, 196–97, 200; power and wages, 266; pricing and, 450–51; private rewards and social returns, 143–44; second-period consumer
monopolistic competition (continued)
- welfare, 79, 107–8; sequential
- monopoly innovator, 219;
  - constrained monopolist, 220–21;
  - contestability, 221–22; socially optimal innovation, 222–23
- Mozilla Firefox, 117
- multiple equilibria, 83, 85, 86, 354, 354, 475, 480; catching-up countries, 360–61; consumption in, 317–18, 318
- multiple potential entrants, 198–200, 199
- multiple potential innovators, 197–98
- Myanmar, 389–90
  - myopic monopolist, 188–90, 189, 196–97, 200, 314
  - Myrdal, Gunnar, 458–59
  - Myriad, 145, 438
  - Nalebuff, Barry J., 120–21
  - Nalebuff-Stiglitz analysis, 120–21, 123
  - Nash-Cournot equilibrium, 110, 116, 193, 194–95, 195
- National Business Survey, 497–98
  - natural resources, 240–46; availability of, 502; effect of improved investment environment, 243; few spillovers from, 422; fish, 240, 240–42, 241, 242; increased competition, 244; making most of, 371, 385–87; optimal resource allocation, 137; regulation of, 246; underpricing of, 171, 377. See also common resources problem
- negative and positive externalities, 20–21
- Nelson, Richard, 505
  - neoclassical model: beliefs and social constructs arising from, 71–72, 74, 460–63, 481; counterproductive policies arising from, 458, 474; on distribution of income, 158; learning society compared to, 47; postcolonial era trade policies, 386; Schumpeter’s critique of, 22; Washington Consensus reliance on, 23, 80, 374–75, 402, 405, 481, 493, 509–10
- Netscape, 117
- New England Telephone, 36
- Newton, Isaac, 48
- New York Telephone, 36
- niches, industrial, 512–16
- nonexcludability property, 136–37
- nonpecuniary intrinsic incentives, 48
- nonrivalrous consumption, 136–37
- non-steady-state analysis, 358–60. See also steady-state
- Nordhaus, William D., 17
- Nordic welfare model, 364–66
- North Carolina, 404–5
- North Korea, 30–32, 31. See also Korea
Northwestern Mutual life insurance company, 35, 35
Nunn, Nathan, 496–98, 512

OECD. See Organisation for Economic Co-operation and Development
Office of Science and Technology Policy, 430
Ohio Valley, 52
Ohlin, Bertil, 503
oligopoly, 109, 115, 336, 405; monopoly versus, 138–41
open-source projects/movement, 74; access and knowledge, 59, 75, 431, 446; as IPR alternative, 445; mobility and, 54, 61, 99–100, 468–70, 472
optimal interventions, 274–79
optimal resource allocation, 137
optimal tax intervention rewrite, 276
optimal timing: in sequential monopoly, 224–25, 225; size of innovation and, 230–32
Organisation for Economic Cooperation and Development (OECD), 520
organization, continuity of, 91
overinvestment, in speed, 235
overvalued currencies, 382

Pareto inefficiency, 41, 126, 141–42, 161, 266, 311, 474, 480; Arrow on, 1–2, 19–20
patent holder: business stealing effect of rents, 179; circumventing, 437; competition for rents, 394; enclosure of commons, 145–46, 238, 433, 451; entertainment and pharmaceutical industry, 429–30; holdups, 146, 435–36, 451, 454; knowledge rents, 45–48; legal framework for property rights, 21; macroeconomic perspective, 30; monopoly, 110, 115–17, 145, 227, 236, 268, 398, 452–53; private rewards and social returns, 143–44, 181, 436; rents, 143–45, 235; sustainable rents, 399. See also creative destruction
patent pool creation, 434
patent races, 77, 103, 110, 144–45, 223–32; competition and innovation rate, 113–15; innovation rate formulation, 113–15; limited innovation, 120–21, 124
patents: adverse effects of, 456; alternative systems comparison to, 449; ambiguous boundaries, 433–34, 478; analysis implications of, 456; circumventing, 437; disclosure requirements, 59–60, 75–76; enclosure of commons, 145–46, 238, 433, 451; evergreening and data exclusivity, 436–37, 440; government, 441; granting and enforcing process, 443; holdup, in Schumpeterian competition, 146; holdups and patent trolls, 435–36, 451, 454; impeding learning, 59, 75, 433–36, 476; as innovation impediment, 59, 75; open-source movement and, 445; patent holder’s profits, 143–44; patent pool creation, 434; patent races, 77, 103, 110, 144–45, 223–32; patent races and innovation rate, 113–15; patent system versus incentive for innovation, 437, 451; patent thickets in, 434, 451, 454; prize system alternative to, 445–47; research distortion by, 446–47; restricted access and knowledge,
patents (continued)
  59, 75, 431, 446, 476; risk and lack of coordination, 451–52; socially unproductive races in, 438; system rules, 440–41; traditional knowledge -, 437; weak, 434. See also spillovers
patent thickets, 434, 451, 454
patent trolls, 435–36, 451, 454
PDV. See present discounted value
perfect spillovers, 108–9, 270
Perleman, Michael, 429
perpetual surplus, 8
pharmaceutical industry, 21, 429–30
Philippines, 505
Phoenix Mutual life insurance company, 35, 35
Poisson process, 224, 233
Poland, 30–32, 31
portfolio approach, to innovation, 448–53, 449
Portugal, 24
positive and negative externalities, 20–21
present discounted value (PDV), 220–27, 225, 231
prize system, 445–47
probability distribution of arrival, 113–14
production: cumulative learning from, 330; specialization, 328–30, 329
production methods: aggregate, function with constant returns to scale, 151–52; episodes of rapid increase in, 36–37; first period and second period, 272; gap between best practices and, 29–30; of goods versus knowledge, 2–3; impact of quotas, 346, 346–47; inefficiencies, 505–6; new, as catalyst for learning economy, 52–53; as nonconcave function of experience, 329; optimal consumption and, 289–95; possibilities schedule, 43; spillovers, 64, 270–71, 343; trade policy role in, 361; value of research and level of, 285
productivity growth, 270–71, 490–91; asymmetric equilibria and advantage of specialization, 328–30, 329; counterproductive policies, 458, 474; cumulative experience, 326–28; fixed labor supply, no lump sum taxation, two sectors, 324–26; G, countries, 39; gap between productivity and best practices, 29–30, 80; hours paid versus, 39; improved learning impacting rate of, 37–38; industry-level tariff-skill interaction term, 512; learning society compared to neoclassical model, 47; macro-stability and long-run, 6, 319–32; neoclassical beliefs and social constructs impacting, 71–72, 74, 460–63, 481; neoclassical model on distribution of income, 158; Nunn and Trefler’s regression results, 512; per country, 39, 39; postcolonial era trade policies, 386; technology and, 270–71, 490–91; Washington Consensus on, 23, 80, 374–75, 402, 405, 481, 493, 509–10
product-variety model, 512–13
progress, rate of, 271
Proposition 1: tighter property rights leads to less innovation, 253–54
Proposition 2: second-period welfare under monopoly versus duopoly, 108
Proposition 3: welfare is higher under monopoly than under duopoly, 108
public goods, two properties of, 135–37
quality of life, 406, 470; communist countries versus non-socialist, 30–32, 31; innovation and enhancement of individual well-being, 160–72; innovation’s contribution to, 136; maximization of societal well-being, 156–58; movement toward frontier impacting, 40; Nunn and Trefler’s regression results, 512; social value and private value of learning, 137; standard of living in learning economy, 482
quota: autarky, 340, 340–41, 345; impact on agricultural sector, 346, 346–47
RAND Corporation, 499
random cost reductions, 210–12
Rashid, Hamid, 403
R & D. See research and development
Real Networks, 117
regulatory banking, 409–11; 2008 global financial crisis, 42, 96, 151, 372, 405, 418, 491, 495
rents: business stealing effect, 179; circumventing patents, 437; competition for, 394; enclosure of commons, 145–46, 238, 433, 431; entertainment and pharmaceutical industry, 429–30; holdups, 146, 435–36, 451, 454; innovation, 233–35, 334–36; knowledge, 45–48; legal framework for property rights, 21; macroeconomic perspective, 30; monopoly, 110, 115–17, 145, 227, 236, 268, 398, 452–53; private rewards and social returns, 143–44, 181, 436; to support R & D, 19; sustainable, 399. See also creative destruction; patents
research and development (R & D): clean technologies, 517–21; collateral and, 408; data exclusivity, 436–37, 440; entrant versus incumbent, 121–22; entrepreneurship, 411–12, 513–14; government funding of, 334, 444–45, 453; increased incentives and, 443–44; industrial firms as source of innovation, 90–93; investment, marginal return to, 208, 208–9, 209; investment model, 283–84; knowledge and peer recognition motivating, 448; learning firm’s ability to support, 93; macro-instability impacting, 96–97; market imperfections in, 267–68; market investment in, 166–67; model of investment in, 283–84; monopolist and duopolist, 109–10; in monopoly versus oligopoly, 138–41; Nash equilibrium formula, 254–55; patent holder’s profits, 143–44; patents distortion of, 446–47; patent system distortion of, 446–47; patterns of, 168–69; private rewards and social returns, 143–44; productivity growth, 270–71, 490–91; profit-maximizing, 249–50; rents to support, 19; risk and lack of coordination in, 451–52; Schumpeterian competition and riskiness of, 131–32, 141–43; spillovers from, 138–41; Stackleberg equilibrium, 117–19; subsidies formulation, 197; sunk costs and, 119–20; tighter IPR impact on, 254–59, 255, 258; underinvestment in, 104; value of research and level of production, 285; in winner-takes-all system, 144–45. See also Schumpeterian competition
reserves and surpluses, 362;
accumulated, 359; agricultural
workers move to cities, 150;
perpetual, 8

returns to scale, 14, 138–39, 140,
151–52, 152, 172, 268, 293; market
power arising from, 398–99
Richardian model, 350, 363
Ricardo, David, 382
rigidities, institutional and societal,
72–73
Rio Agreement, 442
risk: IPR and litigation risk,
433–34; in lack of coordination
of patents, 451–52; of R & D in
Schumpeterian model, 131–32,
141–43; view of capitalism after
2008, 42, 96, 151, 372, 405, 418,
491, 495
Robinson, James, 364
Rodrik, Dani, 389
Romer, Paul, 493; product-variety
model, 512–13
Route 128, Boston area, 506
Royal Society for the
Encouragement of Arts,
Manufactures and Commerce,
445–46

Sah, Raaj Kumar, 110
Sah-Stiglitz invariance theorem,
110
Salter, W. E. G., 158
Samuelson, Paul, 135–36, 382
Scandinavian countries: dynamic
economies, 469; Finland, 30–32,
31; social protections, 468; U. S.
compared to, 365, 470
Schumpeter, Joseph, 7, 14–16, 19–22,
97–98; on market structure, 101–3,
105; monopoly conjecture, 280,
282, 310, 478

Schumpeterian competition,
22, 102–3, 110, 164, 431, 491;
conditions lowering demand
curve for labor, 172–73;
coordination failures, 146–47;
correctness of, 234; on distinctive
properties of knowledge, 135–37;
divergence between social and
private returns, 133; failure
of current market processes,
131–33; GDP in, 169–72; holdup
patents, 146; imperfections of
competition, 138–41; imperfect
risk and capital markets, 131–32,
141–43; inefficiencies inherent in
evolutionary selection, 161–64;
innovation as foremost element,
131–32; interactions among market
failures, 147–48; knowledge
spillovers, 432; learning
externalities and market structure,
139–40, 140; market structure
and, 115, 124, 126; monopoly
rents and enclosure of commons,
145; not best way to finance R &
D, 165–72; reasons markets for
innovation are inefficient, 143–49;
short-run equilibrium, 133–56;
social and private returns to race
winner, 145; socially unproductive
innovation, 149–53; theory of
second best and financing of
innovation, 148–49. See also
creative destruction
sectoral intervention, recent findings,
510–16
Selden, George Baldwin, 433
selection attribute, 448
separable demand equation, 276
sequential monopoly: compared
with persistent monopolist,
225–27; equilibrium: large
innovations, 186–87, 187;
equilibrium: small innovations, 184–86, 185, 186; equilibrium with large innovations, 186–87, 187; equilibrium with small innovations, 184–86, 185, 186; optimal timing, 224–25, 225; persistent myopic monopolist, 188–90, 189, 196–97, 200
Shapiro, Carl, 154–56, 155, 159
Shapiro-Stiglitz model, 154–56, 155
Silicon Valley, 506
size, of industrial sector, 343–44
skill-biased innovation, 157–58
Sloan Foundation, 383–85, 490
Small Business Administration, 408
Smith, Adam, 2, 18–19, 165, 382
Smoot-Hawley Tariff (1930), 508
Social Choice and Individual Values (Arrow), 485
social constructs. See belief systems and social constructs
societal learning, 49, 57, 459;
aggressive protection and subsidies, 389, 511; arguments for
government intervention, 42–43;
localization, 95–99; government encouragement of, 6, 15–16,
societal well-being: innovation and, 169–72; maximization of, 156–58, 190–91, 232–33; under monopoly versus duopoly, 107–8; socially optimal innovation formula, 222–23; social value and private value of learning, 137
Solow, Robert, 1–3, 8, 10, 14–15, 41, 360, 473, 487, 490; on comparative advantage and catching-up countries, 500, 502;
growth model, 158–61; on long-run dynamics and factor-biased technological progress, 158, 175–78
South Carolina, 404–5
Southeast Asia, 30–32, 31
of closed economy, 282; lump sum tax subsidy and, 315–16; optimal industrial, 276–77; targeted, 511; tax policies and, 311–15
sunk costs, 119–20
Supreme Court, U. S.: eBay Inc. v. MercExchange, L.L.C., 435; patent system and, 440–41
surpluses and reserves, 362;
agricultural workers move to cities, 150; perpetual, 8
symmetric equilibrium, 198; two-period, \(N\)-good model with endogenous labor supply, 297–301.
See also competitive equilibrium
tacit knowledge, 25–26, 74, 491;
learning from others, 53
Taiwan: favoring broad barriers to trade, 396; quality of life, 30–32, 31
taxes: benefit, 450; carbon tax, 517–21; consumption and, 388; distortionary tax on agricultural sector, 277–79; fixed labor supply, no lump sum taxation, two sectors, 324–26; interventions and optimal tax theory, 363–64; monopoly tax, 149–450; no lump sum, 306–7, 324–26; optimal learning with lump sum taxation, 301–4; optimal tax intervention, 275; optimal tax intervention rewrite, 276; set of admissible, 364; Smoot-Hawley Tariff, 508; subsidy policies and, 311–15; tariff barriers, 4–5, 500–501; trade interventions and optimal tax theory, 363–64
technology/technological progress: alternative, in market structure, 122; capital for, 79; clean, 517–21; collateral for R & D, 408; computerization, 52;
economics of information, 131–32; endogenization of, 2–5, 16–17, 131–32; factor bias, 152–53, 154; government funding for, 334, 444–45, 453; increased incentives and, 443–44; industrial firms as source of innovation, 90–93; internet, 54, 55, 445; knowledge and peer recognition motivating, 448; learning economy and, 55–56; learning firm’s ability to support, 93; learning to exploit existing opportunities and, 34–36; long-run dynamics and factor-biased technological progress, 173–78, 176; macro-instability impacting, 96–97; market imperfections in, 267–68; market investment in, 166–67; model of investment in, 283–84; monopolist versus duopolist, 109–10; in monopoly versus oligopoly, 138–41; Office of Science and Technology Policy, 430; Ohio Valley know-how, 52; patent holder’s profits, 143–44; private rewards and social returns, 143–44; productivity growth, 270–71, 490–91; profit-maximizing, 249–50; progress versus size of industrial sector, 343–44; rate of, 271, 271; risk and lack of coordination in, 451–52; Schumpeterian competition and riskiness of, 131–32, 141–43; Silicon Valley, 506; social value and private value of learning, 137; spillovers from, 138–41; sunk costs and, 119–20; tighter IPR impact on, 254–59, 255, 258; underinvestment in, 104. See also innovation; knowledge; patents; research and development
Index

Tennessee, 404–5
Texas, 404–5

TFP. See total factor productivity

Thailand: financial policy adverse effects on, 406–7; quality of life, 30–32, 31

total factor productivity (TFP) growth, 497–98


Trade Related Aspects of Intellectual Property Rights (TRIPS), 23, 429, 442, 455

Trefler, Daniel, 496–98, 512

Tressel, Thierry, 403

TRIPS. See Trade Related Aspects of Intellectual Property Rights
trolls, patent, 435–36, 451, 454
Tuncer, Baran, 508
Turing, Alan, 136
Turkey, 508; infant substitution policies, 494; nonprotected firms, 511
two-country, two-good model, 335
two economies model, 341–45
two-good closed economy model, 7
two-period, N-good model with endogenous labor supply: basic intuitions and results, 287–89; basic model: optimal production and consumption, 289–95; full spillovers, 304–6; lump sum taxation, 301–4; no lump sum taxes, 306–7; price interpretation, 295–97; symmetric equilibrium case, 297–301

U. K. See United Kingdom
underinvestment: in innovation, 438; in learning and education, 55, 104
UNDP. See United Nations Development programme
unemployment: demand curve shift for labor, 154–55; industrial policy and, 379; innovation and excessive, 151–59, 152, 154, 155
unexploited productive capacity, 36
United Kingdom (U. K.): aggressive protection and subsidies, 389, 511; G, countries productivity growth comparison, 39; Royal Society for the Encouragement of Arts, Manufactures and Commerce, 445–46; unexploited productive capacity, 36
United Nations Conference on Sustainable Development (Rio agreement), 442
United Nations Development programme (UNDP), 383
United States (U. S.), 505; aggressive protection and subsidies, 389, 511; Agricultural Extension Service, 5, 93; automobile productivity, 351; banking, 404–5; competition laws and policies, 171; Court of Federal Claims, 441; cutthroat competition, 364–65; dynamic comparative advantage, 26; eBay Inc. v. MercExchange, L.L.C., 435; economy during World War II, 37–38; exchange rate, 420; factor endowments, 24; favoring broad barriers to trade, 396; financial markets, 403; G, countries productivity growth comparison, 39; government-funded research, 444–45; heavy industrialization strategy, 27; industrial policy, 387–88, 493; innovation and enhancement of individual and societal well-being, 169–72; intellectual property rights, 168; IPR, 430, 452–53; labor scarcity as inducement to innovation, 159; long-term deficits, 361; market-based system development, 409; monopoly pricing and, 450–51; opposing government intervention, 510; patent pool creation, 434; patent system, 440–44; Scandinavian countries compared to, 365, 470; state banking, 404–5; trade policy, 383–85; Washington Consensus, 23, 80, 374–75, 402, 405, 481, 493, 509–10; World War II economy, 37–38
upstream linkages, 385–87
urban sector: decline in demand for urban goods, 150; dissemination and utilization of information, 4–5, 55, 94, 490
Uruguay round trade negotiations, 59, 403, 429, 435
U. S. See United States
utility, as nonconcave function of consumption, 329

venture capital firms, 408
Verdier, Thierry, 364
Vietnam, 32, 34
Virginia, 404–5
Volcker, Paul, 151

Wacziarg, Romain, 493
Walras, Léon, 102
Wang, Yan, 403
Washington Consensus, 23, 80, 374–75, 402, 405, 481–82, 493, 509–10
Watson, James, 136
WCED. See World Commission on Environment and Development
weak patents, 434

Weiss, Andrew, 77
Winter, Sidney, 505
WIPO. See World Intellectual Property Organization
Woodford, Michael, 500
World Bank, 394, 447, 489, 491, 500, 510
World Commission on Environment and Development (WCED), 442
World Intellectual Property Organization (WIPO), 59, 454
World Trade Organization (WTO), 23, 361, 362, 384, 399–400
World War I, 434
Wright Brothers, 434
WTO. See World Trade Organization

Xerox, 91
X-inefficiency, 122, 125

Yeyati, Eduardo Levy, 403
Young, Alwyn, 513