Index

accident insurance 19, 22, 23, 31
ACE group 18
Administration of Foreign-funded
Insurance Companies Regulation
(AFICR) 13
AEGON 18
Africa 12
agricultural insurance xii, 6, 22
AIA (American International
Insurance)
Best Corporate Citizen 84
categorisation 127
double-management system 82
efficiency levels xvi, 83–5, 100, 102,
111, 113, 115, 145, 151
merger with AXA-Minerals, SFA
efficiency scores 133
Pingan Life takeover 90
reference sets 89, 91, 98, 163–8,
174–9
return to scale 104, 106–8, 149, 150
risk sharing and risk bearing
(RSRB) approach 94–100,
171–9
SFA efficiency scores 133, 134–5
slacks and targets 88, 97, 160–62,
171–4
Standard & Poor AAA accreditation
84
Aigner, D. 73, 124
AIU
categorisation 127
efficiency levels 82, 83, 93, 109–10,
113–14, 119, 143–4
frontier shift 145
productivity growth 143
reference sets 89–92, 163–8, 174–9
return to scale 105, 107, 147, 148
risk sharing and risk bearing
(RSRB) approach 96–7, 99,
169–71, 174–9
SFA efficiency scores 131–2
slacks and targets 87, 97, 99, 158–60,
169–71
Allianz
efficiency levels 85, 95–6, 115, 120
reference sets 91, 99, 163–8, 174–9
returns to scale 106, 108
risk sharing and risk bearing
(RSRB) approach 96–7, 99,
171–9
SFA efficiency scores 133, 134–5
slacks and targets 88, 97, 160–62,
171–4
Allianz Dazhong
categorisation 127
efficiency levels 84, 110–12, 121, 145,
146
as joint venture 17
productivity growth 143
and returns to scale 107, 149
see also Dazhong
Altunbas, Y. 14
American International Assurance see
AIA
American International Group (AIG)
17, 83
Andersen, N. 112
Asia 12, 44
Avkiran, N. 53, 54, 59, 67, 68, 69, 70
AXA-Minmetals
categorisation 127
efficiency levels 84–5, 95, 110–12,
117, 120, 145
joint venture established 17
merger with Pacific-Antai 115, 117
productivity growth 143
reference sets 91, 99, 163–8,
174–9
risk sharing and risk bearing
(RSRB) approach 108, 135,
171–9
Performance of the Chinese insurance industry

SFA efficiency scores 133, 134–5
slacks and targets 88, 97, 160–62,
171–4

bancassurance 28, 29, 44, 83
Banker, R. 66, 70, 75, 103
Battese, G. 73, 75, 124, 125
Bell, A. 47
Benson, J. 47
Berger, A. 14, 26–7, 28, 29–30, 32,
35, 38, 39, 42, 43, 56, 136,
153
Bigsten, A. 46, 58, 126
Boodro, C. 48
Brown, J. 38
Byrnes, P. 55

Canada 33
Canton Insurance Society xii, 6
Cappelli, P. 43, 46–7
Carow, K. 42
Carr, R. 43
carrier liability insurance 22
Chadwick, C. 43, 46–7
Chamberlain, S. 40
Chang, K. 21
Charness, A. 3, 61, 66, 70, 74–5
Chen, C. 6, 13, 18, 19, 23, 24
China
Administration of Foreign-funded Insurance Companies Regulation (AFICR) 13
Consumers Association 21
Draft Regulations Governing Actuarial Methods for New Life Insurance Products 13
housing and healthcare systems reforms 22
Insurance Industry Association 13
Insurance Law xii, 12–13, 20
investment allocation 119
People’s Bank of China (PBC) xii–xiii, 12, 13, 20
People’s Banking Law xii
People’s Insurance Company of China (PICC) see PICC
Provisional Regulations Governing Insurance Enterprise Management 12

state-owned enterprises (SOEs) 7,
16, 18, 46, 58, 93, 126, 127, 129,
152, 157 see also PICC see also insurance companies
China Grain, Oil and Food Import/Export Company 18
China Insurance Regulatory Commission (CIRC) xiii, xiv, 9,
13, 14, 16, 19, 20, 21, 78
China Life Insurance Company xiv, 18
China Maritime Petroleum 18
China Pacific Insurance Company xii, 2, 6, 26
China People’s Life Insurance Joint Stock Corporation Limited xiv, 10
China Petroleum 18
China Securities Regulatory Commission (CSRC) xiii, 20
China United Property Insurance Company 15
Choi, Y. 60
Citibank 18
Citicorp/Travelers Insurance Group merger 42
CLIC categorisation 127
efficiency levels 15, 84–5, 93–5, 100,
102, 111, 115, 120, 145
reference sets 91, 98, 99, 163–8,
174–9
return to scale 106, 149
risk sharing and risk bearing (RSRB) approach 98, 108,
171–9
SFA efficiency scores 134–5
slacks and targets 88, 97, 160–62,
171–4
Coelli, T. 58, 73, 75, 124, 125
Cooper, W. 3, 52–3, 61, 62, 63, 66, 70,
74–5, 115
CPIC Life categorisation 127
efficiency levels 15, 84–5, 93–5, 100,
111, 113, 115, 120, 145
pure efficiency change 149
reference sets 91, 98–9, 163–8, 174–9
return to scale 106, 149
risk sharing and risk bearing (RSRB) approach 98, 108,
171–9
SFA efficiency scores 134–5
slacks and targets 88, 97, 160–62, 171–4
CPIC Non-life
categorisation 127
efficiency levels 16, 82–3, 85, 93, 100, 109–10, 114, 119, 144
frontier shift 145
productivity growth 143
reference sets 91–2, 99, 163–8, 174–9
return to scale 105, 107, 148
risk sharing and risk bearing (RSRB) approach 95–7, 169–71, 174–9
SFA efficiency score 131–2
slacks and targets 87, 96–7, 158–60, 169–71
Cummins, J. 3, 19, 26, 29–31, 32, 33, 34, 35, 36, 37, 38–9, 42, 43, 45, 49, 50, 78, 136
Cybo-Ottone, A. 42
D’Arcy, P. 6
Dazhong
categorisation 127
efficiency levels 82–3, 92–3, 100, 102, 107, 109, 114, 119, 144
frontier shift 145
reference sets 91, 99, 163–8, 174–9
SFA efficiency scores 129–30, 131–2
slacks and targets 87, 97, 158–60, 169–71
see also Allianz Dazhong
DEA (data envelopment analysis) xvi, 3–4, 30, 32–6, 38–9, 61–74
and choice of input/output variables 67–8, 154
envelopment model 63–4
and income approach and constant returns to scale (CRS) 80–93
input minimisation or output maximisation 66–7, 74
and input and output variables 76–80, 85, 88, 90
multiplier model 61–3
statistical properties of estimators 70–71
and stochastic frontier analysis see stochastic frontier analysis
and types of return to scale 64–6, 74
uses and advantages 69–74
versus parametric methods 71–4
versus performance indicators 71
and weights restriction 68–9, 74
and window analysis 108–12
see also Malmquist Index
development; stochastic frontier analysis (SFA)
Deng, Q. 154
Desai, P. 60
Diacon, S. 34, 36, 44, 46, 48
Donni, O. 35
Dyer, L. 46
Dyson, R. 73
efficiency issues xv, xvi–xvii, 1–2, 4, 20, 23
accounting methods flexibility and tax avoidance 28
allocative and technical efficiency, distinguishing between 54–5
and bancassurance 28, 29, 44, 83
branch level studies, need for 156
and changes in reserves 31
COLS analysis (corrected ordinary least squares) 71–4
constant returns to scale (CRS) 64, 65–6, 78, 145–7, 152
consumption efficiency 56
and corporate governance 46
cost efficiency, X-inefficiency and allocative efficiency 54–5
cost scope economies 38
and data envelopment analysis see DEA (data envelopment analysis)
and ‘decision making units’ (DMU) 61–4, 65–6, 68–70, 73, 78
decreasing returns to scale (DRS) 64
definitions of efficiency 52
and diversification 38
and economies of scale and scope 27–8, 36–40, 43
and education levels 7, 23, 58, 126, 129, 140, 152
efficiency frontier research, data requirement 29
efficiency studies review 26–51
efficiency study, reasons for 59–60
efficient peers, frequency of, and managerial practices 89–93
and environmental conditions, uncontrollable 67–8
exchange efficiency and market efficiency 56
and financial performance under TFP framework 58–9
foreign insurers, efficiency levels xv, 93, 94, 126, 127, 128–9, 130, 152
and foreign versus domestic ownership 45–6
increasing returns to scale (IRS) 64
incurred benefits as measurement of life insurance output 30–31
insurers’ production, cost, revenue and profit frontiers 28–30
IT and competitive advantage 50
IT expenditure and staff performance 47–8
IT management and human resource practice 28, 46–8
IT, underwriters and use of 48
joint producers and specialists, coexistence of 39–40
and leadership quality 47
Malmquist Index see Malmquist Index
and mergers and acquisitions 27–8, 36, 40–42, 115–17, 155
and multiple product lines 38
online services for customers 48
and organisational form 44–6
output, input and price measures 30–32
price changes and technical efficiency analysis 156
product distribution strategies 28, 43–4
and product quality hypothesis 30, 43
product strategy and economies of scope 37–40
and productivity 49–50
profit efficiency analysis 56
profit sharing and gain sharing 47
quality, risk and efficiency 60
revenue and profit efficiencies 38, 39–40, 55–6
and risk management 29, 42, 48, 60, 67–8
scores and ranking 32–6
and stochastic frontier analysis (SFA) see stochastic frontier analysis (SFA)
derunderwriting costs and profitability 44
variable returns to scale (VRS) 65–6, 74, 78
window analysis 70, 156–7
see also individual companies;
insurance industry

efficiency levels
and efficient insurers, income approach 80–85
after mergers 115–17, 155
pure efficiency change 149–50
and radial contraction ratio 85–6
and reference sets 87–90, 163–8
and slacks and targets 85–7, 88, 158–62
state-owned versus non-state firms 126
employer liability insurance 22
endowment insurance 23
Epstein, M. 68
EU 20, 35, 36, 37, 42
Färe, R. 57–8, 70, 108, 142
Farrell, M. 54, 55, 70, 74
Fecher, F. 30, 33, 34, 35, 45
Finland 34, 37, 39
Francalanci, C. 47
France 11, 12, 30, 33, 34, 36, 44, 45
Fried, H. 73, 133
Fukuyama, H. 33, 50
Gao, S. 3, 23, 29, 156
Gardner, L. 30, 46
Germany 11, 12, 34, 36
GIGNA 39
Gijbels, I. 74
Gillen, D. 67
Goddard, J. 14
Goldman Sachs 18
Goolsbee, A. 38
Grace, M. 30, 36, 46
Index

Greene, W. 29, 33, 35
Grosskopf, S. 108
Gstach, D. 74

Haier 18
Han, Z. viii
Hannan, I. 14
Hardwick, P. 34
He, J. 154
Henderson, J. 68
Hongkong Mingan categorisation 127
efficiency levels xvi, 81–3, 88, 92–3, 110, 113–14, 119, 143–4, 152, 154
frontier shift 145
input-output comparison with Tokiomarine 88, 89
reference sets 163–8, 174–9
return to scale 105, 107, 147, 148
SFA efficiency scores 129, 131–2
slacks and targets 87, 97, 99, 158–60, 169–71
Hossam, G. 47
HSBC Group 18
Huatai
ACE as shareholder 18
categorisation 127
efficiency levels 16, 82, 92–3, 100, 107, 109–10, 114, 119, 144
frontier shift 145
merger with Tokiomarine 115, 116
reference sets 91, 99, 163–8, 174–9
return to scale 104, 105, 107, 148, 150
risk sharing and risk bearing (RSRB) approach 94–5, 97, 99, 169–71, 174–9
SFA efficiency scores 131–2
slacks and targets 83, 97, 158–60, 169–71
Humphrey, D. 30, 32, 35, 56, 136, 153
Hurley, V. 3
Hwang, T. 3, 23, 29, 156

income approach
and constant returns to scale (CRS) 80–93

efficiency scores and efficient insurers 80–85
efficiency scores and radial contraction ratio 85–6
efficiency scores and reference sets 87–90, 163–8
efficiency scores and slacks and targets 85–7, 88, 158–62
insurance industry
challenges and opportunities 17–24
complex procedures, consumer problems with 19
cultural advantage of national firms 24
DEA applications see DEA (data envelopment analysis)
demand for insurance protection, rise in 23
economic growth and social progress promotion 21–2
and efficiency see efficiency issues employment in xiii, 8
foreign competition and asset management 118
foreign insurers, efficiency levels xv, 93, 94, 126, 127, 128–9, 130, 152
foreign insurers, emergence of 17–18, 118, 120, 155
foreign investment xiii, 8–9, 11, 16–17, 19, 23–4
further research 156–7
future of 22–3
geographic differences xiv, 10–11
growth, rapid 7–11
history of xii–xvii, 6–7
income approach see income approach
and income maximisation 76–81
information disclosure regulation 21
insurance demand 21–3
insurance income compared to other developed nations xv, 1, 11
insurance pricing models 19
insurance security fund system 21
intermediary market xiii–xiv, 9
investment channels 20
joint ventures 17–18, 46, 84–5, 107, 112, 120, 126–9, 133, 143–5, 152, 155
life and health insurers see life and health insurers
major disasters 21–2
Malmquist Index development see Malmquist Index development and management system reform 82
managerial implications see managerial implications
market structure xiv, 14–17, 118
mutual companies 44–6
overseas stock market listing xiv, 10
personnel and relations management 23–4
policy recommendations 152–7
premiums and products xiii, 12, 19, 77
price changes and technical efficiency analysis 156
property-liability insurance see property-liability insurance
regional differences 22–3
regional insurance markets, top 10
regulation and supervision 12–13, 20–21, 100
restructuring xiv, 9–10, 93, 94
risk sharing and risk bearing approach see risk sharing and risk bearing (RSRB) approach
self-regulation 13
and state-owned enterprises (SOEs) 7, 16, 18, 46, 58, 93, 126, 127, 129, 152, 157, see also PICC
stock market investment 20, 44–6, 156
trust and reliability, establishing 18
International Association of Insurance Supervisors (IAIS) 13, 20
International Organisation of Pension Supervisors 13
Ireland 4, 29
Italy 12, 34, 36, 43, 49, 50
Japan 11, 12, 33, 50, 60
Jefferson, G. 59
Johnes, G. and J. 65
joint ventures 17–18, 46, 84–5, 107, 112, 120, 126–9, 133, 143–5, 152, 155
Jovanovic, B. 60
Katrishen, F. 35, 37
Klumpes, P. 30, 33, 43
Kotler, P. 19
Lall, A. 67
Latin America 12
Leibenstein, H. 54
Li, C. 154
Li, G. 154
Li, S. 74
Li, X. 154
liability insurance products 22
life and health insurers 14, 17
efficiency and constant return to scale (CRS) 64, 65–6, 78, 145–7, 152
efficiency ratings with income decomposition 119–20
efficiency scores 32–5, 83–5, 154
income approach, efficiency scores and slacks and targets 88, 160–62
income approach and reference sets 163–8
and input-output variables 80, 128
and peer efficiency 90–91, 93
productivity growth 143–5, 152, 155–6
pure efficiency change 149–50
and returns to scale 104, 106
risk sharing and risk bearing see risk sharing and risk bearing (RSRB) approach
scale efficiency change 149–50
scale efficiency rating 107–8
SFA see stochastic frontier analysis (SFA)
solvency margin 21
super-efficiency rating 115, 116
top five in China 15
window analysis efficiency scores 110–12
Liu, X. 46, 58, 126
Liu, Z. 127
Lorin, M. 48
Lovell, C. 73, 124, 133
Luo, D. ix
Malmquist Index development 4, 28, 49, 58, 70, 142–51
Index

decomposition of productivity growth into technical efficiency improvement and technological progress 143–7, 155
decomposition of technical efficiency change into pure technical efficiency improvement and scale change 147–50, 155–6 and efficiency changes 143 and frontier shifts 143 see also DEA (data envelopment analysis)

Shuji Yao, Zhongwei Han, and Dan Luo - 9781849807258
Downloaded from PubFactory at 09/14/2023 09:38:05PM via free access
slacks and targets 87, 97, 158–60, 169–71
Ping An Insurance Company xii, xiv, 6, 10, 18, 26, 78
Pingan Life
categorisation 127
efficiency levels 15, 84–5, 90, 93, 100, 104, 111, 116–17, 120, 145
merger with Taikang 115, 116–17
reference sets 91, 99, 163–8, 174–9
return to scale 106–8, 115, 149
risk sharing and risk bearing (RSRB) approach 95, 96, 99, 171–9
SFA efficiency scores 134–5
slacks and targets 88, 97, 160–62, 171–4
Pingan (Non-life) 16, 78
Prasada Rao, D. 73, 75, 124
property-liability insurers 14, 17
efficiency and constant return to scale (CRS) 144, 145–7, 152
efficiency ratings with income decomposition 119
efficiency scores 32–5, 80–83, 143, 144, 154
frontier shift 145
income approach, efficiency scores and slacks and targets 85–7
income approach and reference sets 87–90, 163–8
and input-output variables 79–80, 88, 129
and peer efficiency 90, 91–3
productivity growth 143, 152, 155
pure efficiency changes 148
regression results of the SFA approaches 128
and returns to scale 104, 105
risk sharing and risk bearing see risk sharing and risk bearing (RSRB) approach
scale efficiency 147
scale efficiency rating 107, 147, 148
SFA see stochastic frontier analysis (SFA)
solvency margin 21
super-efficiency rating 114, 115–16
and technological progress and innovation 147
top five 15
window analysis efficiency scores 109–10
Prudential 18, 47
Rai, A. 35
Rawson, R. 55
Reeves, T. 46
Regan, L. 44
research, methods and questions 1–4
Rhodes, E. 3, 61, 66, 70, 74–5
risk sharing and risk bearing (RSRB) approach 20–21, 76–8, 79–81, 154
CRS results of 93–100
and cutting number of successful claims 100
and efficiency scores 32–5, 83–5, 93–6, 129–30, 132–5, 154
and frequency of efficient peers 98–100
reference sets 98, 99, 174–9
slacks and targets 96–7, 128, 169–74
Royal & Sun 163–8
categorisation 127
efficiency levels 82–3, 92, 110, 114, 116, 119, 143–4
frontier shift 145
merger with Tokiomarine 115, 116
reference sets 91, 98, 99, 163–8, 174–9
return to scale 104–5, 107, 115, 147, 148
risk sharing and risk bearing (RSRB) approach 94–5, 97, 99, 169–71, 174–9
SFA efficiency scores 131–2
slacks and targets 87, 97, 158–60, 169–71
Ryan, H. 3, 38
Santomero, A. 48
Schellhorn, C. 3, 38
Schmidt, P. 72, 73, 124
Schmidt, S. 73, 133
Schulte-Noelle, H. 48
Scordis, N. 35, 37
Segal, D. 29, 33, 35
Seiford, L. 52–3, 62, 63, 70, 115
Sena, V. 71
Index

Sengupta, J. 60, 67
Shanghai Insurance Industry Association 13
Shao, Y. 154
Shih, H. 6, 13, 18, 19, 23, 24
Simar, L. 30

Sinosafe
categorisation 127
efficiency levels 82–3, 88–90, 94, 100, 107, 109, 114, 119, 143, 144
frontier shift 145
input-output comparison with PICC and Tianan 90
productivity growth 143
reference sets 91–2, 99, 163–8, 174–9
return to scale 105, 107, 147, 148
risk sharing and risk bearing (RSRB) approach 95, 97, 169–71, 174–9
SFA efficiency scores 131–2
slacks and targets 87, 97, 158–60, 169–71

Smith, S. 19

South Korea 11
state-owned enterprises (SOEs) 7, 16, 18, 46, 58, 93, 126, 127, 129, 152, 157, see also PICC

stochastic frontier analysis (SFA) xvi, 3, 30, 33–6, 38–9, 45, 70, 72–4
and DEA comparison 133–9
efficiency scores and interpretation 129–34, 155, 156–7
and firm size 126
human capital and efficiency levels 126
income approach 134
model specification 124–6
regression results 126–9
results comparison 133–9
and RSRB approach 135, 137, 139
state-owned versus non-state firms, efficiency levels 126
see also DEA (data envelopment analysis)

Stoker, B. 61

Street, J. 58
Sun, L. 154

Swiss Reinsurance 16
Switzerland 17, 34, 36

Taikang
categorisation 127
efficiency levels 15, 84–5, 93, 100, 111, 119–20, 145
merger with Pingan Life 115, 117
reference sets 91, 99, 163–8, 174–9
return to scale 106, 108, 115, 149, 150
risk sharing and risk bearing (RSRB) approach 95, 96, 99, 171–9
SFA efficiency scores 134–5
slacks and targets 88, 97, 160–62, 174–9
and Winterthur 17
Taiwan 33, 35
Tavares, G. 70
Tennyson, S. 30, 33, 36, 40, 42, 49
Thanassoulis, E. 1, 55, 60, 61, 63, 65, 73, 79, 90, 104, 142, 150
Thrall, R. 103, 112, 122

Tianan
categorisation 127
efficiency levels 16, 82–3, 90, 93, 100, 109–10, 113–4, 119, 144
frontier shift 145
input-output comparison with PICC and Sinosafe 90
reference sets 88–9, 91–2, 98–9, 163–8, 174–9
return to scale 104, 105, 107, 147, 148
risk sharing and risk bearing (RSRB) approach 94–5, 97, 99, 169–71, 174–9
SFA efficiency scores 131–2
slacks and targets 87, 97, 158–60, 169–71

Timme, S. 36

Toivanen, O. 34, 36–7, 39

Tokiomarine
categorisation 127
efficiency levels 82, 83, 86–8, 100, 109–10, 116, 118–19, 143, 144
frontier shift 145
merger with Huatai 115, 116
merger with Royal & Sun 115, 116
reference sets 91–2, 98–9, 163–8, 174–9
return to scale 104–5, 107, 114–15, 147, 148
risk sharing and risk bearing (RSRB) approach 94–5, 97–9, 169–71, 174–9
SFA efficiency scores 131–2
slacks and targets 85, 87, 97, 102, 158–60, 169–71
Tone, K. 52–3, 62, 63, 115
total factor productivity (TFP) 28, 49–50, 56–9
Turchetti, G. 34, 43, 50
Tzeng, L. 44
UK xv, 11, 12, 33, 34, 36, 43, 46
US
ACE group 18
American International Assurance see AIA
American International Group (AIG) 17, 83
deficient output revenues 56
and deregulation 37, 42
distribution strategies 43
economies of scale and scope 36, 37, 38, 42
efficiency scores 30, 31, 33, 34, 35
insurance companies xv, 11, 12, 20, 31
mergers and acquisitions 40–41, 42
mutual and stock companies, differences between 44
productivity measurement 49
quality and productivity in automobile industry 60
retention and motivation of top executives 47
specialisation 39
Valdmanis, V. 55
Wang, Y. 33, 35
Ward, D. 3, 31, 34, 43
Waters, W. 58
Weiss, M. 3, 26, 29–31, 32, 33, 34, 36, 37, 38–9, 42, 43, 45, 49, 50, 143
Wenchuan earthquake 22
Wilson, J. 14
Wilson, P. 30
Winterthur
categorisation 127
efficiency levels 82–3, 109, 114, 119, 143, 144
frontier shift 145
productivity growth 143
reference sets 91–2, 98–9, 163–8, 174–9
return to scale 105, 107, 147, 148
risk sharing and risk bearing (RSRB) approach 94–5, 100, 169–71, 174–9
SFA efficiency scores 129, 131–2
slacks and targets 9, 87, 158–60, 169–71
and Taikang 17
World Trade Organisation (WTO)
xiii, 1, 8, 16, 17–24, 46, 84, 90–93
GATS 13
Worthington, C. 3
Wu, D. 33
Wu, J. 154
Xia, H. 6
Xie, X. 40, 41
Xinghua
categorisation 127
efficiency levels xvi, 83–5, 90, 94, 100, 107–8, 111, 113, 115, 120, 145, 154
merger with AXA-Minerals 133
reference sets 89, 91, 98–9, 102, 163–8, 174–9
return to scale 104, 106, 108, 149, 150
risk sharing and risk bearing (RSRB) approach 95–6, 99, 171–9
SFA efficiency scores 133, 134–5
slacks and targets 88, 97, 160–62, 171–4
Xinjiang Agricultural Insurance Company xii, 6
Yao, S. viii, 127
Yi An Insurance Group of the USA 18
Yongan
categorisation 127

Shuji Yao, Zhongwei Han, and Dan Luo - 9781849807258
Downloaded from PubFactory at 09/14/2023 09:38:06PM
via free access
Index

efficiency levels 82, 83, 92, 100, 109–10, 114, 119, 143, 144
frontier shift 145
productivity growth 143
reference sets 91, 99, 163–8, 174–9
return to scale 105, 107, 147, 148
risk sharing and risk bearing (RSRB) approach 93–5, 97, 99, 101–2, 169–71
SFA efficiency scores 131–2
slacks and targets 87, 97, 158–60, 169–71

Yuengert, A. 33, 36
Yun, M. 154
Zhao, X. 154
Zheng, J. 46, 58, 126
Zhong Yi of Italy 18
Zhu, J. 1, 53, 60, 69, 71
Zi, H. 31, 32, 33, 35, 36, 37, 38–9, 43, 45, 136
Zurich Insurance of Switzerland 17