# Growth and Structural Changes in the Manufacturing Industries of Bangladesh—An Overview

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In this a paper a few issues a related to factor intensity are investigated to highlight the overall growth and structural changes in the manufacturing industries of Bangladesh in the post-independence period. The general pattern of growth and change in the industrial economy has been described. Thus the changes in macro-economic variables like employment output, value-added, labour, capital etc. in the manufacturing industries of Bangladesh have been analysed. The definitions of the variables used in the analysis are listed in an appendix to this paper.

## Section 1 : Introduction

The development pattern of the manufacturing industries of underdeveloped countries has been analysed by a number of scholars. The most celebrated piece of work has been done by Chenery.[1] The growth pattern is explained by three contributory factors, i. e.

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domestic demand, export expansion and import substitution Economists have applied Chenery's general framework of analysis to developing economies to identify the major causes of growth in the manufacturing sectors.

In the context of India and Pakistan. Ahmad[2], Lewis and Soligo[3], Lewis[4], and Guisinger[5] have examined this problem at length. At a disaggregated level Lewis and Soligo[6] have identified the main causes of growth in the three broad categories of industries, i. e. consumer, intermediate and investment, and investment related goods. While this type of analysis is useful for a number of reasons, there are enormous statistical problems of measurement of import substitution, export expansion, and domestic demand. An attempt has been made to examine selected macro variables that have more direct bearing on factor intensity.

There is an additional reason why this approach has been adopted. By building up a picture from an inter-industry examination of the macro-economic variables focus can be made more directly on the question of factor intensity, factor substitution and even technical progress in the manufacturing industries. Such an approach has been adopted before by other writers. However, the most impressive pieces of work in this area have been done by Salter[7] and Katz[8]. In many ways this type of analysis supplements the findings of the production function approach.

**Section 2 : Analysis of Selected Macro-variables**

One of the basic indicators of the performance of an economy is the gross value of output in the

industrial economy over time, In the period under review the index of the gross value of industrial output rose from 100 in 1973/74 to 151 in 1983/84. This seems to suggest the annual growth rate of the gross value of output of the manufacturing industries has been around 4 per cent per annum. This is obviously a very low rate of growth in comparison with what has been experienced by many other countries.[9]

However, this conceals a great deal of diversity in the growth and performance of the different manufacturing industries of Bangladesh. The completely different sort of developments of the petroleum industry and the textiles should be interpreted carefully. The index of the gross value of production in the petroleum sector rose from 100 in 1973-74 to 4714 in 1983-84. This is mainly because the petroleum sector had very narrow base in the beginning of the period under consideration. On the othet hand the index of production in the textiles sector increased from 100 in 1973/74 to 112 in 1983/84. It is quite evident that this sector has been a relatively stagnant one. It must also be taken into consideration that the textiles sector includes the most important industry of Bangladesh-jute.

Table 1

Index of Gross value of output of Manufacture by Major Industrial Groups (Base: 1973/74=100)

| Sector | 1974/75 | 1975/76 | 1976/77 | 1977/78 | 1978/79 |
|---|---|---|---|---|---|
| 1. Food manufacturing | 145 | 161 | 184 | 211 | 217 |

| | | | | | |
|---|---|---|---|---|---|
| 2. Beverage | 94 | 88 | 96 | 123 | 151 |
| 3. Tobacco | 98 | 107 | 118 | 113 | 125 |
| 4. Textiles | 85 | 91 | 88 | 98 | 107 |
| 5. Footwear | 176 | 152 | 172 | 78 | 76 |
| 6. Furniture | 137 | 178 | 112 | 219 | 231 |
| 7. Paper | 125 | 138 | 107 | 135 | 154 |
| 8. Printing | 115 | 130 | 216 | 194 | 175 |
| 9. Leather | 136 | 366 | 253 | 288 | 317 |
| 10. Chemical | 85 | 127 | 113 | 130 | 154 |
| 11. Petroleum | 3 955 | 3 996 | 7 555 | 5 755 | 7 549 |
| 12. Non-metallic | 178 | 157 | 266 | 300 | 323 |
| 13. Basic metal | 85 | 144 | 195 | 131 | 201 |
| 14. Metal products | 147 | 126 | 267 | 125 | 141 |
| 15. Machinery except electrical | 163 | 193 | 313 | 258 | 315 |
| 16. Electrical machinery | 129 | 285 | 715 | 735 | 872 |
| 17. Transport equipment | 664 | 471 | 656 | 767 | 562 |
| 18. Other manufacturing | 112 | 75 | 107 | 73 | 56 |
| 19. Total manufacturing | 103 | 123 | 136 | 137 | 154 |

| | 1979/80 | 1980/81 | 1981/82 | 1982/83 | 1983/84 |
|---|---|---|---|---|---|
| 1. Food manufacturing | 194 | 228 | 271 | 275 | 233 |
| 2. Beverage | 138 | 159 | 148 | 168 | 283 |
| 3. Tobacco | 129 | 142 | 146 | 135 | 141 |
| 4. Textiles | 107 | 102 | 99 | 120 | 112 |

| | | | | | |
|---|---|---|---|---|---|
| 5. Footwear | 19 | 109 | 213 | 63 | 167 |
| 6. Furniture | 236 | 608 | 569 | 220 | 237 |
| 7. Paper | 164 | 157 | 167 | 126 | 143 |
| 8. Printing | 175 | 214 | 204 | 181 | 187 |
| 9. Leather | 317 | 282 | 314 | 133 | 138 |
| 10. Chemical | 174 | 217 | 236 | 185 | 251 |
| 11. Petroleum | 6 970 | 5 116 | 4 786 | 3 343 | 4 714 |
| 12. Non-metallic | 392 | 382 | 326 | 340 | 312 |
| 13. Basic metal | 183 | 201 | 227 | 64 | 68 |
| 14. Metal products | 161 | 152 | 262 | 102 | 103 |
| 15. Machinery except electrical | 420 | 971 | 822 | 7 716 | 2 848 |
| 16. Electrical machinery | 968 | 977 | 1 014 | 845 | 1 006 |
| 17. Transport equipment | 986 | 1 380 | 992 | 352 | 632 |
| 18. Other manufacturing | 83 | 104 | 133 | 194 | 141 |
| 19. Total manufacturing | 156 | 162 | 170 | 160 | 151 |

*Source* : Calculated from the data reported in Bangladesh Bureau of Statistics, *Statistical Yearbook of Bangladesh* various issues.

Thus the performance of the most significant industries of this country has been very disappointing in the recent period. The apparent rapid expansion in the gross value of output of the two machinery sectors, i. e. the non-electrical machinery and the electrical machinery can also be explained, like that of the petroleum industry, in terms of their narrow bases at the beginn-

ing of the period. There have been relatively higher rates of growth in sectors like food manufacturing, beverage, furniture, printing, chemicals, non-metallic products and transport equipment. It can be seen from Table 1 that the index of the gross value of output rose from 100 in 1973-74 to 233 in the case of food manufacturing, 283 in the case of beverage, 237 in the case of furniture, 187 in the case of printing, 251 in the case of chemicals, 312 in the case of non-metallic products, and 632 in the case of transport equipment in the year 1983/84. Later, sectoral growth rates of output will be compared with those of employment.

Many analysts have considered value-added as a better indicator of the performance of a sector. In Table 2 data on the indices of value-added of the different sectors of the industrial economy of Bangladesh are presented. The overall growth rate of the value-added of the manufacturing sectors is, like that of the gross value of output, not encouraging at all. The index rose from 100 in 1973/74 to 112 in 1983/84. Thus for the manufacturing industries as a whole the value added has been almost stagnant. There are a few interesting things noteworthy of discussion. While value-added of the petroleum sector increased in the beginning of the period subsequently it declined by a substantial amount. Thus the index fell from 100 in 1973/74 to 75 in 1983/84. This result is in sharp contrast with what happened to the value of gross output in this sector.[10]

The trend in the value-added of the textiles sector is roughly the same as that in the value of gross output of this sector. In fact the stagnation in the value-added

Table 2

Index of value added of manufacturing by major industrial groups (Base : 1973/74 100)

| Sector | 1974/75 | 1975/76 | 1976/77 | 1977/78 | 1978/79 |
|---|---|---|---|---|---|
| 1. Food manufacturing | 132 | 125 | 140 | 164 | 163 |
| 2. Beverage | 98 | 94 | 96 | 129 | 151 |
| 3. Tobacco | 92 | 88 | 99 | 99 | 102 |
| 4. Textiles | 74 | 69 | 56 | 84 | 95 |
| 5. Footwear | 218 | 271 | 126 | 56 | 81 |
| 6. Furniture | 122 | 142 | 92 | 282 | 226 |
| 7. Paper | 178 | 107 | 218 | 260 | 289 |
| 8. Printing | 119 | 110 | 208 | 165 | 161 |
| 9. Leather | 160 | 331 | 140 | 256 | 406 |
| 10. Chemical | 65 | 73 | 90 | 101 | 130 |
| 11. Petroleum | 126 | 494 | 663 | 122 | 121 |
| 12. Non-metallic | 155 | 105 | 174 | 769 | 245 |
| 13. Basic metal | 47 | 84 | 152 | 56 | 158 |
| 14. Metal products | 141 | 111 | 413 | 96 | 84 |
| 15. Machinery except electrical | 145 | 146 | 243 | 218 | 243 |
| 16. Electrical machinery | 142 | 283 | 805 | 664 | 757 |
| 17. Transport equipment | 419 | 290 | 912 | 854 | 759 |

| | | | | | |
|---|---|---|---|---|---|
| 18. Other manufacturing | 82 | 73 | 132 | 65 | 41 |
| 19. Total manufacturing | 80 | 78 | 97 | 97 | 117 |

| | 1979/80 | 1980/81 | 1981/82 | 1982/83 | 1983/84 |
|---|---|---|---|---|---|
| 1. Food manufacturing | 146 | 201 | 204 | 206 | 175 |
| 2. Beverage | 130 | 152 | 137 | 169 | 287 |
| 3. Tobacco | 105 | 117 | 116 | 11 | 115 |
| 4. Textiles | 95 | 105 | 92 | 104 | 101 |
| 5. Footwear | 81 | 107 | 196 | 147 | 145 |
| 6. Furniture | 386 | 4703 | 531 | 232 | 230 |
| 7. Paper | 322 | 226 | 235 | 236 | 270 |
| 8. Printing | 177 | 198 | 191 | 164 | 168 |
| 9. Leather | 385 | 417 | 314 | 143 | 148 |
| 10. Chemical | 169 | 183 | 197 | 156 | 212 |
| 11. Petroleum | 717 | 83 | 95 | 76 | 75 |
| 12. Non-metallics | 283 | 267 | 219 | 259 | 237 |
| 13. Basic metal | 72 | 90 | 117 | 50 | 53 |
| 14. Metal products | 109 | 113 | 206 | 61 | 63 |
| 15. Machinery except electrical | 313 | 751 | 657 | 5934 | 2190 |
| 16. Electrical machinery | 741 | 826 | 854 | 735 | 878 |

| | | | | | |
|---|---|---|---|---|---|
| 17. Transport equipment | 577 | 1011 | 471 | 476 | 850 |
| 18. Other manufacturing | 93 | 113 | 128 | 199 | 142 |
| 19. Total manufacturing | 117 | 112 | 112 | 116 | 112 |

*Source* : Calculated from the data reported in Bangladesh Bureau of Statistics, *Statictical Yearbook of Banglodesh* various issues.

of the textile sector is more pronounced. The index was falling in the beginning of the period but subsequently it rose by a small margin. Thus the index rose from 100 in 1973/74 to 101 in 1983/84. The phenomenal growth in the sectors like non-electrical machinery, electrical machinery and transport equipment can be explained in terms of their narrow bases in the beginning of the period. Sectors like food manufacturing, beverages. furniture, paper, chemical, and non-metallic products, showed relatively higher growth rates in the value-added. It can be seen from Table 2 that the index rose from 100 in 1973/74 to 157 in the case of food manufacturing, 287 in the case of beverages, 230 in the case of furniture, 570 in the case of paper. 212 in the case of chemical and 237 in the case of non-metallic products in the year 1983/84.

It was mentioned earlier that it would be interesting to compare the growth rates of the gross value of output and value-added with those of employment. Table 3 presents data on employment indices of the different industrial sectors of the economy. At

the aggregate level it can be seen that the growth rate of employment has been less that of gross output. The index rose from 100 in 1973/74 to 140 in 1982/83. Thus on average annual employment growth rate has been around 3 per cent only. This poor rate of growth of employment is far less than what is required to absorb the current growing rate of unemployment and underemployment in the economy of Bangladesh.[11]

This aggregate picture conceals many important sectoral differences within the industrial economy of this country. Once again if textile and petroleum sectors are considered, the highest employment growth is in the petroleum sector and the lowest in the textile sector. The obvious reason for high employment growth rate in the petroleum sector has been its initial narrow base. The index of employment in the textile sector rose from 100 in 1973/74 to 124 in 1982/83. This sector includes the largest industry of that country, i. e. the jute industry. It may be noted here that the rates of growth of employment in most of the industries have been lagging behind the rates of growth of gross value of output. The relatively higher rates of growth of employment in sectors like metal products, non-electrical machinery, electrical machinery and transport equipment, can also be explained in terms of their lowerbases in the beginning of the period. Generally speaking the relatively lower rate of growth of employment in comparison with that of the value of gross output has been experienced by many countries under import substitution regime.

Table 3

Indices of Average Daily Employment (all employees) by major Industral groups (number) (Base : 173/74 100)

| Sector | 1974/75 | 1975/76 | 1976/77 | 1977/78 | 1978/79 |
|---|---|---|---|---|---|
| 1. Food manu facturing | 132 | 167 | 171 | 151 | 133 |
| 2. Beverage | 97 | 71 | 103 | 119 | 120 |
| 3. Tobacco | 116 | 124 | 106 | 108 | 113 |
| 4. Textiles | 98 | 91 | 89 | 105 | 109 |
| 5. Footwear | 187 | 150 | 140 | 58 | 55 |
| 6. Furniture | 195 | 259 | 137 | 248 | 223 |
| 7. Paper | 130 | 182 | 149 | 130 | 129 |
| 8. Printing | 138 | 144 | 200 | 185 | 186 |
| 9. Leather | 143 | 199 | 143 | 123 | 103 |
| 10. Chemical | 125 | 120 | 123 | 125 | 128 |
| 11. Petroleum | 4710 | 4620 | 4560 | 4930 | 4520 |
| 12. Non-metallic | 154 | 107 | 114 | 144 | 149 |
| 13. Basic metal | 130 | 183 | 128 | 130 | 131 |
| 14. Metal products | 168 | 154 | 173 | 174 | 197 |
| 15. Machinery excep electrical | 144 | 161 | 169 | 174 | 168 |
| 16. Electrical mochinery | 206 | 314 | 487 | 514 | 634 |
| 17. Transport equipment | 423 | 814 | 333 | 297 | 272 |
| 18. Other manu-facturing | 180 | 210 | 345 | 191 | 200 |
| 19. Total | 110 | 111 | 107 | 117 | 119 |

| | 1979/80 | 198 /81 | 1981/82 | 9182/83 |
|---|---|---|---|---|
| 1. Foot manufacturing | 14 1 | 150 | 152 | 153 |
| 2. Beverage | 108 | 95 | 117 | 144 |
| 3. Tobacco | 121 | 128 | 131 | 133 |
| 4. Textiles | 113 | 117 | 120 | 124 |
| 5. Footwear | 48 | 42 | 177 | 184 |
| 6. Furniture | 206 | 236 | 228 | 281 |
| 7. Paper | 147 | 151 | 150 | 149 |
| 8. Printing | 186 | 205 | 243 | 289 |
| 9. Leather | 130 | 125 | 132 | 138 |
| 10. Chemical | 132 | 142 | 148 | 154 |
| 11. Petroleum | 4890 | 5210 | 5520 | 5850 |
| 12. Non-metallic | 136 | 147 | 152 | 156 |
| 13. Basic metal | 133 | 145 | 144 | 143 |
| 14. Metal product | 198 | 205 | 238 | 269 |
| 15. Machinery except electrical | 160 | 271 | 358 | 373 |
| 16. Electrical machinery | 790 | 836 | 845 | 853 |
| 17. Transport equipment | 325 | 347 | 326 | 306 |
| 18. Other manufacturing | 220 | 226 | 233 | 204 |
| 19. Total manufacturing | 122 | 130 | 135 | 140 |

*Source* : Calculated from the data reported in Bangladesh Bureau of Statistics, *Statistical Yearbook of Bangladesh* various issues.

In a study for the period of fifties and sixties, Islam[13] has examined the employment potential of the manufacturing industries of Bangladesh. It has been found that between 1949/50 and 1969/70 growth rate of employment was half of that of the output in large scale manufacturing sector. Thus the large-scale manufacturing sector had not been able to generate sufficient employment to absorb the increase in the labour force of the country. Analysis of data reveals that between 1955 and 1965/66 the growth of employment lagged behind that of output in all the sectors of the industrial economy of Bangladesh. In the case of many industries the rate of growth of employment was substantially less than half the rate of growth of output. In sectors like transport equipment aud miscellaneous industries, employment even declined when output increased substantially. A further analysis for the period 1965/66 to 1968/69 shows broadly similar results. The only exception to this was wood and cork, and coal and petroleum products where employment grew more rapidly than output. It is clear that an employment lag is noticeable not only in the relatively more sophisticated industries but also in the traditional industries like food processing. textiles, leather etc.

In another study, Chowdhury[14] has examined the data of 1954 to 1965 to analyse the growth rates of value-added, capital and labour of the manufacturing industries of Bangladesh. The two main statistical findings are : (a) in the period under review output has been growing at a rate faster than that of capital and labour, and (b) capital has been growing at a fasetr

rate than that of labour.

It is argued by this author that the expansion of output in the period 1954 to 1965 can be explained by economies of scale and/or the combined effects of the two factors of production. By fitting the Cobb-Douglas production function it has been shown that in the manufacturing industries of Bangladesh there has been capital bias technological progress. The relatively slower growth rate in employment in the period 1954 to 1965 has been explained mainly in terms of bias in capital-intensity and under-utilisation of capacity within the manufacturing industries. These two studies in a broad sense also confirm the findings of the present study.

One important way of evaluating the efficiency of industrialisation is to see what has happened to the productivity of labour. In Table 4 data on average labour productivity of the different manufacturing industries are presented. It can be seen from this table that at the aggregate level the index of productivity rose from 100 in 1973/74 to 144 in 1982/83. This indicates that labour productivity of the industrial sector of Bangladesh has remained roughly the same in this period. This aggregate figure however conceals the important fact that there are large intersectoral differences in labour productivity within the industrial economy. Table 4 shows that the productivity index in the textile industry declined from 100 in 1973/74 to 97 in 1982/83. This is very disappointing because textile is the most important industrial sector of the Bangladesh economy. There are also other sectors like

Table 4

Indices of output per head by Major Industrial Groups

(Base : 1973/74=100)

| Sector | 1974/75 | 1975/76 | 1976/77 | 1977/78 | 1978/79 |
|---|---|---|---|---|---|
| 1. Food manufacturing | 110 | 96 | 107 | 140 | 164 |
| 2. Beverage | 97 | 123 | 94 | 103 | 125 |
| 3. Tobacco | 85 | 86 | 112 | 104 | 111 |
| 4. Textiles | 86 | 100 | 98 | 93 | 98 |
| 5. Footwear | 95 | 101 | 123 | 135 | 139 |
| 6. Furniture | 70 | 69 | 82 | 89 | 104 |
| 7. Paper | 96 | 76 | 72 | 104 | 120 |
| 8. Printing | 83 | 90 | 108 | 104 | 94 |
| 9. Leather | 95 | 184 | 177 | 234 | 307 |
| 10. Chemical | 68 | 106 | 92 | 104 | 120 |
| 11. Petroleum | 84 | 86 | 166 | 117 | 167 |
| 12. Non-metallic | 116 | 147 | 233 | 209 | 217 |
| 13. Basic metal | 66 | 78 | 152 | 100 | 154 |
| 14. Metal products | 87 | 82 | 155 | 72 | 72 |
| 15. Machinery except electrical | 113 | 120 | 185 | 176 | 187 |
| 16. Electrical machinery | 63 | 91 | 147 | 143 | 138 |
| 17. Transport equipment | 157 | 58 | 197 | 258 | 206 |
| 18. Other manufacturing | 62 | 36 | 31 | 38 | 28 |
| 19. Total manufacturing | 94 | 111 | 127 | 177 | 115 |

| | 1979/80 | 1980/81 | 1981/82 | 1982/83 |
|---|---|---|---|---|
| 1. Food manufacturing | 137 | 152 | 179 | 179 |
| 2. Beverage | 128 | 167 | 127 | 117 |
| 3. Tobacco | 107 | 111 | 112 | 102 |
| 4. Textiles | 95 | 87 | 82 | 97 |
| 5. Footwear | 38 | 260 | 121 | 134 |
| 6. Furniture | 114 | 258 | 249 | 78 |
| 7. Paper | 112 | 104 | 111 | 84 |
| 8. Printing | 94 | 104 | 84 | 63 |
| 9. Leather | 244 | 225 | 238 | 96 |
| 10. Chemical | 132 | 153 | 160 | 120 |
| 11. Petroleum | 143 | 98 | 87 | 57 |
| 12. Non-metallic | 287 | 260 | 215 | 218 |
| 13. Basic metal | 137 | 138 | 158 | 44 |
| 14. Metal products | 81 | 74 | 110 | 38 |
| 15. Machinery except electrical | 263 | 361 | 229 | 269 |
| 16. Electrical machinery | 123 | 117 | 120 | 99 |
| 17. Transport equipment | 303 | 397 | 304 | 115 |
| 18. Other manufacturing | 38 | 46 | 57 | 95 |
| 19. Total manufacturing | 128 | 125 | 126 | 114 |

*Source* : Calculated from the data reported in the Bangladesh Bureau of Statistics, *Statistical Yearbook of Bangladesh*, various issues.

furniture, paper, printing, petroleum, basic metal, and metal products in which there was a substantial decline in labour productivity.

However, in food manufacturing, footwear, chemicals, non-metallic products and non-electrical machinery, there was, relatively speaking, some improvement in labour productivity. There in an additional piece of evidence on labour productivity of some of the selected industries. These data are reported in Tables 5 and 6. It can be seen from Table 5 that in the period 1969/70 to 1984/85 productivity in four industries, i. e. jute. cotton, paper and steel, declined substantially. The index of jute industry fell from 100 in 1969/70 to 43 in 1984/85. The decline of labour productivity of the cotton and paper industries was greater than that of the jute industry. The indices fell to 36 and 23 in cases of cotton and paper industries respectively. In the case of the steel industry, labour productivity fell from 100 in 1969/70 to 85 in 1984/85.

Additional evidence on labour productivity of cement, fertilizer, petroleum products and paints and varnishes, is available. It can be seen from Table 6 that the productivity index for the cement industry declined from 100 in 1976/77 to 50 in 1984/85. The index for the petroleum products fell from 100 in 1976/77 to 68 in 1984/85. However, there was some improvement in labour productivity of fertilizer and paints and varnishes industries. Thus the productivity index of the fertilizer industry rose from 100 in 1976/77 to 154 in 1984/85. The index for the p ints and varnishes industry rose from 100 in 1976/77 to 228 in

Table 5

Productivity Indices of Industrial Labour (all employees) in Selected Industries at Constant Prices (Base : 1969/70=100)

| Year | Jute | Cotton | Paper | Steel |
|---|---|---|---|---|
| 1969—70 | 100.00 | 100.00 | .00.00 | |
| 1970—72 | 63.40 | 67.90 | 93.40 | ... |
| 1981—72 | 54.50 | 34 30 | 52.40 | ... |
| 1972—73 | 96.20 | 71.50 | 52.10 | ... |
| 1973—74 | 51.60 | 34.50 | 59.80 | 38.30 |
| 1974—75 | 52.10 | 33.40 | 26.40 | 75.70 |
| 1975—76 | 51.40 | 29.90 | 18.60 | 68.90 |
| 1976—77 | 51.90 | 28.80 | 18 60 | 82.20 |
| 1977—78 | 54.50 | 31.40 | 21.58 | 83.02 |
| 1978—79 | 47.75 | 31.40 | 22.13 | 98.64 |
| 1979—80 | 48.79 | 28.51 | 22.32 | 90.42 |
| 1980—81 | 47.75 | 31.10 | 21.20 | 90.17 |
| 1981—82 | 45.67 | 35.24 | 24.74 | 80.56 |
| 1982—83 | 46.71 | 36.29 | 18·04 | 32.06 |
| 1983—84 | 45.15 | 37.73 | 20.09 | 73.16 |
| 1984—85 | 43.10 | 35.71 | 23.85 | 84.67 |

*Source* : Bangladesh Bureau of Statistics, *Statistical Yearbook of Bangladesh*, 1981 and 1984—85.

1984/85. It is thus evident that the available data suggest that in the majority of industries there was a decline in labour productivity in Bangladesh.

One of the important aspects of industrial efficiency is the trend in the unit industrial cost of the various industries of the country. Such data for the industrial economy of Bangladesh are presented in table 7. It can

Table 6
Productivity Indices of Industrial Labour (all employees) in Selected Industries at Constant Prices (Base 1975-77=100)

| Year | Cement | Fertilizer | Petroleum Products | Paints and Varnishes |
|---|---|---|---|---|
| 1976-77 | 100 | 100 | 100 | 100 |
| 1977-78 | 83 | 70 | 88 | 157 |
| 1978-79 | 75 | 90 | 112 | 173 |
| 1979-80 | 71 | 105 | 107 | 226 |
| 1980-81 | 59 | 102 | 102 | 223 |
| 1981-82 | 65 | 101 | 91 | 218 |
| 1982-83 | 69 | 115 | 61 | 182 |
| 1983-84 | 55 | 139 | 66 | 210 |
| 1984-85 | 50 | 154 | 68 | 228 |

*Source* : Bangladesh Bureau of Stastics, *Statistical Yearbook of Bangladesh, 1984-85.*

be seen that at an aggregate level the index of unit industrial cost declined from 100 in 1973/74 to 86 in 1981/82. This seems to suggest that 'there was some improvement of efficiency level in the use of intermediate input in the manufacturing industries. Available data indicate that this is a general trend in all the industrial sectors except petroleum. In the case of petroleum sector the index rose from 100 in 1973/74 to 361 in 1981/82. However, as mentioned earlier, a definite view about the productivity and the efficiency of the petroleum sector cannot be formed from an analysis of such limited data.

In many economic analyses of industrial develop-

Table 7

Indices of unit industrial cost by major industrial group (Base : 1973/74=100)

| Sector | 1974/75 | 1975/76 | 1976/77 | 1977/78 | 1978/79 |
|---|---|---|---|---|---|
| 1. Food manufacturing | 43 | 59 | 69 | 73 | 75 |
| 2. Beverage | 34 | 38 | 51 | 44 | 54 |
| 3. Tobacco | 50 | 88 | 87 | 80 | 94 |
| 4. Textiles | 54 | 61 | 69 | 85 | 82 |
| 5. Footwear | 32 | 49 | 60 | 74 | 80 |
| 6. Furniture | 41 | 50 | 53 | 38 | 50 |
| 7. Paper | 48 | 70 | 64 | 67 | 72 |
| 8. Printing | 43 | 48 | 45 | 61 | 81 |
| 9. Leather | 39 | 49 | 70 | 74 | 101 |
| 10. Chemical | 66 | 92 | 88 | 91 | 102 |
| 11. Petroleum | 100 | 151 | 108 | 140 | 115 |
| 12. Non-metallie | 41 | 77 | 87 | 87 | 92 |
| 13. Basic metal | 87 | 110 | 72 | 100 | 89 |
| 14. Metal products | 42 | 52 | 36 | 90 | 108 |
| 15. Machinery except electrical | 45 | 57 | 56 | 54 | 63 |
| 16. Electrical machinery | 49 | 56 | 51 | 67 | 70 |
| 17. Transport equipment | 51 | 84 | 49 | 62 | 54 |
| 18. Other manufacturing | 41 | 54 | 69 | 102 | 123 |
| 19. Total manufacturing | 59 | 77 | 77 | 91 | 93 |

| | 1979/80 | 1980/81 | 1981/82 |
|---|---|---|---|
| 1. Food manufacturing | 60 | 51 | 57 |
| 2. Beverage | 45 | 49 | 65 |
| 3. Tobacco | 70 | 57 | 72 |
| 4. Textiles | 56 | 56 | 65 |
| 5. Footwear | 259 | 46 | 58 |
| 6. Furniture | 30 | 17 | 20 |
| 7. Paper | 57 | 82 | 90 |
| 8. Printing | 60 | 62 | 81 |
| 9. Leather | 62 | 51 | 55 |
| 10. Chemical | 83 | 64 | 66 |
| 11. Petroleum | 166 | 268 | 361 |
| 12. Non-metallic | 67 | 68 | 88 |
| 13. Basic metal | 94 | 83 | 90 |
| 14. Metal products | 80 | 79 | 58 |
| 15. Machinery except electrical | 39 | 36 | 50 |
| 16. Electrical machninery | 51 | 54 | 56 |
| 17. Transport equipment | 68 | 48 | 63 |
| 18. Other manufacturing | 76 | 55 | 54 |
| 19. Total manufacturing | 77 | 75 | 86 |

Source : Calculated from the data reported in Bangladesh Bureau of Statistices, *Statistical Yearbook of Bangladesh* various issues.

ment considerable importance is attached to the concept of value-added per employee. The significance of value added per employee and its different components to measure factor intensity is well-known.[15] The indices ofvalue-added and wage value added per employee are presented in Table 8. and 9. From Table 8 it can be seen that at an aggregate level the index of the value-added per employee declined from 100 in 1973/74 to 83 in 1982/83. One likely interpetation of this is that the productivity of the primary factors of production in Bangladesh manufacturing industries declined. An alternative interpretation is that the skill intensity and/or the capital intensity of the industrial economy of the country declined over time. In addition to this result, it can be seen from Table 9 that the wage value-added per employee also declined from 100 in 1973/74 to 94 in 1982/83. This seems to suggest that at an aggregate level the skill intensity of manufacturing industries of Bangladesh declined over time. This is in conformity with the results of Table 8.

It would now be interesting to present the detailed results on value-added and wage-value added per employee in the various manufacturing industries. In many cases, including textiles, the value-added per employee as well as the wage value-added per employee declined. Thus in the case of textiles the index fell from 100 in 1973/74 to 84 in 1982/83, whereas in the case of petroleum industry the decline was quite substantial. The index of value added per employee fell from 100 in 1973/74 to 1 in 1982/83. Only in cases of food manufacturing, paper, non-metallic products, non-elec-

Table 8

Indices of value Added per employee by Major Industrial Groups (Base : 1973/74=100)

| Sector | 1974/75 | 1975/76 | 1976/77 | 1977/78 | 1978/79 |
|---|---|---|---|---|---|
| 1. Food manufacturing | 99 | 75 | 81 | 109 | 123 |
| 2. Beverage | 102 | 132 | 93 | 108 | 126 |
| 3. Tobacco | 80 | 71 | 94 | 91 | 90 |
| 4. Textiles | 75 | 75 | 63 | 79 | 87 |
| 5. Footwear | 117 | 181 | 90 | 96 | 149 |
| 6. Furniture | 63 | 55 | 67 | 114 | 101 |
| 7. Paper | 137 | 59 | 147 | 200 | 224 |
| 8. Printing | 86 | 76 | 104 | 89 | 86 |
| 9. Leather | 112 | 167 | 98 | 208 | 394 |
| 10. Chemical | 52 | 61 | 73 | 81 | 102 |
| 11. Petroleum | 3 | 11 | 15 | 2 | 3 |
| 12. Non-metallic | 100 | 99 | 152 | 534 | 164 |
| 13. Basic metal | 36 | 26 | 119 | 43 | 121 |
| 14. Metal products | 84 | 73 | 239 | 55 | 42 |
| 15. Machinery except electrical | 101 | 91 | 144 | 149 | 144 |
| 16. Electrical machinery | 69 | 90 | 165 | 129 | 119 |
| 17. Transport equipment | 99 | 36 | 274 | 287 | 279 |
| 18. Other manufacturing | 46 | 35 | 38 | 34 | 21 |
| 19. Total manufacturing | 73 | 70 | 90 | 83 | 98 |

| | 1979/80 | 1980/81 | 1981/82 | 1982/83 |
|---|---|---|---|---|
| 1. Food manufacturing | 103 | 134 | 135 | 134 |
| 2. Beverage | 129 | 160 | 117 | 118 |
| 3. Tobacco | 87 | 91 | 89 | 8 |
| 4. Textiles | 84 | 90 | 76 | 84 |
| 5. Footwear | 169 | 255 | 111 | 80 |
| 6. Furniture | 187 | 193 | 232 | 82 |
| 7. Paper | 219 | 150 | 157 | 158 |
| 8. Printing | 95 | 97 | 79 | 57 |
| 9. Leather | 296 | 333 | 238 | 103 |
| 10. Chemical | 127 | 128 | 133 | 101 |
| 11. Petroleum | 15 | 2 | 2 | 1 |
| 12. Non-metallics | 208 | 181 | 145 | 165 |
| 13. Basic metal | 54 | 62 | 81 | 35 |
| 14. Metal products | 55 | 55 | 87 | 23 |
| 15. Machinery except electricity | 196 | 277 | 183 | 159 |
| 16. Electrical machinery | 94 | 99 | 101 | 86 |
| 17. Transport equipment | 177 | 291 | 145 | 156 |
| 18. Other manufacturing | 42 | 50 | 55 | 97 |
| 19. Total manufacturing | 96 | 86 | 83 | 83 |

*Source* : Calculated from the data reported in Bangladesh Bureau of Statistics, *Statistical Yearbook of Bangladesh* various issues.

Table 9

Indices of wage value-added per Employee (Average earnings of labour) by major Industrial groups

(Base : 1973/74 = 100)

| Sector | 1974/75 | 1975/76 | 1976/77 | 1977/78 | 1978/79 |
|---|---|---|---|---|---|
| 1. Food manufacturing | 100 | 96 | 91 | 91 | 116 |
| 2. Beverage | 100 | 90 | 95 | 86 | 111 |
| 3. Tobacco | 106 | 110 | 101 | 76 | 83 |
| 4. Textiles | 95 | 101 | 102 | 83 | 82 |
| 5. Footwear | 93 | 103 | 100 | 100 | 106 |
| 6. Furniture | 106 | 100 | 109 | 103 | 117 |
| 7. Paper | 101 | 95 | 95 | 90 | 127 |
| 8. Printing | 97 | 85 | 121 | 110 | 121 |
| 9. Leather | 101 | 101 | 102 | 89 | 103 |
| 10. Chemical | 90 | 101 | 104 | 104 | 113 |
| 11. Petroleum | 100 | 56 | 87 | 91 | 95 |
| 12. Non-metallic | 73 | 91 | 97 | 82 | 96 |
| 13. Basic metal | 103 | 100 | 100 | 85 | 111 |
| 14. Metal products | 105 | 95 | 98 | 87 | 93 |
| 15. Machinery excep electrical | 94 | 103 | 95 | 97 | 100 |
| 16. Electrical machinery | 95 | 92 | 96 | 96 | 93 |
| 17. Transport equipment | 70 | 73 | 68 | 69 | 74 |
| 18. Other manufacturing | 94 | 99 | 94 | 91 | 95 |
| 19. Total manufacturing | 96 | 101 | 100 | 87 | 91 |

| | 1979/80 | 1980/81 | 1981/82 |
|---|---|---|---|
| 1. Food manufacturing | 110 | 108 | 118 |
| 2. Beverage | 86 | 106 | 90 |
| 3. Tobacco | 98 | 90 | 96 |
| 4. Texties | 96 | 95 | 81 |
| 5. Footwear | 115 | 33 | 72 |
| 6. Furniture | 106 | 135 | 126 |
| 7. Paper | 97 | 113 | 95 |
| 8. Printing | 128 | 146 | 118 |
| 9. Leather | 104 | 110 | 105 |
| 10. Chemical | 95 | 94 | 93 |
| 11. Petroleum | 98 | 99 | 106 |
| 12. Non-metallic | 98 | 83 | 79 |
| 13. Basic metal | 102 | 126 | 100 |
| 14. Metal products | 91 | 92 | 92 |
| 15. Machinery excets electrical | 119 | 104 | 80 |
| 16. Electrical machninery | 96 | 91 | 89 |
| 17. Transport equipment | 88 | 88 | 71 |
| 18. Other manufacturing | 90 | 85 | 57 |
| 19. Total manufacturing | 100 | 98 | 94 |

*Source* : Calculated from the data reported in Bangladesh Bureau of Statistics, *Statistical Yearbook of Bangladesh* various issues.

trical machinery and transport equipment was there a rise in the value-added per employee. However, in most of the manufacturing industries except food, furniture and printing, there was a decline in wage value-added per employee.

This finding can be compared with the indices of the real wage rates of the different sectors. These data are reported in Table 10. At an aggregate level the index rose from 100 in 1973/74 to 132 in 1982/83. In most of the manufacturing industries there was an increase in the real wage rate. The only exceptions to this were furniture and metal products.

In a study on (then) nationalised industries, Chowdhury[16] found that real wages in the jute and textiles industries declined by more than half in the period 1971/72 to 1974,75. In matches, engineering and edible oil industries, there was a decline in the real wage rate by roughly the same order of magnitude.

These results might appear to contradict the findings of this study. But a closer examination of the data will reveal that in fact this is not so. Thus if the data of Table 10 is carefully looked into, it will be found that in most of the manufacturing industries the real wage rates declined in the period 1973/74 to 1976/77. It is apparent that the results of the two studies are quite consistent. The contradictory nature of the findings of Tables 9 and 10 may also be resolved by a careful scrutiny of the data. While in estimating the value-added per employee the nominal value-added is deflated by the sectoral price indices, in the case of real wage rates the sectoral wage rates are deflated by an

Table 10

Indices of real wage rate of all employees of the manufacturing sector by major industrial groups

(Base : 1973/74=100)

| Sector | 1974/75 | 1975/76 | 1976/77 | 1977/78 | 1978/79 |
|---|---|---|---|---|---|
| 1. Food manufacturing | 69 | 96 | 107 | 140 | 140 |
| 2. Beverage | 68 | 97 | 113 | 110 | 105 |
| 3. Tobacco | 60 | 71 | 103 | 121 | 126 |
| 4. Textiles | 72 | 87 | 91 | 113 | 145 |
| 5. Footwear | 68 | 81 | 95 | 125 | 120 |
| 6. Furniture | 52 | 88 | 79 | 110 | 107 |
| 7. Paper | 68 | 92 | 100 | 122 | 116 |
| 8. Printing | 59 | 78 | 90 | 100 | 99 |
| 9. Leather | 68 | 90 | 106 | 110 | 108 |
| 10. Chemical | 65 | 85 | 97 | 103 | 111 |
| 11. Petroleum | 68 | 99 | 120 | 113 | 128 |
| 12. Non-metallic | 74 | 84 | 104 | 121 | 121 |
| 13. Basic metal | 58 | 106 | 120 | 119 | 130 |
| 14. Metal products | 59 | 84 | 92 | 91 | 89 |
| 15. Machinery except electrical | 66 | 87 | 97 | 101 | 103 |
| 16. Electrical machinery | 64 | 94 | 117 | 142 | 142 |
| 17. Transport equipment | 112 | 120 | 140 | 152 | 166 |
| 18. Other manufacturing | 69 | 85 | 78 | 128 | 119 |
| 19. Total manufacturing | 70 | 88 | 95 | 115 | 135 |

| | 1979/80 | 1980/81 | 1981/82 | 1982/83 |
|---|---|---|---|---|
| 1. Food manufacturing | 131 | 133 | 127 | 138 |
| 2. Beverage | 110 | 111 | 117 | 121 |
| 3. Tobacco | 120 | 123 | 125 | 181 |
| 4. Textiles | 131 | 136 | 122 | 124 |
| 5. Footwear | 126 | 132 | 115 | 119 |
| 6. Furniture | 116 | 120 | 106 | 96 |
| 7. Paper | 134 | 138 | 150 | 178 |
| 8. Printing | 96 | 100 | 106 | 129 |
| 9. Leather | 103 | 106 | 106 | 131 |
| 10. Chemical | 134 | 130 | 129 | 133 |
| 11. Petroleum | 122 | 123 | 136 | 141 |
| 12. Non-metallic | 137 | 137 | 134 | 121 |
| 13. Basic metal | 123 | 130 | 129 | 230 |
| 14. Metals products | 91 | 93 | 86 | 93 |
| 15. Machinery except electrical | 114 | 117 | 119 | 116 |
| 16. Electrical machinery | 128 | 130 | 132 | 126 |
| 17. Transport equipment | 170 | 172 | 188 | 184 |
| 18. Other manufacturing | 137 | 143 | 193 | 183 |
| 19. Total manufacturing | 127 | 132 | 124 | 132 |

*Source* : Calculated from the data reported in the Bangladesh Bureau of Statistics, *Statistical Yearbook of Bangladesh*, 1981 and 1984/85

average cost of living index of the industrial economy as a whole.[17] These two methods of deflating the nominal series into the real series would make substantial differences. There is no logical reason why these two sets of data should reveal the same trend. However, on the basis of data on the real wage rates it would appear that there might have been some substitution against labour employment in the manufacturing industries of Bangladesh.

In this context it would be interesting to see how unit labour costs of the different manufacturing industries behaved over time. The relevant data are presented in Table 11 where it can be seen that the index of the unit labour costs for the manufacturing industries as a whole declined from 100 in 1973/74 to 75 in 1981/82. It was noted earlier that the real wages of labour in the industrial economy increased in this period. Therefore, this decline in unit labour costs may be interpreted as a rise in labour productivity in the manufacturing industries. However, it was seen before that at an aggregate level there was vary little improvement in labour productivity of the manufacturing industries as a whole.[18] But like all other aggregate indices, this index also hides important sectoral differences within the manufacturing industries. Although the general trend in most of the industries is a decline in unit labour costs, there are also industries where this index registered an upward trend. In textiles, printing and petroleum product industries the index rose from 100 in 1973/74 to 111, 141 and 123 respectively in 1981/82. The largest fall in unit labour costs was in furniture, leather,

chemical, non-metallic, basic metal products, non-electrical machinery and transport equipment.

It is now appropriate to examine the data on non-wage value-added per employee of the various industrial sectors of Bangladesh. Such data are reported in Table 12. At an aggregate level the index of non-wage value-added per employee declined from 100 in 1973/74 to 77 in 1981/82. This may indicate that the capital intensity of the manufacturing sector declined in the period under review. This should, however, be interpreted with great caution. First, there are some limitations of non-wage value-added per employee as a measure of capital intensity.[19] Second, the price indices used to deflate value-added of the manufacturing industries as a whole and the different industrial sectors of Bangladesh economy may not be appropriate.

However, in the absence of detailed information on the methods of construction of the price indices nothing can be said definitely. As it was seen before, it should also be noted here that there are large inter-sectoral differences in regard to the behaviour of non-wage value added per employee. What is most interesting to observe is that the index of non-wage value-added per employee of the textile sector declined from 100 in 1973/74 to 50 in 1981/82. This is a very important result from the employment point of view. The underlying reason is fairly obvious. The textile sector, after all, includes the largest industry of Bangladesh, i. e. jute industry. In tobacco, printing, basic metal, metal products and other manufacturing industries, the non-wage value-added per employee also declined.

Table 11

Indices of unit labour costs by major industrial groups
(Base : 1973/74 100)

| Sector | 1974/75 | 1975/76 | 1976/77 | 1977/78 | 1978/79 |
|---|---|---|---|---|---|
| 1. Food manufacturing | 91 | 99 | 85 | 65 | 71 |
| 2. Beverage | 103 | 73 | 101 | 83 | 88 |
| 3. Tobacco | 125 | 127 | 91 | 73 | 75 |
| 4. Textiles | 110 | 101 | 103 | 89 | 84 |
| 5. Footwear | 98 | 102 | 81 | 74 | 76 |
| 6. Furniture | 151 | 145 | 134 | 116 | 113 |
| 7. Paper | 105 | 125 | 132 | 87 | 106 |
| 8. Printing | 116 | 94 | 112 | 105 | 129 |
| 9. Leather | 107 | 55 | 58 | 38 | 34 |
| 10. Chemical | 133 | 96 | 113 | 100 | 94 |
| 11. Petroleum | 119 | 65 | 52 | 78 | 57 |
| 12. Non-metallic | 63 | 62 | 42 | 39 | 44 |
| 13. Basic metal | 157 | 124 | 66 | 85 | 72 |
| 14. Metal products | 120 | 117 | 63 | 120 | 130 |
| 15. Machinery except electrical | 83 | 86 | 51 | 55 | 53 |
| 16. Electrical machinery | 152 | 102 | 65 | 67 | 68 |
| 17. Transport equipment | 45 | 127 | 35 | 27 | 36 |
| 18. Other manufacturing | 150 | 276 | 304 | 241 | 240 |
| 19. Total manufacturing | 102 | 91 | 79 | 74 | 70 |

| | 1979/80 | 198 /81 | 1981/82 |
|---|---|---|---|
| 1. Food manufacturing | 80 | 71 | 66 |
| 2. Beverage | 67 | 63 | 71 |
| 3. Tobacco | 92 | 81 | 86 |
| 4. Textiles | 101 | 109 | 111 |
| 5. Footwear | 299 | 13 | 60 |
| 6. Furniture | 93 | 53 | 51 |
| 7. Paper | 87 | 108 | 85 |
| 8. Printing | 136 | 140 | 141 |
| 9. Leather | 42 | 49 | 44 |
| 10. Chemical | 72 | 62 | 58 |
| 11. Petroleum | 69 | 101 | 123 |
| 12. Non-metallic | 33 | 32 | 35 |
| 13. Basic metal | 74 | 92 | 63 |
| 14. Metal products | 112 | 124 | 84 |
| 15. Machinery except electrical | 45 | 29 | 35 |
| 16. Electrical machinery | 78 | 78 | 74 |
| 17. Transport equipment | 29 | 22 | 23 |
| 18. Other manufacturiug | 238 | 186 | 100 |
| 19 Total manufacturin | 78 | 79 | 75 |

*Source* : Calculated from the data reported in Bangladesh Bureau of Statistics, *Statistical Yearbook of Bangladesh*. various issues.

Table 12

Indices of non-wage value added per employee by Major Industrial Groups (Base: 1973/74=100)

| Sector | 1974/75 | 1975/76 | 1976/77 | 1977/78 | 1978/79 |
|---|---|---|---|---|---|
| 1. Food manufacturing | 99 | 69 | 79 | 113 | 125 |
| 2. Beverage | 102 | 137 | 93 | 111 | 128 |
| 3. Tobacco | 79 | 70 | 94 | 92 | 91 |
| 4. Textiles | 43 | 32 | (-) 2 | 73 | 95 |
| 5. Footwear | 137 | 246 | 82 | 94 | 184 |
| 6. Furniture | 26 | 16 | 32 | 123 | 89 |
| 7. Paper | 366 | (-) 165 | 472 | 892 | 837 |
| 8. Printing | 75 | 68 | 87 | 66 | 49 |
| 9. Leather | 117 | 195 | 96 | 259 | 519 |
| 10. Chemical | 39 | 48 | 63 | 73 | 98 |
| 11. Petroleum | .13 | 10 | 13 | .17 | .25 |
| 12. Non-metallic | 113 | 102 | 178 | 749 | 197 |
| 13. Basic metal | 29 | 18 | 121 | 38 | 122 |
| 14. Metal products | 65 | 52 | 364 | 28 | (-) 3 |
| 15. Machinery except electrical | 112 | 69 | 230 | 240 | 224 |
| 16. Electrical machinery | 61 | 89 | 186 | 139 | 127 |
| 17. Transport equipment | 138 | (-) 15 | 549 | 578 | 552 |
| 18. Other manufacturing | 40 | 27 | 31 | 27 | 12 |
| 19. Total manufacturing | 61 | 54 | 85 | 81 | 101 |

| | 1279/80 | 1910/81 | 1981/82 |
|---|---|---|---|
| 1. Food manufacturing | 102 | 141 | 139 |
| 2. Beverage | 134 | 166 | 120 |
| 3. Tobacco | 87 | 91 | 88 |
| 4. Textiles | 65 | 80 | 50 |
| 5. Footwear | 214 | 442 | 144 |
| 6. Furniture | 256 | 356 | 322 |
| 7. Paper | 982 | 383 | 545 |
| 8. Printing | 60 | 44 | 37 |
| 9. Leather | 379 | 428 | 296 |
| 10. Chemical | 138 | 140 | 147 |
| 11. Petroleum | 12 | (-) .97(-) | 1 |
| 12. Non-metallic | 262 | 228 | 177 |
| 13. Basic metal | 48 | 54 | 79 |
| 14. Metal products | 23 | 23 | 82 |
| 15. Machinery except electrical | 331 | 583 | 366 |
| 16. Electrical machinery | 93 | 101 | 105 |
| 17. Transport equipment | 227 | 490 | 243 |
| 18. Other manufacturing | 36 | 46 | 54 |
| 19. Total manufacturing | 94 | 79 | 77 |

*Source* : Calcualted from the data reported in Bangladesh Bureau of Statistics, *Statistical Yearbook of Bangladaes, various issues.*

The largest decline in the non-wage value-added per employee was in the petroleum sector which is difficult to explain One possible explanation is that this extreme result may be due to limitations of the data used for the analysis. In food, beverage, footwear, furniture,

paper, leather, chemical, non-metallic, non-electrical machinery and transport equipment industries there was an upward trend in the non-wage value-added per employee. It is likely that in these industries there was an increase in capital intensity.

It should be quite relevant to examine the data on unit fixed assets of the manufacturing industries. They are presented in Table 13. Although the value of fixed assets of a sector can be used as an indicator of sectoral capital intensity, there are a number of analytical problems which greatly undermine its usefulness.[20] However, given these limitations it may be used to indicate rough orders of magnitude. It can be seen from Table 13 that at an aggregate level the index of unit fixed assets declined from 100 in 1973/74 to 87 in 1281/82. It appears to indicate that direct capital intensity as measured by the value of unit fixed assets declined. There is a difficulty in interpreting this result. A number of analytical questions with regard to under-utilisation of capacity and appropriate pricing of capital goods are also involved.[21]

Detailed sectoral figures on unit fixed assets can be examined now. It can be seen that the index for the textiles sector declined from 100 in 1973/74 to 97 in 1981/82. This may be interpreted to imply that the value of unit fixed assets remained roughly the same in the most important industrial sector of Bangladesh economy. In food, furniture, chemical, non-metallic, basic metal and transport equipment industries values of unit fixed assets declined very sharply. On the other hand in beverage, footwear, paper, printing, leather,

Table 13

Indices of unit fixed assets by major industrial groups (Base : 1973/74=100)

| Sector | 1974/75 | 1975/76 | 1976/77 | 1977/78 | 1978/79 |
|---|---|---|---|---|---|
| 1. Food manufactring | 65 | 51 | 70 | 69 | 76 |
| 2. Beverage | 72 | 59 | 78 | 59 | 50 |
| 3. Tobacco | 96 | 77 | 61 | 87 | 90 |
| 4. Textile | 108 | 75 | 66 | 64 | 75 |
| 5. Footwear | 73 | 48 | 39 | 36 | 38 |
| 6. Furniture | 133 | 177 | 96 | 161 | 105 |
| 7. Paper | 68 | 125 | 220 | 78 | 70 |
| 8. Printig | 91 | 53 | 62 | 86 | 120 |
| 9. Leather | 81 | 30 | 46 | 42 | 77 |
| 10. Chemical | 130 | 74 | 128 | 79 | 76 |
| 11. petroleum | 624 | 278 | 97 | 167 | 147 |
| 12. Non-metallic | 134 | 98 | 55 | 56 | 46 |
| 13. Basic metal | 93 | 95 | 35 | 48 | 30 |
| 14. Metal products | 130 | 94 | 56 | 240 | 276 |
| 15. Machinery except electrical | 77 | 156 | 105 | 141 | 126 |
| 16. Electrical machinery | 125 | 148 | 135 | 153 | 122 |
| 17. Transport equipment | 74 | 146 | 53 | 46 | 47 |
| 18. Other manufacturing | 54 | 49 | 59 | 105 | 164 |
| 19. Total manufacturing | 97 | 76 | 70 | 65 | 66 |

| | 1979/80 | 1980/81 | 1981/82 |
|---|---|---|---|
| 1. Food manufacturing | 72 | 75 | 61 |
| 2. Beverage | 52 | 72 | 165 |
| 3. Tobacco | 95 | 107 | 97 |
| 4. Textiles | 65 | 83 | 97 |
| 5. Footwear | 374 | 214 | 143 |
| 6. Furniture | 121 | 47 | 43 |
| 7. Paper | 158 | 164 | 139 |
| 8. Printing | 112 | 121 | 159 |
| 9. Leather | 115 | 122 | 128 |
| 10. Chemical | 62 | 57 | 51 |
| 11. Petroleum | 191 | 230 | 228 |
| 12. Non-metallic | 40 | 41 | 45 |
| 13 Basic-metal | 32 | 28 | 22 |
| 14. Metal products | 245 | 301 | 421 |
| 15. Machinery except electrical | 57 | 580 | 606 |
| 16. Electrical machinery | 509 | 702 | 629 |
| 17. Transport equipment | 30 | 22 | 33 |
| 18. Other manufacturing | 174 | 121 | 94 |
| 19. Total manufacturing | 70 | 88 | 87 |

*Source* : Calculated from the data reported in Bangladesh Bureu Statistics, *Statistical Yearbook of Bangladesh*, various issues.

petroleum, metal products, non electrical machinery and electrical machinery the indices of unit fixed assect have increased substantially. It is possible that these manufacturing industries have become more capital-intensive in the process of production.

**Section 3 : Summary and Conclusion**

In this paper an attempt is made to identify some of the basic changes in the industrial structure of Bangladesh. A number of interrelated macro-economic variables are analysed. Although data are examined at an aggregate level importance is not attached to the results of an aggregate analysis. For formulation appropriate industrial policies the detailed sectoral results are more important than the aggregate. It is found that a great deal of sectoral differences exist within the manufacturing industries. In many industries employment growth is lagging behind output growth. There is a considerable amount of capital bias within the manufacturing industries. A general decline in labour productivity of different sectors of the industrial economy is also observed.

Most available evidence indicates that the industrial economy of Bangladesh did not perform well in the recent past. The nationalised industries were running at heavy losses because of poor management, negligence profitability consideration and poor labour-management relations etc. The level of capacity utilisation in most of the industries fell below the levels achieved before independence. This was partly due to shortages of raw materials, spares and components mostly imported, and partly due to low levels of export demand. This is a paradoxical situation because on the one hand underdeveloped countries suffer from scarcity of capital and on the other hand available capital is not fully utilised. It is reasonable to expect that an increased utilisation of capital will lead to higher rates of growth in income

and employment. Thus the overall picture of Bangladesh manufacturing is that this sector is not able to generate sufficient amount of employment and suffers from gross inefficiencies and underutilisation of existing capacity.

**Appendix**

In this paper the following variables are included :

(1) Gross value of output : This refers to the value of output expressed in 1973-74 constant prices. In fact the sectoral value of output in current prices are deflated by the respective sectoral price index.

(2) Value-added : The sectoral value-added in current prices is deflated by the respective sectoral price index. The appropriate method of deflating the value-added is a controversial subject but here only a simple procedure is adopted.

(3) Total number of employees : This refers to the average daily employment. Ideally figures on at least man year of employment should be used but such data are not available.

(4) Volume of fixed assets : First the book values of fixed assets expressed in current prices are taken. Ideally figures on replaeement costs of capital should be used but available data do not allow one to generate such figures. Therefore, the book value of fixed assets is accepted as rough indicator of capital. To express in constant prices of 1973-74 these figures are deflated by the general price index of the capital goods reported in the *Statistical*

*Yearbook of Bangladesh.*

(5) Industrial cost : This refers to all kinds af material costs incurred in the process of production and also includes the cost of fuel and electricity used for manufacturing purposes. But there is no detailed price indices for the industrial materials. To arrive at figures in constant prices the value of industrial cost is deflated by the price index of electricity. Admittedly this procedure introduces an element of arbitrariness.

(6) Total employment cost : This refers to the total employment cost in current prices deflated by the wage index.

(7) Output per head : This refers to total value of output at constant prices divided by the total number of employees.

(8) Unit fixed assets : This is measured as the total value of fixed assets at constant prices divided by the total value of output at constant prices.

(9) Unit industrial cost : This is measured as the total value of industrial cost divided by the total value of output both measured at constant prices.

(10) Unit labour costs : This variable is measured as the ratio of total employment costs at constant prices to the total value of output at constant prices.

(11) Average earning or wage-value added per employee : This is derived as the total employment cost at constant prices divided by the total number of employees.

(12) Non-wage value-added per employee : This is

derived by subtracting wage-value added per employee from the value added per employee.

Notes

1. See in particular the following works; Chenery, H. B. (1960), 'Patterns of Industrial Growth', *American Economic Review*, Vol. 50, September; Chenery, H. B. (1979), *Structural Change and Development Policy*, Oxford University Press.
2. Ahmad, J. (1968), 'Import Substitution and Structural Change in Indian Manufacturing Indutsry 1950-1966', *Journal of Development Studies*, Vol. 4, No. 3, April.
3. Lewis, S. R. Jr., and Soligo, R. (1965), 'Growth and Structural Change in Pakistan's Manufacturing Industry', *Pakistan Development Review*, Vol. 5, No. 1, Spring.
4. Lewis, S. R. Jr., (1969), *Economic Policy and Industrial Growth in Pakistan*, George Allen & Unwin Ltd., London.
5. Guisinger, S. E. (1976), 'Patterns of Industrial Growth in Pakistan', *Pakistan Development Review*, Vol. 15, No. 1, Spring.
6. Lewis, S. R. Jr.; and Soligo, R., *op. cit.*
7. Salter, W. E. G. (1961), *Productivity and Technical Change*, Cambridge University Press.
8. Katz, J, M. (1969), *Productions, Functions, Foreign Investment and Growth*, North Holland Publishing Company, Amsterdam.
9. There are a large number of works which compare the rates of growth among many countries. But a handy reading may be Lee, E. (ed,) (1981), *Export-led Industrialisation and Development*, International Labour Organisation, Geneva.
10. This is partly because of the definition of output and value-added in the petroleum sector. Bangladesh imports crude oil from overseas. This is processed into kerosene, further into diesel, still further into petrol and jet fuel. In the domestic market the demand for diesel is very

high, because this is widely used in Public transport and irrigation. In the recent period a large amount of diesel is also imported from other countries. 'If petrol is considered as the final output of the petroleum industry the amount of value-added may not be that high in this sector. It should, however, be emphasised here that the matter cannot be resolved in the absence of detailed statistics. The complex structure of the petroleum industry has been explained by a fellow colleague, Mr. Masud Kamal Khan, Department of Mechanical Engineering, University of Sydney, who worked for some time in one of the petro-chemical corporations of Bangladesh.

11. The nature and magnitude of unemployment and underemployment in Bangladesh economy are debeted. The interested reader may consult the following. Ahmed, Ifthikar (1974), Employment in Bangladesh. in Robinson, E. A G. and Griffin, K. (ed.), The Economic Development of Bangladesh, The Macmillan press Ltd, London.

12. A large volume of literature in this subject is available. The two most important works are by Little, Scitovsky and Scott, and another by Bhagwati and Krueger. See the following, Little, I., Scitovsky, T. and Scott, M. (1970), *Industry and Trade in Some Developing Countries, A Comparative Study*, Oxford University Press, New York; Bhagwati, J. and Krueger, A. (1978), *Foreign Trade Regimes and Economic Development*, for National Bureau of Economic Research, Ballinger Press, Cambridge, Massachussets. See also, Kruegger, A. O, Lary, H. B., Monson, T. and Akrasanee, N. (1981) (eds.), *Trade and Employment in Developing Coutries*, Vol I. *Individual Studies*, The University of Chicago Preess, Chicago.

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15. Lary,. *H. B.* (1968). Imports of Manufactures from less Developed countries, Columbia University Press, New York, 1964.
16. Chowdhury, N. (1976), 'Real Wages in Nationalised Sector in Bangladesh', *Political Economy, Journal of the Bangladesh Economic Association,* Vol, 2, No. I, Conference.
17. For a detailed discussion on the method of construction of real wage rate indices see Bangladesh Bureau of Statistics, *Statistical Yearbook of Bangladesh* 1982, and also Bangladesh Bureau of Statistics, *Monthly Statistical Bulletin of Bangladesh* some relevant issuse of recent years.
18. The concept of productivity is not as simple as measured in this paper. But even in a detailed statistical study on some selected industries of Bangladesh for the sixties Ahmad and Anwaruzzaman found that in most of the industries productivity declined over time. See Ahmad, Q. K., and Anwaruzzaman. C. (1973). 'Productivity Trends in the Manufacturing Sector of Bangladesh : A Case Study of Selected Industries', *Bangladesh Economic Review,* Vol. I, No. 2, April.
19. For a detailed discussion this subject see Ahmad. A. K. Mona-war uddin, (1987), Factor Intensity. Trade policis and exports of Manufactures : A case study of Bangladesh. ph. D. Thesis at the Univers.ity of Sydney.
20. The limitations of the book values of fixed assets as reported in the Census of Manufacturing Industries have been discussed in Chapter 3 of Ahmad, A. K. Mona-war uddin, op. cit.
21. There is a distinction between capital intensity of full capacity and that at underutilised capacity. On this see Islam R. (1978). 'Reasons for Idle Capital : The Case of Bangladesh Manufacturing', *Bangladesh Development Studies,* Vol.

6, No. I, Winter. On the question of appropriate pricing of capital goods there are enormous theoretical difficulties. See for example, Harcourt. G. C. (1972), *Some Cambridge Controversies in the Theory of Capital* Cambridge University Press, London. In the absence of detailed information reliance was made on the aggregate price indices of the capital goods sector reported in the various issues of the *Statistical Yearbook of Bangladesh*.

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