### 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  
applied technology  
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  
budgets, see also budget  
buildings  
case study of development and commercialization 219–21  
Business Angel Network Southeast Asia (BANSEA) 177  
businesses see companies  
Canada  
experience of 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 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 (UOE) 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
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
case studies of university-industry collaboration 158–61
characteristics of university industry collaboration 158–9
impact on NUS of 182–92
move towards entrepreneurial university model 147–50
impetus for adopting at NUS 172–3
profile of characteristics and research 4–6, 142–7
programs of development 176–81
Global Unichip (Taiwan) 211
vision and mission 173–4
see also output e.g. law and legislation; policies
governments
role in Taiwanese university-industry collaboration 202–3
Global Unichip (Taiwan) 211

see also Global Unichip

Grameen Creative Lab (GCL, Singapore) 177–8

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

Hsung, 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

India
role of universities in supporting innovation within 254–61
Indian Institute of Science, Education and Research (IISER) 257–8

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
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 Rekhhi School of Information Technology 276
Kauffman Foundation 78
Keio University 80
Kertcharoen, T. 330
Kikkoman-NUS Collaborative Lab 188
Kim, L. 262
King Mongut 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
Index

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
department 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
Academic entrepreneurship in Asia

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

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

Qingdao MESNAC Co. Ltd 249

Rajav Gandhi Centre for Biotechnology (RGCB) 257–8

Quanta Computer (Taiwan) 211

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

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
Academic entrepreneurship in Asia

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
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
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
Index

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
Academic entrepreneurship in Asia

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 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

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

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

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
UILC (University-Industry Collaboration) see collaboration, university-industry
UICCC (University-Industry Cooperation Committee, Tsinghua University) 237, 238
UILCP (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
Academic entrepreneurship in Asia

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

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 (UICCC, 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

Wadhwani, 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