India initiated liberal economic reforms in 1991 to transform a slow-growing, large, inward-oriented, state-led economy into an open, market-led, export-oriented industrialising economy, seeking to emulate the East Asian success story. After nearly three decades, however, the outcomes are different. Though economic growth has accelerated, industrialisation has suffered from the manufacturing sector's share in GDP stagnating, and labour-intensive sectors failing to improve their share in India's exports. With rising industrial imports, there is growing apprehension of India becoming prematurely de-industrialised. In response, the government launched the Make in India initiative in 2015, aimed at raising the manufacturing sector's share in GDP to 25 per cent, and to create an additional 100 million jobs by 2022.

Though official estimates show an optimistic image of small scale industries' contribution to industrial output and employment, they do not explain why India failed to boost labour-intensive industrial production as expected of the reforms. Why did they fail to keep the domestic market, let alone expand exports? Given the employment potential of small industry, what would it take to meet the ambitious policy goals of the Make in India initiative?

This book attempts to address these questions. It looks at a series of case studies of the small industry to obtain an in-depth understanding of specific industries, locations and clusters in order to draw meaningful conclusions. It brings together scholars with intimate knowledge and experience of the industries and locations who explore the modern labour-intensive industries, ranging from the sports goods industry and knitwear clusters to foundries and ceramic tile clusters. It seeks to offer rich insights into the current state of the small industry in India that is often overlooked in official statistics and nation-wide surveys. The book also explores the impact of growing automation on manufacturing employment.

R. Nagaraj is currently affiliated with the Centre for Development Studies, Trivandrum. He was formerly Professor of Economics at the Indira Gandhi Institute of Development Research, Mumbai. He has worked extensively on India’s economic growth and industrialisation, public sector performance and industrial labour market. He coedited Political Economy of Contemporary India with S. Motiram, which was published by Cambridge University Press in 2017.
Industrialisation for Employment and Growth in India

Lessons from Small Firm Clusters and Beyond

Edited by

R. Nagaraj
## Contents

*List of Tables*  
vi

*List of Figures and Maps*  
xi

*Preface and Acknowledgements*  
xiii

1. Introduction  
R. Nagaraj  
1

2. Garment Cluster in Kolkata: The Untold Story of Expansion Relying on Low-end Domestic Demand  
Satyaki Roy  
24

3. Constraints to Upgrading and Employment Expansion in the Tiruppur Knitwear Cluster  
M. Vijayabaskar  
49

4. Determinants of Employment in the Indian Automobile Industry  
Madhuri Saripalle  
72

5. Upgrading Technology and Space as Collective Strategy: Creation of Jobs and Market Potential in Gujarat's Ceramic Clusters  
Keshab Das  
100

Varinder Jain  
129

7. Aligarh Lock Cluster: Unravelling the Major Impediments  
Tareef Husain  
153

8. Continued Misery or a Change in Fortune? The Case of the Howrah Foundry Industry  
Judhajit Chakraborty  
173

9. Redevelop and Perish, or Survive and Grow? The Case for Supporting Informal Leather Enterprises in Dharavi, Mumbai  
Kshiti Gala  
196
Contents

    Dinesh Awasthi and Amita Shah
    223

11. Manufacturing and Automation
    Sunil Mani
    250

About the Contributors

Index

277
280
<table>
<thead>
<tr>
<th>Table Number</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Definition of MSME</td>
<td>5</td>
</tr>
<tr>
<td>2.1</td>
<td>Accounts of a simple pair of jeans trousers produced in home-based units</td>
<td>36</td>
</tr>
<tr>
<td>2.2</td>
<td>Average monthly occupational wages</td>
<td>39</td>
</tr>
<tr>
<td>3.1</td>
<td>Share of fabrics in ready-made garment (RMG) exports of India (in %)</td>
<td>52</td>
</tr>
<tr>
<td>4.1</td>
<td>Employment by 3-digit NIC categories in the automobile industry</td>
<td>75</td>
</tr>
<tr>
<td>4.2</td>
<td>Export and import shares of vehicles and component manufacturers in 2018–19</td>
<td>76</td>
</tr>
<tr>
<td>4.3</td>
<td>Research and development intensity</td>
<td>80</td>
</tr>
<tr>
<td>4.4</td>
<td>Descriptive statistics</td>
<td>87</td>
</tr>
<tr>
<td>4.5</td>
<td>Estimation results</td>
<td>90</td>
</tr>
<tr>
<td>4A.1</td>
<td>Employment, trade and R&amp;D in sample tier 1 auto component firms</td>
<td>93</td>
</tr>
<tr>
<td>4A.2</td>
<td>Profile of firms interviewed in the Tamil Nadu small-scale auto cluster</td>
<td>95</td>
</tr>
<tr>
<td>5.1</td>
<td>Aspects of ceramic industry in Gujarat, 1999–2015</td>
<td>102</td>
</tr>
<tr>
<td>5.2</td>
<td>Main products manufactured by sample units</td>
<td>109</td>
</tr>
<tr>
<td>5.3</td>
<td>Number of workers in sample units</td>
<td>110</td>
</tr>
<tr>
<td>5.4</td>
<td>Monthly average income by skilled and unskilled workers in sample units</td>
<td>111</td>
</tr>
<tr>
<td>5.5</td>
<td>Technology used until the mid-1990s in sample units</td>
<td>114</td>
</tr>
<tr>
<td>5.6</td>
<td>In-house changes/innovations undertaken in sample units</td>
<td>115</td>
</tr>
<tr>
<td>5.7</td>
<td>Expectations from the state</td>
<td>123</td>
</tr>
<tr>
<td>6.1</td>
<td>Selected indicators of the organised sports equipment industry in India</td>
<td>131</td>
</tr>
<tr>
<td>6.2</td>
<td>Size of sports goods clusters in Jalandhar and Meerut</td>
<td>133</td>
</tr>
<tr>
<td>6.3</td>
<td>Sample size of the study</td>
<td>133</td>
</tr>
<tr>
<td>6.4</td>
<td>Selected characteristics of sample enterprises</td>
<td>134</td>
</tr>
<tr>
<td>6.5</td>
<td>Various constituents defining the resilience scale</td>
<td>138</td>
</tr>
<tr>
<td>6.6</td>
<td>Various constituents defining functional literacy scale</td>
<td>138</td>
</tr>
<tr>
<td>6.7</td>
<td>Prevalent piece-based wages (in ₹) for home-based workers</td>
<td>145</td>
</tr>
</tbody>
</table>
6.8 Average monthly wages paid in major exporting units in sample clusters 146
6.9 Average incidence of work-related insecurity among wageworkers 147
6.10 Specific interventions aimed at promotion of India’s sports equipment industry 150
7.1 Average import and export of locks from 2004–08 to 2014–18 156
7.2 Number of enterprises, employment and capital investment in the Aligarh lock industry 159
7.3 Trends in employment and sale during the last five years by firm size 160
7.4 Education of firm owners by their size 161
8A.1 Manufacturing employment and gross domestic product (GDP) in India 191
8A.5 Shares of the top three and bottom three states in net state domestic product in total manufacturing at constant prices among seventeen major states 193
8A.6 Share of the top and bottom 50 districts in total manufacturing employment, 1991–11 193
9.1 Awareness and membership of industry organisations 213
9.2 Entrepreneurs’ view on the impact of international competition and national policy changes on their businesses 215
10.1 Characteristics of enterprises 227
10.2 Sectoral annual compound rates of growth 2012–13 and 2017–18 231
10.3 Number of firms engaged in outsourcing and/or subcontracting 232
10.4 The proportion of outsourcing as a share of sales turnover 234
10.5 Strategies to face competition 236
10.6 Sources of social capital 239
10.7 Advantages of operating in Rajkot engineering cluster 240
10.8 The direction of changes in business environment in Rajkot 243
10.9 Perceived impact of recent policies and government campaigns 244
10.10 Policy wish list of firms in the Rajkot engineering cluster 245
11.1 Industry-wide distribution of the operational stock of industrial robots worldwide (percentage shares) 261
<table>
<thead>
<tr>
<th>Table</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.2</td>
<td>Task-wise distribution of industrial robots in world manufacturing 2011–16 (percentage shares)</td>
<td>262</td>
</tr>
<tr>
<td>11.3</td>
<td>Trends in operational stock of industrial robots in India (number)</td>
<td>264</td>
</tr>
<tr>
<td>11.4</td>
<td>Trends in the number of delivered robots</td>
<td>265</td>
</tr>
<tr>
<td>11.5</td>
<td>Task-based operational stock of industrial robots in India, 2011–16</td>
<td>267</td>
</tr>
<tr>
<td>11.6</td>
<td>Extent of the diffusion of automation technologies in India compared with other countries, 2015 (density of industrial robots per 10,000 manufacturing employment)</td>
<td>270</td>
</tr>
<tr>
<td>11.7</td>
<td>Industrial robot usage in MNC affiliates in India’s automotive industry</td>
<td>270</td>
</tr>
</tbody>
</table>
Figures and Maps

Figures

1.1 Share of manufacturing and industry in GDP
2.1 An ustagar with his son in a home-based unit in Chota, South 24 Parganas
2.2 Metiabruz: inside ABM haat in a weekly market, Kolkata
2.3 Regent Garment Park at Barasat, North 24 Paraganas
4.1 Growth in total vehicle production
4.2 Exports and imports from 2000–18
4.3 Ambattur automotive cluster
4.4 Real wage rate: 2000–16
4A.1 Gross turnover in ₹ millions (deflated by WPI)
5.1 Export and import of ceramic products: India, 1988–2017
5.2 China’s share (%) in India’s exports and imports of ceramic products, 1988–2017
5.3 Trade balance in ceramic products: China, 1992–2016
5.4 Trade balance in ceramic products: India, 1988–2017
5.5 Share of exports of ceramic products by type: India, 1988–2017
5.6 Share of imports of ceramic products by type: India, 1988–2017
6.1 (a) Small firms’ average growth (%) in sales by plant size, 2013–18 periods (b) Exporting firms’ sales (in ₹ crore) over the 2013–18 period
6.2 Firm-level variation in resilience scale
6.3 Region-wise trend of India’s export of sports equipment, US$ million
7.1 Average net export (export–import) for 2004–08, 2009–13 and 2014–18 by types of locks in US$ million
9.1 Daily wage rate skilled workers doing product packaging and quality control
9.2 Workers polishing and smoothening tanned leather procured from Kolkata that would previously be tanned in Dharavi
9.3 Spatial constraints are evident as three-fourths of the enterprises are crunched up in less than 500 square feet
9.4 The Indian Leather Art Co. is a space-constrained enterprise, like many others in Dharavi, with narrow steps and a rope for climbing to the manufacturing enterprise 208
9.5 A 15-year-old Juki machine, bought second hand, exemplifying the need to upgrade machinery 210
9.6 Lack of training and vocational skills constrain Dharavi’s leather entrepreneurs 210
9.7 Conventional marketing methods prevail 211
9.8 The Leather Goods Manufacturers’ Association head office in Dharavi 213
9.9 A buyer negotiates and bargains; as a result, the entrepreneur cuts prices, because every retail sale matters for his business to stay afloat 215
11.1 Trends in operational stock of industrial robots in the world and in India (in thousands) 259
11.2 Estimated worldwide operational stock of industrial robots in the 15 largest markets, 2016 259
11.3 Density of industrial robots across both developed and developing countries, 2016 260
11.4 Industry-wise operational stock of industrial robots in India, 2006–16 266
11.5 Trends in density of industrial robots in India, manufacturing versus automotive industry 269
11.6a Trends in employment in India’s automotive manufacturing industry 272
11.6b Share of automotive sector employment in total organised manufacturing sector employment 273

Maps

1.1 Location of the case studies 7
2.1 Kolkata garment cluster: location of places 31
5.1 The Morbi ceramic clusters trapezoid 124
5.2 The Kandla Port link roadway to Morbi ceramic clusters trapezoid 125
8.1 Howrah cluster map 175
9.1 Map of Dharavi area 198
Preface and Acknowledgements

By the middle of the 2010s, India’s economic boom had tapered off after the global financial crisis. India did not suffer as much as the advanced economies did because of its large domestic market and relatively modest exposure to international capital flows. However, India’s growing import dependence and rising share of short-term capital inflows in managing the balance of payment deficit became increasingly evident.

The widely accepted view of industrial stagnation gave rise to the clarion call for ‘Make in India’ – as coined by the then newly elected government. Such a policy goal resonated well with the public in response to growing import dependence on China for even simple consumer goods, such as kites or Ganesha idols. Modest output performance also meant a lack of manufacturing employment growth.

Around the time, I reviewed academic research status on India’s industrialisation trends and patterns for the Indian Council of Social Science Research (ICSSR), analysing the reasons for India’s modest industrial performance. During a discussion with Srinivasan Iyer of the Ford Foundation and P. S. Vijayshankar of Samaj Pragati Sahayog, Bagli, Dewas, an idea emerged for a research programme on the theme of manufacturing growth, employment and livelihood issues. There are many accounts of industrial performance at the aggregate level. However, our understanding of what has happened at the ground level in recent times seems acutely lacking. Likewise, though there is considerable scholarship on labour and employment, the current academic focus on manufacturing production and its implication for jobs and skills appears sparse.

The above idea, it appeared to me, offered an opportunity to bring together scholars to undertake detailed studies into how the labour-intensive industries, locations and clusters were performing. And what would it take to realising the national goal of ‘Make in India’?

Our effort was, in other words, an attempt to do in India’s development discourse what the late Alice Amsden graphically described, ‘Bring Production Back In’. Why has India not performed well even in simple consumer goods? After deliberations with many concerned scholars over a year, the programme took root in 2016 at the Indira Gandhi Institute of Development Research (IGIDR), Mumbai. I mentioned the idea to S. Mahendra Dev, Director, Indira Gandhi Institute of Development Research (IGIDR). He enthusiastically welcomed it, agreeing
Preface and Acknowledgements

to host the research initiative at the institute. I am grateful to the director for the project's smooth functioning and successful accomplishment of its goals. I thank the registrar and the institute's administrative staff for their valuable support; I am particularly grateful to Sayli Charatkar and Pratiksha Worlikar, who gladly shouldered the project administration responsibility.

Kshiti Gala, who initially joined the project to assist me with the academic spadework, did a fine job undertaking the literature review, identifying potential issues for research and scholars with credible research record. I thank her for her help in launching the initiative. During her work, Kshiti became interested in the problems we were investigating. She expressed her desire to conduct an independent inquiry by herself into the Dharavi leather goods cluster, located close to her residence, about which she had personal acquaintance. I encouraged her academic curiosity.

Before formally initiating the project, we had an informal advisory group consisting of Sudip Chaudhuri, Sunil Mani, K. V. Ramaswamy, P. S. Vijay Shankar and C. Veeramani, whose advice was valuable. I am indebted to them all for all their enthusiastic support and their keen interest in our inquiries.

We held a series of workshops to initiate, review and disseminate the research findings in Mumbai and Delhi. We thank Suresh Babu, Mukesh Gulati, Radhicka Kapoor, K. Narayanan, Vikas Rawal, Tamal Sarkar and Padmini Swaminathan for their contributions during these events and for offering their valuable comments and suggestions to the contributors. I thank them all for their sincere and constructive comments.

To disseminate the research finding among academics, civil society organisations and policymakers, we held a workshop in Delhi 2019. I thank K. P. Krishnan, former Secretary, Ministry of Skill Development and Entrepreneurship, for enthusiastically supporting our effort and participating in the workshop. I also thank Gururuprasad Mohapatra, Secretary, Department for Promotion of Industry and Internal Trade; Anand Bhal, former Principal Economic advisor, Government of India; and many other officials for their enthusiastic response to our initiative.

Anwesha Rana, commissioning editor, Cambridge University Press, was very enthusiastic about our research effort right from the beginning. We have worked closely for over two years to bring this book project to fruition. I most sincerely thank her for showing interest in our initiative and being patient with me and the contributors to get our work to completion. I also thank the publisher's anonymous referees, whose comments and suggestions were valuable. They helped us bring out the finding more clearly and improve the quality of reporting of the results. I also thank the publisher's production team, led by Aniruddha De, to efficiently bring out the volume and for their professionally competent job.
Preface and Acknowledgements

More than anyone else, Srinivasan has been a constant source of strength and support throughout the endeavour, without ever interfering in the conduct of research or drawing conclusions and disseminating the results to a broader audience. He was always available to us with constructive suggestions and wise counsel. I am deeply indebted to him. I also thank Seema Sharma and Sundari Kumari of the Ford Foundation, Delhi office, for their consistent and unassuming support for our effort.

Trivandrum

18 March 2021

R. Nagaraj