Index

academic spin-offs 47
Acha, V. 139, 166, 168, 170
added-value solutions 76
AEGIS survey 25, 36, 46, 222
dynamic capabilities 144
European Union 68, 73, 74, 75–81
product supply chains 167, 171, 176
age of firm 27, 102, 104
alertness 122, 220
Arundel, A. 168
Austria 203, 204
‘Austrian paradox’ 206
Barcelona target 207, 208
Belgium 203, 204
Bender, G. 228
Benefit of the Doubt (BoD) 198
binomial distribution (Bernoulli) 105
Birch, D. 118, 123–4
‘black boxes’ 210
Brazil 70
Bröring, S. 142
Bush, V. 197, 208, 209
capabilities 44–5, 84, 220–21, 230–31
absorptive 2, 86, 90
bricolage 51
learning 195
managerial 88
organizational 86, 89
production 89
R&D 33
technological 88, 89, 90
transformative 50–52, 220–21, 231
see also dynamic capabilities
capability-driven pattern 49, 55–7, 61, 62
China 70
clothing sector see textiles and clothing sector
codified knowledge 195
collaboration agreements 31–2, 33
see also technological collaborations
Commission of the European Community 227, 234
Community Innovation Survey (CIS) 32, 196
corporate entrepreneurship 2, 9, 47, 49, 55–6, 57, 58, 73
cost competition 34, 58, 74
see also impact of KIE on growth and competitiveness of European traditional industries
Competitiveness and Innovation framework Programme (EU) 229–30
complementarity 48, 89
Confirmatory Factors Analysis (CFA) 147, 162–5
cost competition 34, 58, 74
see also collaboration agreements
copyright 35
cost competition 34, 58, 74
Croatia 26, 74, 145
cultural factors 233
cumulativeness 207
customer-oriented firms 23, 24, 51, 95, 98–9, 145, 221
product supply chains 168–9, 170–71, 174, 176–80, 186
Czech Republic 26, 74, 145, 202, 203, 204
Knowledge-intensive entrepreneurship in low-tech industries

demographic characteristics 27–8
Denmark 26, 199, 203, 204
dynamic capabilities 145
Export Council 224–5
growth and competitiveness of traditional industries 74, 75
patterns of KIE 47, 50, 52, 55
policy measures 224–5
product supply chains 176–80, 186
disembodied knowledge 179, 182, 186
DISKO survey (Denmark) 199
distributed knowledge bases 23, 63
Doing, Using and Interacting (DUI) 199
dynamic capabilities 138–57, 162–5
AEGIS survey 144
alliance-related 163
case-study data, description of 153
Confirmatory Factors Analysis (CFA) 147, 162–5
development per case-study firm 155
environmental dynamism 140–41, 143
firm selection criteria 150
firm size 151
food and beverage sector 142, 143, 144, 145, 148–9, 150, 152–6
globalization 142
industrial distribution (sample) 145
innovation 142–3, 151
licensing and contracting out research 147
market-sensing 145–6, 151–4, 155, 156, 162, 165
methods 144–50
empirical strategy 144
qualitative case studies 148–50
quantitative survey 144–5
quantitative variables 145–8
technical cooperation agreements 147
networking 146–7, 150, 151, 154–5, 156, 157, 164, 165
new product development (NPD) 146, 151–2, 154, 155, 163, 165
performance measures 148
product differentiation 151
R&D 147, 156, 163
regulatory changes 143
reliability analysis 165
results 150–55
case analyses 152–5
impact of dynamic capabilities on performance 150–52
social changes 143
strategic alliances 147
technological collaborations 147,
150, 151–2, 154–5, 156, 164, 165
technological innovation 151
technology pressure 142–3
technology-sensing 145–6, 150, 151–2, 154, 155, 156, 162, 165
textile and clothing sector 142, 144, 145, 148–9, 150, 152–6
theoretical background 139–44
relevance of dynamic capabilities to low-tech industries 139–41
volatility of global environment 142–3
trade liberalization 142
wood and furniture sector 142, 144, 145, 148–9, 150, 152–6
EC Directorate-General for Research and Innovation 194, 202
eco-innovation 230
educational attainment and expertise 75–6, 83
embodied knowledge 31
entrepreneurial management 138
entrepreneurship 19, 138, 234–5
see also corporate entrepreneurship
environmental changes 166, 175
environmental dynamism 140–41, 143
Estonia 203, 204
European Commission 89, 199, 205, 228
European Industrial Policy 68
European Union 5–6, 203, 204, 222
dynamic capabilities 144, 145, 148–9
new policy rationale 193–4, 202–06, 208–09
triadic competition with Japan and United States 208, 209
see also impact of KIE on growth and competitiveness of European traditional industries
Eurostat 175
evolutionary economics 195, 196, 206, 208, 209, 211
exaptation 185
external knowledge sources 30, 37, 76, 86, 89, 179, 182, 186
Fagerberg, J. 82
Faulkner, W. 186
Finland 203, 204
firm-specific knowledge 172, 174, 179, 181, 182, 184
first-movers 47, 88
Fischer, B. 171
food and beverage sector
Denmark 178
dynamic capabilities 142, 143, 144, 145, 148–9, 150, 152–6
Greece 148
growth and competitiveness 69, 70, 71, 72, 75, 85, 88
patterns of KIE 52, 54, 55
policy measures 222, 225, 229
Portugal 96
product supply chains 168, 169, 175, 176–80, 186
footwear sector 70, 96
foreign direct investment 202, 205
France 26, 74, 145, 203, 204
Frascati Manual 198
Friesen, P.H. 140
Fritsch, M. 230
funding/finance 29, 60–61, 221, 222, 224–6, 229–30
furniture sector see wood and furniture sector
Gauch, S. 96
‘gazelle-firms’ 9, 118, 119, 122–8, 235
competitive advantage 127
cost advantages 127
demand, lack of 132
Ekspert 123
entrepreneurial alertness 122
exponential growth and rapid evolution 128–34
financial resources 132
global financial crisis (2008) 124
import of Western goods 127
inflation 123
infrastructure improvements 128
lines of production 128
management recruitment difficulties 132
modernization 125
motivation 133
network effects 133
number of 124
profits, reinvestment of 132
proprietary R&D departments 127
qualitative improvements 127–8
quality of exponential approximation and non-gazelle revenue dynamics 131
resource constraints 132
sectoral structure of population 125
and structural changes 126
training management personnel 132
Germany 26, 145, 203, 204
Export Council 225
growth and competitiveness of traditional industries 74, 75, 85
patterns of KIE 47, 53, 54, 58, 59
policy measures 224, 225
product supply chains 180–85, 186
dynamic capabilities 142, 143, 144, 148
Russia 124
globalization 70–71, 89, 142, 205
globally available knowledge 220
Godinho, M.M. 106
Greece 26, 145, 203, 204
dynamic capabilities 144, 148–9, 150
growth and competitiveness of traditional industries 74, 75, 85–6
patterns of KIE 47, 51–2, 58
Greenhalgh, C. 96
Griffiths, W.E. 96
growth 8, 43, 69
see also high-growth LMT firms in Russia; impact of KIE on growth and competitiveness of European traditional industries
Grupp, H. 198
Knowledge-intensive entrepreneurship in low-tech industries

Heidemann Lassen, A. 9
Heidenreich, M. 89, 167, 168, 170, 171, 176
Helfat, C.E. 140, 144
Henrekson, M. 118
high-growth LMT firms in Russia 117–35
educational and scientific potential 119
innovativeness 117
National Innovation System (NIS) 119, 120, 122
policy implications 134–5
R&D expenditures 117, 118–19, 135
R&D system, collapse of 120–22
researchers, numbers of and R&D intramural expenditures 121
see also ‘gazelle-firms’
high-tech firms 4–7, 18–22, 24–6, 68, 141
high-tech and low-tech manufacturing sectors: differences and similarities 17–38
data and definitions 25–7
empirical results 27–35
demographic characteristics 27–8
formal collaboration agreements 31–2, 33
formation phase 28–9
innovation performance 32–5
knowledge sources 29–31
networking activities in day-to-day firm operations 31, 32
sources of funding for new firm creation 29
firm distribution per country and sectoral group 26
high-tech manufacturing sector 27
low-tech manufacturing sector 27
medium-high-tech manufacturing sector 27
medium-low-tech manufacturing sector 27
sample sectoral distribution 27
theoretical background 20–25
high-tech and medium-high-tech (HMT) industries 4, 5–6, 18–19, 25–6, 28–31, 33–5
European traditional industries 67, 89
Hirsch-Kreinsen, H. 23, 36, 168–9
Hosmer, D.W. 105
human capital 21, 73
see also educational attainment and expertise; labor-skills
human resource policies 205
Hungary 202, 203, 204, 210–11
imitation 134
impact of KIE on growth and competitiveness of European traditional industries 67–90
absorptive capability 86
capacity competitiveness 82, 87
challenges and transformations 69–73
global financial crisis (2008) 69–70
globalization, process of 70–71
technological transformations 71–3
characteristics of KIE and non-KIE firms, differentiation in 77–8
competence-/capability-building 84
demand competitiveness 82, 87
empirical analysis 73–87
AEGIS survey analysis 73, 74, 75–81
case-study analysis 81–7
export intensity, differentiation in 81
firm level 82, 83–5, 86
firms’ performance, differentiation in 79
formal appropriability methods, differentiation in 78
market and sector expansion 86
meso-level 82
new, innovative products and processes creation 83–4
openness to international markets, differentiation in 81
organizational capability 86
policy implications 87–90
firm level 87–8
sectoral level 88–9
predicted performance, differentiation in 80
price or cost competitiveness 82, 84–5, 87
sector level 85–6
sectoral knowledge base, expansion of 85
structural competitiveness 82
technology or technological competitiveness 82, 87
value chain, diffusion into 85–6
incremental innovation 6, 21, 23–4, 43–4, 54–5, 57, 59–60, 175, 235
India 70
Industrial Marketing and Purchasing Group (IMP) interaction model 167, 171
industry knowledge 30
innovation 18–19, 156, 234–5
activities 22
architectural 9, 24, 45, 52, 221, 235
capabilities 83, 220
chain-linked model 197
dynamic capabilities 142–3
dynamics 96
eco-innovation 230
global 36
informal 118
internal 186
linear model 197, 227
market-pull model 197
modular 9, 24, 45, 57, 221, 235
networking 197, 232–3
opportunities 3–4
organizational 2, 34
performance 32–5
policy 221
Portugal 96
process 24, 33–4, 36, 52
product 24, 36
radical 35, 54–5
Russia 134
strategy 86
systems 2–3
technological 72, 143, 151
type 43
see also incremental innovation; new policy rationale; patterns of KIE; science, technology and innovation (STI) policies
Innovation Union Scoreboard
(European Innovation Scoreboard) 194, 198, 199–201, 205
intellectual property protection 35, 76, 102, 106–07, 114
internal knowledge see firm-specific knowledge
international cooperation 89
international exposure 79
internationalization 202
see also globalization
investment 69
promotion policies 205
see also foreign direct investment
Ireland 202, 203, 204, 210–11
Italy 26, 74, 145, 202, 203, 204
Japan 70, 208
Jensen, M.B. 199
Johansson, D. 118
KEINS project 21
Key Enabling Technologies (KETs) 89–90
knowledge bases 7, 172
knowledge flows 172, 182
knowledge management 138
knowledge sources 29–31, 179, 182, 186
knowledge-intensive activities 176–7, 180–81, 185
knowledge-intensive business services (KIBS) 21
Krasnikov, A. 96
labor-skills 21, 73–4, 76, 89, 99, 195
Laestadius, S. 208
Latvia 203
lead users 25
learning culture, established 51
learning, exploitative 73
learning-by-doing 23
learning-by-using 23
leather sector 69, 70
Lemeshow, S. 105
Lisbon Agenda 207
Lisbon Strategy 222
Lithuania 203
lock-in situations 207–08
Logit Regression Model 105
Luxembourg 204
main features of KIE 2–4
mainstream economics 195, 207, 209, 211
Knowledge-intensive entrepreneurship in low-tech industries

Makkonen, H. 144
Malerba, F. 1–2, 9, 20, 150
management methods 231
management sphere 134
Mangani, A. 96
March, J. 73
market failure 195, 207, 309
market knowledge 22, 30, 179
market opportunities 56–7, 88
market-driven pattern 24, 49–52, 61, 62
market-shift recognition 145
marketing sphere 134
McKelvey, M. 2, 9, 20, 150
Mendonça, S. 95–6, 171–2, 185, 231
metal sector 145
growth and competitiveness 69, 70, 75, 85
patterns of KIE 52, 53, 56, 58, 59, 61
policy measures 222, 226
product supply chains 168, 169
Miller, D. 140
Millot, V. 96
Mokyr, J. 17
multi-channel interactive learning model (networked model of innovation) 197
multi-establishment firms 107, 108, 112, 113
multidimensional representations 198
Netherlands 203, 204
networking 2–3, 31, 32, 37
dynamic capabilities 146–7, 150–51, 154–7, 164–5
innovation 232–3
Russia 133, 134
new customer demands 220, 221
new customer preferences 60
new firms 106, 108, 109, 110, 111, 114
new innovative firms 72–3
new innovative products and processes creation 83–4
new market segments 88, 221
new markets knowledge 220
new policy rationale 193–213
Community Innovation Survey 196
composite indicators 198, 210–11
derived from theories 195–7
design indicators 198
economic impact of innovation (index) 203
economics of innovation 194–5
European Union 193–4, 205–06, 208–09
evolutionary economics 195, 196, 206, 208, 209, 211
high-tech industries 204, 205–08
HM and MT contribution to trade balance 203
indicators 197–205
innovation activities 197–8
innovation intensity indicators 198
innovation models 197
innovation systems approach 207
Innovation Union Scoreboard (European Innovation Scoreboard) 194, 198, 199–201, 205
innovation-driven structural change 206–07
internationalization dimension 202
knowledge-intensity of economy 203
mainstream economics 195, 207, 209, 211
market failure 195, 207, 309
networked model of innovation 208
new league table: research and innovation performance in EU and associated countries 202–05
OECD 193–4
R&D activities 196, 197–8, 209
R&D dimension 202
R&D indicators 198
R&D intensity 203, 208–09
R&D-based innovation 199
research and innovation performance in EU 203
science, technology and innovation (STI) policies 193, 197, 205, 208, 209
science and technology (S&T) excellence 203
science-push model 206–07, 208
sectoral specialization dimension 202
skill indicators 198, 202
specialization dimension 202
systemic failures 209–11
systems of innovation approach 208
  technological indicators 198
new policy regulations 60
new product development (NPD) 146, 151–2, 154, 155, 163, 165
new production processes 87–8
niche markets 88

OECD countries 8, 18, 193–4, 205, 206, 228, 235
four-tier model 26
openness 79
opportunities for KIE 8–9
organizational concepts 231
organizational process structures 24
organizational proximity 233
original equipment manufacture (OEM) 183
Oslo Manual 198

paper and printing sector 69, 70, 72, 75, 96, 145, 169
Patel, P.R. 166
patents 21, 207, 413
path-dependency 7, 21–2, 44, 62–3, 207, 219
fixed 8
technological transformations in European Union 71
patterns of KIE 42–64
academic spin-off 49
analytical framework for empirical analysis 43–6
case studies 49
complementary factors 62
conceptual framework 44
corporate entrepreneurship 49
determining factor 62
empirical findings 48–61
capability-driven 49, 55–7, 61, 62
competitive/sectoral pressure 49, 57–60, 61, 62
complementary factors
  mainly market opportunities 56–7
  profound technological knowledge 53–4
  specific incremental innovation culture 59
transformative capabilities 50–52
  intervening factors 60–61
market-driven 49–52, 61, 62
outcome
  architectural innovations 52
  far-reaching incremental innovations 60
  mostly modular incremental innovations 57
towards ‘radical’ incremental innovation 54–5
science and technology-driven 49, 52–5, 61, 62
entrepreneurial opportunities 44
impact of patterns 45
incremental innovation 54–5, 57, 59, 60, 62
industrial start-up 49
innovation 45
intervening factors 45, 60–61
local level of firm and/or actor 44–5
methodology 46–8
data base 46–7
moderating factors 62
sectoral system, level of 44
theoretical and policy implications 61–4

Pavitt, K. 168, 169, 176
Peneder, M. 206
performance measures 148
Peteraf, M.A. 140
PILOT project 68
Poland 203, 204
policy measures for promotion of KIEs 218–36
  awareness and understanding, increase in 227–8
  capabilities 220–21, 230–31
  company-specific knowledge and innovation capabilities 220
  competitive pressure 219
  empirical findings: limited support from public measures and policy 221–6
  LMT-specific support absent 222–4
  selective support from multiple policy levels 224–6
general recommendations 226, 227–30
globally available knowledge 220
inclusive policies 228–9
innovation networks 232–3
interrelationships between LMT and high-tech, promotion of 233–4
key drivers 219–21
needs of firms, focus on 229
new knowledge, integration and use of 220
opportunities, identification of 220
path-dependency 219
policy recommendations 226–34
reflective approach 219–20, 221
skills and knowledge base improvement 231–2
specific recommendations 227, 230–34
startup funding 224–6, 229–30
technology push 225
transformative capabilities 220–21, 231
Portugal 26, 145, 203, 204
growth and competitiveness of traditional industries 74, 75, 85
patterns of KIE 47, 56, 59, 61
policy measures 225
see also trademark use in Portugal
power-dependence relation 183, 186–7
practical knowledge 22–3, 179, 220
price or cost antagonism 22
principal component analysis 198
printing sector see paper and printing sector
process knowledge, firm-specific 179
process technologies 37
product differentiation 95, 98, 151
product field-specific knowledge 53, 172, 181
product quality and variety 96
product supply chains 166–87
analytical framework 173
attitude 178
business strategy 184
buyer–supplier interactions 171
case studies 175–85
DanCream: customer organization (Denmark) 176–80, 186
E-Thread: supplier organization (Germany) 180–85, 186
Community Innovation Survey (CIS) 170–71
competences 177
conflicts 182–3
cross-sectoral 172
customer-oriented firms 168–9, 170–71, 174, 176–80, 186
demand 170–71
firm-specific knowledge base 172, 174, 181, 184
impact 179–80, 184
innovation-process specialists 168–9
inter-sectoral relations 170
interaction process and its atmosphere 174
interorganizational relations 170, 172
inventor 177
investment and innovation strategies 186
knowledge bases 172
knowledge flows 172, 182
knowledge flows, disembodied 179, 186
knowledge sources 186
knowledge-intensive activities 176–7, 180–81, 185
LMT firm 177, 181
macro-environment and atmosphere 183–4
main driver 181
motivation 181–2
new market niches 169
organizational factors 174
position of firm 186
power-dependence relation 183, 186–7
process specialists 169
readjustment of perspective 170–75
scale-intensive firms 168–9
sector- or product field-specific knowledge base 172, 181
sources of knowledge 179, 182
supplier-dominated firms 168, 170–71, 176, 178, 180–85, 186
Index

- technology 186
- trigger 178
- widely applicable knowledge base 172
- work experience 177
- Protogerou, A. 31

- qualitative analysis 17
  - dynamic capabilities 139, 144, 156
  - growth and competitiveness of European traditional industries 82, 87
  - patterns of KIE 46, 48
  - product supply chains 175, 176
  - see also AEGIS
- quality competitiveness 74
- quantitative analysis 17, 139, 144, 156, 207

R&D
- -based product innovation 24
  - capabilities 33
  - collaborations 37
  - cooperation agreements 31, 32
  - dynamic capabilities 144, 147, 156, 163
  - expenditure 227–8
  - external 29
  - in-house 22, 29–30, 76
  - indicators 228
  - intensity 4–6, 18, 26, 35, 72, 231
  - investment 21, 222
  - levels 23
  - product supply chains 184
  - Russia 117, 118–19, 120–22, 135
  - see also new policy rationale
- reflective approach 219–20, 221
- regional development policies 205
- regional embeddedness 61
- regional proximity 114, 221
- relevance of low-tech industries 4–6
- reliability analysis 165
- revealed comparative advantage (RCA) 70
- Robertson, P.L. 166, 168, 171, 172
- Rogers, M. 96
- Romania 203
- Russia 70
  - see also high-growth LMT firms in Russia
- sales and exports 7, 74, 79–80
- scale-intensive firms 23–4, 168–9
- Schmoch, U. 96
- Schubert, T. 198
- Schumpeter, J. 2, 18–19, 55, 117
- Schwinge, I. 23, 36
- science, technology and innovation (STI) policies 193, 197, 205, 208, 209
- science and technology-driven pattern 49, 52–5, 61, 62
- science-push model 197, 206–07, 208
- scientific knowledge 2, 23, 31, 199, 220
- sectoral and firm level, differentiations between 6–7
- sector-specific knowledge base 172, 181
- sensitivity analyses 198
- Slovakia 202, 203
- Slovenia 202, 203, 204
- SMEs 229, 230, 234
- Smith, K. 68, 168, 172
- social capital 83
- sociological factors 209
- Spain 203, 240
- spin-offs 47
- start-ups 47, 55, 57
- strategic alliances 147
- supplier-dominated firms 168, 170–71, 176, 178, 180–85, 186
- Sweden 26, 74, 145, 203, 204
- systemic failures 209–11
- systems of innovation 2–3
- tacit knowledge 195
- technical cooperation agreements 31–3
- technical process structures 24
- technological change 19
- technological collaborations 147, 150, 151–2, 154–5, 156, 165
- technological diversification/expansion 24–5
- technological innovation 143, 151
- technological knowledge 2, 22, 53–4, 199
- technological opportunities 57
- technological product or process bottlenecks 58–9
- technological transfer mechanisms 89
technological transformations 71–3
technology
fusion 24
see also science, technology and
innovation policies; science and
technology-driven pattern
technology-push 52, 225
Teece, D.J. 138, 141, 145
textiles and clothing sector 58
dynamic capabilities 142, 144, 145,
148–9, 150, 152–6
Germany 180
Greece 148
growth and competitiveness 69, 70,
71, 72, 75, 85, 86, 88
policy measures 222, 225, 229
Portugal 96
product supply chains 169, 180–85,
186
theoretical knowledge 23
‘Think small first’ principle 234
tobacco sector 70, 75, 145
trade fairs 37
trade liberalization 142
trademark use in Portugal 95–115
asymmetric distribution 113
bivariate correlation matrix 110
co-location 109
data 97–8
descriptive statistics for variables in
regressions 111
determinants 105–13
estimation method 105
hypotheses 105–08
regression results 109–13
variables used in regression
108–09
employer with university degree/
business degree (human capital)
101, 107, 108, 110, 111, 112,
114
firm age, applying for trademarks by
102, 104
firm-specific variables 114
genuine and unique character of
products 102
geographical proximity 114
industry effect 108, 109, 110, 111,
112
industry, firms applying for
trademarks by 100
intensity of trademarking 102
inter-sectoral variation 96
management structures 101–02
metropolitan center 106–07, 108,
110, 111, 112, 113–14
Ministry of Employment 97
multi-establishment firms 107, 108,
112, 113
National Institute of Industrial
Property (INPI) 97–8
new firms 106, 108, 109, 110, 111,
114
number and percentage of firms
applying for trademarks,
evolution of 99
patterns 98–104
product development and branding
102
Quadros de Pessoal (QP) database
97–8
recurrent trademark applicant 99,
102, 107–09, 110, 111, 112, 113,
114
region, firms applying for
trademarks by 103
regional-industry effect 108, 110,
111, 112
scale of operations 101–02
size of firm 99, 101, 108, 110, 111,
112, 113, 114
trademarks 35, 95–7
traditional industries see impact
of KIE on growth and
competitiveness of European
countries
trans-sectoral knowledge 221
trans-sectoral opportunities 220
Turnbull, P.W. 171
turnover of firm 27–8, 34
United Kingdom 26, 74, 145, 203, 204
United States 70, 208–09
unpredictability (uncertainty) 140
unweighted averages 198
Valla, J.P. 171
value chains 70–71
von Tunzelmann, N. 139, 166, 168,
170
weights, assigning 198
wood and furniture sector 229
dynamic capabilities 142, 144, 145, 148–9, 150, 152–6
Greece 148
growth and competitiveness 69, 70, 71, 72, 75
Portugal 96