THE MANUFACTURING SECTOR IN SUDAN:

STRUCTURE, PERFORMANCE, AND EFFICIENCY

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ABSTRACT

The sturcture of manufacturing output in Sudan is typical of most developing countries where processing of agricultural materials into simple consumer goods dominates other manufacturing activities. Food processing is of overwhelming importance and accounts for more than half of manufacturing activity. Textiles, wearing and apparel and leather products constitute the second largest manufacturing activity providing one-fifth of manufacturing employment.

Small establishments-employing less than 25 workers-constituted 95 percent of the total number of manufacturing establishments in 1981/82. While these small establishments had a 15. 8 percent share of gross investment and 27. 2 percent share of employment, they had a proportionate 49. 5 percent share of gross value added and 34. 2 percent of gross output in manufacturing. Thus, the higher gross output and value added per unit of investment in the small establishments compared to the larger ones make the small sector a relatively efficient one.

Manufacturing is preponderantly in the private sector. It accounts for 69 percent of gross value added, 78 percent of gross output, 53 percent of gross investment and 42 percent of employment in the manufacturing sector (1981/82 Industrial Survey).Yet some 50 large establishments-most of them concerned with the processing of agricultural materials-are government owned. They account for 14 percent of gross investment, 10 percent of gross value added, 26 percent of employment and 9 percent of gross output. Therefore, the higher gross output and value added per unit of investment in the private sector compared to the public one make the private sector a relatively efficient one. However, these distribution shares pertain only to large establishments. This data deficiency cautions us from drawing too firm conslusions about the efficiency of the private sector.

Our estimates indicate that the elimination of resource malallocation which existed in the manufacturing sector in 1981/82 involves a shift of 3 percent of GDP and a gain of 4 percent in consumer welfare. Constant

costs and unitary elasticities of demand are assumed. On both counts we tend to overstate the welfare loss.

Finally, the results of our analysis should be heavily qualified when taking into consideration deficiencies in the 1981/82 industrial survey data.

1. Introduction:-

In the Sudan, industry is primarily an agro-industry based on the processing of agricltural materials into simple consumer goods such as wheat flour, sugar, edible oil, processed vegetables and fruits, soft drinks, animal feed, leather, shoes, etc. Other important manufacturing activities involve the production of cement, soap, tyres, batteries, plastic and petorleum products. If we rank these manufacturing activities according to their economic significance, food processing comes first accounting for more than half of manufacturing activity, processing of non-food agricultural materials into products such as textiles and leather constitute the second most important manufacturing activity providing one-fifth of total employment in the sector. On the other hand, basic metal industries and machinery rank, last accounting for about six precent of gross manufacturing output.

Many companies, both private and public are engaged in the manufacturing activities. The government participation is mainly in sugar, textiles, cement and tanneries. The public sector has monoply only in cement industry. The private sector has a larger share of investment and output in the other subsectors.

The manufacturing sector contributes about 8 percent of gross national product (GDP), employs about 145000 workers representing less than 5 percent of the labour force and contributes less than 1 percent of the total exports (Economic Survey 1984/85). The distribution of employment among the manufacturing subsectors indicates the dominance of traditional manufacturing subsector-processing of agricultural materials. Again, the manufacturing exports are mainly in the oil milling industry, that is, edilbe oil and oil cakes amounting to 5 percent of total exports in 1983/84 (Bank of Sudan-Annual Report).

The limited contribution of the manufacturing sector to the economy at large is due to many problems facing the sector: high import dependence coupled with inability to maintain a steady inflow of imported raw materials and spare parts, unreliability of enegy supply, shortage of skilled manpower, inadequate transport infrasturcture, etc. These porblems are reflected in low capacity utilization, low porductivity, low rates of return and resource malallocation.

This article examines both structure and preformance of the manufac-

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turing sector. How manufacturing industries allocate their resources? The likely effect of such allocation on the main economic goal-efficiency- in addressed.

The article is organized as follows: Section 2 provides a detailed and Through review of the structure and performance of the manufacturing industries. The analysis distinguishes between small and large establishments as well as between private and public ones. The economic performance of the public manufacturing sector compared with the private sector is envisaged. Similarly, the comparative performance of large and small establishments is examined. Section 3 addresses the economic efficiency issue. In particular, the impact of manufacturing resource malallocation on efficiency is examined. Estimate of welfare losses are provided. An assessment of these estimstes is given in section 4. Finally, section 5, is summary and conclusion .

2 - Structure and Performance of Manufacturing Sector :

The manufacturing structure in Sudan is typical of most less Developed Countries (LDCs) where simple consumer goods dominate other manufacturing activities. As this section shows, this tendency appears to have been more pronounced and more visible in Sudan than in other LDCs.

The structure of manufacturing output has traditionally involved simple consumer goods utilizing agricultureal materials such as cotton, sugar-cane, groundnuts, vegetabes , etc. In particular, food, beverages and tobacco production is of overwhelming importance. Based on the 1981/82 Industrial Survey carried out by the United Nations Industrial Development Oraganisation (UNIDO), this sector accounted for 78 percetn of total number of establishsments, 60. 7 percent of employment, 48. 7 percent of wages and salaries, 72 percent of gross output, 76. 8 percent of gross value added and 61. 5 percent of total fixed capital in the manufacturing sector (see table 2.1). Food processing is dominated by sugar and oil milling. Other food processing activities include bakeries, floor mills, confectionaries, vegetable and fruit canning.

Processing of non-food agricultural materials into goods such as textiles, wearing and apparel and leatrer products has accounted for the second largest manufacturing activity. This sector provides 19. 7 percent of manufacturing secctor employment, but its contribution to manufacturing value added is much less, amounting to 4. 6 percent, and its share in the total number of establishments is only 2 percent. (see table 2. 1).

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Table 2. 1 The Structure of the Manufacturing Output in Sudan.
1981/82

ISIC	Industry Branch	No. of Establishments No.%		No of Employment No.%	
31	Food, beverage & tobacco	5275	78. 0	87739	60. 7
32	textiles, wearing apparel and leather	138	2. 0	28409	19. 7
33	wood, wood products and furniture	182	2. 7	2091	1. 5
34	paper & printing	97	1. 4	4225	2. 9
35	chemicals & chemical products	118	1. 7	5336	3. 7
36	Non-metallic mineral products	81	1. 2	4741	3. 3
37	basic metal industries	12	0.2	777	0. 5
38	fabricated metal products	854	12. 6	10803	7. 5
39	Other manufacturing industries	2	0. 0	382	0. 3
	Total	6759	100	144503	100

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Table 2. 1 (con.)

ISIC	Wage/ Salaries Value (000's)%		Gross Output Value (000's)%		Gross Value added Val. (000's)%		Capital Value%	
31	75149	48. 7	1105973	27. 0	428030	76.8	661544	61.5
32	35957	23. 3	105879	6.9	25809	4.6	188614	17.5
33	2720	1. 8	10217	0.7	5411	1.0	14944	1.4
34	6370	4. 1	32057	2.1	8917	1.6	14635	1.4
35	11722	7. 6	139012	9.0	34231	6.1	114116	10.6
36	4305	2. 8	28128	1.8	10199	1.8	30866	2.9
37	1471	1. 0	17372	1.1	7223	1.3	2749	0.3
38	16043	10. 4	90601	5.9	36940	6.6	45851	4.3
39	551	9. 4	6846	9.4	337	0.1	2165	0.2
Total	154288	100	1536085	100	557097	100	1075485	100

Source: Based on the Industrial Survey, 1981/82. Table 3. 6, p77

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The distribution of manufacturing establishments by size shows that about 6412 establishments (95 percent of the total) were small employing less than 25 workers each. Although the small scale establishments account for 95 percent of the total number of manufacturing establishments, they do not account for more than 15. 8 percent of total capital investment and 27. 2 percent gross output and 49. 5 percent of total value added in manufacturing sector (see table 2. 2 A) The recorded large establishments employing more than 25 workers account for 347 concerns (5 percent of total number of manufacturing establishment). They account for 72. 7 Percent of industerial employment and rather more than half of gross value added in manufacturing (50. 5 percent) Nevertheless, the higher gross output, value added, and employment per unit of investment in the small establishments compared to the larger ones make the small sector a relatievely efficient one and preferred area for resource allocation (See table 2. 2B).

The dominance of food, beverages and tabacco production is exhibited in the case of both small and large establishments, although it is more evident in the small establishments case than in the large ones. There are about 5124 small food, beverages and tobacco establishments. They account for 80 percent of all small manufacturing establishments, 67 percent of employment, 82 percent of gross output and 87 percent of value added in the small manufacturing sector (1981/82 industrial survey).

In contrast to food processing, textiles, wearing and apparel and leather products are dominated by large establishments. Where 17. 6 percent of the large establishments are engaged in the production of textiles, etc, only 1. 2 percent of the small establishements are in this sector. This explains the above mentioned discrepancy between the relatively low share of this sector in the number of establishment (only 2 percent) and its relatively high share in manufacturing employment (19. 7 percent).

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Table 2. 2 A comparative Share of Small and large Manufacturing Establishments, 1981/82

Manufacturing Indicator	Small No. or Value%		Large No. or Value	
No. of estabishments	6412	95	347	5
No. of employment	39335	27.2	105168	72.8
Wages and Salaries (in Ls 000's)	36424	23.6	117864	76.4
Gross otuput (in 000's)	525088	34.2	1010997	65.8
Gross value added (in 000's)	725648	49.5	281449	59.5
Gross investment (in 000 s)	169928	15.8	905557	84.2

Source: based on the Industrial Survey of 1981/82 Table 3. 6 page77

Table 2. 2. B Coparative Performance of Small & Large Manufacturing Establishments, 1981/82.

Performance Indicator	Small	Large
Gross output/ Investment	3. 090	1. 116
Value added / investment	1. 622	0. 311
Value added/ employee	7007	2676
Gross output/ employee	13349	9613

Source: Own calculations based on Table 2. 2 A.

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The manufacturing sector is characterized by low rate of capacity utilization-30 percent according to the World Bank (1987) estimate. Nevertheless, the amount of idle capacity in the textile and food industries has been of particular concern as Sudan has imported many goods which it could produce itself. Textile industry is working about 25 percent of capacity-below the average of 30. The production of cloth had fallen from 300 million metres in the 1970s to 50 million metres in 1985/86. In 1986/87 imports of textile amount to 27 million Sudanese Pounds (Economic Survey, Bank of Sudan Annual Report).

Industry in Sudan is preponderantly in the private sector. This sector account for 52. 7 percent of gross investment, 69. 2 percent of gross value added, 78. 6 percent of gross output, 41. 9 percent of employment and 58. 4 percent of wages and salaries in the manufacturing sector in 1981/82 (See table 2. 3 A) It is worth mentioning that these distribution shares pertain only to large establishments employing 25 workers and more. Nonetheless,

"If the whole manufacturing sector was considered, the shares of the private sector would most certainly rise" (1981/82 Industrial Survey, page 41).

The government owns 50 large establishments; most of them are engaged in the processing of agricultural materials. In particular the government owns 13 textile plans, 7 food processing factories, 4 sugar factories, 4 tanneries, etc. While the public establishments had a 14. 3 percent share of gross investment and 26. 4 percent share of employment (See table 2. 3 A), they had a disproprtionate 9. 2 percent share of gross output and 10.2 percent share of gross value added in the manufacturing sector. Other economic indicators of relative performance-given in table 2. 3B-show that the public sector performed relatively poor in comparison with the private sector. For isntance, the ratio of value added to investment in the private sector is twice as high the public sector ratio. When interpreting these results, it must be borne in mind that data provided by the industrial survey of 1981/82 is the best that is availble, it has many shortcomings and deficiencies. In particular, the lack of data pertaining to both private and public small establishmensts is of overwhelming impotance since 95 percent of manfacturing establishments are small .

The ownership pattern of manufacturing enterprises mirrors closely the output of the manufacturing sector .The dominance of the two subsectors-food, beverages and tobacco and textiles, wearing and apparel and leather-is preserved across the different types of ownership patterns, albeit with some slight variations. In the public sector, thes two susbectors accounted for 66 percent of all manufacturing enterprises, 85. 4 percent of employment, 66. 7 percent of gross output, 53. 1 percent of gross value added and 95. 6 of gross investment. On the other hand, they account-

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ed for only 60 percent of all privately owned entrprises, 74 percent of employment, 74. 3 percent of gross output, 70. 7 percent of gross value added and 66. 2 percent of capital investment in the private manufacturing sector (industrial survey).

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Table 2. 3 A The Structure of the Manufacturing Sector by Type of Won-ership-1981/82.

Manufacturing indica-tors	Public Sector No. or value %		Private Sector No. or value %		Mixed Sector No. or Value	
No. of establishments	50	14.4	290	83.6	7	2.0
No. of Employment	27724	26.4	44020	41.9	33424	31.7
Wages & Salaries	29498	25.0	68825	58.4	19543	16.6
Gross Output	92784	9.2	794279	78.6	123935	12.2
Gross Value added	28593	10.2	196177	69.2	56675	20.1
Gross Investment	129671	14.3	477527	52.7	298360	33.0

Source: Based on Industrial Survey, 1981/82 Table 3. 7 page 78. N. B. Wages & Salaries, gross output, value added and investment are in thou-san pounds.

These distribution shares pertain only to large establishments employing 25 wrkers or more.

Table 2. 3 B Indicators of Relative Performance of Manufacturing Sector by Ownership.

Indicator	Public Sector	Private Sector
Gross output/ Investment	0. 716	1. 663
Value Added/ Investment	0. 221	0. 441
Value Added/ Employee	1031	4457
Gross Output/ Employee	3347	18044

Source: own calculations based on Table 2. 3 A.

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3- Econnomic Efficiency :-

The notion of efficiency was first developed by an Italian economist, Vilfredo Pareto. The concept of economic efficiency is named in his honour as Pareto optimality. Economic efficiency is far from simple, but it basically means that nothing is being wasted. Efficiency is present when economy's resources are so organized that it is impossible to make everyone better off by any reallocation of resources. Conversely, inefficiency is present when resources can be reallocated to make everyone better off or when at least one person could be made better off without hurting anyone else. Ever since Adam Smith (1939) argued that perfect competition would lead profit - maximizing producers and utility-maximizing consumers to an efficient allocation of economy's resources, economists have been captivated by its charm. Nevertheless, his argument has been qualified by many economists (e.g. Schumpeter, (1942), Galbraith (1956), etc). For instance, a perfectly competitive allocation of resources will be economically efficient if externalities are not present.

Assuming that all the conditions of perfect competition are met, the long-run equilibrium of the purely competitive industry requires its returns (profits) to equal the opportunity cost of its capital - the return that capital can earn elsewhere. No industry will provide a rate of return larger than the opportunity cost of capital. For if returns in one industry are particularly low, resources will flow out of it. On the other hand, capital will be attracted into any industry in which unusually high profits are being realized. The new capital will increase output in that industry, which will then drive down prices and profits until the point at which the rate of return on capital has been reduced to the level of its opportunity cost. Given this situation of optimal resource allocation, we can pick out the places where resources are misallocated by looking at the rates of return on capital. Those industries which are realizing higher than average rate have too few resources, whereas those realizing lower than average rate have too many resources. The rates of return on capital as defined in the 1981\82 industrial survey are given in table 3.1. The differences among these rates of return, as between industries, give us a broad indication of the extent of resource malallocation in the Sudanese manufacturing sector in the early eighties.

How much reallocation of resources it would take to eliminate the observed divergences in the rates of return depends on demand elasticities for the goods in question. For instance, a unitary elasticity of demand indicates that the amount of excess profits measures the amount of resources that must be called into an industry in order to expand its output and wipe out the excess (monopoly) profit. That is, monopoly profit is defined as existing in an industry when its rate of return on invested capital is higher than that earned by all industries. Alternatively, if the elasticity

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of demand is different from one, then the desired resource transfer becomes a multiple of the elasticity (See Hotelling (1938), Harberger (1954), etc,).

Pending a discussion of the assumptions used and the possible biases in the survey results, we find that to obtain equilibrium we would have to transfer about 203 million Sudanese pounds in resources from low-profit to high-profit industries. We tentatively conclude that the malallocations of resources which existed in the Sudanese manufacturing sector in the early eighties could have been eliminated by a net transfer of roughly 43 percent of the resources in the manufacturing sector, or 3 percent of the total resources of the economy as measured by GDP. It is worth mentioning that, although the extent of manufacturing resource malallocation is great (43 percent) it only represents a relativey small fraction of the GDP (3 percent). This can be attributed to the limited contribution of the manufacturing sector to GDP, as noted earlier.

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Table 3.1 Capital Investment and Rate of Retun on Capital In the Manufactuing sector, 1981\82.

ISIC Code	Industry	Capital (Ls 000's)	Rate of Return
3111	Slaughtering and preparation of meat	2952	0.519
3112	Dairy Products including ice cream	2368	0.042
3113	Canning and preservation of fruits and vegetables	3476	0.218
3115	Vegetables and animal Oils and fats	142575	0.329
3116	Grain and mill products	57756	2.314
3117	Bakery, macaroni and moodle products	52215	2.053
3118	Sugar Industry and refinery	356423	0.887
3119	Sugar, Confectionary, cocoa and chocolate products	8158	0.612
3121	Food Industries not elsewhere classified	14408	0.394
3122	Prepared animal food	4943	0.210
3131	Distilled alcoholic drinks	613	0.083
3134	Soft and carbon drinks	12407	0.191
3140	Tobacco, cigar and cigarette industries	3250	5.367
3211	Weaving, spinning and dyeing preparation	171675	0.060
3212	Blankets, bedsheets and towels	534	0.058
3213	Knitting, needlework, socks and stockings	882	0.181
3215	Cordage, rope and twine	251	0.243
3220	Ready made apparel excluding footwear	2185	0.038
3231	Tanning and preparing of leather	5446	0.022
3233	Leather and substitute products excluding footwear	3718	1.275
3240	Footwear except plastic and rubber	3923	0.471
3311	Preparing wood and saw mills	1220	0.190

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3320	Wood prosucts including furniture	13723	0.170
3411	Pulb, Paper and papercard	3812	- 0.360
3420	Printing and publishing unit	10824	0.360
3511	Basic Chemiclas excluding fertilizers	1834	2.068
3521	Paints, varishes and others	1365	0.155
3522	Drugs and medicines	2297	0.503
3523	Soap, cleaners and toilet products	16008	0.174
3529	chemical products not elsewhere classified	1836	0.337
3530	petrolum refineries	42292	0.130
3551	Tyre and tube industries	59356	0.147
3560	Plastic peoducts not elsewhere classified	6930	0.290
3620	Glass and glass products	2665	- 0.020
3692	Cement, quickline and paste	13163	0.543
3699	Non-metalic minerals not elsewhere classiied	15065	- 0.030
3710	Basic metal industires	696	- 0.070
3720	Non-ferrous metal industries	2052	2.830
3811	Cuttery, handtools and metalic outfittings	2920	0.387
3813	Structural metal products	2576	0.160
3819	Fabricated metal products not elsewhere classified	4962	0.607
3822	Agicultural machines	2998	- 0.124
3833	Household appliances		0.675
3839	Electircal apparatus not elsewhere classified	15444	0.416
3843	Motor vecles activities	9417	0.606
3901	Other Industries not elsewhere classified	2165	- 0.099

Source: 1981/82 Industrial Survey

N. B rate of return on capital= (gross value added-wages & Salaries)/ Capital.

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What is the cost to society of resource misallocation, or inefficiency? By how much would people be better off if these desired resource transfers were effected? These questions were answered by Harberger (1954) for an analogous problem. His method for calculating the welfare loss is based on the well-known dead-weight triangle area (e. g. Hotelling (1938), Ruffin and Gregory (1988), Tullock (1967), Spencer (1986), etc.)) Our estimate of the deadweight loss amounts to about 263, million Sudanese pounds that is, about 4 percent of the economy's output (GDP) or 14. 38 Sudanese pounds per cpaita.

4- Assessment of Empirical Findings:-

Our empirical findings are assessed in terms of assumptions and data used. The assumption of long-run constant costs provides a reasonable upper limit for our estimates of resource malallocation and welfare loss since costs in all probability would tend to be increasing rather than decreasing in the manufacturing sector. The presence of rising costs would result in a lowering of both our estimates. Less resources would have to be transferred in order to equalize rates of return, and the increase in consumer welfare resulting from the transfer would be correspondingly less.

Similarly, we think that the assumption of unit elasticity of demand provides a reasonable upper limit for our estimates. The question then arises: how high are these eslaticities of demand confronting the industries in question? By looking at the list of industries in table 3. 1, one gets the feeling that the elaticities in question are probably quite low. This presumption is further strengthened by the fact that what we envisage is not the substitution of one industry's product against all other products. but rather the substitution of one great aggregate of products (those returning high rates of return) for another aggregate (those returning low rates of return).

Our estimates of welfare loss must be heavily qualified when taking into account deficiences in the 1981/82 industrial survey results. In particcualr, the indirect measure of the rate of return on capital provided by the survey. This indirect measure is defined as gross value added less salaries and wages divided by gross investment. As it is evident from the defintion of value added given in many macroeconomic textbooks (e. g, Miller (1983) this proxy is gross of many factors and it might better be termed the "economic surplus". Thus, the indirect measure of the rate of return on capital which we have used is an over - statement of the actual rate leading to an over- statement of the estimated welfare loss. Of course it would have been much better to get a direct valuation of profit and to divide the latter by capital in the industry. Unfortunately, "such valuations proved very difficult in the Sudan" (1981/82 Industrial Survey, page 57).

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The real problem is in assigning a measure of accuracy and reliability to the Survey results used. Errors could result from faulty responses, faulty coding, faulty reproduction of results, etc. More important, we did not attempt to get rid of short - term variations in the rates of the return by, say, averaging the rates for each industry for a five of or even ten - year period due to lack of data. Definitely, the one year period-1981/82- can not dub for long -run partial equilibrium conditions. It is likely that recent studies based on more recent reliable data would show a distinct drop in welfare loss.

Finally we turn to ask what resource misallocation we have measured of monopoly neglecting other sources of inefficiency. Monopooly is inefficienct for three reasons. Firs, monopoly leads to contrived scarcities. Second, the resources used to acquire monopoly power could have been used elsewhere in the economy. Finally, monopoly does not force efficiency in production. Our analysis only addresses the first source of inefficiency. The second source of inefficiency stems from monopoly rent-seeking activities where real resources have to be spent on lobbying, etc, to turn the industry into monopoly and acquire the monopoly profit. Tullock (1967) and Krueger (1974) have argued that estimates of the dead-weight losses from monopoly - such as ours represent lower bounds to the true loss of society because they neglected the fact that monopoly rent seeking can lead to substantial social losses. Although monoploy rent seeking is a very logical concept it is very hard to quantify with any precision. Our analysis does not attemp to assess it. Finally, monopoly usually includes costs that consumers under purely competitive conditons would not elect to pay for such as high advertising and packaging cost, etc. Leibenstein (1966) termed those organizational slacks "X- inefficiency". How large are monopoly X- inefficiencies? Primeaux (1977) conducted an interesting test of X- ineficiency. He found that in 49 U. S. cities, there was competition between at least two electric companies and the costs of those companies that face competition was II percent below those of monopoly supplies (See primeaux (1977). We did not attempt to quantify X-ineficiency due to lack of data.

5. Summay And Conclusion:-

The structure of manufacturing output in the Sudan is typical of most LDCs. Processing of agriculture materials into simple consumer goods such as sugar, wheat flour, edible oil, processed vegetables and fruits, etc, dominates other manufactring activities. Food, beverages and tobacco sector accounts for almost 77 percent of manufacturing value added, 78 percent of the total manufacturing establishments, and about 62 percent of capital investment in the Sudanese manufacturing sector. Invariably, textile, wearing apparel and leather products constitute the second most important manufacturing activity providing 19 percent of total man-

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ufacturing employment and about 7 percent of maunufacturing output. Most of the remaining manufacturing activity are small with limited contribution to the economy at large.

The majority of the manufacturing establishments is comprised of small enterprises empoying less than 25 workers. Based on the 1981/82 industrial survey, 6412 establishments -95 percent of the total number of establishments surveyd-are small. These small establishments are basically labour intensive employing 27. 2 percent of total maunfacturing employment and utilizing 15. 8 percent of manufacturing capital investment. Yet they had a proportionate 49. 5 percent share of gross manufacturing value added and 34. 2 percent of gross manufacturing output. On the other hand, the large establishments had a 72. 8 percent share of employment and 84. 2 percent share of gross investment. Nevertheless, they accounted for only 50. 5 percent of gross value added and 64. 8 percent of gross output in industry. Thus the ratio of value added to investment and the ratio of gross output to investment were higher for the small establishments than for the larger ones implying a higher level of efficiency for small establishments.

Most of the maufacturing activity is in the private sector. It controls over 83 percent of the manufacturing establishments and accounts for about 42 percent of manufacutring employment, 58 percent of wages and salaries paid by the manufaturing sector, about 79 percent of gross output and 70 percent of manufacturing value added. Calculated performance indicators show that the public sector performed relatively poorly in comparison with the private sector. For instance, value added per employee was 10131 Sudanese pounds in the public sector compared to 4457 pounds in the private sector. It should be noted that this conclusion is based on data pertaining only to large establishments employing 25 workers or more.

We measured the malallocation of resources which existed in the manufacturing sector in 1981/82. Our estimates indicate that the elimination of this misallocation of resources involves a maximum shift of 3 percent of GDP and again of 4 percent in consumer welfare. In reaching these estimates we have employed a long-run model of competitive factor markets. Constant costs and unitary elasicities of demand are assumed.On both counts we tend to overstate the wefare loss.

Finally, the results of our analysis should be heavily qualified when taking into account deficiencies in the 1981/82 industrial survey, particularly the indirect measure of the rate of return on capital and the lack of data pertaining to both private and public small establishments of welfare loss. The latter data deficiency cautions us from drawing too firm conclusions about the efficiency of the private sector in comparison with the public sector because 65 percent of the manufacturing establishments are small.

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