Index

Abernathy, W.J. 7
absenteeism 75–6, 110, 113
accessories 15
accommodations 118–19, 119–20, 122, 124, 132, 165
agile manufacturing 174
Air War College (US) 176
Allen, G.C. 90
alternative model of capitalism 136
Anglo-Saxon model, free economy 119
annual model changes 37
anthropology of the car 169–70
anti-competitive selling strategy 37
Aoki, Masahiko 34
artifacts, as fictions 169, 170–71
assembly lines
group-based 112
linked 111
mechanically paced 112
segmented 98–9, 100–107, 111–12, 114, 155
stoppages see stoppages
see also sub-assembly lines
assembly operations
flexibility 16–17
hybrid systems 111
reorganization, Toyota 107–10, 155
single integrated and distinct assembly processes 17–18
see also engine assembly; mixed assembly
assembly plants
IMVP survey 72–3
labour hours, Europe 93
lean 177
organizational experiments, Europe 110–11
performance indicators 28
production space, Toyota 108–9
see also individual plants; volume assembly plant
assembly sector, radical change in 1–2
assembly workers
control over production, Ford 114
employee working time 75–6
IMVP data collection 73
militancy 112
satisfaction 158, 177
self-organization 112
technical control 112
Toyota 98, 101, 176–8
see also Japanese car assemblers
Austin Motors 21
automation 77–80, 91, 111
available production time 151
average lead times 30, 32, 57
Bannock, Graham 36–7
basic part of car 29
‘batch and queue’ approach 148, 149
best practice 107, 138, 175
bias, IMVP survey 74, 79, 80, 85, 87, 91, 93
bicycle assembly
‘batch and queue’ approach 149
takt time 153
BMW
–Rover Group controversy 44–65
‘creaming off’ strategy 53
customization 157
quality car image 37
UK production locations 64
wide selection 26, 27
body metaphor 146
body shops 72
body-in-white 72
Brady, C. and Lorenz, A. 52, 53, 61, 62
British Leyland 121, 122
‘bubble economy’, collapse of 113, 128
‘build-to-order’ 21, 29, 32, 37, 38, 53, 55, 62
business cycle, lean production 150–51
capacity utilization 34–5, 87
capitalism
Japan as alternative model of 136
and lean thinking 6, 173
resurgence of Western 5
see also commodity capitalism;
corporate capitalism; industrial
capitalism; natural capitalism;
progressive capitalism
car
anthropology of 169–70
basic and secondary parts 29
car bodies, ultra-light 175
car industry
changing patterns of global ownership 123
cultural fiction 169–70
dullness of post-Japanese 157–8
Japanese see Japanese car industry
natural capitalism 175
rivalrous asymmetries in world’s 120–25
UK see United Kingdom, car industry
US see United States, car industry
car manufacturing
improvement, Rover 60
Japanese transplants 132–3
radical change in 1–2
see also production
Cassino (Fiat) 111
Chevy 15
Chicago History of Civilisation 18
Chrysler 37, 167
Cold War 135, 136, 172
collaboration 122, 131, 132
colours 15, 29
commerce, and Utopia 173–6
commodity capitalism 170
communist threat, Japan as bulwark
against 135, 137, 172
competitive convergence 129
confirmation biases 5, 63, 65
counterfactuals 4, 5, 9, 22, 64, 119, 148
counterfactuals 4, 5, 9, 22, 64, 119, 148
Cowley Plant 64, 65
craftwork 146, 155–6, 157, 159, 177
distribution systems 54–5, 58, 124
domestic economy, Japan 113, 138, 164, 165
domestic sales, Toyota 92
domestic monopolies 122
domestic sales, Toyota 92
delivery scheduling, Rover 54–5
defence contractors, lean thinking 176
desegregating consequences, asymmetries
120
default selection 28–9
development by invitation’ 135
distinct assembly process 18
distortion, Japan as bulwark
against 135, 137, 172
distortion, Japan as bulwark
against 135, 137, 172
consumer conditioning 37
center, pace of production 151, 153
consumer sovereignty 37, 163
consumer–factory relationship 171, 178
continuous flow 148
continuous improvement 50
continuous training 113
conventional assembly lines
calculating stoppage times 103–4
stoppage frequencies 104–6
temporary, unplanned stoppages 102, 114
Coriat, Benjamin 21
corporate alliances 132
corporate capitalism 164, 165
corporate practices, Japanese
distinctiveness 136
cost, new production system 1
cost control 56
cost control 56
cost control 56
cultural anthropology 170
cultural fiction, Japanese efficiency as 168–73
cultural fiction, Japanese efficiency as 168–73
customer order lead times 33, 34, 61
customization
build-to-order 21, 37, 38, 53, 62
Japanese eschewal of 4, 9, 16, 17, 19, 127
Rover 53
Shingo prize 148
see also accessories; mass
screening; mass
see also accessories; mass
customization; options; wide
selection
default selection 28–9
defence contractors, lean thinking 176
delivery scheduling, Rover 54–5
Department of Trade and Industry (DTI) 133
destabilizing consequences, asymmetries
120
disturbances by invitation’ 135
distinct assembly process 18
distortion, Japan as bulwark
against 135, 137, 172
distortion, Japan as bulwark
against 135, 137, 172
distribution systems 54–5, 58, 124
dock-to-line’ movement 54
domestic economy, Japan 113, 138, 164, 165
domestic sales, Toyota 92
domestic sales, Toyota 92
5-door hatchbacks 52–3
5-door hatchbacks 52–3
Index

Dore, Ronald 136
Drucker, Peter 20

economic downturn, Japan 113
Edwardes, Sir Michael 121
electrical parts, line segmentation 100–101
emergent asymmetries 120–21
employee working time, IMVP survey 75–6
*The End of the Road: BMW and Rover – A Brand Too Far* 47–8
enemy, social formation 137–8
governmental Acts 111
Environmental Protection Agency (EPA) 174–6

ergonomics 101, 111
Europe

assembly plant automation 79
average working hours 93
labour hours 93
organizational experiments 110–11
‘world car’ debate 126
see also Western Europe
European Community, price–cost margins 123
European consumers 37
exceptionalism 93, 136

factories

changes in Japanese 4
labour saving, Toyota 91
see also consumer–factory relationship
factory order lead times 56, 57–8
factory-fit options 29, 30, 31, 32, 55
factory–market interface 17, 35, 109, 149

*The Factory & the City: The Story of the Cowley Automobile Workers in Oxford* 64

Fiat, organizational experiments 111–12

fiction

artifacts as 169, 170–71
see also cultural fiction; historical fiction
flexibility/flexible assembly 16–17, 29
Austin Motors 21
inimical to ‘world car’ strategy 126

myth of Japanese 4, 5, 16, 35–8, 109
new production system 1
stocks, leads and width 28–35, 56
flow metaphor 146–7, 148, 149, 151–2
Ford, Henry 1, 38, 146–7
Ford Motor Company 122
advertising campaign, 1960s 19
flow 147
market positioning 53
ownership structure 167
product development 37
wide selection 27, 126
worker control over production lines, 1970s 114
Fordism 1, 7, 124, 125, 126
see also ‘crisis of Fordism’ narrative
Fordist mass production 3, 4, 15–16, 19, 34, 39, 171
foreign car sales 120
foreign direct investment (FDI)
American era of horizontal 124
Japanese outward
introduction of lean production in US and UK 132–4
relaxation of 138–9
US and UK economies as beneficiaries 118
restricted by Japanese domestic policy makers 138
Framingham plant 89
Francaise de Mechanique factory 111
France

average working hours 92
‘crisis of work’, car industry 112–13
productivity and hours of work 93
Freeman, Chris 3, 71, 91

general case, flow 147

General Motors (GM)
distinct assembly processes 18
industrial unrest 114
J-car 125
market positioning 53
mix model specifications 36
mixed assembly 19
ownership structure 167
product development 37
wide selection 15, 19, 27, 126
German *technik* 156, 157

Germany, average working hours 92
Gilpin, Robert 22, 124, 125, 127, 130, 132
global consumerism 1, 3
global Fordism 126
global ownership, changing patterns 123
global stresses, lean production as response to 2
global supply logistics 126, 127
global warming, lean production as answer to 6, 173–6

globalization
hollowing out of Japan’s industrial base 138
myth about Japanese prowess 118, 140

Gorz, Andre 177–8
governments
facilitation of corporate accommodations 132
introduction of lean production in US and UK 132, 133
Japanese model 128, 130
see also state interference; state support
Gronning, T. 91
group assignments 111
group hierarchy 101
group work 112
group-based lines 112
growth rates, IMVP survey 86–7, 91–2

hatchbacks 52–3
Henry Ford see Ford, Henry
Henry, Jules 137–8
historical counterfactual, Toyota break from mass production 4
historical fiction, manufacturing 4, 175
historical precedence, introduction of mixed-assembly 21
historical revisionism 38, 39
Honda 123
–Rover connection 45, 47, 50, 51, 56, 59–62
accommodation between Leyland and 122
wide selection 26
Honda Civic 58
Honda Concerto 52, 53, 56, 60
hours of work average 92, 93

see also labour hours; shift work and hours
House of Commons Trade and Industry Committee investigation 133
human-made objects, societal beliefs 168
hybrid assembly systems 111
hybrid-electric engines 175

Iaccoca, Lee 126
Ikeda plant 101
import penetration
UK reaction to Japanese 120–23
US reaction to Japanese 123–4
IMVP studies 10
IMVP survey 4, 69–71, 175
formal structures of indices 81–8
general issues of design and interpretation 71–81
lean production: critical issues and interpretation 89–93, 163
questionnaire 87–8
in-process gauging 111
indirect plant labour, IMVP survey 90
industrial capitalism 175
industrial history 37–8
industrial organization, Japanese 166
industrial unrest 114
inflation, lean production 150
Ingersol Management Consultants (IMC) 111–12
international alliances 124
international context, myth making 164
International Motor Vehicle Programme see IMVP survey
intra-process buffers 100, 101, 101–2, 104, 112
investment
in plants and equipment 90–91, 167–8
see also foreign direct investment

J-car 125
Jain, Sarah 170
Japan
average working hours 93
‘development by invitation’ 135
economic downturn 113
model of government 128, 130
regional divergence, organization 114
US foreign policy towards, post-World War II 134–5
Japanese car assemblers
aggressive posture vis-à-vis rival
markets 121
average working hours 92
capacity utilization 34–5
comparative efficiencies 39
domestic car production 139
as harbingers of post-Fordism
manufacture 63
labour hours 93
latecomers to mixed assembly 4, 9,
16, 162
role in change 4
transplant-supported 123
wide selection, eschewal of 4, 9, 16,
17, 19, 127
see also Toyota
Japanese car industry
factories, changes in 4
ownership structures 166
Japanese corporations, failure to
innovate 129–30
Japanese crisis
lean production 127–31
see also reorganization, of work
Japanese production methods
acceptance of counterfactual claims
about 119
key to export success 130
new system 1, 2–4
Rover experimentation with 47,
50–59
short-term reprieve, Rover 62
‘world car’ controversy 126
job enlargement 111
joint ventures 126, 131, 132
Jones, Daniel 64, 65, 145–58, 173, 174,
175
Jurgens, Ulrich 155
just-in-time
intra-process buffers as breach with
102
lack of change in business inventory
data 148
Rover experimentation with 45,
50–59, 60
kaizen 50
Keywords 170
Koito Manufacturing 166
Korea, average working hours 92
Krafcik Automation Index 81–2
Krafcik, J.F. 71, 73, 81, 87, 89
Krafcik Labour Input Index 73, 82–4
Krafcik methodology 88
Kyushu plant 100–107, 108, 111
labour hours, IMVP survey 74, 77–80,
93
labour saving, Toyota factories 91
Le Mans (Renault) 111, 113
lead times
width selection 28–35
see also customer order lead times;
factory order lead times
Lean and Environment Steering
Committee 175
Lean Manufacturing and the
Environment 174–5
lean plants 177
lean production
as answer to global warming 6
architect of see Ohno, Taichii
IMVP survey 89–93, 163
introduction, US and UK 132–4
Japanese car industry 3
Japanese crisis 127–31
as response to global stresses 2
takt time and flow 151–5
use of term 5, 69
lean production dream 177
lean revolution 106, 109, 119, 120, 131,
140, 145, 158, 178
Lean Thinking 145–58, 174
as counterfeit 155–7
global warming 173–4
key features 146–51
takt time and flow 151–5
lean thinking
and untrammelled capitalism 173
US procurement, military equipment
176
literary milestones 6–7
lobbying
against Japanese car entry 117, 121–2,
123
relaxation of Japanese outward
investment 138–9
lock-in, pre-production 58
Lockheed Martin 176
logistics
  Rover 54–5, 58–9
  see also global supply logistics; product supply
Longbridge plant 47, 50–59, 63
Lordstown plant 114
Lorenz, A. see Brady, C. and Lorenz, A.
Lydon, D. 20, 70

The Machine that Changed the World
  69, 70, 145
management philosophy 3
manufacturing
  historical fiction 175
  see also car manufacturing
market strategies, Japanese corporations’ failure to innovate 130
marketing strategy, Rover 61
mass customization 21–2, 23, 28, 35, 39, 70
Mass Customization 22
mass markets 1
mass production 149
  as cycle enhancing 150
  Fordist 3, 4, 15–16, 19, 34, 39, 171
  as synonymous with variety as well as volume 163
  usage of words 20, 162, 170
material culture 169–73
Mazda 323 58
measurement bias, IMVP survey 93
mechanical technology 8
mechanically paced assembly lines 112
mechanization 101, 111
Mercedes-Benz 37, 155
MG Rover
  re-establishing of Longbridge 47
  width of selection, selected ranges 26, 27
Milgrom, Paul 168
Miller, Daniel 169
mini-lines 98, 100, 101, 102
Ministry of International Trade and Policy (MITI) 138
mix model specifications 19, 36, 38, 162, 164, 168
mixed-assembly
  historical precedence 21
  Japanese as latecomers in 4, 9, 16, 162
North America, 1960s 19
mixed-part delivery 54
model customization 21
model derivatives 27, 28, 30, 52, 59
model specification counts 23–8
model specifications
  IMVP survey 74–5
  width selection 17–19
  see also mix model specifications
Model T 38, 147
monopolies, domestic 122
Motomachi plant 108–9
muda 101, 146, 157
Murakami, Yasusuke 22
myth of Japanese efficiency 1–2
  BMW–Rover Group controversy
    44–65
    a brief reprise 162–55
    lean production 69–97
    rivalrous asymmetries 118–40
    thesis and scope 2–8
    wide selection 15–40
  see also totalizing myth
myth making, as production politics 131–9
national champions 138
nationalisms 171
Natural Capitalism 173–4
natural capitalism 175
neocraftmanship 177
New Keywords 170
new model worker, Toyota 176–8
new system of flow management 147, 148
new system of production, 1970s 1, 2–4
niche marketing 52, 63, 158
niche markets 1
Nissan 123, 132, 167
non-value added activity 175
North America see United States
notation, IMVP survey 85
oligopolies 120, 122, 131
operational effectiveness 129–30
operations management 7–8
options 15, 27, 29, 30, 31, 32, 55, 56
organizational change 3–4
organizational experiments 110–14
overseas sales 92
overtime 81, 92
overwork 178
ownership
changing patterns in global 123
structures, Japanese car industry 166–7

perfection metaphor 146, 149–50
Pickens, T. Boone 166
Pine, Joseph B. 22
Pischetsrieder, Hans 62, 65
planned production schedules 148
plasticity of thought 138, 172
Plaza Agreement (1985) 135
political utility, acceptance of
counterfactual claims 11–12, 119
Pontiac 18
Porsche
craft culture 156
customization 157
quality car image 37
Porter, Michael 21–2, 128–30, 136
pre-production ‘lock-in’ 58
premium quality 50, 62
price competition 158
price–cost margins 123, 124, 158
pricing policies 123
prior scheduling 29, 56
pro-rata allowances, IMVP survey 73–4,
75
product combinations 24–5, 26
product development 37
product engineering, selling strategy 37
product marketing strategy, Rover 51–2
product specifications 171
product stocks, width selection 28–35
product supply, Longbridge 50–59, 63
product variety 18, 21, 56, 109, 163
product–price positioning 51–3
production
consumer demand and pace of 151,
153
facilities, single integrated and
separate 17–18
methods see Japanese production
methods
modelling 17
new system, 1970s 1, 2–4
planned schedules 148
politics, myth making as 131–9
reorganization of 3, 100–107, 155
space, assembly plants, Toyota 108–9
see also assembly operations; car
manufacturing; lean production;
mass production; pre-production
lock-in; volume production
production fantasy 171
production-based advantage 130
productivity
increases, Rover 60–61
Japanese approaches 129
survey see IMVP survey
UK car industry 133
progressive capitalism, Japan as model
of 135, 136
protectionism 122, 128
Prown, Jules David 169
pull metaphor 146, 148
quality
culture of 50
new production system 1
quality car producers 155–6, 157
quality cars, customization 37
recruitment difficulties 113
relief, IMVP survey 75–6
Renault
Nissan acquisition 123
organizational experiments 111
response to ‘crisis of work’ 113
reorganization
product supply function, Longbridge
50–59
of production 3, 100–107, 155
of work 4, 107–10
see also Japanese crisis
repetitive synchronous task cycle 153–4
rivalrous asymmetries, world’s car
industry 120–25
Roberts, John 168
Rover see BMW–Rover Group
controversy; MG Rover
Rover 200 52, 53, 55, 56, 58, 60
Rover 400 52, 53, 55, 56, 58, 60
Rover Metro 58
Saab-Scania, organizational experiments
111
Sakakibara, Masakamo 22, 128–30
sales
performance improvement, Rover 60
Toyota 139
up-market sourcing, Rover 52
see also domestic sales; foreign car
sales; overseas sales
scheduling 59–60
see also planned production
schedules; prior scheduling
Schonberger, R.J. 53–4
secondary part of a car 29
segmented assembly lines 98–9,
100–107, 111–12, 114, 155
self-organization 112, 177
selling strategy, product engineering
37
shielding 111
shift work and hours (IMVP survey) 81,
85–6
Shingo Award for Excellence in
Manufacturing 22, 148, 176
Shingo, Shigeo 147
Simon, Herbert 71
single integrated assembly process
17–18
single-piece flow 148
small-fit parts 54
SMMT see Society of Motor
Manufacturers and Traders
social change 4
‘social’ factors, in production 75
social/psychological preparations, war
137
societal beliefs, human-made objects
168–9
societal stresses, material culture 169,
171
Society of Motor Manufacturers and
Traders (SMMT) 121, 122
Soete, Luc 3, 71, 91
space congestion, Toyota 108–9
special case, flow 147
standard activities, IMVP survey 73, 75
standard specifications 28–9
state industrial policy, Japan 128
state interference, Japan 128, 129
state support, protection 122
stock–flow ratios 31, 32, 33, 34, 56,
61
stoppages
conventional assembly lines
calculating stoppage times 103–4
frequencies 104–6
temporary, unplanned 102, 114
Ohno’s encouragement of 108
poor working conditions 109
segmented lines 114
strategic choice 37
stress see global stresses; societal
stresses
sub-assembly lines 72, 101
substitute specifications 29, 56
synchronicity of work 55, 153–4
Takaoka plant 89, 92, 101
Takeuchi, Hirohito 21–2, 128–30
takt time 146, 151–5
task work 112
Taylorism 177
team work 112, 113
technical control 112
technical stagnation 37
technik 156, 157
technology 7–8
diffusion, decrease in Japanese
advantage 130
Termoli (Fiat) 111–12
throughput time, Toyota 102, 103, 104–5
time, new production system 1
total automation index 82
total buffer time 103
total throughput times, Toyota 102, 103,
104–5
totalizing myth 165–8
Toyota 98–115, 123
assembly workers 98, 176–8
beneficiary of cultural process 44
break from Fordist mass production 4
capacity utilization 34
customer choice 16
customization 22, 29, 70, 148
diagram of factory scheduling 59
factory–market interface 17, 35, 109,
149
flexibility 2, 5, 39, 70
growth rates 92
as harbinger of post-Fordist state 36
high selling prices 158
IMVP survey 69
investment in plant and equipment 91
just-in-time 148
labour saving 91
lean production see lean production
mixed assembly 9, 19, 21
organizational experiments 110, 111
ownership structure 167
plants see Ikeda plant; Kyushu plant;
Motomachi plant; Takaoka plant
reorganization of operations 4,
107–10
sales and production 92, 139
segmented assembly lines 98–9,
100–107, 155
wide selection 19, 23, 26–7
Toyota City 61
Toyota Corolla 26–7
Toyota Corona 58, 59
Toyota Production System 101, 146,
174
Toyotism 177
trade-off curve, product stocks and lead
times 30–31
transfer machines 111
transformation myth 16
transplantation 123, 131, 132
Tsutsumi site 59
turnover, French crisis of work 113
‘two Japans perspective’ 128
unequal development, emergent
asymmetries 120–21
unitarism 12
United Kingdom
car industry
average working hours 92
Japanese manufacturing transplants
132–3
overall productivity 133
state-supported restrictions on
Japanese imports 122
suffering from EEC imports, 1970s
122
Trade and Industry Committee
investigation 133
efficiency of manufacture 134
government reaping credit for
inculcating lean production
133–4
reaction to Japanese import
penetration 120–23
United States
Air War College 176
car industry
average working hours 92
consumer conditioning 37
mixed assembly 19
reaction to Japanese import
penetration 123–4
wide selection 18, 19, 20, 27–8
commodity violence 170
corporate competitiveness 130
debate, ‘world car’ strategy 125
explosion in lean thinking ventures
176
lean thinking in procurement of
military equipment 176
operational effectiveness 129
organizational experiments 110, 114
post-war foreign policy towards Japan
134–5
renaissance of Japan 137
unplanned stoppages 102, 114
‘up-market’ sourcing 51, 52
Utopian socialism 173
Vauxhall (GM), width of selection,
selected ranges 26, 27
vertical integration 73–4, 81, 166–7,
168
Vietnam War 135, 137
Volkswagen, wide selection 26
volume assembly plant, working model,
width selection 28–9
volume production 16, 163
volume selling 52, 53
Volvo, organizational experiments
111
war, social/psychological preparations
137
warehouses, Rover 54–5
waste 101, 146, 157
Western Europe
organizational experiments 110
wide selection 27–8
worker militancy 112
see also France; Germany; United
Kingdom
Whisler, T.R. 59–60
wide selection, myth of 15–40, 126–7
flexibility: stocks, leads and width 28–35
Japanese flexibility 36–8
model specification counts 23–8
terminology 17–18
Williams, K. 89, 90
Williams, Raymond 170
Womack, James P. 72, 90, 145–58, 173, 174, 175
women workers, Toyota 101
Woolard, F.G. 20–21
work
reorganization of 4, 107–10
synchronicity of 153–4
see also craftwork; crisis of work;
hours of work; overwork
work-form experimentation 110–14
working model, volume assembly plant 28–9
working practices, IMVP survey 86–7, 92
working time per employee, IMVP survey 75–6
‘world car’ controversy 119, 125–7
world’s car industry, rivalrous asymmetries in 120–25