

# Index

---

- academia–government–industry triple helix *see* university-run enterprise to regional IT industrial clusters
- Andreozzi, M. 86
- Apple iPad 123, 126
- Apple iPhone 2, 123, 126, 168
- Autumn Guangzhou Export Commodities Fair (2004) 92
  
- banks/banking 89–91, 94, 98
  - China Redevelopment Bank 100
  - Hong Kong 62
  - Import–Export Bank of China 100
  - World Bank 88
- Beijing (and) 36, 71, 163
  - Beijing–Shanghai high-speed railway 1–2
  - Municipal Development and Reform Commission (BDRC) 20
  - Municipal Science and Technology Commission (BSTC) 20
  - regional innovation system of 16–17
  - research institutes in 21
  - Zhongguancun high-tech park 17
- Bi, Y. 161, 162
- Bohai Bay Area *see also* industry–science linkages in Bohai Bay area; regional dimension of innovation systems; regional innovation systems of Bohai Bay area
  - Beijing, Hebei and Tianjin provincial governments in 21
  - Commission of Economy and Information Technology 20
  - Department of Education 20
  - Development and Reform Commission 20
  - Finance Bureau 20
  - Ministry of Science and Technology (MOST) 19–20
  - R&D personnel in 22, 24
  - weak regional linkages in 36–7
- Brazil 80
  - R&D facilities in 79
- Business Week* 104, 111
- Byers, T. 86
  
- case studies *see* Chinese manufacturing companies catch-up strategy; Lenovo Group Ltd; high speed railway (HSR) development in China
  - Bahai Bay Area 16–38
  - Changhong 142–54
  - Huawei 103–20
  - Neusoft 67, 68, 71, 74–84
  - Northeastern University xix, 69–71, 73, 81
  - Pearl River Delta 41–64
  - photo voltaic industries *see* solar photovoltaic industry
  - Richen 162–3
  - Spreadtrum 123–37
  - Suntech–Power 87, 90, 93, 95, 99
  - Tencent 158, 159–60, 162–4, 167
- China
  - 3G service licences 135
  - Catalog of Chinese High Technology Products for Export (2006) 100
  - Communist Party of China, Central Committee of 2–3 *see also main entry*
  - computerization of government in 78
  - delay in 3G market development in 133
  - domestic feed-in (FIT) incentive mechanism 98–9

- drive for indigenous innovation 44
- early printing techniques xii–xiii
- Export and Credit Insurance Corporation 100
- Eleventh Five-Year Plan (2006–2010) 100
- grants of *hukou* incentives 92
- high speed rail in *see* high speed railway (HSR) development in China
- International Hi-tech Fair 163
- hukous* 166
- Hundred Talent Programme 160
- ICT, rapid growth of 124–9 *see also* Spreadtrum
- Import–Export Bank of 100
- intellectual property rights 87, 162
- internet users in 124
- Ministry of Agriculture (MOA) 88
- Ministry of Information Industry of China 131
- Ministry of Science and Technology (MOST) 19–20, 88, 165
- Mobile 135
- patent filing in 92 *see also* patents/patenting
- PV industry in *see* solar photovoltaic (PV) industry
- rare earth metal (REM) holdings in 94
- Redevelopment Bank 100
- Shenzhen University Park 58
- State Development Planning Commission (SDPC) 88
- State Economic and Trade Commission (SETC) 88
- State Education Commission 71
- State Intellectual Property Office (SIPO) 165
- Suntech-Power PV module manufacturing company 90
- Technology and Information Department 10
- transnational communities 165–6
- Twelfth Five-Year Plan and green technology 100
- Unicom 135
- university industry relations/university-run enterprises (UREs) 72–3, 84
- weak protection of IPR in 57 *see also* intellectual property rights
- Chinese Academy of Sciences (CAS) 2, 3–4, 8, 20, 22, 88, 148, 160, 163
- Institute of Computing Technology (ICT) 1, 3–4, 70
- Institute of Energy Conversation 95
- New Technology Development Company (NTC) 3–4
- Shenzhen Institute of Advanced Technology (SIAT-CAS) *see* SIAT-CAS
- Chinese Entrepreneurs* 116 *see also* Ren, Z.
- Chinese manufacturing company's catch-up strategy *see also* R&D talent's creative role identity management
- Communist Party of China, Central Committee of (CCCPC) 2–3
- Decision on the Reform of S&T System (1985) 2–3
- Computing Technology Institute *see* Chinese Academy of Sciences
- Economist, The* 2010 Corporate Use of Innovation Award 103
- Ederer, M. ix
- electronics firms *see* upgrading strategies of electronics firms
- equipment manufacturing orders (OEM) 55
- European Commission 88
- European Union (EU) 9, 60
- Europe 2020 strategy/Innovation Union initiative viii
- member states 88, 166
- Fushun Steel Corporation 74
- Gao, S-J. 123
- Germany (and) 34, 91, 105
- College of Architecture (Berlin, 1799) 71
- feed-in-tariff (FIT) public incentives mechanism 89
- high speed rail in 9, 10, 13
- Industrial Technology Research 34
- global financial crisis 8, 44, 97

- global market(s) 7–8, 60–61, 88, 99, 107  
 leader 111  
 share 109
- globalization 108, 114, 118
- Guangdong 21–3, 37, 41, 62, 89, 167  
 innovation system 43–51  
 comparison with Hong Kong 50–51  
 technological activities in 45  
 surge in patent applications from 45–6
- Guangzhou 163  
 Export Commodities Fair (2004) 92  
 Institute of Energy Conversion (CAS) 95  
 University 86
- Gutenberg xii–xiii  
 and movable-type printing xii
- Hebei 16, 19, 21–3, 30
- high speed railway (HSR) development in China (and) 1, 9–14  
 1994 Railway Technology Policy revisions 10  
 Chinese railway system before 2004 9–10  
 choice of HSR technology 10  
 economic feasibility and sustainability of HSR projects 14  
 government planning and development stages of HSR 11–13  
 localization and integration of imported HSR technology 13–14
- Hong Kong 42–3, 162, 167  
 banks and trade credits 62  
 Basic Law 112  
 electronics firms in *see* upgrading strategies of electronics firms  
 firms in Guangdong 45 *see also* Guangdong  
 GCL-Poly Energy Holding Co. Ltd 96  
 innovation in 43, 62
- Lenovo 6–8 *see also* Lenovo Group Limited  
 Science Park 61  
 Stock Exchange 6
- Hu, X. 157
- Huawei 42, 103–22, 123, 126, 136–7, 167, 170 *see also* Ren, Z.  
 2010 Annual Report 109  
 Basic Law 112–14  
 corporate culture of 109–16  
 core value system 112–14  
 cultural changes and global competition 111–12  
 ownership and governance structure 115–16  
 standardization of procedures and systems 114–15  
 as global force 118–19  
 growth of 104–9  
 through constant innovation 105–7  
 through internationalization 107–9  
 leadership/influence of Zhengfei Ren 116–18 *see also* Ren, Z.  
 rankings of 103  
 wins LTE World Summit 2011 awards 103  
 ‘wolf culture’ 110–11
- IBM 4–7, 80, 81, 109, 115  
 Lenovo 60, 72
- industry–science linkages in Bohai Bay area (and) 26–36  
 findings 36–8  
 industry views 33–4  
 local government views 34–5  
 research institutions’ views 31–3  
 case studies for 31–2  
 types of cooperation between universities and enterprises 35–6  
 universities’ views on 27–31  
 barriers to industry research cooperation 30  
 case studies 28–9
- information and communication technology (ICT) 109, 123, 127, 167 *see also* Spreadtrum
- innovation activities and IP 169 *see*

- also upgrading strategies of electronics firms
- innovation index 55
- innovation systems, regional
  - dimensions of 17–19 *see also* industry–science linkages in Bohai Bay area; regional innovation systems of Bohai Bay area
- Institute of Computing Technology (ICT) *see* Chinese Academy of Sciences (CAS)
- Intel 81–2, 165
- intellectual property (IP) 68, 160, 170
  - assignments 79
  - protection of 126, 162–3
  - State Intellectual Property Office (SIPO) 165
  - technologies 106–7
  - weak protection of 169
- intellectual property rights (IPR) 30, 32, 35, 57, 87
  - infringement of 61, 162
  - registration of 46
- International Telecommunication Union (ITU) 129
  - approve TD-SCDMA system 129
- IT Manager's World* 110
- Japan 7, 13, 66, 71, 74–5, 81, 91–3, 97, 107, 126, 143, 158 *see also* Neusoft economy of 17
  - high speed rail in 9–10
  - as top PV country 88–9
- Jiangsu 16, 21, 42, 89–90, 96
- Kroll, H. 16, 41
- Kuhlmann, S. 18
- Kyoto Protocol Clean Development Mechanism 95
- Lenovo Group Limited (and) 2–8, 17, 60, 126, 170
  - acquires IBM PC businesses 7–8, 72
  - assistance from parent institution 4
  - China's S&T system reform and Lenovo's pre-launch stage 2–3
  - difficulties in early years 3–4
  - early stage of company creation 3
  - establishment of basic concept of enterprise management 5–
- Hong Kong Lenovo 6–8
- identification of role of NTC 4
- integration of Han-card technology with computer 4–5
- internationalization of company 6–8
- New Technology Development Company (NTC) 3–7
- Li, S. 1
- Liaoning Province 16, 22–3, 68–9, 77–8
  - leading industries in 69
  - Software Engineering Technology Research Centre 71
- Luo, X. 16
- management of China's high speed railway development *see* high speed railway (HSR) development in China
- Market Research Report for the Global Wireless Communication Equipment* (2009) 103
- MediaTek Inc. 128–9, 134
- micro-databases: SCOPIS and PATSTAT 27
- Microsoft 75, 81, 83, 165
- Ministry of Railways (MOR) 9–14
  - Main Technology Policy of Railways revised (1994) 10
  - speed-up campaigns 11–12
- models
  - extended creative role identity process 152
  - fabless production 59, 61
  - government-pulled triple helix 67–8, 78–9
  - utility 46–51, 92, 162, 165
  - visual modelling technique 80
- NASDAQ 95, 96, 128, 131, 167
- NASDAQ: SPRD 124
- National Electric Power Company 88
- National Engineering Research Centre for Computer Software (of NEU) 71
- Neusoft Corporation (and) 68, 71, 74–84 *see also* Liu, J.
  - administration and local government support to high-tech entrepreneurship 77–8

- 'China's Microsoft' 75
- Computer Tomography (CT)
  - production process/CT-C2000 80
- continuous innovation for
  - competitiveness 79
- development of own-copyright software 76
- Fahe Fang 80
- FDI, growth and
  - internationalization 80–83
- founder of 75 *see also* Liu, J.
- Java technology 79
- listed on Shanghai Stock Exchange 73, 79
- NEU-ALPINE 75, 76, 77, 80
- Openbase 80
- partnerships 81
- returns to NEU and role of UREs 83
- Software Centre/Park 75, 79
- Solution Architecture (NeuSA)
  - university–industry linkages under government-pulled triple helix model 78–9
- X-ray machines 80
- New Technology Development Company (NTC) 2–8
  - becomes Lenovo Holding Company 7
- Northeast College of Technology 71
- Northeastern University (NEU) 69–74
  - see also* Neusoft Corporation
  - administration support to UREs 73
  - collaboration with industry 73
  - contribution from Neusoft to 83
  - incubator of NEU Entrepreneurial Park 73
  - political origin of 70
  - research atmosphere basis of 70–71
  - research projects 74
  - Science Park 70, 73
  - Science and Technology Enterprise Group Co. Ltd 74
- OmniVision Technology 128
- original brand manufacturer (OBM) 59–61
- original equipment manufacturer (OEM) 59–61
- patents/patenting 5, 7, 25, 27, 31–2, 42, 44–52, 60, 61, 74, 79, 92, 105, 134, 143, 148, 158, 162, 165
- Pearl River Delta xviii, 19, 24, 29, 32, 34, 51–2, 62, 123 *see also*
  - upgrading strategies of electronics firms
  - PV industry 97
  - regional innovation system of *see* upgrading strategies of electronics firms
- Petti, C. 157
- Philips and X-ray machines 80 *see also* Neusoft Corporation (NEU)
- photovoltaic (PV) industry *see* solar photovoltaic industry
- polysilicon 95–8 *see also* solar photovoltaic industry
- Qrobot (and) xxi, 158–69
  - in perspective 164–9
  - Richen Intelligent Technology Co. Ltd 162–3
  - Tencent's QQ 158–60
- R&D employees' creative role
  - identification in CBRDC (and) 146–52
  - the creative climate 149–50
  - creative role expectation from the talent market 148–9
  - divergent creative role expectations 146–8
  - strategy for improving 150–52
- R&D Magazine* awards 103 *see also* Huawei
- R&D talent management in
  - Changhong R&D Center (CBRDC) (and) 142–6
  - background of Center 143–4
  - career management 145–6
  - R&D job design 145
  - R&D performance appraisal 145
  - R&D workforce 144–5
  - training and education 146

- R&D talent's identification and management  
 creative role identification as critical R&D talent management issue 153  
 elements influencing creative role identity 142  
 employees' creative role identification *see* R&D employees' creative role identification in CBRDC  
 employees' social identification structure and priorities 153  
 extended creative role identity process model 152  
 process of creative role identity 141–42  
 R&D talent management in Changhong R&D center (CBRDC) *see main entry*  
 reasons for studying 139–41  
 self-realization 141  
 regional dimension of innovation systems 17–19  
 regional innovation systems of Bohai Bay area 19–26  
 findings of study on 36–8  
 industry system 24–5  
 policy system 19–21  
 administration policy 19–21  
 industry–science linkages policies 21  
 science system 21–3  
 public research institutions 22–3  
 universities and colleges 21–2  
 summary of 25–6  
 Ren, Z. xx, 104, 105–6, 108–9, 110–13, 114–15, 120  
 awarded Lifetime Excellence Award (*Chinese Entrepreneurs*, 2008) 116  
*Business Week's* one of China's Most Powerful People 2009 104  
 leadership of/influence on Huawei 116–18  
 ranked one of 100 most influential people (*Time Magazine* 2005) 117  
 'The winter of Huawei' 117  
 renewable energy 89, 93–5, 100  
 research projects 32, 66, 70, 76  
 NEU 74  
 research and development (R&D) (and) xxi, 42, 55, 60, 61, 84, 101, 135–6 *see also R&D entries*  
 centres/institutions 78, 88  
 expenditure 16, 22, 24, 25, 42, 52  
 internal R&D/innovation activities 57  
 laboratories 165  
 personnel 22, 23–5, 66, 143, 146, 149, 165  
 tax incentives 34  
 Robotics, International Federation of (IFR) 157  
 robots/robotics 157–9 *see also* Qrobot  
 Buddy (MSN) 159  
 Kysoh 159  
 Mydeskfriend 159  
 Rockwell Semiconductors 134  
 Rosenberg, N. 18  
 Sanhao Science and Technology Street 70  
 Santai, Sichuan Province 71  
 Schiller, D. 41  
 Science and Technology, Ministry of (MOST) 19–20, 88, 165  
 Science and Technology Development Zone of Nanhu 70  
*Scientific American* 157  
 Shandong 16, 22–3  
 Shanghai 16, 163  
 Baosteel Group Corporation 74, 77  
 Stock Exchange 79  
 Zhangjiang High-tech Park 128  
 Shantong, L. 1  
 Shenzhen 61, 97, 105, 117, 160, 162 *see also* SIAT-CAS  
 municipality 43, 166–7  
 PV-powered gadgets 88  
 University Park 58  
 Shi, J. 139  
 SIAT-CAS 158–66  
 Engineering Centre 165  
 Technology Transfer Office 161  
 Silicon Valley 127, 128, 166  
 Singapore 42, 61, 162  
 Advanced Digital Sciences Centre (ADSC) 161

- solar photovoltaic industry (and)  
 86–102 *see also* China and Hong Kong  
 Canadian Solar 90  
 early days of 87–9  
 Euro-China Solar Promotion Committee 97  
 evolutionary advancement and competitive advantage 92–5  
 exhibition in Guangzhou 92  
 GCL Silicon 96  
 Hanwha SolarOne/SolarFun (Linyang Group) 95–6  
 industrial clustering into new Millennium second ‘phase’ 89–92  
 Tenth Five-Year Plan 89–90  
 issue for Chinese government 88–9  
 in Japan 88–9, 91  
 JA-Solar launch 94  
 LDK-Solar 95  
 leverage of technology transfer and FDI 97–9  
 new feed-in (FIT) incentive mechanism 98–9  
 ‘new phase’ old business model and ‘systemic’ interaction 95–7  
 R&D technology 98  
 Rene-Sola/Zhejiang Yuhui Solar Energy Source 95  
 Solar Power Inc. 95  
 state and creation efforts for (towards 2016) 99–101  
 studies of 88  
 Suntech-Power 90, 92, 95  
 Trina-Solar 90–91  
 Italian connections of 90–91  
 Yingli-Solar 91
- Spain  
 high speed rail in 9  
 solar PV industry in 97
- Spreadtrum xx–xxi, 123–38  
 co-founders of 127–8  
 focused on China and indigenous innovation 129–31  
 ICT growth in China 124–9  
 international capital market 131–3  
 learning-by-doing – improving corporate management 133–5  
 and TD-SCDMA standard 129–31
- Suntech-Power PV module manufacturing company 90  
 listed on New York Stock Exchange 90  
 survey(s) 19, 59, 62–3  
 R&D personnel 146–9  
 technological upgrading process of electronics firms in the PRD (2009) 51
- Tagscherer, U. 16  
 Taiwan/Taiwanese 34, 42, 43, 55, 57–9, 61, 62, 63, 97, 126, 128, 140  
 Takeuchi, H. 18  
 Tang, C. 139  
 TD-SCDMA standard 129–31, 133, 135–6  
 TD-SCDMA/GSM baseband chip 124  
 technological entrepreneurship differentiating traits of 169–70  
 Tencent 158–63, 167  
 PaiPai (Shop QQ) 163  
 QQ instant messaging service 158–60  
*see also* Qrobot
- Terman, F. 76, 77  
 Thomson Reuters 92, 94  
 Tianjin 16, 19, 21–4, 30, 78  
 New Area 28  
 Tiger economies 42
- United Kingdom (UK): Higher Education Funding Council for England (HEFCE) 79  
 United Nations (UN) Development Program 88  
 United States of America (USA) 60, 162  
 Department of Energy 88  
 First Solar company 90  
 intellectual property assignments 79  
 New York Stock Exchange (NYSE) 90, 91  
 Qualcomm 129  
 SRS 161  
 universities  
 government pulled triple helix 67–8  
 history of 71  
 industrial base and political influence Liaoning Province 68–9

- Northeastern University (NEU)  
69–74 *see also main entry*
- upgrading strategies of electronics  
firms 41–65
- case studies (Hong Kong) for 58–62  
‘fabless’ production of display  
integrated circuits (ICs)  
61–2
- transition from OEM to OBM  
59–61
- comparison of innovation in  
Guangdong and Hong Kong  
50–51
- context for regional-sectoral study of  
41–3
- Guangdon innovation system  
43–50
- business innovation in 43–5
- general development of  
technological activities in  
45–50
- innovation activities of electronics  
firms in the Pearl River Delta  
51–8
- innovation and innovation  
intensity 52–5
- use of external sources for  
innovation activities 55–8
- venture funds: Legend Capital 131
- Wan, Y. 123
- Wang, H. 1
- Wenzhou 160
- Wu, Y. 103
- Xiaoping, D. 94
- Yan, H. 1
- Yangtze River Delta 19, 21–2, 23, 24,  
29, 32, 34, 42, 47, 89, 90, 123  
R&D personnel in 22, 24
- Zhang, S. 157
- Zhang, Y. 103
- Zhejiang 16, 21, 89, 95, 99
- Zhou, C. 66, 84
- ZTE 42, 123, 126, 136–7, 170





