Contents

| | of tables and figures | vii |
|----------|---|-------|
| Forewo | | xi |
| Lai Jaya | awardena and Charles Cooper | |
| Preface | 2 | xiii |
| Surendr | ra J. Patel | |
| I | The golden age of south's development | xiii |
| II | The framework of approach | xv |
| Ш | Technological transformation: Volume I - Asia | xviii |
| | Acknowledgements | xix |
| | Appendix | XX |
| | Notes | xxiv |
| Bangla | desh | 1 |
| A.A. A | bdullah and Atiq Rahman | |
| I | Introduction | 3 8 |
| II | The historical roots of stagnation | |
| Ш | The class structure and technology | 11 |
| IV | The agricultural sector | 13 |
| V | Human resource and infrastructure | 19 |

| | 11.4 | Changes in the distribution of income and poverty Changes in GDP per head of economically active persons in | 47 |
|----|------|--|------|
| | 11.5 | agricultural and non-agricultural sectors | 47 |
| | 11.6 | Branch shares of manufacturing value added: | 4/ |
| | 11.0 | 1962/63-1984/85 | 48 |
| | 11.7 | Branch shares of employment in manufacturing industry: | 40 |
| | | 1962/63-1984/85 | 49 |
| | 11.8 | Changes in value added per employee in manufacturing | 47 |
| | 1110 | industry: 1962/63-1984/85 | 50 |
| | 11.9 | Changes in trade and its structure: 1959/60-1984/85 | 51 |
| | | | 31 |
| In | dia | | |
| | Tab. | | |
| | 3.1 | Growth rates in gross domestic product by sector: 1950-81 | 74 |
| | 3.2 | Historical growth rates in agricultural production: 1891-1984 | 74 |
| | 3.3A | Average compound growth rate in index of industrial | |
| | | production (IIP) | 76 |
| | 3.3E | Growth rates of industrial sector based on ASI and NAS | |
| | | Period I: 1959-60 to 1965-66 and Period II: | |
| | | 1966-67 to 1979-80 | 76 |
| | 3.4 | I Brown at Michael Co. Michael Co. | |
| | | production | 80 |
| | 3.5 | TFPG estimates: 1959-60 to 1979-80 | 83 |
| | 3.6 | Increase in engineering and project exports | 85 |
| | 3.7 | Annual rates of increase in selected indicators of | |
| | | infrastructural development | 87 |
| | 3.8 | Changes in aggregate and per capita output | 90 |
| | 3.9 | Changes in sectoral shares of GDP | 91 |
| | 3.10 | Occupational distribution of work force | 92 |
| | 3.11 | Changes in GDP per head of economically active | - |
| | | population in major sectors | 93 |
| | 3.12 | Changes in branch shares of manufacturing value | 75 |
| | | added in the registered (factory) sector | 94 |
| | 3.13 | Changes in branch shares of employment in selected | 74 |
| | | manufacturing industry in the organized (factory) sector | 95 |
| | 3.14 | Changes in trade and its structure | 96 |
| | 3.15 | Changes in gross value added per employee in | 70 |
| | | selected manufacturing industries | 97 |
| | 3.16 | Changes in indicators relating to technological | , |
| | | development | 98 |
| | 4.1 | Relative shares of sub-groups in capital goods sector | 102 |
| | 4.2 | | 102 |
| | 4.3 | Sectoral distribution of stock of foreign direct | 102 |
| | | invocation and a 1064 1 1000 | 106 |
| | 4.4 | Densies authorized | 100 |
| | 4.5 | Dottorn of revelter makes 1:-1 . 1 . 1 | 1107 |
| | | | |

| | 46 | Foreign exchange payments of foreign collaborations | 110 |
|----|------------|--|------------|
| | 4.7 | National expenditure on scientific research and development | 110 |
| | | (R and D) and related activities in selected years | 113 |
| | 4.8 | Stock of scientific and technical personnel | 117 |
| | 5.1 | Log linear regression explaining the relation between | |
| | | expenditure on R and D and cost of technology import | 122 |
| | | in manufacturing private sector | 122 122 |
| | 5.2 | Elasticity coefficients - ownership by group | 126 |
| | 5.3 | Selected indicators of technology behaviour | 129 |
| | 5.4 | Foreign exchange costs of ammonia plants in FCI projects | 127 |
| | Figu | <u>ires</u> | 77 |
| | 3.1 | Trends in index of industrial production: 1951-85 | |
| | 3.2 | | 78 |
| | | 1951-85 | , 0 |
| So | outh I | Korea | |
| | <u>Tab</u> | les 1 GPD 1052 84 | 155 |
| | 3.1 | Changes in real GDP: 1953-84 | 157 |
| | 3.2 | Changes in sectoral shares of GDP: 1953-84 Changes in sectoral shares of employment: 1963-84 Changes in sectoral shares of employment: 1963-84 | 157 |
| | 3.3 | Changes in GDP per head of economically active | |
| | 3.4 | manulation in major sectors | 158 |
| | 3.5 | | 159 |
| | 3.3 | Changes in branch shares of employment in | |
| | 3.0 | manufacturing industry | 159 |
| | 3.7 | | |
| | 3.7 | manufacturing industry | 161 |
| | 3.8 | Changes in trade and its structure | 162 |
| | 3.9 | Development of social infrastructure | 164 |
| | 3.1 | O Income distribution | 164 |
| | 4.1 | Capital formation and its sources | 167 170 |
| | 4.2 | Indicators of human resource development | 170 |
| | 4.3 | Inflow of foreign technologies | 175 |
| | 4.4 | R and D investments | 175 |
| S | ri La | nka | |
| | | bles CDP: 1050-83 | 209 |
| | 3.1 | Changes in sectoral shares of GDP: 1950-83 | 210 |
| | 3.2 | Average annual growth rates of GDP | 211 |
| | 3.3 | | 213 |
| | 3.4 | / | 213 |
| | 3.5 | 6 Structure and growth of manufacturing according to broad | |
| | 3.6 | industrial grouping: 1970, 1975-84 | 214 |
| | 4 1 | | 22 |
| | - | | |

| 4.2 | Profile of capital formation: 1960-85, private | |
|---------------|--|-----|
| | sector and public corporations | 222 |
| 4.3 | Financing of investment: 1970-85 | 225 |
| 4.4 | Direct import content of capital expenditure | 225 |
| 4.5 | Profile of manufacturing industry: 1982 | |
| | Domestic production of capital goods | 226 |
| 4.6 <i>A</i> | A Statistics on education: schools | 229 |
| 4.6E | Statistics on education: university and technical education | 230 |
| 4.7 | University admissions and output by academic streams | 232 |
| 4.8 | Firms with foreign capital participation in the | 232 |
| | manufacturing sector: sectoral distribution | 243 |
| 4.9 | R and D investments: 1966-83 | 245 |
| 4.10 | Stock of science and technology personnel | 247 |
| 5.1 | Cost of production per pound of tea: 1971 | 253 |
| 5.2 | Yield trends in tea: 1934-83 | |
| 5.3 | Tea acreage and production in the major tea producing | 257 |
| | countries: 1983 | 257 |
| 5.4 | Use of fertilizer by major crops | 257 |
| 5.5 | Fertilizer use in tea: estates and smallholdings | 262 |
| 5.6 | Yield of dry rubber: new RRIC clones and PB 86 | 262 |
| | compared | 0.5 |
| 5.7 | Yield performance, rubber: 1951-85 | 267 |
| 5.8 | World production of natural rubber: 1967-78 | 270 |
| 5.9 | Acreage replanted without 1050 of | 270 |
| | Acreage replanted, rubber: 1950-85 | 273 |
| J.10 | Smallholders' rubber acreage classified according to rubber clones | |
| 5 1 1 | | 275 |
| 5.11 5.12 | Rubber industry: share of smallholdings | 275 |
| J.12 5 12 | Rubber yields: 1980-82 | 276 |
| 5 1 1 | Yield trends in paddy: 1950-84 | 284 |
|).14 5 1 5 | Growth rates in the paddy sector | 284 |
| 5.13 | Weed control methods in paddy: 1978-79 | 291 |
| 0.10 | Adoption of the high yielding package singly and in | |
| | combinations of components by farmers cultivating | |
| | night yielding varieties of paddy | 292 |
| 5.17 | Transplanting trends in paddy | 292 |
| 5.18 | Cost of fertilizer in paddy cultivation: 1973-74 | 298 |
| 0.19 | Profile of industry: 1952-82 | 304 |
| $^{\prime}.1$ | Tea: yield, acreage and production: 1934-85 | 313 |
| 7.2 | Rubber: yield per hectare in tapping 1951-85 | 314 |
| | | 314 |
| igu | res | |
| 5.1 | Productivity performance in tea: 1934-85 | 255 |
| 0.2 | Productivity performance in rubber: 1950-85 | 255 |
| 5.3 | Productivity performance in paddy (Maha season): | 271 |
| | 1944/45-83/84 | 202 |
| 5.4 | Productivity performance in paddy (Yala season): 1944-84 | 282 |
| | 17 F Paddy (1 ala scasoli): 1944-84 | 283 |

| | VI | The cotton textile industry | 23 |
|------|-------|--|-------|
| | | Jute textiles | 29 |
| | VIII | The fertilizer industry | 32 |
| | IX | Research and development | 37 |
| | X | Conclusion - what kind of technological transformation | |
| | | do we need? | 41 |
| | ΧI | Appendix | 44 |
| | | Notes | 52 |
| | | References | 57 |
| Inc | lia | | 59 |
| | | brahmanian | 37 |
| | I | Introduction | 61 |
| | II | The economic and technological setting | 66 |
| | Ш | Growth of output and structural changes in the economy | 71 |
| | IV | Development of technology-embodying inputs | 99 |
| | V | Managing the dynamics of technological transformation | 119 |
| | VI | Concluding assessment | 135 |
| | | Notes | 140 |
| | | References | 142 |
| Sa. | uth K | Towns. | 4 4 5 |
| | isu K | | 145 |
| LII. | I | Introduction | 1.45 |
| | II | | 147 |
| | Ш | The economic and technological setting | 149 |
| | IV | Growth and structural changes in the economy | 153 |
| | V | Development of technology-embodying inputs | 165 |
| | V | Managing the dynamics of technological transformation | 176 |
| | V1 | Concluding assessment Notes | 184 |
| | | | 189 |
| | | References | 191 |
| | Lan | | 195 |
| Wi | lfred | S. Nanayakkara and P.C. Rodrigo | 175 |
| | I | Introduction | 197 |
| | II | The economic and technological setting | 199 |
| | Ш | Growth and structural changes in the economy | 205 |
| | ΙV | Development of technology-embodying inputs | 219 |
| | V | Managing the dynamics of technological transformation | 250 |
| | VI | Concluding assessment | 308 |
| | | Appendix, tables | 312 |
| | | Notes | |
| | | Selected bibliography | 315 |
| | | | 316 |

List of tables and figures

Bangladesh Tables

| 1 40 | G 1 C 1 C 1 C 1 C 1 C 1 C 1 C 1 C 1 C 1 | 4 |
|------|--|----|
| 1.1 | Growth of employment by broad industry groups | 7 |
| 1.2 | Levels and changes in labour productivity by sector | |
| 1.3 | Trend in consumption of certain selected lieffis | 7 |
| 4.1 | Exponential growth rates in crop production: 1949/50- | |
| | 1083/84 | 14 |
| 12 | Relative contribution of different factors to growth of crop | |
| 4.2 | | 14 |
| | output | 15 |
| 4.3 | Use of modern agricultural inputs | |
| 5.1 | Some indicators on education system | 22 |
| | Installed spindleage and loomage in the cotton textile | |
| 6.1 | instance spinineage and roomage are | 27 |
| | industry in selected years | |
| 6.2 | Spindle and loom productivities in the cotton textile | 20 |
| | industry: 1961/62-1982/83 | 27 |
| | measury. 1997 to the second learning | |

Spindle and loom productivities in the cotton textile industry: 1961/62-1976/77, 32 count and 54 pick basis,

11.2 Changes in sectoral shares of GDP: 1949/50-1983/84

11.3 Changes in sectoral shares in employment: 1951-1983/84

(LBS spindle loom hour)

Principal R and D organization

11.1 Changes in real GDP: 1950/51-1985/86

28

38

44

45

46