Index

3G IP core network techniques 317
3G mobile telecommunications 301, 317

absorptive capacity 17, 29, 140, 141, 151, 247
ABTCP (Associação Brasileira Técnica de Celulosa e Papel: Brazilian Pulp and Paper Technical Association) 100, 101, 102, 103, 104, 109, 114, 116, 117, 118, 119, 120, 121
Academia Sinica 294
accessibility of knowledge 9
accountability 88
Acer 291, 306, 319, 326
Acha, B. 57, 61, 89, 232, 233, 234
Act for Encouraging the Machine Parts Industry (Korea, 2001) 276
active learning system 160, 181
Adriaans, T. 341
Aeromot 168
aeronautical sector, Brazilian 15–16
deregulation of (1978) 168, 191
distance from global innovation frontier 192
exports 157, 173–4
system of innovation 166–74
following loose characteristic of national system of innovation 193
general characteristics of Brazilian civil aircraft market 172–4
learning strategy of Embraer 170–72
post-privatization period 169, 191
pre-foundation of Embraer 166–7
seeking international market phase 168–9, 190–91
starting-up phase 167–8
technology capability of suppliers 16, 157–8
analytical framework for studying 164–5
characteristics of foreign suppliers located in Brazil 177–9
characteristics of local SME supplier firms 175–7
government policies for upgrading 193
linkages for each group of SME suppliers 184–92
results on technological capacity accumulation by local SME suppliers 179–90
selection of sample 174–5
see also Embraer Aerospace Technical Centre (CTA) 167, 168, 169, 188, 190
African Rural Energy Enterprise Development (AREED) 346
Agarwal, D. 363
Agarwal, K. 363
agricultural regime, Tanzanian 349–51, 352, 360
AIAB (Associação das Indústrias Aeronáuticas do Brasil) 173
air conditioning 46
Airbus 179
aircraft system integrators 175
airframe structural components 176, 177
airframe structural sections 176, 177, 178, 179
airframe structures and related systems 175, 176, 177, 178
Albu, M. 89
Alcatel 45
Alvial, A. 246
AMA (Applied Material Inc.) 273
American Air Force 166
Amesse, F. 60
Amsden, A. 208

367
AMT 600 aircraft 181
AMX aircraft 170, 178
analysts/programmers 146
Andersen, B. 6
ANOVA test 74, 76, 96
antitrust regulations 8
Antonelli, C. 63, 266
Antunes, Azevedo 110
application knowledge 137, 138
Applied Material Inc. (AMA) 273
appropriability of knowledge 9, 143
Aquarotica 249
Aracruz Celulose 108–9, 110, 111–12, 113, 114–15, 118
architectural innovation 17, 235, 244, 251
AREED (African Rural Energy Enterprise Development) 346
Argentina
literacy rates in 136, 137
market for software products and services in 135, 136
participation in education in 136
Ariffin, N. 163
Arocena, R. 145, 152
Arrow, K.J. 63
Artech 143, 144
Arthur, B. 11
Arthur, M.B. 89
Arusha 347, 352
Arvidsen, A. 361
ASEAN (Association of Southeast Asian Nations) 208–9
asexual reproduction 111
Asian financial crisis (1997) 262
Asian-Pacific Regional Operations Center 301, 321
Associação Brasileira de Normas Técnicas (ABNT) 106, 120, 121
Associação das Indústrias Aeroespaciais do Brasil (AIAB) 173
Association of Salmon and Trout Producers of Chile see Association of the Salmon Industry in Chile (SalmonChile), formerly Association of Salmon and Trout Producers of Chile 18, 238, 241, 242, 244, 246, 247, 248, 258
collective capability and role of 248–51
Audretch, D. 151
AUO 275
Australian pulp and paper industry 104
automobile industry, Korean 276
automotive engineering courses 216
Automotive Experts Dispatching Programme (2003–05), Thailand 215
avitronics components 176, 177
B-testers 143
B2B (business-to-business) e-commerce systems 302
Bacha, C.J.C. 100, 102, 103, 106
Bae 172
Bahia Sul 114, 115
Baker, A. 104
Banco Nacional de Desenvolvimento Econômico e Social (BNDES) 105–6, 109, 110, 114, 120, 121, 123
Banadirante aircraft 167, 170, 173
Bangalore software cluster 133
banking information systems 309
Barras, R. 234
Bell, M. 57, 59, 60–61, 65, 89, 161, 163, 165, 201, 208, 235–6
Belo Oriente, Minas Gerais 109
BenQ 324
biofuels 335, 343, 345, 347, 361
see also Jatropha biofuels in Tanzania
biogas 341, 345, 348–9, 358, 359
biosafety 115, 116, 120
biotechnology
firms located in Zonamérica 148
forestry-related 99, 111, 112, 113, 116, 123
impact on high- and low-tech sectors 232
salmon-farming related 244
biotechnology sector, Taiwan 303, 304
Index

Birkinshaw, J. 58
Bitzer, J. 134
Bjorndal, T. 238
BNDES (Banco Nacional de Desenvolvimento Econômico e Social) 105–6, 109, 110, 114, 120, 121, 123
BNDESPAR 114, 120
Board for Industrial and Financial Reconstruction (BFIR) 40
Bolivia
literacy rates in 137
participation in education in 136
Bombardier–Canadair (Bombardier Aerospace) 172
bonded factories 326
Boonchukosol, K. 216
Borgatti, S.P. 72, 84
Borges, I. de C. 116
Borrás, S. 99
Botucatú 168
bounded rationality 5
Boyd, W. 101
BRACELPA (Brazilian Association of Pulp and Paper) 117, 118, 121, 130
Brasil 71
Brasilia EMB 120°
aircraft 168, 169, 170, 173, 177
Brazil
aeronautical sector in see aeronautical sector, Brazilian; Embraer
demand for software products in 136
federal system of government in 123
ICT sector in see ICT sector, Brazilian
industrialization policies of 104, 156–7, 160, 172, 173
liberalization policy adopted by 160, 173
literacy rates in 137
market for software products and services in 135, 136
military dictatorship in 106, 108, 156
offset programmes of 190
national innovation system of 160, 193
participation in education in 136
pulp and paper industry in see pulp and paper industry, Brazilian
selected economic sectors in relation to their distance from the global innovation frontier 192–3
Brazilian Air Force 166–7, 169, 177, 189
Brazilian Association of Pulp and Paper (BRACELPA) 117, 118, 121
Brazilian Embassy 191
Brazilian Eucalyptus Genome Network 116
Brazilian Genome Project 116, 120
Brazilian ICT law 58, 67–74, 95
Brazilian Institute for Geography and Statistics (IBGE) 174
Brazilian Ministry of Aeronautics 167, 173
Brazilian Ministry of Agriculture, Livestock and Supply (MAPA) 118, 121, 123
Brazilian Ministry of Defence 168, 169, 170, 178
Brazilian Ministry of Development, Industry and Foreign Trade (MDIC) 118, 121, 123
Brazilian Ministry of Environment (MMA) 118, 121, 123
Brazilian Ministry of Science and Technology (MCT) 67, 116, 118, 120, 121, 122, 123
Brazilian Pulp and Paper Technical Association (ABTCP) 100, 101, 102, 103, 104, 109, 114, 116, 117, 118, 119, 120, 121
Breschi, S. 65, 159
BRIC group 193, 277
bridging organizations 354
broadband development in Taiwan 305, 311, 317, 318
broadband wireless products 45, 305, 317
Brown, J.S. 66
Brusoni, S. 63, 175
BSNL 45, 52
‘built to order’ strategy 306
C-DOT 42–52
index of innovation capability 47–50
spillover effects of 50–52
C100 motorcycles 211, 218
Callon, M. 6, 264
Campinas 83
Campinhos, Edgard 112
Campos, W. de O. 112, 113
Canadair 172
Cantwell, J. 236
capital goods industry, Korean 18, 259–86
exports 262–3, 277, 278
ICT use in 265–6, 277
importance of the capital goods industry and the Korean experience 260–64
imports from Japan 259, 261–4, 268, 276
opportunities for catch-up 275–7
sectoral system of innovation and the machine tools industry 264–7
demand conditions or market regimes 266–7
regimes of knowledge and technologies 265–6
roles of actors 267
summary and conclusions 277–9
three barriers to catch-up in 267–75
dumping pricing by incumbent firms 270–72, 282–6
filing IPR lawsuits against catching-up firms 273–5
weak demand and weak R&D 267–70, 271
capital goods industry, Thailand 213
Carlsson, B. 6, 159, 264
cash crops 349
Cassiolato, J.R. 83, 159, 160, 174
Catholic University, Uruguay 146
CBA 123 aircraft 170
CD-Rs 272, 285, 330, 331, 332
Celma 179
Celmar 115
Celulose Nipo-Brasileira (Cenibra) 109, 110, 111, 113, 115, 118, 122
Central Drug Research Institute (CDRI), India 33, 41, 42
Centre for Development of Telematics see C-DOT

Centro Nacional de Pesquisa Florestal (CNPF) 112, 120, 121
CESAER 2001 174
Cessna 172
Chachage, B. 339, 340, 341
Chaebols 261
Chagas disease 35
Challenge 2008: the National Development Plan 288, 301, 305, 316
Champion Paper Company 105, 106, 115
Chandler, A.D. 64
Chaudhuri, S. 30, 35, 38, 39, 40, 41
chemical pulp processes 99, 101–5, 107, 108, 117
chemistry (plastics) 242
Chen, Dung-Shen 214
Chen, Wen-Tang 321
Chen, Xin-Hong 320
Chernobyl disaster 337
Chiang Tung Bank 291
Chile
literacy rates in 136, 137
participation in education in 136
salmon farming in see salmon farming
China
competition to Thai and Vietnamese motorcycle industries from 17, 209, 218–19
extent of impact of 219–22
reasons for differences in responses to 226–8
transformation of sectoral innovation systems as a result of 222–6
FDI in Taiwan 291
foreign exchange control in 325
Korean machine tool exports to 262–4, 277, 278
Taiwanese investment in 306, 314–15, 323–33
telecommunications industry in 42–3
threats and opportunities to ASEAN countries from 208–9
trade balance between Taiwan and 323, 329–30
transformation of innovation system in 55
Index

China Automotive Industry League 209
China Automotive Technology and Research Center 209
Chinese computer 308
Chinese ICT standards 308, 321
Chinfon Group 229
Chulalongkorn University 216
Chungwha Telecom Co. 301, 309
Cia Suzano de Papel 105, 114, 115, 116
Cia Vale do Rio Doce 114
circuit switching 42
Clapp, J. 237
Clark, K. 234, 235, 236
Cleaner Production Agreement (Acuerdo de Produccion Limpia: APL) 247, 248, 249, 258
clinical trials 36
cloning 111–13, 114, 116
clustering of innovative activity
  Bangalore cluster 133
  Brazilian ICT sector 83
  Chilean salmon farming industry 17–18, 242, 251
  Silicon Valley cluster 133, 307
  Taiwanese IT manufacturers in mainland China 327–8
Uruguayan software sector 15, 131–53
CMM certification 85
CMMI (Capability Maturity Model Integration) project 149
CNPF (Centro Nacional de Pesquisa Florestal) 112, 120, 121
Coase, R.H. 60, 62
‘code of good practice’ (codec de buenas practicas) 246, 258
codified knowledge 59
Código Florestal (Law No. 4771, 15 September 1965) 106–7
coevolution 5, 11, 21
  of knowledge base and organization network in Brazilian ICT sector 57–98
  of technology and societal factors 20, 336
Cohen, W. 10, 140
collaborative agreements in the Brazilian aeronautical sector 189, 190, 191
collaborative-design manufacturers (CDMs) 302, 306
collaborative factor 248
collective capability 232, 235, 237, 250
  importance for low-tech sectors 252–3
  and role of the Association of the Salmon Industry in Chile 248–9
  influence on external standard-setting 249–51
collective efficiency 250
Colombia
  literacy rates in 137
  market for software products and services in 135
  participation in education in 136
Comércio, J. 105
Commander, S. 134
Commonwealth Scientific and Industrial Research Organization 107
  communality concept 169
  communities of practice 14, 65–6, 83–5, 87
Companhia Melhoramento 102
Companhia Paulista de Estradas de Ferro 101
Companhia Vale do Rio Doce 109
Compaq 306
  comparative advantages 57, 63, 64–5, 81, 83, 193, 266, 287
  complementarities 10–11, 132
  completely build units (CBUs) 211, 216, 224
  completely knock-down (CKD) units 211
  conferences and exhibitions, knowledge flows from 143, 144, 145, 150
  conflict of interests 65–6
  consultants, knowledge flows from 144
Contingency Centre of National Information and Communication 317
  contracts 8
Cooke, P. 6, 158, 159
  core competence 235, 236
Costa, I. 160
Council of Scientific and Industrial Research (CSIR) 41, 42, 50
Coutinho, L. 167, 168
CTA (Aerospace Technical Centre) 167, 168, 169, 188, 190
cultural traditions 354, 360
Cummings, J.L. 66
cumulativeness of knowledge 9–10, 143
Cusmano, L. 57, 61, 89
custom-made motorcycle parts 211
customers, knowledge flows from 143, 144, 145, 184, 188–92, 260, 265, 266, 279
customs duties 45, 50, 55, 148
Customs Tariff Law (Japan, 2003) 275
Cusumano, M. 134
CUTI (Uruguayan Business Association of Information Technologies) 131, 133, 148–9, 150
Cutler, C. 237, 245
CVD (chemical vapour deposition) machines 273
Daewoo Electronics 275
Daey Ouwens, K. 339, 363
Dagnino, R. 157, 166, 167, 168, 172
Dahlman, C.J. 100, 138, 160, 192
Dahmen, E. 10
Damiani, J.H.S. 174
Dar es Salaam 347, 352, 363
see also University of Dar es Salaam
David, P. 11
Davies, A. 57
DBTEL 326
De Ferranti, D.M. 159, 232
De Havilland 172
DeBresson, C. 60
decentralized electricity provision 348, 352
De Fillipi, R.J. 89
deforestation 100
delayed payment 269, 270
Dell 306
demand 5, 7, 10, 11, 132
for Chilean farmed salmon 238–9
for Korean machine tools 266–70, 277
for software products and services in Latin America 135–8, 152
for Taiwan’s ICT products 309–10, 315–18, 319
for Thai and Vietnamese motorcycles 218–19
Demonstrated IT Application Research Program, Taiwan 316
dengue fever 35
Department of Industrial Technology, Ministry of Economic Affairs (DoIT/MoEA), Taiwan 288, 299–300, 302
Department of Science and Technology, India 36
Department of Telecommunications, India 44, 45–6, 55
developed networks 79–80, 86
developing networks 79, 86
development blocks 10
Development Fund of Executive Yuan 291
DGBAS (Directorate General of Budget, Accounting and Statistics), Taiwan 290, 291
diesel engines, use of Jatropha oil in 341, 346–7, 358
digital archives 313, 314
digital content sector, Taiwan 303, 304
Digital Taiwan 309
Directorate General of Budget, Accounting and Statistics (DGBAS), Taiwan 290, 291
Directorate General of Telecommunications (DGT), Taiwan 301
DiStar 213
distributed innovation systems 6
diversification of products 241, 242, 251
division of labour 260, 320, 325–6, 328–9
Docpharma 41
Doctorate degrees 294
dominant design 11
Donangelo, A. 172
Dornier 172
Dosi, G. 6, 8, 9, 58, 61
dot.com bubble 324
Doughty, R.W. 101, 102, 104, 107, 111, 112, 113
Draft National Pharmaceuticals Policy (2006,2), India 31–2
Drug Price Control Order (DPCO), India 33, 35
Drugs and Cosmetics Act (India, 1940) 36
Drugs and Cosmetics Rules (DCR), India 36
DSL service 309
Duguid, P. 66
Dumont, Santos 166
dumping pricing 270–72, 282–6
Dunning, J.H. 65
Duran, J. 232
Duratex 116
Dutta, S. 310
Dyer, J.H. 66
dynamic capabilities 61, 161, 163
dynamic complementarities 10–11, 132
e-business 288, 302–3
E-Business Standard Research Plan 288
e-learning 309, 313–14
e-Taiwan program 288, 304–5, 309, 317, 319
E85 fuel 347
E&E of Taiwan 275
Eagle, J. 237
economic geography literature 151
economies of scale 64, 108, 110, 111, 138, 169, 241, 323
economies of scope 64, 138
Edquist, C. 6, 264
education
participation in Latin American countries 136
in Taiwan 293–4, 318
educational establishments
role in knowledge networks in Brazilian ICT sector 14, 71, 72, 73, 75, 82, 83, 86
see also university–industry linkages
Edwin, W. 361
EI database 295
Eindhoven University of Technology 335, 347
Eleb 175
electricity provision 348, 352
Elzen, B. 362
EMB 110 Bandeirante aircraft 167, 170, 173
EMB 120 Brasilia aircraft 168, 169, 170, 173, 177
EMB 121 Xingú aircraft 169, 173
Embraer
Brazilian aeronautic sector before founding of 166–7
changes implemented (1996–2005) 174
economic performance of 173–4
founded (1969) 16, 157, 166, 167
learning strategy of 170–72
main civil aircraft models manufactured by 172–3
main competitors of 172
monopoly granted to 172
post-privatization period 169, 191
privatization (1994) 16, 157, 169, 173, 191
seeking international market phase 168–9, 190–91
starting-up phase 167–8
technological capability of suppliers 16, 157–8
analytical framework for studying 164–5
characteristics of foreign suppliers located in Brazil 177–9
characteristics of local SME supplier firms 175–7
government policies for upgrading 193
linkages for each group of SME suppliers 184–92
results on technological capacity accumulation by local SME suppliers 179–90
selection of sample 174–5
EMBRAPA (Empresa Brasileira de Pesquisa Agropecuária) 112, 119, 120, 121, 122, 123
embroidery machines 273
Empresa Brasileira de Pesquisa Agropecuária (EMBRAPA) 112, 119, 120, 121, 122, 123
EMR (Exclusive Marketing Rights) 34
enabling networks 78–9, 86
ENAER 171
Energy Information Administration, Tanzania 343
energy regime, Tanzanian 345–9, 352, 360
Engaruka 347, 351, 358, 359
engineering projects and consulting 176, 177
Enos, D. 161
enterprise resource planning (ERP) 136–7, 177, 182
Environment Component Index 310
environmental and social responsibility 109, 110, 113, 116, 124
environmental standards 245, 247, 248, 249, 258
ERJ 135 aircraft 173
ERJ 140 aircraft 173
ERJ 145 aircraft 169, 170, 171, 173, 177, 178
ERJ 170 aircraft 173, 177, 178
ERJ 190 aircraft 169, 173
ERJ 195 aircraft 173
Ernst, D. 64, 228, 236
ERP (enterprise resource planning) 136–7, 177, 182
Espírito Santo 110
EU Community Innovation Survey 133
eucalyptus
increasing investment in R&D of eucalyptus forestry and pulp process 104–7
introduction into Brazil 99, 100–103
new techniques in production of 111–16
responsibility for research into 119, 120, 122–3
take-off in production of eucalyptus pulp 108–10
Eucalyptus World Congress 107, 119, 120
European Union 193, 360
evolutionary theory 5–6, 7, 9, 233
innovation projects central in 57–8
strategic niche management (SNM) rooted in 336
and technological capability accumulation 161
Exclusive Marketing Rights (EMR) 34
Executive Yuan, Taiwan 291, 299–300, 301, 302, 304, 305, 308, 309, 317
exhibitions and conferences, knowledge flows from 143, 144, 145, 150
expectations of actors, dynamics of 338
Jatropha biofuel production in Tanzania 355–6, 357, 358, 359, 360, 361
experts, hiring of 184, 189, 215
export processing zones 326
exports
Brazilian aeronautical sector 157, 173–4
Brazilian pulp and paper industry 14, 108, 110
Chilean farmed salmon 237, 238, 251
Chinese motorcycle industry 17, 209, 219–22, 224–5
farmed salmon by major countries 238
Japanese machine tools to Korea 259, 261–4, 268, 276
Korean machine tool industry 262–3, 277, 278
Taiwanese high-tech industry 315–16
Taiwanese IT manufacturers in mainland China 329–30
Uruguayan software sector 131, 148–9
Failache, C. 138, 147
Fairchild 172
Fairchild–Dornier 172
‘family’ concept 169
Fan, Z.-K. 317
FAO (Food and Agriculture Organization) 107, 118, 119, 121
FAPESP (State of São Paulo Research Foundations) 116
Faust, K. 60
Federal Rural University of Rio de Janeiro (UFFRJ) 117, 119, 121
Federal University of Parana (UFPR) 119, 121
Federal University of Rio Grande do Sul (UFRGS) 119, 121, 122
Federal University of Viçosa (UFV) 106, 117, 119, 121, 122, 123
Federation of Korean Industries (FKI) 268, 269, 271
Ferraz, J.C. 167, 168
Ferreira, M. 111, 112, 113
fertilizers 341, 351, 358–9
Fforde, A. 218
Figueiredo, P.N. 161, 162, 163
filière 10
financial regime, Tanzanian 351–2
FINCA 351
FIND 287, 302, 305
FINEP 174
flat-panel display industry, Taiwan 303, 304, 312
flexible specialization 235
flight controls 178, 179
Fokker 172
Fombrun, C.J. 65
Fone, N. 347
Fonseca, M. da G. de 115
Food and Agriculture Organization (FAO) 107, 118, 119, 121
Fordist mass production 235
foreign exchange control 321, 325
foreign technology agreements 33
Forest Eucalyptus Genome Sequencing Project Consortium 116, 120
forestry research institutes 106
forestry schools 106, 117, 119
Foss, N.J. 58
Fransman, M. 161, 164
Freeman, C. 6, 10, 158, 159, 264
Freitas, I. 245, 254
Frischtak, C. 100, 160, 164, 167, 168, 169, 170, 192
Fundacion Chile 246, 249, 258
Fundamental Communications Basic Act (Taiwan, 2004) 301–2
fuselage parts and components 176, 177
genomic eucalyptus research 115–16, 122, 123
geographical proximity 145, 151, 268
Germany, Korean machine tool exports to 278
Geuna, A. 63
Giddens, A. 61
Giuliani, E. 57, 61
Glenmark 41
global production networks 228
global sourcing strategies 212, 217
global warming 343
Globelics India Conference (Trivandrum, 2006) 4
GLP certification 36, 37–8
GM Daewoo 272
gmelina 110
GMI (Graduate School of Management and Innovation) 212, 213, 216
GMN Automobile and Motorcycle Parts Manufacture JV Co., Ltd. 214
Goldstein, A. 108
Good Laboratory Practice (GLP) Compliance Monitoring Authority 36
Gordiho Braune & Cia 102
Gosh, A. 340
governance in the global market 235–7
government e-services, Taiwan 287, 316
government research institutes see public research institutes, interaction with
GPRS 317
Graduate School of Management and Innovation (GMI) 212, 213, 216
Granovetter, M.S. 61
Granstrand, O. 69
Grattapaglia, D. 116, 122–3
Green, R.D. 169, 172
Gübitz, G.M. 339, 340
Guess, G.M. 109
Gulati, R. 63
Gunaratne, L. 348
HACCP (Hazard Analysis and Critical Control Point) 246
HACCP-CC 246, 258
HACCP-PP 246, 258

Franco Malerba and Sunil Mani - 9781849802185
Downloaded from PubFactory at 09/16/2023 07:20:05PM
via free access
Hamel, G. 235
Hanoi University of Technology 217
Hansen, M.T. 66
hardware product development
knowledge network 14, 59, 69, 70,
73, 76, 77, 78, 79, 81, 82, 83, 84,
86, 95, 97, 98
Hart, S. 109
Heeks, R. 135
Heller, J. 339, 341
Henderson, R. 234, 235, 236
Henning, R. 341
HG products 241
Hilgemberg, E.M. 100
Hindustan Antibiotics Limited (HAL)
39–40
Hirsch-Kreinsen, H. 232, 233, 234,
235, 236
HIV/AIDS 35
Ho Chi Minh City University of
Technology 217
Hobday, M. 57, 64, 89, 229, 234
Hodgson, G.M. 158
Hoge, W. 110
Honda 211, 212, 213, 214, 217, 218,
221, 222, 227
Honda Supercub motorcycle 211, 229
Honeywell 171
Hong Kong 325, 326
Hoogma, R. 337, 363
horizontal collaborations, knowledge
flows from 143–4, 151
Household Energy Network 348
Hsinchu Science Park 290, 307
Huang, C.Y. 306
Huang, Gwo-Jiunn 308
Huawei 44
Hughes, T.P. 6, 264
Hunter, H. 100
Hwanak 272
Hwang, Chul-Ju 273
hydraulic systems 176, 178, 179
hydro power 336
Hyundai Heavy Industry 272, 286
Hyundai Motors Kia Motors 272
Iammarino, S. 236
IBGE (Brazilian Institute for
Geography and Statistics) 174
IBM 306
ICT
emergence of 232
evolution in Taiwan see under
Taiwan
use in Korean capital goods industry
265–6, 277
see also ICT sector, Brazilian;
software sector, Montevideo,
Uruguay
ICT law, Brazil 58, 67–74 passim, 95
ICT sector, Brazilian
knowledge networks in 14, 57–98
analysis and implications 85–9
boundaries between firms and
technological partners 14, 59,
62–4, 74, 76–80, 86, 95–6
definition and use of knowledge
network 60–62
formation of channels for
knowledge flows 14, 59, 65–6,
75–6, 83–5, 86, 87, 98
general characteristics of database
66–74
specialization in different
governance mechanisms 14,
59, 64–5, 74–5, 81–3, 86–7,
97
liberalization of 58, 83
total investments in R&D in
telecommunications and
computers sectors 71
total outsourcing of R&D in
telecommunications and
computers sectors 71–4
IDE (Institute of Developing
Economies) 210
Ideasoft 143
IFI (Institute for Development and
Coordination of the Aerospace
Industry) 168, 169, 174
III (Institute for Information Industry)
19, 288, 292, 295, 296, 308–9, 315,
321, 323, 331, 332
Iizuka, M. 245, 254
import-source diversification policy
276
import substitution
in Brazil 58, 104, 156, 160, 172, 173
in Korea 275, 276
in Thailand 211
Index

Industrial Machinery and Instruments (IMI) Holding 217–18
industrial robots 270–72, 286
Industrial, Technology and Trade Policies (Brazil, 2004) 156
Industrial Technology Research Institute (ITRI) 19, 292, 295–6, 331, 332
industry associations, Brazilian pulp and paper industry 119, 120, 121, 122
industry–university linkages see university–industry linkages
informatics 137
Information Month 309
Ingenio incubation programme 141, 147
innovation intensity 232, 235, 236
innovation projects, knowledge networks formed by, in Brazilian ICT sector 14, 57–98
analysis and implications 85–9
boundaries between firms and technological partners 14, 59, 62–4, 74, 76–80, 86, 95–6
definition and use of knowledge network 60–62
formation of channels for knowledge flows 14, 59, 65–6, 75–6, 83–5, 86, 87, 98
general characteristics of database 66–74
specialization in different governance mechanisms 14, 59, 65–6, 74–5, 81–3, 86–7, 97
innovation system literature 6, 264
innovative capability 162, 163, 165, 202
in Brazilian aeronautical sector 16, 157–8, 179–81, 183–8, 190, 191
in Uruguayan software sector 138–40, 141, 151
Institute for Development and Coordination of the Aerospace Industry (IFI) 168, 169, 174
Institute for Information Industry (III) 19, 288, 292, 295, 296, 308–9, 315, 321, 323, 331, 332
Institute of Developing Economies (IDE) 210

in transitional ASEAN economies 209
in Vietnam 211, 213
import tariffs, Vietnamese motorcycle industry 221, 224
imports
Brazilian aeronautical sector dependent on 16, 157, 174
controls in Indian telecommunications industry 45
controls in Korean capital goods industry 275, 276
Indian telecommunications industry dependent on 13, 27, 29, 44
machine tools into Korea from Japan 259, 261–4, 268, 276
motorcycles and parts into Thailand and Vietnam 17, 219–22, 224–5
controls by Thai government 221
controls by Vietnamese government 213, 215, 216, 221, 224, 226
oil imports into Tanzania 343–4, 348
pulp imports into Brazil 107–8
by Taiwanese IT manufacturers in mainland China 329–30
Impuesto a la Renta de Industria y Comercio (IRIC) 147
IMS Health–ACNielsen (formerly ORG) 36
incubation programmes in Uruguayan software sector 141, 147
India
market for software products and services in 135
pharmaceutical industry in see pharmaceutical industry, Indian telecommunications industry in see telecommunications industry, Indian
Indian Drugs and Pharmaceuticals Limited (IDPL) 39–40
Indian Patents Act (1970) 34, 54
Indian Pharmaceutical Policy (1994) 31
individual (tailor-made) software 134, 137
Industrial Automation and Electronic Business: iAeB Program, Taiwan 302
industrial district literature 151
Franco Malerba and Sunil Mani - 97818490802185
Downloaded from PubFactory at 09/16/2023 07:20:05PM
via free access
institutions 5, 7–8, 29, 132, 233
new institutions in Brazil 105–7
strategic niche management (SNM) and 362
supporting Chilean salmon farming industry 245–50
supporting Thai and Vietnamese motorcycle industries 219, 225–6
supporting Uruguayan software sector 133, 144, 145, 147–50, 152
Instituto de Pesquisas e Estudos Florestais (IPEF) 106, 107, 111, 112, 115, 117, 120, 121, 122, 123
Instituto Universitario Autónomo del Sur 146
Intarakumnerd, P. 212, 215
Integrated Beyond 3rd Generation (iB3G) Double Network Integration Plan 305
Integration Heterogeneous Network 317
Integro 148, 149
Intel 320
Intellectual Property Institute 215, 223
interaction processes 5, 11, 132
in Uruguayan software sector 132–3, 140–46
interactive learning spaces 152
Inter-American Development Bank 135, 147, 148
intermediate materials or parts industry, anti-dumping appeals by firms in 272
International Energy Administration 346, 363
International Finance Corporation (IFC) 114, 120, 121
International Paper Company 115
international partnerships in the aeronautical industry 170
international seed bank 107
internet penetration rate, Taiwan 318
investment capability 162, 163
IPEF (Instituto de Pesquisas e Estudos Florestais) 106, 107, 111, 112, 115, 117, 120, 121, 122, 123
IPR lawsuits against catching-up firms 273–5
ISDN facilities 46, 50
ISO 9000 standards 182–3, 245, 247, 248, 258
ISO 14000 standards 245, 247, 248, 258
ISO 14001 standard 247
Israel, market for software products and services in 135
ITA (Technological Institute of Aeronautics) 167
ITI Ltd 44, 46, 52
ITRI (Industrial Technology Research Institute) 19, 292, 295–6, 331, 332

Jacobson, S. 159
Jaffe, A.B. 151, 153
Japan
IPR protection by 274–5
machine tool exports to Korea 259, 261–4, 268, 276
machine tool imports from Korea 277, 278
Japan External Trade Organization (JETRO) 228, 229
Jari project 110, 115
Jatropha biofuels in Tanzania 20, 335–63
conclusions and policy issues 360–63
internal rates of return for 355, 357
Jatropha production chain 339–42, 361, 362, 363
landscape assessment 342–5
recent developments at the niche level 352–9
dynamic niche formation at the cultivation stage 353–6
fieldwork methodology 352–3
fragmented niche dynamics at the oil pressing stage 356–7
rudimentary niche formation at the end-use stage 358–9
regime assessment 345–52
agricultural regime 349–51, 352, 360
energy regime 345–9, 352, 360
financial regime 351–2
vegetable oil regime 351
relative price of 347, 348, 349, 353, 358, 359, 360
strategic niche management approach described 337–9
Index

uses
  - biogas 341, 345, 348–9, 358, 359
  - briquettes as oven fuel 341, 358
decentralized electricity provision
  - in diesel engines 341, 346–7, 358
  - fertilizers 341, 351, 358–9
  - oil in cooking stoves 341, 359
  - oil lamps 341, 348, 359
  - soap-making 341–2, 359

Jessop, B. 236
jigs and tools 176, 177
Johnson, B. 236
joint ventures
  - Brazilian aeronautical sector 175
  - Brazilian pulp and paper industry 114–15
  - Korean capital goods industry 276
  - Taiwanese ICT sector 307
  - Thai and Vietnamese motorcycle industries 209, 212, 213, 214, 224, 228
Jones, N. 339
Joosung Engineering 273–4
Jou, Sue-Ching 214
Jubilant Organosys 41
Jundiaí, São Paulo 101
just-in-time delivery 174
Jusung Engineering Co. 269
Juvenal, T.L. 100, 105, 106, 108, 109, 110, 113, 115

Kao, K.S. 323
Karve, A.D. 341
Kasetsart University 223
Katikarn, C. 223
Katz, R. 66
Kawasaki 212, 213, 272
Ke, J.S. 309, 318, 319
kerosene 348, 359
Kesidou, E. 139, 142, 147
Kilimanjaro 352
Kim, L. 64, 162–3, 228, 236
Kim, S.-R. 89
King Mongkut’s University of Technology Thonburi (KMUTT) 209
Kiryung Electronics 275
Klabin 115
Klein, P.G. 58
Klepper, S. 11
Knight, L. 66
Knight, P. 114, 192
knowledge, dimensions of 9–10
knowledge base 5, 8–11, 21, 29, 132, 233
  - in low-tech sectors 232, 252
type of, and knowledge networks
  - in the Brazilian ICT sector
    - see knowledge networks in the Brazilian ICT sector
  - of Uruguayan software sector 134–5, 151
knowledge-based economy 9, 192
Knowledge Economics Development Act (Taiwan) 299
knowledge networks in the Brazilian ICT sector 14, 57–98
  - analysis and implications 85–9
  - boundaries between firms and technological partners 14, 59, 62–4, 74, 76–80, 86, 95–6
  - definition and use of knowledge network 60–62
  - formation of channels for knowledge flows 14, 59, 65–6, 75–6, 83–5, 86, 87, 98
  - general characteristics of database 66–74
  - specialization in different governance mechanisms 14, 59, 64–5, 74–5, 81–3, 86–7, 97
  - knowledge spillovers 10, 65, 88
    - definition of 153
  - in Uruguayan software sector 140–46, 149, 151
  - knowledge transactions in the Uruguayan software sector 140–45, 151
Korea
  - automobile industry in 276
capital goods industry in see capital goods industry, Korean
  - industrialization policies in 156–7, 275–6
  - main export products of 262
  - national innovation system of 160
  - technological capability
    - accumulation in 162–3

Franco Malerba and Sunil Mani - 9781849802185
Downloaded from PubFactory at 09/16/2023 07:20:05PM via free access
Korea International Trade Association 262, 263
Korean Federation of Small and Medium Businesses (KFSB) 269, 270
Korean Ministry of Commerce, Industry and Energy 278
Korean Trade Commission (KTC) 272, 286
Kosnik, J. 211
KPMG 41
kraft pulp process 104
Kubitschek, Juscelino 104
Küppers, G. 60
Kuwayama, A. 232
L1 price 46
Laboratorio Tecnológico del Uruguay (LATU) 147
laboratory and equipment infrastructure knowledge network 59, 69, 70, 72, 77, 78, 81, 82, 83, 84, 86, 87, 95, 97, 98
labour mobility in Taiwanese ICT sector 307 in Uruguayan software sector 15, 140, 142, 147, 151
labour productivity in Taiwan 290
Lall, S. 139, 162, 163, 164, 228, 235
Lam, A. 89
Lamberg, J.-A. 101
land ownership 354
landing gear 175, 176, 177, 181
landscape 337, 338
influences on development of Jatropha biofuels in Tanzania 342–5
Lane, P.J. 66
Lastres, H. 159, 160, 174
Latecoere 171
Latin American Development Bank 118, 120
LATU (Laboratorio Tecnológico del Uruguay) 147
Law of Biosafety (Brazil, 2004) 116, 120
Law of e-Signature (Taiwan, 2002) 309
Law of Similars (Brazil, 1967) 172
LCD (liquid crystal displays) machine market 273–4
Leão, R.M. 100, 104, 106, 107, 111, 112
learning at niche level 338
Jatropha biofuel production in Tanzania 354–5, 356–7, 358, 359, 360, 361
Lee, K. 260, 264, 266, 267, 268
Lee, M.Y. 293
leishmaniasis 35
Leon Feffer & Co. 103
leprosy 35
Levin, R.C. 8
Levinthal, D. 10, 140
LG Electronics of Korea 275
licensing 260, 265
Liebherr Aerospace 175
Lifan Motorcycle Manufacturing JV Co. 214
Likert scale 140, 141, 145
Lilja, K. 101
Lim, C. 260, 264, 266, 267, 268, 277
Lin, H.-Y. 290
Lin, X.-W. 290
linkages capability 162
links and complementarities 10–11, 132
Lissoni, F. 65
literacy rates 136, 137, 318
lithium batteries 272, 282, 283, 286
Liu, Meng-chun 320
local content ratio 214, 221, 224
local knowledge, role of 236
Lopez-Claros, A. 310
Lorentzen, Erling 108–9
low-tech sectors changes at macro level 232
development strategy for developing countries 234–5, 236, 251–3
innovation in 17–18, 233–4, 236, 237, 250, 253
see also salmon farming
Lubatkin, M. 66
Lucent 52
Ludwig, Daniel 110
Lundvall, B.A. 6, 99, 159, 160, 236, 264
M-Taiwan Program 288, 305, 317, 319
machine tools industry, Korean see capital goods industry, Korean
machinery, basic 244
Madslien, J. 347
malaria 35
Malerba, F. 4, 5, 8, 9, 28, 29, 57, 60, 61, 66, 131, 132, 143, 159, 160, 207, 233, 252, 259, 264, 279
Manaus Free Trade Zone 67
Mani, S. 30, 42, 44, 47, 50, 54, 55, 83, 264
Manning, S. 89
Mansell, R. 134
manufacturing and design outsourcing 175
Marin, A. 65
market hyper-segmentation 234
market niche, creation of 234–5, 236, 253, 338–9, 360
market segmentation 324
Marques, R. 160, 164, 166, 192
Marshall, A. 59, 145
Martin, R. 151
Martini, A.J. 101, 102
Mashelkar, R.A. 33
Mashelkar Committee 33, 36–8
Maskell, P. 233
Massachusetts Institute of Technology (MIT) 167
master’s degrees 294
Matrix Labs 41
Mattos, R.L.G. 100, 105, 106, 108, 109, 110, 113, 114, 115
MBendi: Information for Africa 344
McKendrick, D.G. 99
mechatronics 277
Media Tek 320
Mejía, T. 137–8, 146
Mello, Helládio do Amaral 106
Mandonça, S. 232, 233, 234, 254
mergers and acquisitions
aeronautical industry 172
Brazilian pulp and paper industry 114, 115
Chilean salmon farming industry 239, 241
Indian pharmaceutical industry 40–41
Taiwanese IT industry 324
metallurgy 242
Metcalfe, S. 6, 11
Metso 117
Mexico
market for software products and services in 135
software clusters in 135
Meyer, A.D. 62
Meyer, M. 58, 89
micro-credit 351–2, 361
Microsoft 320
middleware (system) product
development knowledge network
14, 59, 69, 70, 73, 76, 77, 78, 79–80, 81, 82, 84, 85, 86, 87, 95, 97, 98
Millennium Development Goals 343
Miller, D. 64
Miller, J.H. 339
Minas Gerais 106, 109, 118, 121
mobile communications industry
India 42, 44, 45, 46, 51–2
Taiwan 301, 305, 315, 319, 321
operations in mainland China
324, 325, 327, 328
Mogi-Guaçu, São Paulo 105
Montero, C. 243
Montevideo software cluster see software sector, Montevideo, Uruguay
Mora, A.L. 100, 101, 102, 103, 106
Morogoro 341, 352
Mortimore, M. 228
motorcycle industry, Thai and Vietnamese 16–17
competition from China 17, 209, 218–19
extent of impact of 219–22
reasons for differences in responses to 226–8
transformation of sectoral innovation systems as a result of 222–6
demand conditions 218–19
firms 212–14
government policies 214–16
institutions 219, 225–6
inter-firm linkages 225, 227
methodology for study of 209–10
products 210–12
supporting knowledge-producing agents 216–18, 225
motorcycle repair shops 223
Motorola 52, 327
Mowery, D. 173
Mtu Wa Mbu 347
Mu, Q. 264
multi-regime analysis 345, 363
multi-technology firms 69
Nadvi, K. 237
NAFTA (North American Free Trade Agreement) 193
Naiji 272
Nanya Technology 275
NAOE award 319
Narula, R. 65
NASA 167
National Aquaculture Policy, Chile (Política Nacional de Acuicultura en Chile: PNAC) 248
National Biofuels Taskforce, Tanzania 344, 352
National Bureau of Statistics, Tanzania 343, 349, 363
National Commission for Aquaculture, Chile (Comisión Nacional de Acuicultura) 248
National Communications Commission (NCC), Taiwan 302
National Communications Commission Organization Act (Taiwan, 2005) 301–2
National Council of Research, Brazil 116, 118, 120, 121, 123
National Fishery Service, Chile (Servicio Nacional de Pesca: SERNAP, later SERNAPESCA) 246, 249, 258
National Information and Communication Infrastructure Security Mechanism Plan (Taiwan) 317
National Information and Communications Initiative Committee (NICI), Taiwan 288, 304, 305
National Information Infrastructure (NII), Taiwan 309
National Metal and Materials Centre (MTEC), Thailand 217
National Pharmaceutical Pricing Authority (NPPA), India 36
National Pine Institute, Brazil 102
National Science and Technology Development Agency (NSTDA), Thailand 209, 217, 228
National Science and Technology Policy Committee, Thailand 215
National Science and Technology Program for Digital Archives (Taiwan) 313, 314
National Science and Technology Program for e-learning (Taiwan) 313–14
National Science and Technology Program for Telecommunications (Taiwan) 313, 314, 317
National Science and Technology Program Implementation Regulations (Taiwan) 312
National Science and Technology Strategic Plan (2004–13), Thailand 215
National Science Council (NSC), Taiwan 290, 293, 294, 295, 296, 297, 298, 310, 311, 312, 313, 314, 317
national systems of innovation 6, 264
Brazilian 160, 193
differences between sectoral innovation systems and 11–12, 158
Korean 160
Taiwan’s 19, 288, 292–8
National Youth Commission of the Executive Yuan 308
Navarro de Andrade, Edmundo 101, 102, 103
NCC (National Communications Commission), Taiwan 302
neglected diseases, development of drugs for 13, 28, 35
Neiva 168
Nelson, R.R. 6, 7, 9, 11, 59, 63, 158, 159, 161, 264
Network Science Park 314
Networked Readiness Index (NRI) 309–10
networks 5, 7, 21–2, 233
developed networks 79–80, 86
developing networks 79, 86
enabling networks 78–9, 86
formation at niche level 338

Jatropha biofuel production in Tanzania 353–4, 356, 358–9, 360, 361

Indian pharmaceutical industry 54

Indian telecommunications industry 54

knowledge networks in Brazilian ICT sector 14, 57–98

analysis and implications 85–9

boundaries between firms and technological partners 14, 59, 62–4, 74, 76–80, 86, 95–6

definition and use of knowledge network 60–62

formation of channels for knowledge flows 14, 59, 65–6, 75–6, 83–5, 86, 87, 98

general characteristics of database 66–74

specialization in different governance mechanisms 14, 59, 64–5, 74–5, 81–3, 86–7, 97

in low-tech sectors 17, 233–4, 237, 251, 252

new chemical entities (NCEs) 35

new drug discovery research (NDDR) 35

New Technology Enterprises (NTEs) 55

New Zealand, pulp and paper industry in 104

niches, creation of 234–5, 236, 253

conclusions and policy issues for Jatropha biofuels 360–63

description of SNM approach 337–9

potential niches for Jatropha biofuels 347–9

recent developments for Jatropha biofuels 352–9

dynamic niche formation at the cultivation stage 353–6

fieldwork methodology 352–3

fragmented niche dynamics at the oil processing stage 356–7

rudimentary niche formation at the end-use stage 358–9

Nicholas Piramal 41

NICI (National Information and Communications Initiative Committee), Taiwan 288, 304, 305

NII (National Information Infrastructure), Taiwan 309

Nokia 320

non-profit organizations 139

Nonaka, I. 89

Nordström, M. 361

North American Free Trade Agreement (NAFTA) 193

North American pulp and paper industry 100, 101, 104

notebook computers 314, 322, 325, 327, 328

Nunes, P. 104

OECD 36, 253, 288, 298, 310

OEM–ODM–OBM model 234

see also original equipment manufacturers (OEMs); own-brand manufacturers (OBMs); own-design manufacturers (ODMs)

Ohara, M. 211, 222

OHSAS 18001 standard 247

oil crisis (1973) 337

oil lamps 341–2, 348, 359

oil price 343

Oliveira, L.G. 160, 161, 164

Olmstead, A.L. 100

online banking 309

open-type national laboratories 19, 296

openness factor 247

Openshaw, K. 339, 340

operating profit margin 320

optical-fibre backbones 305

Organization for Economic Cooperation and Development (OECD) 36, 253, 288, 298, 310

Organization for Nucleotide Sequencing and Analysis Network 116, 120

organizational-centred capability 165, 202–3

in Brazilian aeronautical sector 179–81, 184, 187

organizational contingencies literature 64–5

organizational learning 22, 63, 87, 88, 89

organizational process changes 164–5, 201
in Brazilian aeronautical sector 182–4, 187
organizational structures 6, 7
in Brazilian pulp and paper industry 115
original equipment manufacturers (OEMs) 212, 225, 302, 305, 306, 310, 319, 320–21
orphaned drugs, development of 33
Orsenigo, L. 9
Otahara, J. 229
Owen-Smith, J. 57
own-brand manufacturers (OBMs) 212–13, 223–4, 226, 227, 306
own-design manufacturers (ODMs) 212, 302, 306, 310, 319, 324, 328
packet switching 42
Padgett, J. 172
Panamericana Têxtil 105
Papel Simão 105
Paraguay
literacy rates in 137
participation in education in 136
Paraná 118
Parker Hannifin 171
passive learning system 160, 179
Patel, P. 58, 65, 159
patent lawsuits 273–5
patent licence fees 274
patent licensing 260, 265
patent system 8
Indian pharmaceutical industry 13, 28, 34–5, 54
TRIPS compliance 13, 28, 34–5
patents granted
to assignees in Taiwan 295, 296, 297
Indian pharmaceutical industry 27, 30, 41, 42
Indian telecommunications industry 27, 30
path-dependency 9, 11, 61, 88
Patton, M.Q. 174
Pavitt, K. 58, 59, 60–61, 63, 64, 159, 163, 165, 201, 208, 236, 265
PECVD (plasma enhanced chemical vapour deposition) 273
Penrose, E.T. 63
Perez, C. 234–5, 236
Perez-Aleman, P. 246
Pérez Casas, A. 147
performance indicator, aircraft 173
Perrow, C. 65
Perry, G.E. 159
Peru
literacy rates in 137
participation in education in 136
pharmaceutical industry, Indian
government research institutes 13, 28, 41, 42
innovative performance of 12–13, 27, 28, 30–31, 53–4
manufacturing enterprises 36–41
mergers and acquisitions 40–41
orphaned drugs development 33
overall policy framework 31–3
patent regime 13, 28, 34–5, 54
patents granted 27, 30, 41, 42
Pharmaceutical Research and Development Support Fund (PRDSF) 33
price regulations 32, 35–6
private sector enterprises 399–40
product and quality regulations 36, 37–8
public policy support for 31–6
public sector enterprises 39–40
R&D expenditure 30, 35
R&D-intensive companies 33
sectoral system of innovation 13, 28, 31–41, 54
tax incentives 33
trade balance 30
Pharmaceutical Research and Development Support Fund (PRDSF) 33
Pietrobelli, C. 232
PINTEC (Brazilian innovation survey) 71
Piore, M. 235
Piper 172, 191
Pisano, G. 6
Planning Commission 53
Ponsse 122
Ponte, S. 237
Pontificia Universidade Católica (PUC) 119, 121
Porter, M. 260
Porto Alegre 168
Portocel 110
Portuguese pulp and paper industry 104
POS (Procedimento Operacion de Saneamiento: Sanitary Operation Procedure) 246
poverty in Tanzania 343–4
Powell, W.W. 57, 60, 65
Pöyry Group 117
Prahalad, C.K. 235
Pramanik, K. 341
Prebisch, R. 232
predatory pricing 270–72, 282–6
Prencipe, A. 175
pre-sensitized printing plates 272, 282, 283, 284, 285, 286
price competition 222, 227, 321, 324
price discounts 269, 270
price index 36
price regulations in the Indian pharmaceuticals industry 32, 35–6
private research institutes, interaction with
  Brazilian pulp and paper industry 122
  in knowledge networks in the Brazilian ICT sector 14, 71, 75, 81, 82, 83, 85, 86
Vietnamese motorcycle industry 217
private sector firms
  in Brazilian pulp and paper industry 15, 106, 108–25 passim
  in Indian pharmaceutical industry 13, 28, 38–40, 54
  in Taiwanese ICT sector 19
privatization of Embraer (1994) 16, 157, 169, 173, 191
process technology knowledge network 14, 59, 69, 70, 73, 76, 77, 78, 79, 81, 82, 84, 85, 87, 95, 97, 98
product-centred capability 165, 202–3
  in Brazilian aeronautical sector 179–81, 184, 185
product changes 164–5, 201
  in Brazilian aeronautical sector 183–5
product standards see standards
production capability 162, 163, 165, 202–3
  in Brazilian aeronautical sector 179–82, 184–7
  in developing countries 207, 228
production capacity 161, 209
production-chain management 361
production cycle 174
production (process and equipment) changes 164–5, 201
  in Brazilian aeronautical sector 182–7
Proença, D.J. 157, 166, 167, 168
Programa de Apoyo al Sector del Software 148–9
Programa de Desarrollo Tecnológico (PDT) 147
project-based revealed technological advantage (PRTA) index 59, 75, 81, 82, 86, 97
property rights 8
propulsion systems 175, 176, 178
public goods 63
Public Key Infrastructure (PKI) 317
public–private partnerships
  in Brazilian aeronautical sector 169
  in Brazilian pulp and paper industry 106, 120, 122
public research institutes, interaction with
  Brazilian aeronautical sector 166–7
  Brazilian pulp and paper industry 122–3
  Indian pharmaceutical industry 13, 28, 41, 42
  Indian telecommunications industry 13, 28–9, 42–4, 45, 46–52, 54
  in knowledge networks in Brazilian ICT sector 14, 71, 72, 73, 75, 81, 82, 86
  Taiwan’s ICT sector 19, 295–6, 307, 308–9
  Thai motorcycle industry 216–17, 223, 225, 227
  Vietnamese motorcycle industry 217–18, 227
public technology procurement in the Indian telecommunications industry 28, 44, 45–6, 48–50, 54
Puerto Montt 254
pulp and paper industry, Australian 104
pulp and paper industry, Brazilian
beginnings of comprehensive
government innovation policy
(1955–1970) 103–7
catch-up learning dynamics and the
second-generation innovation
system 113–16
conclusion 124–5
establishment of learning network
(1900–1955) 100–103
exports 14, 108, 110
innovation, industrial growth and
the culture of entrepreneurship
new institutions in 105–7
production statistics for long- and
105, 108, 109, 113, 128–30
research policy 123, 124
sectoral innovation system today
116–24
shifting learning dynamics of the
sectoral innovation system
world ranking in production 14, 99
pulp and paper industry, New Zealand
104
pulp and paper industry, North
American 100, 101, 104
pulp and paper industry, Portuguese
104
pulp and paper industry, Scandinavian
101, 104
PVC plates 272, 286
Pyka, A. 60
Quadratic Assignment Procedure (QAP) 59, 75–6, 84, 86
Quadros, R. 160
‘quality seal’ standards (sello de
calidad) 246, 249
quality standards see standards
Queiroz, S.R.R. 160
R&D expenditure
Brazilian telecommunications and
computers sectors 71
Indian pharmaceutical industry 30,
35
Indian telecommunications industry
30
Taiwan’s ICT industry 310, 311, 313,
314, 318
Taiwan’s total 292–3, 297
R&D intensity in the Taiwanese ICT
industry 320
R&D-intensive companies (gold
standard companies) 33
R&D outsourcing
Brazilian telecommunications and
computers sectors 71–4
Indian telecommunications industry
44–5
R&D personnel, Taiwan 294
R&D quality systems knowledge
network 59, 69, 70, 72, 77, 79,
81, 82, 84, 85, 97, 98
Rabellotti, R. 135, 232
railways, Brazilian 100, 101, 103,
110
Rajya Sabha 49
ram-press 341, 356, 357
RAMA (2001) 247, 248, 249
Ramani, S.V. 34
Ranbaxy 40–41
rate contract 45–6
Raven, R. 337, 363
Raynolds, L. 232
Reed, G.M. 101
reflexive learning 355, 357, 359
reforestation 102, 106–7, 113
regime
change of 339
influences on development of
Jatropha biofuels in Tanzania
345–52
agricultural regime 349–51, 352,
360
energy regime 345–9, 352, 360
financial regime 351–2
vegetable oil regime 351
regional/local innovation systems 6
Reier, S. 110
renewable Energy Policy Network 343,
348
renewable energy sources 336, 343,
345–6, 361
see also biofuels; Jatropha biofuels in
Tanzania
replacement equipment manufacturers (REMs) 212
replication 6
RESA (2002) 247, 248, 249
research activities knowledge network 14, 59, 69, 70, 72, 76, 77, 78, 80, 81, 82, 83, 84, 85, 86, 87, 95, 97, 98
Research and Development of Key Parts, Components and Products Program, Taiwan 290
Research Group IP (International Programs) 341
Research Institute of Technology for Machinery (RITM) 217
resource-based view 63, 80
retrofitting capabilities 47
revealed technology advantage (RTA) index 75
reverse engineering 28, 34, 35, 163
reverse product cycle 234
Rhode, P. 100
Rhodes, R. 236
Rieiro, M. 138, 146
Rio Claro, São Paulo 101
Rio Grande do Sul 112, 168
see also Federal University of Rio Grande do Sul (UFRGS)
Ripasa 115, 116
risk sharing/co-development partnerships 171–2, 177, 188, 189
robots 270–72, 286
Rocha, M.G. de B. 112, 113
Rodrik, D. 261, 275
Rodríguez-Clare, A. 260, 261
Romer, P. 260
Romijn, H. 138
Rosenberg, N. 7, 9, 10, 158, 159, 173
Rothwell, R. 65
routine capability 163, 165, 202
in Brazilian aeronautical sector 179–88
royalties and fees 273
RPG (Aventis) 40–41
RTA index 75
Rugman, A.M. 64
Rural Energy Area (REA) Tanzania 344
Rural Energy Fund (REF), Tanzania 344
Rwambali, F. 344
S/A Industries Reunidas Francisco Matarazzo 103
Saab 172
Sabel, C. 235
Safe Quality Food (SQF-SOTA) standards 249, 250, 258
salmon farming
Chilean 17–18, 237
concentration of industries 240–41
diverse variety of technologies needed for 242–4
exports 237, 238, 251
FDI in 240–41
global position of industry 238–9
increase in value added in products 241–4, 251
policy implications 252
prices 239
production volume 238
skill development 244
standards developed in 246–51, 258
suppliers to 241–4, 251
growth worldwide 237
production and exports by country 238
SalmonChile see Association of the Salmon Industry in Chile (SalmonChile), formerly Association of Salmon and Trout Producers of Chile
Salter, A.J. 64
Samsung Electronics 275
Samsung SDI 275
Santos, P.T. dos 113
Sanyang Motors 213, 214, 221
São Paulo 101, 102, 105, 116, 118, 121, 168
see also University of São Paulo
São Paulo Research Foundations (FAPESP) 120, 121
satellite telecommunications 301
Saxenian, A. 133, 151
Sayari oil expeller 341, 356–7
SBIR (Small Business Innovation Research), Taiwan 299
Scandinavian pulp and paper industry 101, 104
Sectoral systems of innovation and production

Schmitz, H. 250
Schumpeter, J. 160
SCI database 295
science parks 290, 292, 307, 314
scientific publications 295, 297
Second Pulp and Paper plan (II PNPC), Brazil 114
Second World War 104, 166, 232
sector, definition of 5, 264
sectoral system framework 5–12, 160–61, 233
aggregation issue 12
boundaries of 9, 10–11, 233
broad, open and flexible framework 12
in context of developing countries 207–8, 234–7
differences between national innovation system perspective and 11–12, 158
elements of 5, 6–11, 29, 132–2, 207, 233, 264
evolutionary theory and 5–6, 7, 9, 57–8, 233
innovation system literature and 6, 264
Sedjo, R. 116
Seed Net 309
SEED Plan (Software Engineering Environment Development), Taiwan 308–9
selection 5, 6, 132
in Brazilian pulp and paper industry 100, 101
in Uruguayan software industry 133
Selela 359
semiconductor industry, Taiwan 19, 295, 303, 304, 312, 327
semiconductor production equipment 262, 273, 274
semiconductors product development knowledge network 14, 59, 69, 70, 73, 76, 77, 78, 79, 81, 82, 84, 95, 97, 98
Seoul National University 274
SEPIN 67, 71, 72
SERNAP see National Fishery Service, Chile (Servicio Nacional de Pesca: SERNAP, later SERNAPESCA)
SERNAPESCA see National Fishery Service, Chile (Servicio Nacional de Pesca: SERNAP, later SERNAPESCA)
Servício Florestal do Brasil 101
Shen, R.-J. 330
Shenzhen 326
Shuma, J. 361
Siemens 52, 324
SIGes (Sistema Integrado de Gestions: Integrated Management System) 247, 249, 258
Silicon Plaza 148
Silicon Valley 133, 307
Silveira, J.M. da 116
silviculture 99, 105, 111–12
Simmie, J. 146
Simon, H.A. 61
Singer, H.W. 232
Singh, H. 66
Singh, Manmohan 55
Sjolander, S. 69
skilled workers, availability of in Brazil 117
in Chile 244
in India 35
in Taiwan 287, 293–4
in Uruguay 15, 136, 141
small and medium-sized firms enterprise resource planning (ERP) products for 136
making a technological catch-up in the Korean capital goods industry see capital goods industry, Korean
technological capability of local SMEs in the Brazilian aeronautical sector 16, 157–8
analytical framework for studying 164–5
characteristics of local SME supplier firms 175–7
government policies for upgrading 193
linkages for each group of SME suppliers 184–92
results on technological capacity accumulation by local SME suppliers 179–90
selection of sample 174–5

Franco Malerba and Sunil Mani - 9781849802185
Downloaded from PubFactory at 09/16/2023 07:20:05PM
via free access
in Uruguayan software sector 15, 137, 138, 141, 147, 150, 152
Small Business Innovation Research (SBIR), Taiwan 299
SME 007 Plus 213, 223, 225, 227, 228
Smith, Adam 260
Smith, S.E. 39–40
smuggling 216, 344
Snoeck, M. 131
soap-making 341–2, 359
social network analysis 60
social responsibility 109, 110, 113, 116, 124
Sociedade de Investigações Florestais 120, 121, 123
SOE award 319
software consulting services 138, 139
software development, firms engaged in 138, 139
software product development knowledge network 14, 59, 69, 70, 73, 76, 77, 78, 79–80, 81, 82, 83, 84, 85, 86, 87, 95, 97, 98
software sector, Montevideo, Uruguay 15, 131–53
conclusions and policy implications 150–52
emergence and development of 132, 135–8
exports 131, 148–9
key characteristics of sample of firms 138, 139
knowledge base of 134–5, 151
learning processes and innovation outcomes 132–3, 138–46
primary data collection 133
role of public policy 146–7
sectoral systems of innovation (SSI) framework for analysing 132–3
size and growth of 134
supporting institutions and private networks 133, 144, 145, 147–50, 152
solar power 336, 346
Sonaca 171
SOTA (Salmon of the Americas) 249
‘special quality’ 235
specific tools sector, Korean 277
spin-offs
Embraer founded as 167
in Uruguayan software sector 15, 140, 141–2, 145–6, 151
SS7 Intelligent Network signalling systems 46, 47
stage-skipping catch-up 277
standardized software 134, 138
standards
in Brazilian aeronautical sector 182–3
in Chilean salmon industry 246–51
collective capabilities and role of Association of the Salmon Industry 248–9
details of 258
factors that make firms comply 247–8
historical perspective 246–7
influence on external standard-setting 249–51
Chinese ICT standards 308, 321
for developing countries in the global context 237, 245–6
in Indian telecommunications industry 46
in Thai and Vietnamese motorcycle industries 214, 215, 219, 224, 226
Stankiewitz, R. 6, 264
Stanturf, J.A. 100, 101
State of São Paulo Research Foundations (FAPESP) 116
Staubman, R. 341
Stefanuto, G.N. 83
Stigler, G. 260
Stoker, G. 236
Stolovich, L. 133, 138
StoraEnso 114–15
Storper, M. 151
strategic alliances
Brazilian pulp and paper industry 118, 122
BRIC countries 193
risk sharing/co-development partnerships in Brazilian aeronautical industry 171–2, 177, 188, 189
strategic niche management (SNM)
20, 336
applicability for developing countries
362
description of SNM approach 337–9
extensions to 362–3
limitations of 362
niche analysis for Jatropha biofuels
352–9
dynamic niche formation at the
cultivation stage 353–6
fieldwork methodology 352–3
fragmented niche dynamics at the
oil processing stage 356–7
rudimentary niche formation at
the end-use stage 358–9
subcontracting 269, 320
Subramanian, D. 44
Subsecretaria de Pesca 248
sulphate pulp process 101, 104–5, 107,
108
sulphite pulp process 101, 102, 103, 104
Sunley, P. 151
Sunstar Co. 273
suppliers
to Chilean salmon farming industry
241–4, 251
knowledge flows from 144, 184,
188–90
technological capability of see
technological capability
Survey of National Science and
Technology Activity, Taiwan 292
sustainable development 336
Sutz, J. 145, 152
Suzuki 212, 213, 214, 221
Swan, JA. 66
system of innovation approach 158–61
Szapiro, M. 83
tacit knowledge
in communities of practice 66
converted into explicit knowledge
through software 266
of Embraer suppliers 191
innovation project approach and
59, 60
from interface between producers
and customers 260, 265, 266,
279
Taiwan
growth drivers since 1990 289–91
industrial structure change 289–91
trends in productivity 290
trends in venture capital and FDI
290–91
ICT industry in
Challenge 2008 Program 288, 301,
305, 316
Chinese standards adopted in 308,
321
current status of information
society 318
demand conditions 315–16
deregulation of
telecommunications 291,
301–2, 307, 309, 319
e-Taiwan Program 288, 304–5,
309, 317, 319
evolution from a historical
perspective 308–9
expenditure to GDP ratio 287
exports 315–16
FDI in China 306, 314–15, 323–33
hardware sector output 287
industry performance of 312–15
infrastructure of 316–18
interaction with research institutes
19, 295–6, 307, 308–9
interaction with universities 296–7
internet penetration rate 318
internet subscribers 287, 318
M-Taiwan Program 288, 305, 317,
319
methodology and analytical
framework for study of 288–9
motivation and objectives 287–8
performance and demand
conditions 309–10
policy implications 318–23
product differentiation in 308, 320
Projects A, B, C, D and E 288,
302–3, 304, 307, 316, 318–19
software sector output 287
technology performance of
310–12, 313
Two Trillion Twin Stars
programme 287, 303–4
major policies and governance
298–308
existing industrial policies 298–300
knowledge flow and interactions
with outside 307–8
major new policies 301–5
mode of governance 305–7
transformation of innovation system 292–8
education systems and human
capital 293–4
patents and publications 294–5, 296, 297
role of research institutes 295–6
role of universities 296–7
Taiwan Intellectual Property Office
(TIPO) 296
Taiwan Ministry of Economic Affairs
(MoEA) 19, 288, 289–90, 292, 296, 299, 300, 302, 304, 305, 308, 317
see also Department of Industrial
Technology, Ministry of
Economic Affairs (DoIT/MoEA), Taiwan
Taiwan Ministry of Education 293
Taiwan Ministry of Finance 309
Taiwan Ministry of the Interior 305
Taiwan Ministry of Transportation
and Communications 309
Takeuchi, H. 89
Taller de Informática 146
Tanzania
energy policy in 344–5
poverty-related indicators for 343–4
total surface area 344
see also Jatropha biofuels in
Tanzania
Tanzanian Ministry of Agriculture and
Minerals 352
Tata Consultancy Services (TCS) 148
tax incentives
Brazilian aeronautical sector 168, 190
Brazilian forestry sector 102, 107
Brazilian ICT sector 58, 67, 69
Indian pharmaceutical industry 33
for Jatropha niches 360
in mainland China 325
for R&D and personnel training in
Taiwan 299, 304, 321
Uruguayan software sector 147, 148
TCP/IP internet communication
agreement 309
TD-SCDMA 317
TDP-contracted research institutes 300
technological capability
catch-up in the Korean capital goods
industry see capital goods
industry, Korean
definitions of 161–2, 165
domains of 162–3, 165, 202–3
evolutionary perspective and 161
levels of see innovative capability;
routine capability
obtaining in developing countries
207–8, 228, 235–7
see also collective capability
relationship between technological
change and 164
of suppliers in Brazilian aeronautical
sector 16, 157–8
analytical framework for studying
164–5
characteristics of foreign suppliers
located in Brazil 177–9
characteristics of local SME
supplier firms 175–7
government policies for upgrading
193
linkages for each group of SME
suppliers 184–92
results on technological capability
accumulation by local SME
suppliers 179–90
selection of sample 174–5
of suppliers in Thai and Vietnamese
motorcycle industries 212–13, 215, 218, 223–8
technological change
levels and domains 164–5, 201
implemented by SMEs in Embraer
supply chain 182–7
linkages contributing to
implementation in Embraer
supply chain 184–92
relationship between technological
capability accumulation and
164
and system of innovation literature
159
technological Institute of Aeronautics (ITA) 167
sectoral systems of innovation and production

Technological Institute of Aeronautics (ITA) 167

Technological intensity 232, 234, 235

Technological niche, creation of 338, 360

Technological opportunities 10, 63, 66, 79, 80, 87

Technological services knowledge network 14, 59, 69, 70, 72, 76, 77, 78, 80, 81, 82, 84, 85, 86, 95, 97, 98

Technological systems 6, 264

Technological training knowledge network 14, 59, 69, 70, 72, 76, 77, 78, 80, 81, 82, 83, 84, 86, 87, 95, 97, 98

Technology deterministic perspective 65

Technology Development Programs (TDP), Taiwan 299–300, 318–19

Technology Information and Forecasting Assessment Council, India 52

Technology licensing 260, 265

Technology Research Program for Innovative Services, Taiwan 316

Technology transfer 19, 163, 181, 189, 190, 223, 228, 297, 307

Technopress 240, 242

Teece, D. 6, 59, 63, 66

Teeselink, M. 153

Telecommunications industry, Chinese 42–3

Telecommunications industry, Indian dependent on imports 13, 27, 29, 44 domination by MNCs 13, 27, 29, 30, 44, 52

government research institute 13, 28–9, 42–4, 45, 46–52, 54

Innovative performance of 12–13, 27, 30–31, 53–4

Manufacturing enterprises 52–3

outsourcing deals between foreign MNCs and Indian contract research organizations 44–5

Patents granted 27, 30

Public technology procurement 28, 44, 45–6, 48–50, 54

R&D expenditure 30

Sectoral system of innovation 13, 28–9, 41–53, 54

Technical standards 46

Telecommunications industry, Taiwan 288–9

deregulation of 291, 301–2, 307, 309, 319

Exports 315–16

Further development of 311

National Science and Technology Program for 313, 314, 317

Policy suggestions for 322

R&D project funding and manpower 312

Revenues to GDP ratio 302

Shipments value of products 315

See also mobile communications industry

Teng, B.S. 66

Thai Automotive Institute 209, 215

Thai German Institute 216–17

Thai Ministry of Commerce 223

Thai Ministry of Industry 215, 223

Thailand

Economic growth rate 218

GNI per capita 218

Motorcycle industry in see motorcycle industry, Thai and Vietnamese

Thaksin administration 215

Thompson, J.D. 58, 65

Tidd, J. 57, 58, 62

TIER 320

Tiger Motorcycle 209, 212–13, 223, 225, 227–8

TIRDO 363

Toivanen, H. 100, 101, 102, 104

Tokai 273

Torch Programme 55

Tourism 208

Toyota 216

Trade balance

between Taiwan and mainland China 323, 329–30

Indian pharmaceutical industry 30

Indian telecommunications industry 30

Korean machine tool industry 259, 261–4, 276

Transaction cost theories of the firm 62–3
transaction costs 246
transportation costs 347
TRIPS compliance 13, 28, 34–5
trust building 354
tuberculosis 35
Tunduru 352
turbines 179
Tushman, M.L. 66
Two Trillion Twin Stars programme 287, 303–4
Tzeng, G.K. 293

Uisso, J.P. 344
UMC 320
UNCTAD 135, 228
UNDP Human Development Index 343
UNIDO 341
United Kingdom
biofuel blends in 347
Korean machine tool exports to 278
United States, Korean machine tool exports to 277, 278
Universidad de la República 146
university–industry linkages
Brazilian aeronautical sector 188–92
Brazilian ICT sector 68
Brazilian pulp and paper industry 106, 117, 119, 120, 122
literature on 89
Taiwanese industry generally 296–7
Thai motorcycle industry 216, 223, 225, 227
Uruguayan software sector 141, 144, 145, 146
Vietnamese motorcycle industry 217, 227
University of Dar es Salaam 347, 358
University of São Paulo 106, 112, 117, 119, 121, 122
University ORT of Uruguay 146, 147
Uruguay
literacy rates in 136, 137
participation in education in 136
real GDP growth 136
software sector in see software sector, Montevideo, Uruguay
Uruguayan Business Association of Information Technologies (CUTI) 131, 133, 148–9, 150
Uruguayan Ministry of Education and Culture 147
US Forest Products Laboratory, Madison, Wisconsin 102
Usage Component Index 310
user fees for telecommunications 321
USMC 320
Valença, A.C. de V. 114
Valle, C.F. do 114
value added
increases in Chilean salmon farming industry 241–4, 251
increases in Thai motorcycle industry 222, 227
of Taiwan’s ICT industry 320
van der Laak, W.W.M. 354, 355, 356, 357, 359, 363
van Eijck, J.A.J. 336, 363
Vanderveest, P. 237
variety creation 5, 6, 89, 132, 133
Vega, M. 65
vegetable oil regime, Tanzanian 351
Veloso, F. 136
venture capital 290–91
Veracel Celulose 114–15, 118
Vietnam
GNI per capita 218
motorcycle industry in see motorcycle industry, Thai and Vietnamese
Vietnam Academy of Social Science (VASS) 210
Vietnam Engine and Agricultural Machinery Corporation 217
Vietnam Institute of Economics 210
Vietnam Manufacture and Export Processing Co., Ltd. (VMEP) 213, 214, 221
Vietnamese Ministry of Industry 217, 229
Vietnamese Ministry of Transport 229
Viotti, E. 159–60
Visser, J. 341
Voith 117–22
von Hippel, E. 58
von Tunzelmann, N. 60, 66, 89, 232, 233, 234, 236, 254
Votorantim Celulose e Papel 114, 115, 116, 118
W-CDMA 317
wages 109, 328
Wal-Mart 249, 258
Walker, G. 66
Waltring, F. 237
wars 337
Wasserman, S. 60
Wave α motorcycle 222
Weber, M. 363
Wehn, U. 134
Weiszflög, Hasso 102
Wenger, E. 66
Westphal, L.E. 162
Whitelaw, J.A. 148
Williamson, O.E. 60, 62
WiMAX 55
wind power 336, 346
Winter, S.G. 6, 158, 161
WITSA 135
WLAN 317
Woodward, J. 58, 65
World Bank 114, 118, 136, 137, 153, 218, 343
World Fact Book 343
World Resources Institute 346
World Trade Atlas 220
World Trade Organization (WTO) 34, 172, 301
Wright, G. 100
Wu, R.-I. 291, 306
Yamaha 212, 213, 214, 221, 222, 227
Yaskawa 272
Yin, K.K. 174
Young, A. 260
Young, J. 109
Yu, T.S. 289
Zanfei, A. 65
Zeidan, R.M. 115
Zonamerica Business and Technology Park 133, 148
ZTE 44