

Index

- Abrol, D. 262
Academy of Sciences (Malaysia) 291
administration
 of Malaysian university-industry
 collaboration 298
 of technology transfer at Tsinghua
 University 236–41
advice, legal
 role at Multimedia University 306
AEC (Atomic Energy Council)
 (Taiwan) 202
agencies, governmental
 role in Taiwanese university-
 industry collaboration 202–3
 *see also output e.g. law and
 legislation; policies*
agencies, science
 as element of India's NSI 256, 257
Agency for Industrial Science and
 Technology (Japan) 80
Agrawal, A. 89, 102
Agriculture Department (Thailand) 315
All India Council for Technical
 Education (AICTE) 258
alumni, university
 experience of entrepreneurial start-
 ups 127–8
analysis, comparative
 of technology commercialization
 18–25
applications, patent
 development of ideas involving at
 NTUST 218
 of Japanese universities 91–2
 process at University of Tokyo 75–6
 role of Japan Patent Office 79
Applied and Technological Service
 Center (ATSC, Thailand) 325–6
assignments, invention
 process of deciding requirement at
 University of Tokyo 74–5
Association of University Technology
 Managers (AUTM) 19, 20, 33, 34,
 36, 37
Atomic Energy Council (AEC,
 Taiwan) 202
Atomic Energy Department (DAE,
 India) 256, 257
ATSC (Applied and Technological
 Service Center, Thailand) 325–6
AverMedia Technology (Taiwan)
 211
Baark, E. 162, 262
BANSEA (Business Angel Network
 Southeast Asia) 177
Basant, R. 262
Betagro Group 314
Bose, S. 268–9
Brimble, P. 317, 323
budgets *see* finance and budgets
buildings
 case study of development and
 commercialization 219–21
Business Angel Network Southeast
 Asia (BANSEA) 177
businesses *see* companies
Canada
 university-industry cooperation and
 patent co-ownership 78
capital, human
 experience of HKUST research
 personnel 145–6
 salience as element of India's NSI
 258–9
 salience for success of technology
 commercialization and transfer
 in Chinese universities 248–9
capital, venture
 role in NUCTECH technology
 commercialization 245–6

- significance in HKUST research and development 149
 significance in Singapore innovation 167
- Carraz, R. 103
- case studies
 organization-level cooperation 51–7
 technology transfer and commercialization 211–13, 219–21, 242–7, 327–31
 university-industry collaboration 158–61, 328–9
- Cell for Technology Innovation, Development and Entrepreneurship Support (C-TIDES, IIT Madras) 274
- Center for Commercialization and Technopreneur Development (CCTD, Malaysia) 304–6, 307
- Center for Research and Postgraduate Programs (CRPP, Malaysia) 301
- centers, research
 as element of Chinese and Tsinghua University collaboration 227–30
see also specific centers e.g. Hong Kong University of Science and Technology; Korean Advanced Institute of Science and Technology; Kyushu University; Multimedia University
- Centre for Industrial Consultancy in Sponsored Research (ICSR, Madras) 274
- Chan, L. 175, 181
- Chandra, P. 262
- Chareon Pokhaphan Group, 314
- Chee-Hwa, T. 135
- Chen, L-G. 211–13, 219–20
- Cheung, P. 144
- Cheung, S-Y. 147–8
- Chidambaram, R. 262
- China
 role of intellectual property transfer and licensing 227, 228
 role of research centers 227–30
 role of science parks 230–33
 role of UOEs 233–4
see also institutions e.g. Tsinghua University
- Chinese University of Hong Kong (CUHK) 139, 141, 147
- Chung Nam Corporation 160–61
 collaboration, research as mechanism for technology transfer 76–80
- collaboration, university-industry (UIC)
 and economic development in Thailand 316–17
 case studies 158–61, 212–13, 328–9
 characteristics of development in Thailand 312–16
 comparison and extent in Japan and USA 29, 32–8
 development in Malaysia 297–9
 extent and expenditure on Taiwanese 199, 200–202
 role of Taiwanese government 202–3
 salience in technology commercialization policies 22
see also cooperation, university-industry
see also organizations involved e.g. Ministry of Economic Affairs (Taiwan); Education Ministry (Taiwan) National Science Council (Taiwan); Science and Technology Advisory Group (Taiwan)
see also specific centers e.g. Hong Kong University of Science and Technology; Kyushu University; Mahidol University; National University of Singapore; University of Tokyo; Tsinghua University
see also subject of e.g. research and development; transfer, technology
- commercialization, technology
 analysis of university 18–25
 case studies 211–13, 219–21, 242–7, 327–31
 characteristics of university approaches to 2–3
 comparison between Korea and USA 132–3

- extent in Malaysia 296
- forms of and benchmarks within universities 6–8
- growth and organization within universities 1–2, 9–10
- policies and university experiences in Korea 111–13
- recommendations for promoting 133–4
- salience and protection of intellectual property rights 249–51
- see also* policies, technology commercialization
- see also centers embracing e.g.* Hong Kong University of Science and Technology; Korean Advanced Institute of Science and Technology; Mahidol University; Multimedia University; National University of Singapore; National Taiwan University; NUTECH; National Taiwan University of Science and Technology; Tsinghua University
- see also elements and output e.g.* applications, patent; collaboration, university-industry; cooperation, university-industry; disclosures, invention; income; licensing; patents and patenting; research and development; start-ups and spin-offs; transfer, knowledge; transfer, technology
- companies
 - experience of use of incubation process at KAIST 128
 - funding of research and expenditure in Japan and USA 33–5
 - role of Japanese in innovation 30–31
 - salience as element of India's NSI 259, 261
 - see also* collaboration, university-industry
- competition
 - role in Korean university technology commercialization 112–13
- computers
 - software business innovation in India, 261
- consultation, industrial and technological
 - role as element of Kyushu University innovation 60–62
 - role in IIT knowledge and technology transfers 278, 279
- contracts, technology
 - as element of Tsinghua University collaboration 224–6
 - intellectual property rights in Japanese 95–7
 - see also* Office of Contract and Grant Administration; research and development, contract
- cooperation, organization-level achievements and case study of Kyushu University 51–7
- history and role of at IMAQ 50–51, 57–9
- overview and significance at Kyushu University 48–50
- cooperation, university-industry enhancing Taiwanese science and technology 204–206
- see also* collaboration, university-industry
- creation, enterprise (spin-offs) at IIT Madras and Bombay 279–81
- creation, knowledge
 - activities at IIT Bombay 270–73
 - development of at KAIST 114–21
 - role of publications in NUS 184
 - see also* transfer, knowledge
- CRPP (Center for Research and Postgraduate Programs, Malaysia) 301
- C-TIDES (Cell for Technology Innovation, Development and Entrepreneurship Support, IIT Madras) 274
- culture, university
 - challenges for technology transfer and commercialization in Mahidol University 333
- DAE (Atomic Energy Department, India) 256, 257

- Defence Research and Development Organization (DRDO, India) 256
- Demonstrator Applications Grants Scheme (DAGS, Malaysia) 294
- Department of International Collaboration (DIC, Tsinghua University) 237, 238, 240
- Department of Space (DOS, India) 256, 257
- development, economic
 - changes and policies in Singapore 165–9
- development and research *see* research and development
- DIC (Department of International Collaboration, Tsinghua University) 237, 238, 240
- disclosures, invention
 - changes after entrepreneurial organization of HKUST 153, 154
- DRDO (Defence Research and Development Organization, India) 256
- drugs
 - business enterprise and innovation in India 259, 261
- economies
 - influence on Thailand's of university-industry collaboration 316–17
 - overview of developments in Korea 108–10
 - overview of developments in Singapore 165–9
- education
 - as mission and key activity of KAIST 115, 116
 - development of entrepreneur at NUS 176–80
 - influence on innovation in Thailand 316
 - measurement indicators at NTU and NTUST 206–207, 214–16
 - role as complement to university research and development 289–90
 - role in enabling university-industry collaboration in Malaysia 298–9
 - role in technology commercialization at NUTECH 246–7
 - salience of entrepreneurship in technology commercialization policies 23–4
 - salience of entrepreneurship education in MMU 307–8
 - see also output and outcomes e.g.*
 - collaboration, university-industry; cooperation, university-industry; programs, education; publications; transfer, technology
 - education, higher
 - need for transformation of in Hong Kong 135–6
 - overview of in Hong Kong 138–50
 - see also institutions e.g.* universities
 - Education Act (2001, Thailand) 316
 - Education Bureau (Hong Kong) 138
 - Education Ministry (MOE, China) 228–9, 240
 - Education Ministry (MOE, Korea) 113
 - Education Ministry (MOE, Taiwan), 202–3
 - Education, Culture, Sports, Science & Technology Ministry (MEXT, Japan) 69–70, 71, 74, 92, 93, 94, 96
 - Eighth Malaysian Plan for science and technology 293–4
 - engineering
 - entrepreneurship model of support at IITs 261–2
 - enterprises (spin-offs)
 - incubation on creation of at IIT Madras and Bombay 279–81
 - enterprises, university-owned (UOEs)
 - role at Tsinghua University 234–5
 - role in China 233–4
 - entrepreneurial university
 - changes at HKUST resulting from shift towards model 150–58
 - model for IIT approach to engineering and science 261–2
 - shift towards model in NUS 169–92
 - moves towards model in HKUST 147–50

- entrepreneurship
 - and new venture creation at KAIST 125–8
 - salience of education for at Multimedia University 307–8
 - salience of education in technology commercialization policies 23–4 *see also* innovation; outreach, entrepreneurship; technopreneurship
- Entrepreneurship Centre (NEC, National University of Singapore) 176–9
- Environmental Protection Administration (EPA, Taiwan) 202
- environments, socio-economic science and technology resources supporting Taiwanese 200–206
- Essential (Higher Education Institution) Regulation (1969, Malaysia) 299
- Etzkowitz, H. 136, 169, 261–2
- expenditure, research and development
 - characteristics of increase in Malaysian 291–2
 - comparison of USA and Japan 33–5
 - experience in Thailand 313
 - experience of Hong Kong universities 139–42
 - in KAIST 117–19
 - in Taiwanese science and technology development 200–202
 - share of in Western countries and Japan 30
 - see also* finance and budgets; grants, research and development
 - see also specific centers e.g.* Hong Kong University of Science and Technology; Korean Advanced Institute of Science and Technology; Kyushu University
- exports and imports
 - role in innovation in Thailand, 313–14
- faculty, university
 - characteristics and challenges at IITs 266
 - experience of entrepreneurial start-ups at KAIST 126–7
 - policies on technology commercialization involvement 9–10
- Fifth Malaysian Plan for science and technology 291–2, 293–4
- finance and budgets
 - characteristics of IIT 266–7
 - in Malaysian research and development 291–4
 - policy of sharing at IIT Madras and Bombay 276, 277
 - role in technology commercialization and transfer at NUTECH 245–8
 - see also elements e.g.* expenditure, research and development; funding, research and development
- Freeman, C. 255
- Friedman, T. 29
- Fujisue, K. 262
- Fukuoka Intellectual Cluster Plan 63–4
- Fukuoka Prefecture
 - role of Kyushu University in regional innovation 63–4
- Fundamental Science and Technology Act 1999 (Taiwan) 202
- Fund for University Student Entrepreneurs (FUSE, Singapore) 178
- funding, research and development
 - company funding of Japanese and USA 33–5
 - experience of Hong Kong universities 139–42, 144–5
 - sources at Mahidol University 319–20
- GCL (Grameen Creative Lab, Singapore) 177–8
- Geosyndicate Power Private Limited 280–81
- Germany
 - university-industry cooperation and patent co-ownership 77–8
- Geuna, A. 8
- Global Knowledge Enterprise (GKE) strategy (Singapore)
 - creation and organization of 174–6

- evolution of organization and strategies 181–2
- impact on NUS of 182–92
- impetus for adopting at NUS 172–3
- programs of development 176–81
- vision and mission 173–4
- Global Unichip (Taiwan) 211
- governments
 - role in Taiwanese university-industry collaboration 202–3
 - see also output e.g. law and legislation; policies*
- Grameen Creative Lab (GCL, Singapore) 177–8
- Gu, S. 262
- Guideline of the Long-Term Plan for Science and Technology Development (China) 237*
- Guidelines Over Regulating the System of University Owned Enterprises 235*
- Gupta, A. 262
- Health Department (Taiwan) 202
- Henderson, R. 89, 102
- Hicks, D. 262
- High-Tech Venture Center (HTVC, Korea) 120
- Higher and Secondary Education Department (India) 266–7
- HKU (Hong Kong University) 139, 141, 147
- HKUST *see* Hong Kong University of Science and Technology
- Hong Kong
 - need for university transformation 135–8
 - overview of tertiary education in 138–50
- Hong Kong Polytechnic University (HKPU) 141–2
- Hong Kong University (HKU) 139, 141, 147
- Hong Kong University of Science and Technology (HKUST)
 - case studies of university-industry collaboration 158–61
 - changes as result of shift towards entrepreneurial university model 150–58
 - characteristics of university industry collaboration 158–9
 - move towards entrepreneurial university model 147–50
 - profile of characteristics and research 4–6, 142–7
- Hsing, I-M. 160–61
- HTVC (High-Tech Venture Center, Korea) 120
- Human Resource Development Ministry (India) 266–7
- Humboldt, W. von 289
- Hyundai Motors 110, 117–18
- ICSR (Industrial Consultancy and Sponsored Research Centre, IIT Madras) 274
- IISER (Indian Institute of Science, Education and Research) 257–8
- IITs *see* Indian Institutes of Technology
- Ijichi, T. 35
- iLEAD (Innovative Local Enterprise Achiever Development, Singapore) 177
- ILO (Industry Liaison Office, Singapore) 176
- IMAC (Kyushu University) *see* Intellectual Property Management Centre
- IMOS (Institute of Microelectronic Systems) (Malaysia) 291
- imports and exports
 - role in innovation in Thailand 313–14
- income
 - from intellectual property in Japanese universities 94, 95
 - policies on sharing income from commercialised technology 10
 - see also types e.g. royalties*
- incubation, business
 - experience of use of at KAIST 119–20, 128
 - see also outputs e.g. start-ups and spin-offs*
- India
 - role of universities in supporting innovation within 254–61
- Indian Institute of Science, Education and Research (IISER) 257–8

- Indian Institute of Technology (Bombay) (IIT Bombay)
 history and organization 268–70
 knowledge production and transfer activities 270–81
 profile of features 4–6
- Indian Institute of Technology (Madras) (IIT Madras)
 characteristics of student body 268
 history and organization 267–8, 269
 knowledge production and transfer activities 270–81
 profile of features 4–6
- Indian Institutes of Technology (IITs)
 entrepreneurial university as model for approach to work of 261–2
 historical development and characteristics of 263–7
see also particular e.g. Indian Institute of Technology (Bombay); Indian Institute of Technology (Madras)
- indicators, performance
 of education, research and technology commercialization at NTUST 214–16
 salience in technology commercialization policies 24
see also ranks and ranking, university
- Indiresan, P. 262
- Industrial Consultancy and Sponsored Research Centre (ICSR, IIT Madras) 274
- Industrial Research and Consultancy Centre (IRCC, Bombay) 275–6
- industries *see* companies
- Industry Liaison Office (ILO, Singapore) 176
- innovation
 as challenge for Mahidol University 332
 as model for IIT approaches to engineering and science 261–2
 development challenges and policies in Singapore 165–9
 development characteristics and trends in Thailand 312–16
 impact on Taiwanese science and technology 204–6
 role of companies and universities in Japan 30–32
 role of Indian universities in supporting 254–61
 role of Kyushu University in regional 60–64
 role of Singapore universities in developing 169–70
 salience for role of universities 310–11
see also entrepreneurship; research and development
see also facilitators e.g. collaboration, university-industry
- Innovation and Technology Commission (ITC, Hong Kong) 158
- Innovative Local Enterprise Achiever Development (iLEAD, Singapore) 177
- Institute of Microelectronic Systems (IMOS, Malaysia) 291
- Institute of SME Development (Thailand) 315
- Institute of Space Science and Technology (IST, India) 258
- Intellectual Property Management Centre (IMAQ, Kyushu University)
 history of cooperation involving 57–9
 involvement in research 48, 49, 50–51
 organization, operation and strategies 40–41
 role of technological consultation 60–62
- Intellectual Property Management Office (Japan) 74
- Intensification of Research in Priority Areas (IRPA) program (Malaysia) 293
- International Technology Transfer Center (ITTC, Tsinghua University) 237, 240–41
- inventions, university
 extent in Japan and USA 35–7
 management of process and policies at University of Tokyo 72–6

- see also elements e.g. patents and patenting*
- 'Invigorating Education Towards the 21st Century' program (China) 229
- IRCC (Industrial Research and Consultancy Centre) (Bombay) 275–6
- IRPA (Intensification of Research in Priority Areas) program (Malaysia) 293
- IST (Institute of Space Science and Technology) (India) 258
- IIT Bombay (Indian Institute of Technology (Bombay))
 history and organization 268–70
 knowledge production and transfer activities 270–81
 profile of features 4–6
- ITC (Innovation and Technology Commission) (Hong Kong) 158
- ITTC (International Technology Transfer Center (Tsinghua University) 237, 240–41
- IIT Madras (Indian Institute of Technology (Madras))
 characteristics of student body 268
 history and organization 267–8, 269
 knowledge production and transfer activities 270–81
 profile of features 4–6
- ITRI (Taiwan) 211
- Japan
 company contribution to national and regional innovation in 30–32
 comparison with USA of university-industry collaboration 32–8
 extent of university-industry collaboration 29
 history of legal frameworks for technology transfer 69–71
 organization of university intellectual property management 92–5
 role of contractual research in universities 95–7
 university contribution to national and regional innovation 31–2
- university involvement in intellectual property rights 101–3
 university reform supporting academic patenting 88–92
see also players e.g. Kyushu University; Tohoku University; University of Tokyo
- Japan Patent Office 79
- Jeilin Technology (Taiwan) 211
- Jeng, J-Y. 217, 218
- Jensen, J. 86
- KAIST *see* Korean Advanced Institute of Science and Technology
- Kanama, D. 98
- Kanwal Rehkhil School of Information Technology 276
- Kauffman Foundation 78
- Keio University 80
- Kertcharoen, T. 330
- Kikkoman-NUS Collaborative Lab 188
- Kim, L. 262
- King Mongkut University of Technology Thonburi (KMUTT) 316
- Kneller, R. 92, 97–8, 262
- knowledge
 changes in creation of at HKUST 152–3
 changes in pace and nature of knowledge creation and commercialization at NUS 184–7
 extent and contribution of knowledge creation and commercialization activities at KAIST 114–21
 production of at IIT Madras and IIT Bombay 272–3
see also transfer, knowledge
see also output e.g. publications
- Knowledge-Based Economy Master Plan (Malaysia) 298
- Korea
 comparison with USA in technology commercialization 132–3
 policies for technology commercialization 111–13
 socio-economic development 108–10

- Korean Advanced Institute of Science and Technology (KAIST)
 entrepreneurship and new venture creation 125–8
 knowledge creation and commercialization at 114–21
 profile of characteristics 4–6, 113–14
 technology commercialization at 121–5, 128–32
- Korea Venture Business Center (KVC) 126
- Krishna, V. 262
- KSTC (Kyushu University-Steinbeis Japan Inc.) 62–3
- KVC (Korea Venture Business Center) 126
- Kyushu Institute of Design 38, 40
- Kyushu University
 case study of 51–7
 contribution to regional innovation system 59–64
 profile of characteristics 4–6, 38–40
 sponsored research and collaboration at 41–4, 48–59
 survey of joint and sponsored research 44–8
see also elements e.g. Intellectual Property Management Centre
- Kyushu University-Steinbeis Japan Inc. (KSTC) 62–3
- laboratories
 as element of India's NSI 256
- Lanqing, L. 245–6
- Lau, J. 159–60
- law and legislation
 supporting Taiwanese science and technology 202
 technology transfer in Japan 69–71
see also advice, legal; reform, legislative; *specific e.g.* Patent Law; University Incorporation Law
- Law to Promote Transfer of University Technologies (1998, Japan) 71, 89
- Law to Strengthen Industrial Technology (2000, Japan) 71, 89
- learning *see* education
- Leydesdorff, L. 261–2
- liaison, industrial 39, 41, 48, 50, 53, 57, 88, 93, 101, 175, 180–81, 274, 275, 311
see also Industry Liaison Office
- licensing
 changes after entrepreneurial organization of HKUST 155–6
 function restructuring at NUS 180–81
 process and features of KAIST technology for 124–5
 role in technology commercialization at NUS 186–7
see also technology licensing offices
see also object of e.g. patents and patenting; property, intellectual
- links, university-industry *see* collaboration, university-industry
- Liu, P. 205
- Lundval, B. 255–6, 261–2
- Mahakittikun, V. 331
- Mahidol University (MU)
 case studies of technology transfer and commercialization 327–31
 experience of university-industry collaboration 322–3
 future technology transfer and commercialization challenges 323–4, 331–3
 profile of characteristics and organization 4–6, 317–19
 research and development performance 319–22
 technology transfer and intellectual property policies 324–6
- Mahidol University Act (2007) 323
- Malaysia
 development of university-industry collaboration 297–9
 science and technology development within 290–96
 university activity and outreach 289–90
see also Multimedia University management, invention process and policies at University of Tokyo 72–6

- see also methods e.g.* collaboration, research
management and protection, intellectual property
income in Japanese universities from, 94, 95
in NUTECH technology commercialization 249–50
organization of within Japanese universities 92–5
see also rights, intellectual property
manpower, university *see* personnel, university
marketing, patent process at University of Tokyo 75–6
Massachusetts Institute of Technology (MIT) 100, 254
Mass Communication Organization of Thailand 314
MASTIC (Science and Technology Information Centre) (Malaysia) 291
Medical Council of India (MCI) 258
medicines
business enterprise and innovation in India, 259, 261
Menon, P. 262
mentoring 7, 20, 23, 26–7, 167, 175, 177, 178, 182, 191, 192, 216–17, 274, 275, 304
MEXT (Education, Culture, Sports, Science & Technology Ministry, Japan) 69–70, 71, 74, 92, 93, 94, 96
Miner, A. 136
Ministry of Economic Affairs (MOEA, Taiwan) 202–3
Ministry of Interior (MOI, Taiwan) 202
Ministry of International Trade and Industry (MITI, Japan) 92, 94
Ministry of National Defence (MND, Taiwan) 202
Ministry of Science and Technology (MOST, China) 240
Ministry of Science and Technology (MOST, Korea) 113
Ministry of Science, Technology and Innovation (MOSTI, Malaysia) 291, 294
Ministry of Transportation and Communications (MOTC, Taiwan) 202
MIT (Massachusetts Institute of Technology) 100, 254
MITI (Ministry of International Trade and Industry, Japan) 92, 94
Mitr Phol 314
Miyamoto, M. 51
MMU *see* Multimedia University
MND (Ministry of National Defence, Taiwan) 202
models
entrepreneurial university model in NUS 169–92
entrepreneurial university model in HKUST 147–58
MOE (Ministry of Education, China) 228–9, 240
MOE (Ministry of Education, Korea) 113
MOE (Ministry of Education, Taiwan) 202–3
MOEA (Ministry of Economic Affairs, Taiwan) 202–3
Mohamad, M. 300
MOI (Ministry of Interior, Taiwan) 202
Mok, K. 137
MOST (Ministry of Science and Technology, China) 240
MOST (Ministry of Science and Technology, Korea) 113
MOSTI (Ministry of Science, Technology and Innovation, Malaysia) 291, 294
MOTC (Ministry of Transportation and Communications, Taiwan) 202
MPEG-4 codec
case study of development and commercialization 211–13
MTDC (Technology Development Corporation) (Malaysia) 296
MU *see* Mahidol University
Multimedia University (MMU, Malaysia)
history and characteristics 4–6, 299–300
research initiatives at 300–303

- technology transfer and
commercialization at 303–8
- Muscio, A. 88
- Nagaoka, S. 35
- Nanotechnology Center (Mahidol
University) 330
- Naresuan University 316
- Nath, N. 262
- National Communications
Commission (NCC, Taiwan) 202
- National Council for Scientific
Research and Development
(NCSRD, Malaysia) 290–91
- National Information Technology
Council (NITC, Malaysia) 291
- National Innovation Agency
(Thailand) 315
- National Research Foundation
(China) 244–5
- National Science and Technology
Development Agency (NSTDA,
Thailand) 315–16
- National Science Council (NSC,
Taiwan) 202–3
- National System of Innovation (India)
definition 255–6
players involved 256–61
- National Taiwan University (NTU)
case study of technology
commercialization 211–13
future prospects and challenges
213–14
indicators of research
commercialization 206–7
profile of characteristics 4–6, 20–21
- National Taiwan University of Science
and Technology (NTUST)
case study of technology
commercialization 219–21
future prospects and challenges
221
indicators of education, research and
technology commercialization
214–16
profile of characteristics 4–6, 214
technology commercialization at
216–18
- National University of Singapore
(NUS)
comparison of technology
commercialization with UK
and USA universities 192–5
Global Knowledge Enterprise
strategy at 172–82
impact of Global Knowledge
Enterprise strategy 182–92
profile of characteristics 4, 170–72
- NUS Entrepreneurship Centre (NEC,
Singapore) 2, 176
- NUS Overseas College (NOC,
Singapore) 176
- NUS Publishing (NPU, Singapore)
176
- NUS Venture Support (NVS,
Singapore) 178
- NCC (National Communications
Commission, Taiwan) 202
- NCSRD (National Council for
Scientific Research and
Development, Malaysia)
290–91
- NEC (NUS Entrepreneurship Centre,
Singapore) 2, 176
- Nehru, J. 263, 268–9
- Nelson, R. 88, 255–6
- networks, informal
salience in university technology
commercialization policies 24
- Nigam, N. 262
- Ninth Malaysian Plan for science and
technology 292, 296
- Nissan Chemical
case study of cooperation with
Kyushu University 51–7
- NITC (National Information
Technology Council, Malaysia)
291
- NOC (NUS Overseas College,
Singapore) 176
- NSC (National Science Council,
Taiwan) 202–3
- NSTDA (National Science and
Technology Development
Agency, Thailand) 315–16
- NTU *see* National Taiwan University
- NTUST *see* National Taiwan
University of Science and
Technology
- Nuclear Energy Unit (Malaysia) 291

- NPU (NUS Publishing, Singapore) 176
- NUS *see* National University of Singapore
- NUCTECH (China)
 case study of technology commercialization 242–4
 drivers enabling technology commercialization at 247–51
 history of 244–5
 key factors in process of commercialization 245–7
- NVS (NUS Venture Support) (Singapore) 178
- Office of Contract and Grant Administration (OCGA) 143, 149
- Office of Research Affairs (Korea) 119
- Okuwada, K. 98
- Operating-Asset Management Committee (Tsinghua University) 242
- organization and reorganization
 challenges for technology transfer and commercialization at Mahidol University 333
 NUS Global Knowledge Enterprise strategy 174–6, 181–2
 technology commercialization at NTU 207, 209–10
 technology commercialization at NTUST 216–18
 technology transfer at Tsinghua University 236–41
 licensing function at NUS 180–81
 transformation of HKUST to entrepreneurial university model 147–58
see also outcomes e.g. disclosures, invention; patents and patenting; start-ups and spin-offs
- organizations, research and development (RDOs)
 influence on innovation in Thailand 315–16
- parks, research
 role at IIT Madras 275
- parks, science
 as element of university-industry linkages in China 230–33
- Patent and Trademark Amendments Act (1980, Japan) 86
- Patent Law (Japan) 72–3
- Patents Act (1983, Malaysia) 298
- patents and patenting
 activity at IIT (Madras) and IIT (Bombay) 272–3
 changes after shift towards entrepreneurial university model in HKUST 153–4
 characteristics and processes at KAIST 123–4
 characteristics and trends at Tohoku university 97–101
 characteristics, strengths and weaknesses of academic patenting 86–7
 Japanese university reform supporting 88–92
 patent process licensing at University of Tokyo 75–6
 number and significance in Malaysia 294–5
 role in technology commercialization at NUS 184–6
 role in work of Mahidol University 320–22
 university involvement in Malaysia 297
see also applications, patent; licensing, patent; rights, intellectual property; transfer, technology
- patenting
see also methods e.g. consultation, industrial and technological; sponsorship, project
see also outcomes and output e.g. collaboration, university-industry; cooperation, university-industry; publications; transfer, technology
see also specific centers e.g. Hong Kong University of Science and Technology; Korean

- Advanced Institute of Science and Technology; Kyushu University; Mahidol University; Multimedia University; National Taiwan University; National Taiwan University of Science and Technology
- Perception Digital Ltd
case study of university-industry collaboration 159–60
- Personal e-Motion (PEM) (company) 190, 191, 192
- personnel, university
changes after shift towards entrepreneurial university model in HKUST 151–2
changes as element of Global Knowledge Enterprise strategy 183–4
HKUST research personnel 145–6
salience as element of India's NSI 258–9
salience for UOEs 248–9
- Petroleum Authority of Thailand 314
- Phang, J. 174
- pharmaceuticals
business enterprise and innovation in India, 259, 261
- policies
as challenge at Mahidol University 324–6, 332
influence on innovation in Thailand 314–15
innovative system changes in Singapore 165–9
role in Korean university intellectual property 112–13
science and technology legislation and government agencies in Taiwan 200–206
- policies, technology
commercialization
characteristics of and implications for university 9–10, 25–7
of Korean government 111–13
salience of performance indicators and university networks 24
see also subjects influencing e.g.
collaboration, university-industry; transfer, technology
- Private Higher Educational Institutions Act (1996, Malaysia) 298, 299
production, knowledge *see* creation, knowledge
programs, education
entrepreneurship at NUS 176–80
projects
role of sponsorship at IIT Madras and Bombay 277–9
- promotion, university
salience in university technology commercialization policies 24–5
- property, intellectual
history of legal frameworks within Japan 69–71
management at Multimedia University 306
policies at Mahidol University 326
role of government policies in Korean university 112–13
transfer and licensing at Tsinghua University 227, 228
see also management and protection, intellectual property; rights, intellectual property
- PTT Group 314
- publications
as strength of KAIST research and education 116–17
changes after shift towards entrepreneurial university model in HKUST 152–3
characteristics and quality at IIT Madras and IIT Bombay 270–72, 273
role in knowledge creation at NUS 184
salience as element of India's NSI 258, 260
- Qingdao MESNAC Co. Ltd 249
- Quanta Computer (Taiwan) 211
- Rajav Gandhi Centre for Biotechnology (RGCB) 257–8
- Raju, V. 262
- ranks and ranking
university 8, 41, 43, 91, 97, 119, 145, 147, 171–2, 184

- Raymond Industrial
case study of university-industry
collaboration 160–61
- RCT Corp 218–19
- RDMD (Research and Development
Management Department,
Tsinghua University) 237–8,
239–40
- RDOs (research and development
organizations)
influence on innovation in Thailand
315–16
- reform
legislative 10, 12, 19, 235
see also law and legislation
see also specific laws e.g Law to
Promote Transfer of University
Technologies; Patent Law;
University Incorporation Law
- reporting, invention
process of determining work
relatedness in Japanese
universities 72–3
- research and development
experience of Hong Kong
universities 139–42
history of within Malaysia 290–96
policy attention in Singapore 167–9
role as complement to university
teaching 289–90
role of contractual in Japanese
universities 95–97
situation in Taiwan 199
types and role in Japan and USA
31, 33–5
see also expenditure, research and
development; innovation;
parks, research; patents and;
sponsorship, research and
development
- research and development, contract
7, 8, 14, 18–19, 43, 44, 48, 50, 51,
69–70, 71, 73, 79, 80, 88, 89, 90,
93, 99–100, 101, 103–4, 117–18,
120–21, 124, 125, 139, 144,
149–50, 151, 158, 159, 228, 230,
236, 237, 238, 239–40, 241, 248,
250, 316, 370
see also Office of Contract and
Grant Administration
- Research and Development/
Innovation Survey (2002,
Thailand) 313
- Research and Development
Management Department
(RDMD, Tsinghua University)
237–8, 239–40
- research and development, sponsored
7, 8, 9, 11, 18–19, 22, 29, 32, 33,
34–5, 38, 41–59, 60, 62, 64–5,
69–70, 71, 73, 76, 77, 81, 89–90,
93, 114, 129, 130, 143, 161, 202–3,
206, 207, 255, 267, 269, 270, 273,
275, 276–9, 282–3
see also Centre for Industrial
Consultancy in Sponsored
Research
- Research Grants Council (RGC, Hong
Kong) 138–9
- Research Management Center (RMC,
Malaysia) 301, 303
- resources, university human *see*
personnel, university
- RGCB (Rajav Gandhi Centre for
Biotechnology) 257–8
- rights, intellectual property
organization of within Japanese
universities 92–5
protection of in NUCTECH
technology commercialization
249–50
reforms supporting in Japan 88–92
role in Japanese contractual research
95–97
salience in work of Japanese and
USA universities 101–4
salience of protection in Chinese
university technology transfer
and commercialization
250–51
see also management and protection,
intellectual property
- RMC (Research Management Center)
(Malaysia) 301, 303
- Rosenberg, N. 88
- royalties 9, 19, 20, 25, 35, 36, 70, 71,
73, 74, 75, 78, 79, 92, 111, 112,
120, 121, 122, 124, 148, 155–6,
180, 186–7, 204, 206, 211, 213,
216, 218, 220–21, 250, 276, 277

- see also* income, policies on sharing income from commercialised technology
- Rural Technology Business Incubation (RTBI, India) 279
- Sampat, B. 297
- Samsung Electronics 110, 114, 117–18
- Sarkar, N. 263
- SBIR (Small Business Innovation Research) 2
- Schiller, D. 317
- Science and technology
 - history of Malaysian research and development 290–96
 - impact of innovation on enhancing 204–6
 - legislation supporting Taiwanese 202
 - resources for development of Taiwanese 200
 - see also elements e.g.* collaboration, university-industry; cooperation, university-industry
 - see also organizations involved in e.g.* Science and Technology Advisory Group
- Science and Technology Advisory Group (STAG, Taiwan), 203–4
- Science and Research Institution (SRI, Tsinghua University) 236, 237
- Science and Technology Basic Plan and Law (1995, Japan) 89
- Science and Technology Information Centre (MASTIC, Malaysia) 291
- Sengupta, A. 262
- Senugupto, B. 267–8
- services (to society)
 - as mission and key activity of KAIST 115
- Seventh Malaysian Plan for science and technology 292, 296
- Sharif, N. 162, 262
- Shih, C. 173, 174
- Siam Cement Group 313–14
- Sine, W. 91
- Singapore
 - economic development changes and policies 165–9
 - role of universities in developing national innovation system in 169–70
 - see also* National University of Singapore
- Siriraj Dust Mite Center (Siriraj Hospital)
 - case study of technology transfer and commercialization 330–31
- Siraj Hospital
 - history and role as element of Mahidol University 317–18, 321–2
- SIRIM (Standards and Industrial Research Institute of Malaysia) 298
- Sixth Malaysian Plan for science and technology 291–2
- SK Telecom 118
- Small and Medium Enterprises Bank (Thailand) 315
- Small and Medium Enterprises Promotion Office (Thailand) 315
- Small Business Innovation Research (SBIR) 2
- society
 - overview of developments in Korea 108–10
 - see also elements e.g.* economies; education; law and legislation; policies
- software, computer
 - business innovation in India, 261
- Space Studies Centre (Malaysia) 291
- spin-offs and start-ups *see* start-ups and spin-offs
- sponsorship, project
 - role at IIT Madras and Bombay 277–9
- SRI (Science and Research Institution) (Tsinghua University) 236, 237
- STAG (Science and Technology Advisory Group, Taiwan), 203–4
- Standards and Industrial Research Institute of Malaysia (SIRIM) 298
- STANG Holdings Company Ltd
 - case study of technology transfer and commercialization 327–8
 - profile of characteristics 326

- start-ups and spin-offs
 case study of HKUST 159–60
 changes after shift towards
 entrepreneurial university
 model in HKUST 156–8
 decline in efforts to promote start-
 ups in Japanese universities
 79–80
 experience of venture at KAIST
 126–8
 incubation and creation of at IIT
 Madras and Bombay 279–81
 role in technology
 commercialization at NUS
 188–92
- students, university
 characteristics of IIT 265–6
 experience of entrepreneurial start-
 ups at KAIST 127–8
see also university name e.g. Indian
 Institute of Technology
 (Madras)
- Sunplus Technology (Taiwan) 211
 Suranaree University of Technology
 316
 Swaminadhan, D. 262
- T21 (Technopreneurship 21) initiative
 168
- TAF (Technology Acquisition Fund,
 Malaysia) 296
- Taipei 101 building
 case study of development and
 commercialization of 219–21
- Taiwan
 role of science and technology
 research and collaboration 199
 socio-economic environment and
 policies 200–206
see also National Taiwan University
 and National Taiwan University
 of Science and Technology
- Takahashi, M. 103
- TCELS (Thailand Centre of Excellence
 for Life Sciences) 328–9
- TDC (Technology Development
 Corporation, Malaysia) 296
- teaching *see* education
- technology
 case study of video 211–13
 process and features of licensing of
 at KAIST 124–5
see also contracts, technology;
 transfer, technology;
 technopreneurship
see also elements e.g. collaboration,
 university-industry;
 cooperation, university-industry
see also organizations involved in
e.g. Science and Technology
 Advisory Group
- Technology Acquisition Fund (TAF,
 Malaysia) 296
- Technology Business Incubation Team
 (Korea) 119–20
- Technology Development Corporation
 (MTDC, Malaysia) 296
- Technology Incubator and
 Unisplendour Corp Ltd (China)
 241
- technology licensing offices (TLOs)
 activity in Taiwan 202–3
 creation and role in Japan 71, 74–6,
 92, 93–4
 creation of in Hong Kong 147
 organization of in Korea and at
 KAIST 111–12, 120–21
- Technology Licensing Offices Project
 316
- Technology Transfer and
 Commercialization Promotion
 Act (2006, Korea) 112
- Technology Transfer Promotion Act
 (2000, Korea) 111
- technopreneurship
 activities at Multimedia University
 304–6
 T21 initiative 168
- Telecommunication and Computer
 Networking (TeNeT, IIT Madras)
 274
- Telecommunication Authority of
 Thailand 314
- tenCube (company) 190, 191
- Ternouth, P. 78, 79
- Thai Airways International 314
- Thailand
 characteristics of innovation
 and university-industry
 collaboration 312–16

- university-industry collaboration and economic development 316–17
 - see also* Mahidol University
- Thailand Centre of Excellence for Life Sciences (TCELS) 328–9
- Thailand Research Fund (TRF) 315
- 'third mission' 1, 2–3, 16, 21, 88
- Thursby, M. 86
- TLOs *see* technology licensing offices
- Tohoku University
 - profile of features 4–6
 - salience of intellectual property rights 103–4
 - trends in patenting activity within 97–101
- Toyama Plan (Japan) 90
- transfer, knowledge
 - activities at IIT Madras and IIT Bombay 273–81
 - need to reorganise university support structures in IITs 254–5
 - as part of technology commercialization at NTUST 217–18
 - see also* creation, knowledge
- transfer, technology
 - extent in Japan and USA 35–7
 - history of legal frameworks within Japan 69–71
 - increasing salience in USA 310
 - salience of technology transfer to SMEs in university technology commercialization policies 22–3
 - types of university-based 88–9
 - see also centers utilising e.g.* KAIST; Kyushu University; Indian Institute of Technology (Madras); Mahidol University; Multimedia University; National University of Singapore; NUTECH; Tsinghua University; University of Tokyo
 - see also elements e.g.* contracts, technology; patents and patenting; property, intellectual
 - see also mechanisms of e.g.* collaboration, research
- TRF (Thailand Research Fund) 315
- Triple Helix (concept)
 - application to Hong Kong national innovation system development, 137
 - application to Singapore national innovation system development, 169
 - role of academic institutions 261
- Tsinghua Auto Manufactory 234
- Tsinghua Computer Manufactory 234
- Tsinghua Enterprise Cooperation 241
- Tsinghua Holdings Co. Ltd 236, 241–2, 245–6, 248
- Tsinghua Technology Service Company 234
- Tsinghua University
 - case study of technology commercialization 242–7
 - characteristics of industry links 224–35
 - commercialization and technology transfer structures 223, 236–42
 - profile of features 4–6
- Tung, C-H. 137
- UGC (University Grants Committee, Hong Kong) 138–9
- UIC (University-Industry Collaboration) *see* collaboration, university-industry
- UICC (University-Industry Cooperation Committee, Tsinghua University) 237, 238
- UICP (University-Industry Collaboration Program, Hong Kong) 142
- United Kingdom
 - comparison with NUS of technology commercialization 192–5
 - university-industry cooperation and patent co-ownership 78
- United Nations Educational, Scientific and Cultural Organization (UNESCO) 268
- United States of America
 - comparison with Japan of university-industry collaboration 32–8

- comparison with Korean technology commercialization 132–3
- comparison with NUS technology commercialization 192–5
- influence on Asian university technology commercialization 19–20
- university-industry cooperation and patent co-ownership 78
- salience of university technology transfer in 310
- university involvement in intellectual property rights 101–3
- UNITELE (University Telekom) (Malaysia) 299
- universities
 - need for transformation of in Hong Kong 135–8
 - overview of in Hong Kong 138–50
 - role of universities in Malaysian science and technology development 290–96
 - see also* culture, university; faculties, university; inventions, university; ranks and ranking, university
 - see also activities engaged in e.g.* commercialization, technology; innovation; patents and patenting; property, intellectual; rights, intellectual property; transfer, technology
 - see also features and output e.g.* collaboration, university-industries; enterprises, university-owned; innovation; management and protection, intellectual property; research and development; transfer, knowledge
 - see also name e.g.* Hong Kong University; Hong Kong University of Science and Technology; Indian Institute of Technology; Kyushu University; Multimedia University; National University of Singapore
- Universities and University College Acts (1971, Malaysia) 298
- University Business Incubation Project (Thailand) 316
- University Grants Committee (UGC, Hong Kong) 138–9
- University Incorporation Law (2004, Japan) 71
- University-Industry Collaboration Program (UICP, Hong Kong) 142
- University of Tokyo
 - management of invention process and policies 72–6
 - profile of features 4–6
 - research collaboration and technology transfer involving 76–80
 - see also elements e.g.* Intellectual Property Management Office
- University Telekom (UNITELE, Malaysia) 299
- University-Industry Cooperation Committee (UICC, Tsinghua University) 237, 238
- University-Industry Collaboration (UIC) *see* collaboration, university-industry
- University-Owned Enterprises (UOEs)
 - role at Tsinghua University 234–5
 - role in China 233–4
- ventures, new
 - effect of KAIST on creation of 125–6
- videos
 - case study of technological development of 211–13
- Wadhvani, R. 270
- WizLearn (company) 189, 190, 191, 192
- Wong, P.K. 262
- Wong, R. 136, 161, 165, 169, 170, 188
- Woo, C-W. 147–8
- World Forum (organization) 30
- World Is Flat, The* (Friedman) 29
- Xiaoping, D. 235
- Zhang, H. 244

