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9. ABSTRACT

An analysis of the overall performance of the Tunisian economy between 1962 and 1971, the period of the Ten Year Perspective Plan. In the process of the analysis, certain problems of measurement and the solutions adopted are discussed in detail. The manufacturing sector is singled out for special emphasis. Three measures are developed for the analysis: capital-output ratios, capital-labor ratios, and output-labor ratios. These measures are calculated on a disaggregated basis.

The major findings are that, though by international standards the performance of the Tunisian economy was very good, the heavy investments concentrated in relatively few industries did not produce commensurate results. The detailed analysis showed that particularly in the public sectors, investments produced insufficient output, were very capital-intensive, and yet produced inadequate output per man.

In explanation, a series of policy problems is discussed, including, most importantly the institutional problems of making execution of policy decisions more responsive to the decision of the policy makers.

Supporting detail is presented in Appendix Section V and Appendix Tables.

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Investments, Employment, and Output per Man
In the Tunisian Economy, 1961-1971

by

Wolfgang F. Stolper

37



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The University of Michigan
Ann Arbor, Michigan 48108

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Cette article présente une analyse du fonctionnement de l'économie Tunisienne entre les années 1962 et 1971, la période désignée sous le titre: Plan perspectif des dix Années. Au cours de l'analyse, certains problèmes de mesurage ainsi que les solutions adoptées sont discutés en détail. Le secteur industriel est particulièrement mis en évidence pour une étude plus approfondie. Trois mesures sont développées dans cette analyse: le coefficient de capital, capital par emploi et valeur ajoutée par emploi. Ces mesures sont calculées sur une très base désagrégée.

Les conclusions importantes sont que, bien par le standard international l'accomplissement de l'économie Tunisienne fut très bon; les investissements, concentrés dans relativement peu d'industries n'ont pas produit des résultats proportionnés. L'analyse détaillée montre que particulièrement dans le secteur public, les investissements avaient produit un rendement insuffisant. Bien qu'ayant absorbé beaucoup de capital par emploi, ces investissements ont pourtant produit un valeur ajoutée par emploi inadéquate.

En explication, une série de problèmes de politique économique est discutée, surtout: le grand problème institutionnel de rendre l'exécution de la politique économique plus responsive aux décisions prises.

Les détails sont présentés dans la section V ainsi que dans les tables de l'appendice.

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It is a pleasure to acknowledge the generosity of the Tunisian Government in making the figures available which are the basis of this study. In addition, an incalculable debt is due to Monsieur Chelbi, Monsieur Bel Hadj Amor, Monsieur Jebeli, Mr. J.G. Kleve and my colleague Elliot Berg who have read the first draft of the paper carefully and made important criticisms and suggestions that led to several important reformulations. The usual disclaimer has to be made that I remain solely responsible for the way in which I have used the figures for further calculations and in which I have interpreted them. Nothing in the text represents the opinion of the Government or any of its officials.

Finally, an earlier version of the paper was discussed at a conference in Tunis at the end of April 1973, and individual points were discussed with Mr. Gordon Billington, Mr. Bertil Walstead, Mr. Alexander Nowicki and Mr. Marc Lenot of the IBRD. All have contributed to clarifications without implying any responsibility on their part.

Wolfgang F. Stolper
Ann Arbor, Michigan

September 1974

Note: This paper is intended as part of a major study of the Tunisian economy during the period of the First Ten Year Plan 1962-1971. The other planned chapters, to some of which reference is made in the text, and their authors are:

J.G. Kleve, "The Financing of Investments in Tunisia, 1961-1971"

R.J. Blake, Jr., "Import Controls and Production in Tunisia"

Th. E. Daves, "Progress and Policies in the Tunisian Agricultural Sector, 1962-1971"

A. K pfer, "The Incidence of the Tunisian Tax System"

P. Heller, "An Analysis of the Health Sector"

The planned analysis of the Education sector, unfortunately, did not materialize.

It is planned to publish some of the other papers in the preliminary form of a Center Discussion Paper.

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I. Introduction

Tunisia became independent in 1956 in a smooth and peaceful transition. During the first few years of adjustment, the economy does not seem to have grown very much. In 1961 deliberate attempts were made to accelerate the development of the economy and to influence its structure through a program of massive investments, industrialization and institutional changes. A Ten Year Perspective Plan for the years 1962-71 was published; at the same time a detailed Three Year Plan for the years 1962-1964 was worked out, to be followed by a Four Year Plan for the years 1965-1968, and a Three Year Plan for 1969-1971.

All Plans were published. From 1965 on, Annual Economic Budgets were published, which functioned as accounts for the past, as annual economic Plans, and as rolling forecasts for the economy. The statistical basis of the planning was improved, and methods of following the execution of the Plan were developed and put into practice.¹ At the same time, the economy went through a major crisis in the middle 1960's as foreign exchange reserves were exhausted, savings did not rise adequately and growth virtually stopped. This crisis and other problems that arose were met in a pragmatic fashion. The Tunisians succeeded in dealing with the most pressing problems, and growth eventually resumed. And at least one crisis was met with a reversal of policy: the forced cooperatization of agriculture and small trade was reversed in 1969, as the economy went back to its originally announced aim of coexistence of the public and private sectors.

The Ten Year Plan and the following medium term plans were sophisticated documents. Yet it is not unfair to characterize them as essentially technocratic and input-directed. Even though the Tunisian economy is a small economy, planning was also inward-directed, with exports being the leftovers, and imports what obviously couldn't be produced at home. Emphasis was on investments, and outputs were expected to result automatically, and depend on assumed capital-output ratios or on optimistic project analyses. Even the period of forced cooperatization can be interpreted not merely as "ideological", but as a belief that if only farmers and small traders were grouped in sufficiently large units, investments would become possible that would raise output. It was only towards the end of the period, with the last Four Year Plan for the years 1969-1972 and perhaps even only with the new planning period that started in 1973 that economic policy was given an adequate space.

The present study deals with economic developments during the period of the Ten Year Plan, 1962-1971. It is limited in essence to the industrial sectors--manufacturing, mining, power, including petroleum and electricity, and construction--and to the major non-governmental service sectors, tourism and

transport. Separate chapters are devoted to agriculture, and one of the major social sectors, health.

The present study is in "real" terms, i.e. in terms of Tunisian prices of 1966. However, the companion analysis of the flow of funds by J. G. Kleve, i.e., essentially of the means of financing the investments, is in current prices, since it is dubious what meaning can be given to "real" flows of funds and "real" savings.³ In addition, there remains the problem whether Tunisian prices of 1966 are or are not "distorted". Studies of other countries, undertaken by Little, Scott, and Scitovsky and their associates, show that growth, measured in constant domestic prices can disappear when the same output is valued in international prices. For this reason a study of effective protection and, as far as the present chapter is concerned, a measurement of Tunisian GDP in international prices is included. As far as the present chapter is concerned, the use made of Blake's contribution is to measure to what extent growth measured in Tunisian prices of 1966 is real, or to what extent we deal with a transfer of resources from the taxed to the protected sectors.

It would be possible to study developments by comparing plans with achievements. This, however, has not been done except incidentally. To make such a comparison meaningful, one would have to assume that the original plans were sensible as well as realistic, and that no unforeseen events occurred which required adjustments. There were criticisms levied against some of the major projects (which nevertheless were executed) as early as 1963 or 1964, and at least for the first period, the investment--i.e., the input--plans were roughly fulfilled. An argument could be made that Tunisia would be better off if some of the plans had *not* been executed. This is particularly true in the agricultural sector, but not only there.

Our method of analysis does not make such comparisons. Instead, three measures have been developed by which to judge what happened: (marginal or average) capital-output ratios, capital-labor ratios, and output-labor ratios. The basic aim is to find out how efficiently the Tunisian economy has transformed inputs into outputs. The rationale of the procedure is as follows.

Everyone agrees that investments are needed to increase productive capacity. These investments should, of course, be as efficient as possible. This means that for the economy as a whole investments should not be larger than needed to produce outputs; that they should be purchased as cheaply as possible, and that they should, individually, fulfill their purpose of producing output. If everything went as rationally as possible, C/O ratios of different projects and/or sectors should differ only for technical reasons.

Reality is everywhere quite different. Output may be small, investments may be too expensive. Compared to the differences found in fact, the differences in C/O ratios that could be explained by technical requirements are minor. Throughout the study a breakdown by public and private investments is made. The figures and what is known of reality suggest that institutional factors--they will be discussed specifically below--and wrong economic policies rather than technical requirements explain large C/O and C/L ratios. If the C/O ratio in the economy is large, this is not because of an unfavorable sectoral distribution of investments. Nor is a high C/L ratio due necessarily to technical requirements. We show this in detail.⁴

In the course of development, capital-labor ratios seem to have increased. We cannot conclusively prove that they have done so, because we are unable to make even an approximate calculation for 1961 or 1962. However, the new investments in such industries as steel or hardware certainly require more investment per worker than previous artisan or industrial production where it existed. We can estimate the C/L ratios for 1971 by industry, often by firm, by public and private sector. And we can form a judgment whether the C/L ratios are high or not. They can be interpreted either as the amount of capital invested per man, or, when calculated as marginal ratios, as the amount of investment required to create additional jobs. In cases of old industries, only the second interpretation is valid.

If employment creation is the major aim of the economy, the investments should be spread as thinly as possible, given the technical constraints of different industries. In fact, for various reasons which were characterized before as "institutional" the amounts of capital required to create an additional job in the public sector were rather high. If, therefore, the investment did not create the employment desired, it should with too capital-intensive methods have at least produced more per employee. That is, the higher the C/L ratio, the higher the output-labor ratio ought to be, other things being equal of course. We can estimate O/L ratios both for 1961 and 1971, and find that in important cases, the O/L ratios have fallen despite heavy investments and almost certain increases in C/L ratios.

Now it would be tempting to say that this result was due to large employment creation. For this to have been the case, however, the C/L would have to remain rather low, and the C/O ratios also should have been lower. It is suggested that the three measures together allow an interpretation of what might be called "implicit" planning.

In order to establish the point beyond reasonable doubt the analysis proceeds in as much detail as possible. In important cases, particularly in the metalworking and chemical industries, the figures have been broken down to the level of the individual plant. The analysis, though highly disaggregated, nevertheless remains essentially on the macro-economic level, since no financial or economic payoff studies are included. Because the Tunisian economy is a small economy, our procedure is possible to an extent that would be impossible to achieve in India, for example.

The analysis pays particular attention to the industrial sector, and especially to three important subsectors: the mechanical and electrical industries; the building materials industries; and the chemical industries. In those sectors detailed studies have been made based on the balance sheets of the individual enterprises.

The manufacturing sector in Tunisia is still relatively small. It nevertheless is of considerable interest to go into detail. It is this sector which was to create jobs and transform the economy, and it is this sector whose development was forced particularly during the period of the First Three Year Plan by huge investments. It was during this period that the major industrial investments in the steel mill, the refinery, the Ateliers Mechaniques du Sahel (AMS) and others were put in place. It is also in the industrial sector that the employment data are sufficiently good to allow a detailed analysis, often by individual firms, of output per man and of the efficiency of investments.

As indicated before, separate chapters will deal with agriculture and one of the major social sectors, health.

II. Methodological Problems: the Data

Modern economics is quantitative, and "quantitative" means measurement. Moreover, in all social sciences we rarely deal with clear-cut homogenous concepts. All our concepts mean only what they are measured to mean. Results vary radically depending on how the raw data are put together. It is, therefore, essential to understand the nature of the data and the methods employed. For the precise meaning, and not merely their accuracy, depends on their measurement.

A. Employment Data

The Ministry of the Plan, together with other governmental institutions, has developed a set of employment data which correspond in detail to the classification and content of the national accounts.

First, outside of agriculture and services, both the national accounts and the corresponding employment data omit in principle artisan production. The only major exception is the artisan production of carpets sponsored by the Office National de l'Artisanat. Also, small bakeries and butcher shops are covered. But, for example, small flour mills grinding wheat for customers are not included either with output or with employment. Neither do village tailors exist as far as the statistics are concerned. For 1972, the Ministry of the Plan estimates the omissions to be 26.5% of manufacturing employment.

Secondly, it has not been possible to develop independent estimates of employment for all sectors. For example, in agriculture or tourism, or even parts of the food processing industries, the employment data depend essentially on the results of special enquiries for one year, which are then used as bench marks. Employment is then projected to move with value added, or, in the case of tourism, with hotel capacity. There is not much else that can be done short of organizing an annual census or sample survey. However, in all such cases, it is not possible to use the data for an analysis of productivity. Moreover, while it is likely that tourist employment will in fact move more or less with hotel capacity, allowing for slow changes in productivity and rates of occupancy, agricultural employment cannot really be assumed to move with output or even acreage.⁶

In the case of mining, of most manufacturing industries, petroleum and other energy production, as well as in the case of some specially important food industries (e.g. sugar refining), it is possible to develop employment series from the industrial surveys. Even in these cases it is necessary to interpolate occasionally. The data are firm in all cases for the years 1963, 1966 and from 1968 on. In many important cases they are firm for all years. In any case, the data can be used to measure trends in productivity. The detailed analysis will be restricted to the important cases in which output and employment data have been independently estimated.

All data refer to full time and full time equivalent of seasonal employment. A certain erratic movement is introduced into the figures by the fact that they refer to the year-end rather than to the average of the year. However, over the years, this erratic movement should smooth out.

The Institut National de Statistiques also publishes employment data. However, their coverage varies from year to year. In some years, artisan production is included, in others it is excluded. Also, the classification of the data does not correspond to the breakdown of the national accounts. Hence the summary data are not suitable to study changes in productivity, which the data developed by the Ministry of the Plan allow us to do. Neither series is suitable to study the development of employment in the economy as a whole. In 1973, the Ministry of the Plan has made estimates of employment not covered by the series to allow a judgment on employment.

B. Production Data

The quality of the production data varies a good deal as is to be expected. However, the data for the industrial sector, with the exception of the artisanat production of carpets and of the construction and public works sector, are good. They are in principle built up from data of individual firms, and in many of the most important industries rest on balance sheets. Without going into every detail of the calculations we wish to discuss a number of problems that arise in the calculation of value added in constant prices and the reasons for the solutions adopted. It appears that while there is a great deal of folklore among practitioners, the solutions written down are not always totally clear, and for obvious and sufficient reasons the actual practice differs frequently from the ideal even where the ideal is understood. The methodological comments will serve to bring some of the problems into focus, as well as to explain how the reconstructed series differ from older series.

The first group of remarks refers to the method of finding value added in constant prices. We describe first the methods used, then discuss the problems involved.

The method most frequently employed has been to find for one recent year the ratio of value added to value of output, and to apply this ratio to the value of output in constant prices in all years. This has been done by the Ministry of the Plan⁷ and has been modified by us in only one respect. The investigations of the Ministry of the Plan have frequently given that ratio by firm. The past calculations have applied the average rates for an industry as a whole to the value of output for the industry as a whole. The method has been refined by us by applying the proper ratio to each product, or in the case of mining even to separate mines. This method allows for a change in the structure of production from a poorer to a richer mine. The differences in the results are more than marginal.

A second method of estimation involves the most important enterprises, such as the steel complex, for which balance sheets have been available for a number of years, preferably for all years of the existence of the industry as with steel, or for the whole period under investigation, as with chemical fertilizers. In this case value added has been calculated in current prices from the balance sheets, and deflated to arrive at value added in constant prices. The index used for chemical fertilizers (and also for phosphate mining) was the import price index, for other articles the appropriate sectoral price index, or the wholesale price index. Such indices were applied also to value of production in current prices to arrive at an estimate in constant prices.

We have in principle used the last method where possible (i.e. deflation of actual value added in current prices), otherwise the first method. There are two differences to the variant of the method employed by the Ministry of Plan.

(i) We have in principle calculated value added by calculating the value of production (sales adjusted for stock change) and deducting the value of purchased inputs (adjusted for stock change). We have not found value added by adding wage and salary payments, profits and depreciation and direct taxes. In principle the two approaches should give the same results. In practice they can and do vary a good bit. One reason may be that a firm receives operating subsidies in order to pay wages and depreciation. This adjustment will tend to reduce value added as calculated by us compared to the official figures.

(ii) We do not count among the purchased inputs financial payments of the enterprises. Of course, the ordinary cost of banking, say, is an input like any other. The actual financial payments, however, reflect the capital structure of an enterprise, which from the standpoint of economic analysis of value added is an accidental factor. It should not make a difference in the result, whether an enterprise has no debt, has only long term debt, or is burdened with many short term obligations, as is the case with many of the major enterprises. This adjustment tends to raise value added as calculated by us compared to the official figures.

"Value added in constant prices" is in principle a volume concept. It may be thought that the best method of arriving at this value would be either to let value added move with the physical volume of production, or, where this is not possible, to value inputs and outputs separately in constant prices. Our method of applying variable proportions of value added to value or production in current prices to value of production in constant prices arrives at a volume of production which does not move necessarily parallel to the volume of production measured in physical units. The methods used are justified as follows. To be sure, "value added in constant prices" is a volume concept. We repeat, however, first, that in economics we only rarely deal with homogeneous commodities, such as electric current, or super triple phosphate fertilizer. Iron ore from different mines varies considerably in its fe-content and other properties. Hardware obviously defies a method of valuing output which is feasible for cement, namely to multiply tonnage with a constant price.

This means that we cannot avoid using a price structure to value output (production). Valuing inputs and outputs in constant prices separately is only rarely practicable. In fact we believe that it is not always correct. Surely, the basic idea is to eliminate changes in the price *level* and not all changes in relative prices. Such changes may reflect not only changes in supply and demand, but also technical changes, or increased real cost as, for example, when it is necessary to dig deeper in a mine; decreased real cost when, for example, a firm learns its business in the process of "doing". When the ratio of value added to value of output in current prices improves, because another firm producing its inputs has become more efficient, it would seem absurd not to allow for this change. Similarly, if a steel mill, for example, must pay higher prices for iron ore because the real cost of the latter have increased, it would be meaningless to say that "in constant prices" nothing has "really" changed. It is this reasoning which we feel makes it proper on the whole, to apply an annually changing ratio of value added to value of production in current prices to a

series of value of production in constant prices, or alternatively, to find value added in current prices and then deflate it by an appropriate index.

Another choice relates to the index used for deflation. We feel that a distinction should be made between cases in which the current prices of inputs and outputs are both determined in the Tunisian market, and cases in which one or the other is determined abroad, as is the case with a pure export product, such as cacao in West Africa, or super-triple phosphate fertilizer, the domestic Tunisian consumption of which is negligible.

In the first case, deflation by the Tunisian wholesale price index seems clearly appropriate--the question of just how good this index is being a separate and logically not relevant question. Where the output price is determined abroad while input prices are formed domestically, the ideal seems to us to be to deflate value added in current prices by the index of import prices which determine the real value of exports to the Tunisian economy. In fact we have deflated mining output of phosphate rock and the output of super-triple phosphate fertilizer by the Tunisian index of import prices.

We have stressed these points of measurement because the different measurements do in fact make a big difference as indicated by Table 1, comparing different calculations for phosphate rock, and super-triple phosphate fertilizer.

C. Measurement of Productivity--Output per Man

Our preferred measurement of productivity is value added in constant prices per full time and full-time-equivalent seasonal employee. We prefer value added to either physical output or value of output for the following reasons:

Physical measures are available only for a few cases of homogeneous goods. Value of output is sensitive to the degree of vertical integration of an industry--admittedly not a serious problem in Tunisia--and it would in any case not allow comparison between different industries or branches within an industry. Output per man reflects the efficiency with which labor and the other factors cooperating with labor are employed. Indices of productivity and of output of industries always refer to value added.

It is conceivable, and indeed often the case, that output per man measured by value of output moves differently over time from output per man as measured by value added. This is likely to be the case when input-output relations change over time. In fact, however, because value added is frequently calculated by applying a single ratio to value of production, the movement of the two measures will be frequently parallel though their level will differ substantially.

III. Overall Developments

A. Growth

Gross Domestic Product at constant market prices grew from 1961 to 1971 at 5.5% compound⁸ and slightly faster when measured at factor cost. Industry grew at 7.6% and manufacturing at 7.2%.⁹ The detailed analysis of this performance is the main object of this paper.

TABLEAU - TABLE 1

Comparison of Value Added in Constant Prices,
Calculated by Different Methods

	1961	1966	1970	1971
A. <u>Phosphate Rock</u>				
		000 D		
1. Official ¹	5482	8236	5395	5186
2. Deflated by export prices of phosphate rock	5904	8502 ²	8148	8597
3. Deflated by general import price index ⁴	4755	8236 ³	5037	5072
4. Deflated by terms of trade index ⁴	5119	8502 ²	7602	8399
B. <u>Total Fertilizers</u>				
1. Deflated by Export Price ⁵	815	2050	3277	4272
2. Deflated by general import price ⁴	801	2050	2611	3500

Notes: ¹ Ministère du Plan, Production et Valeur Ajoutée Par Branche 1961-1971, n.d. mimeo, Table 2.2 Deflation by wholesale price index.

² Difference to official figure due to separate valuation of each mine.

³ Official figure.

⁴ Indices from: INS Statistiques du Commerce Extérieur de la Tunisie, Année 1972, Série: Commerce Extérieur, No. 3.

⁵ Refers to average value of exports of Super-Triple phosphate fertilizer, calculated from various issues of Statistiques du Commerce Extérieur. This index has been applied also to the production of super triple fertilizer. The other fertilizers are of comparatively minor importance and have been calculated the the standard method outlines in the text.

There is no separate official calculation of value added of fertilizers in constant prices. Instead, value of production of all chemical outputs has been calculated in constant prices, and a common proportion of value added to value of production has been applied to all years.

The Ten Year Perspective Plan foresaw a 6% rate of growth compound. Compared to that aim, achievements fell somewhat short.¹⁰ Moreover, the good performance of the economy is largely due to the rapid growth since 1970, a consequence partly of good weather, partly of a change in policy. Had the terminal year been 1970, the overall growth rates would have been 5.1% for GDP at market prices, not quite 6.7% for industry, and 6.3% manufacturing. Though not analyzed in this chapter, the good growth has continued through 1972 and 1973.

Judged by international comparisons, however (and staying only with growth as a criterion) the Tunisian economy has done rather well. OECD data suggest that average growth rates of African countries were about 3% - $3\frac{1}{2}\%$. India and Pakistan, before the division of that country, grew at 3.8%. American underdeveloped countries did better, about 4.2% for South and 6.7% for North America. Only oil producing countries, and countries like Zambia with copper did much better, as well as Taiwan (9.9%), South Korea (7.8%), Thailand (7.6%), and Hong Kong (13.0%).

Interesting and even suggestive as such figures are, they are not really suitable to permit a particular country to draw policy conclusions from them. The data, as OECD points out continue to contain large inconsistencies despite the best efforts of OECD to remove them. The price structure of countries varies so that even measurements in constant prices mean different things. In particular, distortions through the protective system and through over-valued exchange rates can lead to growth rates that are substantially above those that a valuation in world market prices would give.¹¹ Blake's contribution will assess these distortions and their implications. In addition, growth of GDP measures essentially the development of resources available for all purposes, including factor payments abroad. It tells directly neither how the welfare of the population has changed, nor what were the sacrifices needed to achieve it.

B. The Investment and Savings Effort

Judged by international comparisons, the Tunisian economy has done rather well. Among other criteria frequently used to judge the performance of an economy are the investments and savings effort. By these standards the Tunisian economy has also done well. It must be stressed, however, that both measure essentially inputs, i.e. they measure a cost to the economy. Even though the ability to raise increasingly large resources for development and to rely more and more on one's own effort is extremely important, the final test must be how well these resources have been used to produce outputs and/or to raise the standard of living of the population. It is for these reasons that output per man is emphasized as the primary criterion of achievement.

We turn first to the more conventional measures. In 1961, the first year before the 10 Year Perspective Plan, Real Gross Fixed Capital Formation was 21.3% of GDP at market prices. In 1971 it was 22.2%.¹² This represents by international standards a high and sustained effort: Savings figures are more meaningful in current than in constant prices. Here the achievement is equally substantial: In 1971, 76.9% of gross fixed investments (in current prices) were financed by domestic savings, compared to 48.3% in 1961.¹³ Here too the performance improved from 1966 on.

However, when the magnitude of the effort is considered, the results are

disappointing. The average marginal capital-output ratio (calculated as the sum of gross investments over the years 1960 through 1970 divided by the change in GDP at market prices between 1961 and 1971, both in constant prices) was 4.05, a rather high figure (1199.0 mil D divided by 296.0 mil D). As already pointed out, we will show in detail that this figure *cannot* be explained by an unfavorable sectoral distribution of investments, but by the fact that many large investments particularly in agriculture and some major industries, did not produce the expected results.

In fact, seen *ex ante*, the sectoral distribution of investments looks rational and favorable both from an economic and a social point of view. Over the years 1960 through 1970,¹⁴ agriculture received almost 20% of investments, industry 26.6% (manufacturing 11.8%), non-governmental services 13.3%, housing 12.7%, with the rest going to social capital, such as schools and hospitals (19.3%), and a small unidentified rest of 3.2% probably all small private agriculture and industry. The structural change in GDP at factor cost over the decade is small, but not unreasonable: Agriculture's share fell from 20.9% in 1961 to 18.4% in 1971, both being excellent agricultural years. The share of industry rose from 20.9% to 25.3%, most of it in "energy", i.e. petroleum (1.1% → 6.1%). The share of manufacturing remained substantially constant, mainly because of the excellent performance of agriculture. It may be more meaningful for purposes of describing the structural change, to omit Government, (mostly imputed) rents, and domestic services from the total of GDP at factor cost. Appendix Table A.4 gives the relevant figures, which also show a slight increase in the share of manufacturing from 10.1% to 11.8%. The table also gives the distribution of investments over the years 1960-70, and the sectoral employment figures for 1961 and 1971.

That the investments should have produced quite different results, and that the fairly high capital-output ratio for the economy as a whole cannot be explained by the sectoral distribution of investments is proved beyond doubt by the figures on Annex Table A.5, which gives not only sectoral capital-output ratios, but ratios for subsectors and in a few cases for individual major investments which in fact represent whole industrial branches. In fact, such capital intensive industries as petroleum or chemicals do not have particularly high C/O ratios, while the C/O ratios for steel or the Ateliers Mechaniques du Sahel (AMS), a plant producing hardware, or for that matter SOGITEX, the government owned textile company, are extremely high and at least in the case of steel cannot be explained by operations below full capacity (Annex Table A.5). Clearly the effectiveness of many individual investments was disappointing.

The original plan¹⁵ had expected rather low capital-output ratios. Based on 1958 data, and corrected for excess capacities in 1958-61, the planners had assumed C/O ratios in manufacturing of 2.5 compared to a reality of 5.0; in mining of 3.7 compared to a reality of 26.4, but in energy of 11.4 compared to a reality of only 4.8. But, as Table A.5 indicates, this favorable outcome was due not merely to essentially fortuitous petroleum finds (C/O of 4.4), but to an excellent showing of electricity and other energy (C/O of 5.7). The assumed C/O ratio of transport and communications was even 5%, with reality being significantly better with 7.0. What clearly happened was low productivity of investments in manufacturing and mining--the latter mainly because of unfavorable price developments--and neither an unfavorable sectoral distribution of investments, nor an insufficient emphasis on "directly productive" expenditures. Our argument is practically proved by the fact that the actual C/O for agriculture is 6.7 compared to the planners' expectations of 7.3.¹⁶

C. Per Capita Consumption and Output per Employee

This disappointing result comes out clearly in two further measures, both of which must also be refined by detailed analysis. Per capita private consumption in 1971 was in real terms 91.8 D of 1966 purchasing power, compared to 75.9 D in 1961 and 72.6D in 1962 (see Table A.1a). This reflects both changes in policy and the excellent crop in that year. Until 1968, per capita private consumption was essentially constant around 78-81 D. Only in 1969 did it jump to $84\frac{1}{2}$ D, and in 1971 to 91.8 D. It should be immediately stressed that this figure does not include social consumption (such as schools and health care) which is included with public consumption. To that extent the welfare of the population and its change during the decade is understated. Nevertheless, per capita consumption between 1961 and 1971 rose only about 2% p.a. compound, though in fact almost the whole increase was in the last year.

The second measure of disappointment is output per employee. We omit from comparison agriculture, construction and non-administrative services for which, as explained before, no independent estimates for employment could be made. For the same reason we also omit the artisan production of carpets.

TABLE 2
Gross Value Added, Employment, and Output per Employee
in Mining, Manufacturing (less Carpets) and Energy
1961 and 1971 - Constant Prices

	1961			1971			VA/E (1971) as % of VA/E (1961)
	Value Added 000 D	Employ- ment	VA/E D	Value Added 000 D	Employ- ment	VA/E D	
Mining	7602	12528	607	8816	18627	473	77.9%
Manufacturing (less Carpets)	29951	30975	967	59541	64121	929	96.0%
Energy	4013	3710	1082	37966	6093	6231	575.9%

As Table 2 shows, output per man in mining has fallen by 1971 by more than 20% as compared to 1961, the major reason being, of course, the fall in the export price of phosphates and phosphate fertilizer. Output per man in manufacturing less carpets has fallen by 4% despite heavy investments. It has risen substantially in energy, mainly but not only because of petroleum finds. The non-petroleum sector also doubled its output per man over the plan period. The electricity corporation which also provides city gas is efficiently run.¹⁷

This unsatisfactory development in output per man has come about despite massive investments and almost certainly increasing capital-labor ratios. With the exception of mining, and to some extent textiles and chemicals, most investments have established new industries (steel, automobile assembly, hardware, pulp and paper, etc.). It seems therefore legitimate to measure the gross amount of capital invested in the various industries in 1971 by the sum of annual investments 1960 through 1970. We give in Table 3 the C/O, C/L, and O/L ratios for the major sectors. C/O and C/L ratios are marginal ratios for the major sectors, i.e. they measure the amount of additional output or *additional* employment associated with the investment over the decade.

TABLE 3
Capital-Output Ratios, Capital-Labor Ratios
and Output-Labor Ratios, Constant Prices,
by Major Sector

	Capital/Output	1971		1961	1971	O/L Ratio 1971 as % of 1961
		Capital/Labor	Output/Labor	D	D	
Mining	26.4	5197	605	473	78%	
Energy	4.8	67792	1082	6231	576%	
Manufacturing*	5.0	3593	801	761	95%	
Non-government services**	2.6	2928	1154	1132	98%	

*Including carpets

**Excludes domestic services and house rentals
 See Table A.4 for the basic data.

Table 3 shows several surprising features, even allowing for the crudeness of the methods employed. First, the average marginal capital output ratio is understandably highest for mining.¹⁸ But it is quite low in non-government services, which contain the capital intensive transport sector and the heavy investments in tourism, investments which moreover were also needed to repair extensive flood damage rather than to increase capital stock. And it is higher in manufacturing than in energy, which contains such extremely capital intensive industries as petroleum and electricity generation. Clearly, no amount of adjustment one may wish to make by a refinement of the figures can change the fact that high capital-output ratios are not explicable by the technical requirements associated with different sectors. Efficiency, not the structure of investments, is the issue.

Secondly, all sectors have almost certainly become more capital intensive. Only in mining, chemicals and productive services were there substantial investments in existence before 1961. In at least two major sectors, a very large part of gross fixed investment must be for replacement--there were the disastrous floods in 1964 and other years requiring major road and railway repairs. In energy and manufacturing, most of the investments represented essentially additions to capital stock.

Total investment per additional job created was by far the lowest in the "productive" service sector. But the C/O ratio was also the lowest. One can accept therefore that output per man remained virtually constant.¹⁹ Labor intensive methods have created employment and output. The energy sector has by far the highest capital intensity of the major sectors. But since it has a low C/O ratio, and since its output per man increased almost six-fold, we can conclude that the high C/L ratio is due to technical requirements and that the sector has performed well. Mining is, of course, a special case. Its output per man has declined by about 22% but this is due mainly to the deterioration of phosphate export prices. So, while the combination of a very high C/O ratio with a large C/L ratio and a falling O/L ratio is a poor result, it is largely due to circumstances outside the control of the Tunisian Government.

Manufacturing is a different story. Its C/O ratio is higher than that

of energy or "productive" services. It has undoubtedly become much more capital intensive over the decade. It seems that in manufacturing, the results have been the worst of all possible worlds. The high C/O ratio suggests that investments have produced insufficient output. The high C/L ratio suggests that investments have not produced sufficient employment either. But not having produced sufficient employment there should at least have been an increase in output per man, and this, too, did not come about.

Thirdly, we will show in detail in the next section that the private sector has in important cases performed significantly better than the public sector. Virtually all large scale investments in manufacturing are in the public sector: El Fouladh, the steel mill; AMS, the hardware plant; SIAPE, the public chemical fertilizer plant; STS, the sugar refinery; STC the Kasserine paper pulp plant. Only one large-scale private investment in the industrial sector comes to mind: NPK in the chemical fertilizer sector, to which perhaps the petroleum exploration activities might be added. We give the various measures for many of these investments in the Annex Tables. Only SIAPE has performed well.

Because it is precisely the investments in the public sector that have performed, on the whole, inadequately, they have been a drain on the economy and on the budget. They have therefore had an unfavorable effect not only on growth, but also the savings effort (see the chapter on the financing of investments), per capita consumption and income distribution. While this cannot be established in as great detail as desirable, we will devote a chapter to the existing evidence on income distribution. Because of its central importance the next section is devoted to the detailed examination of the differential performance of the public and private sectors.

Finally, the combination of high capital-output ratios and decreased output-labor ratios in the manufacturing sector means that the large investments cannot be defended on the grounds that they have created employment, and that as long as there are unemployed and underemployed resources, any increase is to the good. If the objective of economic policy is to create jobs--meaningful jobs as the present phraseology goes--the technologies employed and the projects selected surely should not be such that it takes increasing amounts of capital to create a job. In fact Sections IV and V will show in detail wherever such detail is available that the private sector has created jobs much more efficiently than the public sector. As a method of creating employment, the policy must be judged inefficient despite the doubling of employment in the manufacturing sector.²⁰

IV. The Manufacturing Sector: Public and Private Developments

A. Introductory Remarks

The present section raises the major policy problems which are to be resolved, and perhaps the last problem Tunisian policy makers have been unable to resolve: how to make the public sector more efficient; or perhaps more generally: how to make the detailed planning and the execution of the major public projects more responsive to the decisions of the economic policy makers. It can be argued that Tunisian planners--a generic term used for policy makers in general--have, at least for the time being, solved the balance of payments and the domestic savings problems.²¹ The population problem, and therefore also the employment and distribution problems remain but there, too, we shall argue

elsewhere, developments have by no means been all bad. The central problem remains inadequate *productivity* without which it is difficult to imagine the solution of the longer-term problems just mentioned. And this problem is intimately connected with the performance of the public sector and the problems of economic policy.

This section will therefore focus on the manufacturing sector, first in overall terms, and then specifically on some details of the mechanical and electrical industries and the chemical industry, two major branches in which private and public firms produce identical or nearly identical products; where therefore there can be no doubt about comparability of performance in the small. The more detailed discussion of the individual industries will be left to Section V, which is in the nature of an Appendix. We feel it necessary to present the detail at least in Section V because only the detail can prove the point we wish to make.

B. Public and Private Developments

In the present section, we use investment figures in current prices unless otherwise stated. These figures are precisely known at least for the public sector and for the major private investments. For that reason we prefer them to the estimates in constant prices, since there may be some question about the price index used to deflate the investment figures. Since the major public investment effort was made in the early years of the 'sixties, when prices were much lower, while most major private investments occurred later, we bias the analysis in favor of public investments. In comparing investment in current prices with the increase in output measured in constant prices we further bias the case against the argument that investments have not produced either sufficient output or sufficient employment. In order to eliminate as far as possible the effect of the weather, we have eliminated olive oil from both the output and the employment of the food industries. We have also excluded the artisan production of carpets from investment, output, and employment of the textile sector, as well, and SOTUPALFA which has not yet started to produce by 1971.

Appendix Tables A6, A7, and A8 show investment, for the decade, value added and employment for 1961 and 1971, broken down by the public and the private sectors. The public manufacturing sector has received 81.1% of total investments. As a result, its share in total manufacturing output rose from 20.7% in 1961 to 38.1% in 1971, and its share of employment from 20.6% to 34.0%. It will be seen from Appendix Table A7, that building materials were already in 1961 to about 90% produced by public enterprises. The three major changes have occurred in the mechanical and electrical industries, textiles, and paper industries, associated, of course, with El Fouladh and AMS, SOGITEX, and STC respectively. All three are associated with major problems. A fourth change in the wood, cork, and furniture industries has not had the same problems.

Both public and private production has become more developed in the sense of being more diversified and of having become more capital-intensive. The relative importance of the food industries has fallen from about three-fifths to a third in the course of the decade; that of textiles and of the mechanical and electrical industries has risen substantially. (Appendix Tables A8 and A9.)

We have calculated (marginal) capital-output, capital-labor and output-labor ratios for all sectors. (Table 4, Appendix Table 10A, Table 5, Appendix Tables 10B, C.) Consider first, the comparative performance of the public and

TABLEAU - TABLE 4

Coefficient de Capital - Capital Output Ratios
 Industries Manufacturières - Manufacturing Industries
 Par Secteur Publique et Privé - By Private and Public Sector
 (Capital : Prix Courants - Current Prices)
 (Valeur Ajoutée : Prix Constants - Value Added: Constant Prices)

	<u>TOTAL</u>	<u>Publique Public</u>	<u>Privé Private</u>
1. IAA - Food Industries	3.9	7.1	1.3
2. MCCV - Building Materials	4.5	4.7	2.6
3. IME - Mechan. Elect. Industries	7.5	13.6	1.6
4. Ind. Chimiques - Chemicals	2.9	3.5	2.3
(a) Moins - Less ICM	2.1	1.9	2.3
5. Textiles	3.6	6.1	1.7
6. Bois, Liège, Meubles - Wood, Cork, Furniture	1.4	0.5	1.8
7. Papier, Imprimeries - Paper, Printing	8.2	29.7	1.3
(a) Moins - Less SOTUPALFA	5.1	16.9	1.3
8. Divers - Miscellaneous	1.3	-	1.3
9. Total	4.4	7.3	1.6
(a) Moins - Less ICM and SOTUPALFA	4.1	6.7	1.6

Sources: Tables A.6 and A.9

Notes: ICM (Industries Chimiques du Maghreb) and SOTUPALFA (Société Tunésienne du Papier d'Alfa) were in 1971 still in the construction stage. Though ICM had some employment, neither produced any output in 1971.

TABLEAU - TABLE 5

Industries Manufacturières - Manufacturing Industries
Capital-Labor Ratio, 1971 and Output-Labor Ratios 1961, 1971
Capital par Emploi, 1971, et Valeur Ajoutée per Emploi, 1961, 1971

	Capital-Labor-Emploi 1971 Dinars			Output Labor - Valeur Ajoutée Emploi 1961 (Dinars) 1971			Change in Output per man 1971 - 1961					
	Total	Publ.	Priv.	Total	Publ.	Priv.	Total	Publ.	Priv.			
1. IAA - Food	6320	24674	1474	871	911	868	1046	2091	925	120	230	107
2. MCCV - Building Mat.	6387	6724	3550	676	725	437	1053	1097	783	156	151	179
3. IME - Mech. Elect. Ind.	6482	8199	2118	979	947	988	868	412	1209	89	44	122
4. Ind. Chimiques - Chemicals	4549	5087	4162	863	815	921	1508	1592	1430	175	195	155
5. Textiles	2189	4833	873	407	253	416	564	772	484	139	305	116
6. Bois, Liège, Meubles - Wood, Cork, Furniture	919	860	939	565	532	573	620	855	533	110	161	93
7. Papier, Impression- Paper, Printing	4455	6347	1997	786	1280	739	848	435	1137	108	34	154
8. Divers - Miscellaneous	1450	-	1450	553	-	553	984	-	984	178	-	178
9. TOTAL	4006	7208	1449	778	780	777	887	996	831	114	128	107

Note: Capital : Prix Courants - Current Prices
 Valeur Ajoutée - Output; Prix Constants - Constant Prices
 Industries Chimiques sans ICM - Chemical Industries without ICM
 Papier, Impression - Paper Printings - Sans - Without SOTUPALFA
 Textiles sans - without tapis - carpets
 Food Industries - IAA - without - sans olive oil huile d'olives

private sector in converting investments into outputs. Except in the chemical and the building materials industries, public sector investments in fact have created new industries. The chemical and the wood, cork, and furniture industries are the only industries in which the capital-output ratio of the public sector is lower than that of the private sector. Even including ICM, the capital-output ratios in the chemical industry are low despite its technically conditioned capital-intensive nature. This suggests a good economic efficiency in an industry, a large part of which is subject to international competition. It is, however, also due to the fact that the public investment in the fertilizer sector created facilities additional to substantial ones already in existence; the private investments created totally new capacities where none existed before. The two figures must therefore be interpreted in a slightly different manner.

For all other industries (except the miscellaneous industries which are entirely private) the capital-output ratios of the public sector are substantially higher than those of the private sector. We shall demonstrate in the small that this is only partly explicable by the different structures of the public and private sectors. The capital-output ratios are particularly high in the mechanical and electrical industries and in paper and printing, and they are high in textiles by normal standards. With the exceptions noted the public sector has used investments less efficiently than the private sector to create output. All investments have had time to mature. If they have not reached capacity output, the explanation can not be that there was not enough time.

Turn next to capital-labor ratios. As Table 5 shows, the public sector has, with the exception of the wood, cork and furniture sector, required more investment to create a job than the private sector. To be sure, public investments have gone primarily into industries which for technical reasons are more capital intensive, while private investments have gone into technologically more labor intensive industries, the major exceptions being the heavy private investments in chemical fertilizers and tires. However, one should normally expect capital-intensive production to create more output per man than labor-intensive technologies, not only less employment per unit of investment.

One test, therefore, of whether a higher capital intensity is reasonable is whether it is accompanied by a higher output per man. As the figures show, this is not the case. While capital intensity is on the whole higher in the public sector this is not so with output per man which in the important cases of the mechanical and electrical industries and the paper industry has actually fallen substantially between 1961 and 1971. The conclusion is inevitable that with the exception to be noted, the public sector has created new jobs less efficiently than the private sector, and the low output-capital ratios are paralleled by relatively low output-labor ratios.

To go into detail: with the exception of the wood, cork, and furniture industry, it has cost a multiple to create one additional job in the public than in the private sector. The significance of the figures differs in the various industries. The enormous investment per additional man in the food industries is practically due to the creation of a sugar refinery, a new industry. The difference in the cost of creating additional jobs in the building materials industry may be largely due to technical reasons: a third of public investments went to cement, another third to bricks. Even so it cost 9584D to create each of the

additional 599 jobs in cement production, and 6728 D to create each of the additional 834 jobs in brick manufacturing. Both figures seem high. Even though the government textile industry is modern, the cost of creating an additional job suggests great inefficiency; it is almost as high as with the chemical fertilizer industry! Similarly, the cost of job creation in the paper and printing sector is largely due to STC, the pulp factory. Only in the wood, etc. sector is the performance of the public sector better than that of the private sector. This is due to a combination of good management, and of expanding an existing industry.

As expected, output per man has slightly increased over the decade--about 1.3% per annum compound--and it has increased more in the public than in the private sector (2.5% p.a. and 0.6% p.a. compound respectively). Unfortunately this cannot be interpreted to mean that the public sector has been that much more efficient. The mechanical and electrical industries received 31% of public investments, yet output per man fell by 56%. It did create more jobs than the private sector (4365 compared to 2935) but at almost four times the cost per job. Paper and printing received 12.4% of total public investments, yet output per man fell by 66%. The sector created 1294 additional public jobs compared to 996 in the private sector, at more than three times the cost per job. The food industries received 17.1% and textiles 17.3% of public manufacturing investments. Output per man rose to 230% of 1961 in the former and 305% in the latter. Yet not only was the cost of producing additional jobs high: in the food industries only 831 new "public" jobs were created compared to over 3000 in the private sector (at 6% the cost per job); in the textile industry the figures are 4161 "public" and 8355 "private" jobs respectively.

The detail clearly makes it impossible to argue that the heavy investments were needed to raise output per man. Put differently, the average increase in productivity is due primarily to the composition of the average; it includes now more industries where one would expect output per man to be high for technical reasons. It has not increased because in each individual component output per man has increased because of investments in that component. Tables 5 and A-3 show that this has all too frequently not been the case.

(1) The Mechanical and Electrical Industries

It is possible to find four identical or almost identical branches in which both public and private firms exist. There are significant differences in output per man in general and in these four branches in particular.

First, Table 6 shows that of all the industries in the public sector only vehicle and radio and television assembly have a value added of more than 1000 D per person. There are nine of the 16 private industries that surpass that level. No private industry produces as little per man as ship building or "other iron products". The difference cannot be attributed to a higher capital intensity in the private industries. Quite the contrary is the case. The industries with the lower output per man are undoubtedly also more capital intensive.

Second, in the four branches in which public and private firms are active and in which we have excellent data for six years, output per man in the private sector is with two exceptions consistently and substantially lower in the public than in the private sector (Table 7). Moreover, there is little evidence of "learning by doing" over the years, except perhaps in the private assembly of

TABLEAU - TABLE 6

IME - Mechanical and Electrical Industries, 1971 - According to Public and Private Ownership

	Public Private Mixed Value Added (1966 P)			Public Private Mixed Employment			Public Private Mixed VA/E		
	000 D						D		
Steel - Sidérurgie	1133			1608			705		
Car Assembly	779			554			1406		
Radio - TV Assembly	292	86		216	42		1352	2048	
Lead Metal			315			429			734
Foundry	179	213		447	300		400	710	
Scaffolding		701			841			834	
Iron Pipes		72			89			809	
Metal Containers		729			528			1381	
Heating Apparatus	57			77			740		
Agricultural Implements		19			37			514	
Stores, Grills, etc.		49			62			790	
Blades		93			58			1603	
Nails, Screws		33			47			702	
Sparkplugs, Batteries		254			163			1558	
Piston Motors		82			61			1344	
Electric Motors	102			104			981		
Other Iron Products	174	239		572	161		304	1484	
Lead Products		135			47			2872	
Aluminum Products		263			337			780	
Wires, Cables		563			408			1380	
Ship Building	216	136		698	94		309	1447	
TOTAL	2932	3667	315	4276	3275	429	686	1120	734

TABLEAU - TABLE 7

Mechanical and Electrical Industries
Output per Man in Public and Private Enterprises
Foundry Products; "Other" Iron Products; Ship Building; Radio and TV Assembly

	A. <u>Articles de Fondéries - Foundry Products</u>						<u>VA/E Public</u> <u>VA/E Private</u> (%)
	Privé - Private			Publique - Public			
	VA (000 D)	E	VA/E (D)	VA (000 D)	E	VA/E (D)	
1963	129	149	866	-	-	-	-
1966	177	202	876	107	261	410	47
1968	216	265	815	273	291	938	115
1969	197	274	719	142	491	289	40
1970	192	244	787	158	347	455	58
1971	213	300	710	179	447	400	56
	B. <u>Autres Produits en Fer - "Other" Iron Products</u>						
1963	27	47	574	-	-	-	
1966	29	55	527	- 61	476	- 128	negative
1968	143	136	1051	344	654	526	50
1969	128	142	901	42	564	74	8
1970	149	157	949	301	497	606	64
1971	239	161	1484	174	572	304	20
	C. <u>Construction Navale - Ship Building</u>						
1963	69	70	986	-	-	-	-
1966	157	96	1635	144	738	195	12
1968	83	85	976	116	738	157	16
1969	69	75	920	204	1107	184	20
1970	125	97	1289	158	777	203	16
1971	136	94	1447	216	698	309	21
	D. <u>Appareils Télés et Radios - Radio and TV Assembly</u>						
1963	-	-		12	48	250	-
1966	-	-		140	103	1359	-
1968	15	44	341	268	127	2110	619
1969	58	21	2762	205	187	1096	40
1970	61	21	2905	261	203	2610	90
1971	86	42	2048	292	216	1352	66

radios. Only in the case of ship building²² can the abysmal performance be explained by a combination of virtually no new investments and an attempt to train a large number of workers.

The discussion of further detail is left to Section V.

(2) The Chemical Industries

The important comparison in the chemical sector relates to the production of chemical fertilizers, where a private plant started production in 1965. This industry is subject to international competition. Only in the production of explosives (for use in the mines) do private and public production exist. In all other branches, all production is either public or private. Private production, particularly of tires, is heavily protected and raises problems of price distortion which we discuss briefly below, and which is treated in detail by Blake. Our discussion relates only to super-triple phosphate fertilizer.

As Table A9 indicates, SIAPE, the public, and NPK, the private fertilizer plant, have received about the same amount of investments between 1960 and 1970, about 2.8 million D each, in current prices. The marginal C/O ratio for the fertilizer sector as a whole is 2.1, with the public SIAPE doing much, much better with 1.6 compared to 3.0 for the private plant. The difference is partly explained by the fact that SIAPE is an established firm, while NPK had to "learn by doing". (In fact, part of the plant had to be rebuilt.) In addition, private investments occurred from 1964 on, while about a fourth of public investments were made before that date at lower prices.

Even so, the output performance of both the public and the private plant is good. However, it cost 35,550 D to create an additional job in the public plant, compared to only 5762 D in the private plant.²³ Output per man in SIAPE is, however, 72% above output per man in NPK, and it has risen by 473% between 1961 and 1971. The conclusion must be that the sector has performed well. The figures are found in Table 8.

(3) Other Major Public Investments

Even though in the other industries no direct comparison can be made between public and private investments in the same branch, it is necessary to point out, on Table 9, the performance of the other major public investments. C/O ratios of 8.7 (textiles) to 26.7 (steel) are high. Steel in 1971 operated at capacity. The cost of creating new jobs is throughout high, and output per man low, despite the fact that, with the exception of perhaps steel and paper pulp, there has been substantial price distortion in favor of Tunisian producers (see below).

The conclusion seems inevitable that the private sector has done significantly better than the public sector as far as output and employment creation is concerned. In the public sector, with the major exception of chemical fertilizers and the minor exception of wood, cork, and furniture, investments created neither sufficient output nor sufficient employment. Though matters improved with the change in policies, the basic problem particularly of steel, paper pulp and the other major investments that have inadequately paid off, remains since it is not easy to undo quickly past mistakes. We now turn to the policy problems raised by the facts, and to the conclusions to which we are driven.

TABLEAU - TABLE 8

The Chemical Fertilizer Industry
Public and Private Performance

	C/O	C/L	O/L		Changes in O/L
		1971	1961	1971	1971/1961
		Dinar	Dinar		%
All Fertilizers ¹	2.1	9432	773	2135	276
SIAPE (Public)	1.6	35550	582	3332	573
NPK (Private)	3.0	5762	-	1933	-

Source: Table A.9

Notes: Total excludes ICM

Investments in current prices, output in constant prices. Estimates of investment in constant prices suggest slightly lower C/O and C/L values.

¹Includes other fertilizers: Investments: 84000 D; Output: 1961: 469000 D; 1971: 383000 D; Employment: 1961: 466; 1971: 505.
Excludes ICM.

TABLEAU - TABLE 9

Performance of Other Major Public Investments

	C/O	C/L	O/L		Changes in O/L 1971/1961 %
		1971 Dinar	1961	1971 Dinar	
1. STS (sugar refinery)	2.6	13464 ^a (15233) ^b	-	5275	-
2. Cement (CAT; CPB)	7.1	9564	906	1101	122
Bricks	6.0	6711	483	835	173
3. Steel (El Fouladh)	26.7	18844	-	705	-
Hardware (AMS)	13.1	3991	-	304	-
Car assembly (STIA)	2.6	3763	1200	1442	120
4. Textiles (SOGITEX)	8.7	4784	253	772	305
5. Paper Pulp (SNC)	13.1	10005	-	762	-

Source: Table A.9

Notes: Investments 1960-70 in current prices.
Output (value added) in current prices.

C/O: Investments 1960-70 divided by increase in output 1961-1971
C/L: Investments 1960-70 divided by increase in employment 1961-1971
^aadditional, and ^btotal employment in 1971. STS employed 49 people in 1961, but produced no output as yet. In this case, however, the higher figure seems more meaningful.

C. The Major Policy Problems

Too high capital-output ratios mean too many inefficient investments. This means that, considering the growth that was achieved--and the reader is reminded that we do not talk in aggregate terms but essentially on an individual plant level, and that we have omitted agriculture as well as investments that have not yet matured from consideration altogether--too much was invested. At the same time, the investments were too capital intensive, i.e. they have not created sufficient jobs—a phenomenon essentially confined to the public sector. Yet, output per man was inadequate, which means that too many people were employed. In that sense, production was simultaneously too capital intensive *and* employed too much labor, the former statement referring to the C/L ratios, the latter to the O/L ratios. We have to search for an explanation in the underlying policies.

(1) Growth vs. Employment

Fashions change in economics as elsewhere. Achieving growth is now not considered to be worthy of its former status as overriding aim of development policy, nor as a proxy for the good life. The rapid population increases almost everywhere and the recalcitrance of the problem have shifted emphasis to employment creation and income distribution. Hence it is at times argued that there may be a trade-off between growth and employment. We feel that whatever merit this discussion may have *in abstracto*, it is questionable how applicable it is to Tunisia.

The troubles with productivity, etc. which we have identified have been associated essentially with public enterprises, more specifically, with particular manufacturing enterprises. These enterprises seem to be used not merely as agents of change, but as means of employment creation.

Now, first, additional employment created in a particular firm or industry cannot be equated with an increase in employment in the economy as a whole. To the extent to which the "additional" employment has required operating subsidies from the budget--and there are continuing important instances of this, even not counting the operating subsidies hidden in the investment budget--this is clearly not so. Such subsidies are transfers from foreign donors or the taxpayers at large, whose spending would have created employment elsewhere. At the least it would have to be shown that the transfer was the result of a very progressive tax system, went from the rich to the poor, did not induce the rich to spend or to save less, and would not have created more employment, even with the same tax rates, when used to create new, more profitable capacities. In two important cases, the steel mill and the hardware plant, value added in several years was below wage payment. There are instances of negative value added even in Tunisian prices, both current and constant (see, e.g. Table 7B, 1966). We deal with the problem of price distortion separately.

Secondly, the whole problem of a trade-off is meaningful only if the economy is near an optimum--which we need not specify too precisely. It would be difficult to argue that the only or even the easiest way in which employment in Tunisia could be increased was by foregoing production. Given the values for the C/O, C/L and O/L ratios we have found in Tunisia, it is hard to argue that there was in fact such a choice. Tunisia--and we are convinced many other countries--should get more growth *and* more employment for the effort.²⁴

It is difficult to discuss the policy problem in simple terms, because almost all issues of economic policy come together at this point. The policy aims are clearly several: (a) Since the population at large is poor, a major aim must be to raise their income. This means that increases in output per man must remain an overriding aim. (b) Since in most underdeveloped countries the number of people at an acceptable level of living is relatively small, it is a policy aim to raise the standards of the lower part of the income distribution scale more than the top third or so. (c) Since the population is increasing rapidly, it becomes important to utilize the countries' abundant resources, i.e. (mostly unskilled) labor to the utmost extent.²⁵

Now growth depends on how much a country can invest, how efficiently it invests, and how efficiently its labor performs. Without growth there cannot be an increasing standard of living. Neither can there be increasing per capita income unless most of the population can be in time employed at a better level of productivity than subsistence agriculture and traditional employment seem to provide.

Employment depends essentially on three conditions: aggregate demand and its structure, the technologies employed in producing the various goods, and the level of investment. The level of investment will affect aggregate demand. The technologies employed will depend on relative factor prices. The amount of investment will depend on the total level of savings, the balance of payments, and investment outlets. The structure of demand will depend on relative factor prices which affect incomes, and relative goods prices which affect the way the incomes are spent, which in turn affect aggregate demand and employment. We will try to discuss each of the components of an essentially interdependent system.

Total demand depends on aggregate spending. In underdeveloped countries, the major limit to domestic expansionary monetary and fiscal policies comes from the fact that it is difficult for them to raise domestic output quickly in response to expanding monetary demand, and that the balance of payments will set a limit quickly because investments in particular require imports of goods that cannot be produced at home. The limits to domestic expansionary policies can be extended only if domestic total output can expand rapidly without undue price rises. This requires an increase in productivity.

The limits to domestic expansionary policies can be raised also only if the balance-of-payments constraint becomes less binding. This can be achieved in part by larger capital inflows. Such inflows have always been forthcoming in Tunisia. Their limit will be reached when the debt service becomes burdensome. This must happen sooner or later, unless the capital imports are used efficiently to raise total output without undue inflationary consequences, so that Tunisian production becomes internationally competitive. We arrive at the same conclusion that productivity increases are required.

We turn now from the aggregate demand to the structure of demand. Employment will depend on the level of investments and the structure of demand. Different products are produced with different factor proportions when confronted with the same relative factor prices. Unfortunately the proposition to shift the structure of demand in favor of goods using more labor intensive methods is less operational than appears, and it is dangerous advice.²⁶ Of

course, if we assume that there is only one method of production available for each good, then it is hardly necessary to solve an input-output table to prove that if the structure of demand is shifted towards labor intensive goods, total employment will rise--other things being equal. All this also assumes that we can order all productions at least roughly according to their labor intensities.

The problem with this proposition is that with a closed economy there has to be an arbitrary decision how far not to produce capital intensive goods. Zambia has copper, Tunisia phosphate rock. Should we dig it out by hand? Why not? No railways or trucks? It is possible to transport by bicycle, just as it is possible to produce electricity with a bicycle dynamo. With an open economy the repercussions are even more difficult to escape: there are likely to be balance-of-payments repercussions, positive when the hand-produced goods substitute for imports, negative when savings are affected, catastrophic when productivity of export goods or import substitutes is reduced.

It seems better to avoid this purely technocratic approach and revert back to economic policy: the achievement of proper factor proportions in the economy as a whole by achieving the best factor proportions in individual industries. It has been shown that different factor proportions in individual industries are consistent with the same *constant* factor proportions in the economy as a whole. The economic proposition is that factor proportions employed will be affected by the manner in which relative factor prices are set.

This raises a number of separate problems. Here we assume that decision makers do in fact pay attention to relative prices which, as will be argued in Section (4), is not always the case. The problem becomes one of making factor prices reflect the scarcities of the factors. This will simultaneously ensure --within the technologically feasible limits--that whatever is produced will be produced with the technologies using relatively much of the abundant factor, in effect, labor. It will also ensure that some productions which are too capital intensive at any set of relative factor prices, will not be undertaken at all.

It is *not* claimed that changing relative factor prices will quickly solve the employment problem. For one thing, skilled labor is not overly abundant, unskilled labor is, which must first be transformed into more skilled labor. There are, after all, more than two or three factors. Population is increasing very rapidly. And there are the institutional problems discussed below of making decision makers responsive to *any* set of factor prices. It is claimed, however, that the solution of the employment problem contains as its major ingredient the change in relative factor prices through proper policies. This is being discussed in the next section.

We conclude, therefore, not that employment creation should receive less emphasis, but that the problem is *not* one of growth vs. employment. We proceed to investigate the specific problems that might, in Tunisian context, have resulted in too little output, too capital-intensive methods, and too little output per man.

(2) Interest Rates, Tax Rates and the Exchange Rate

Even though the private sector has done better than the public sector, the issue seems to us nevertheless not necessarily to be one of public vs. private ownership, but one of decentralized vs. centralized decision making, or

perhaps better, of administrative vs. economic decision making. There is much evidence that managers of public enterprises are not allowed to manage, but are subject to detailed bureaucratic supervision. This means not only frequent intolerable delays, but it means that the economic signals of prices, interest rates and the exchange rate lose their role in allocating resources and guiding decisions. To the extent to which this is the case much discussion of price policy, or the proper interest rate loses significance and relevance to the detriment of growth and a rising standard of living.

In the present section we assume that the signals of prices, interest rates, the exchange rates do in fact influence actual decisions, as indeed they do to a large extent both in the public and in the private sector. We will, however, return to this problem below [Sections (4) and (5)]. It is natural, therefore, that we start, not with how prices and interest rates ought to be set --i.e. the problem of shadow factor prices--but with how in fact they are set. To achieve increasing employment, growth and a proper use of domestic and imported inputs, it is important that interest rates, wage rates and the exchange rates reflect as much as possible real scarcities of the various factors. However, these scarcities are very much influenced by government policies. It may be best to start with a consideration of interest rates.

Medium and long term investments are financed in Tunisia by special funds emanating from foreign aid and/or the budget. At present the long term lending rates are around 9%. In fact, funds are sufficient to finance all enterprises at 9%, partly because investment funds are fed by foreign aid and the budget, but partly because administrative delays in granting (or refusing) loan requests form a second rationing device for funds, albeit a somewhat arbitrary one.

Assuming that these administrative bottlenecks are removed, should the rates be raised? Foreign aid is not at present a bottleneck nor has it been in the past. Whether funds are sufficient to finance all projects viable at 9% or more depends on how many funds the government is willing and able to divert into investment channels. As long as the government is willing and able to raise taxation in order to finance investments, it is difficult to argue that the interest rate should be raised above 9%. The problem therefore becomes one of the level of taxation. How much money should the government raise for investments? In that sense fiscal and monetary policy are substitutes for each other.²⁷

The effect of a 9% rate of interest must be to make investments more capital intensive than at, say, 12%, other things being equal. It also means that private savings will be stifled because banks cannot offer high rates to savers. Hence, maintaining a relatively low interest rate structure necessitates high rates of taxation if funds are to be provided. This involves also a shift from private to public savings,³ as disposable private incomes are reduced by taxation. There is no necessary increase in national savings.

At the same time, it is argued that there is much underemployment, particularly in agriculture and small trade, and open unemployment in the major cities. There is some evidence that this unemployment is concentrated mainly among the totally unskilled. Nevertheless the effect of a comparatively low rate of interest--and conventional wisdom says that 9% is low in underdeveloped countries--must be to use too capital intensive methods, provided, of course, that decisions are made economically and not administratively. In fact, two further effects are likely though not necessary in an optimizing world. The

less capital costs, the less incentive there is to husband it also in the sense that one gets the most and best machinery and building for one's money. The less capital costs, the higher wages are--by definition and the assumption of other things being equal--but the easier it is to pay relatively high wages in capital intensive industries, thus reducing employment. We have already mentioned that wage payments are frequently higher than gross value added. We have conclusive evidence that in Tunisia, wage and salary payments are by international standards a very high percentage of value added and of the value of output, despite the relative capital-intensive nature of production.

At the same time final demand is reduced through taxation and expenditures of tax receipts on investment goods, most of which are imported. With the balance of payments being at present relatively easy because of increased exports, tourism, and workers' remittances, combined with fairly strong import controls, there is no pressure to devalue. Yet the currency in terms of purchasing power parity is fairly obviously overvalued, most certainly for industrial goods. (See Section (3) on price distortion.) This means that if any economic profitability calculations are made at all, techniques that are both too capital and too foreign exchange intensive will be favored, compared to techniques that use less of both these factors, and more labor.

Thus, in order to sustain the present (relatively) low interest rates and (relatively) high industrial wage rates, there must be high taxation and a reduction of final demand, below the possible level. The high protection of a few capital intensive industries goes at the expense of both growth and employment. The subsidization of unprofitable industries has the same effect.

The conclusion of this discussion is *not* that interest rates should be raised and wages lowered, at least not necessarily so. It will be remembered that in Tunisia banks lend at medium and long terms from special funds fed from the budget and foreign aid. As far as medium and long term lending is concerned, the banks (most of which are also in the public sector) are a pure transmission belt. Their own funds raised from the public at lower rates are lent at 10% at short term nominally, and are usually rolled over, thus becoming in effect long term. The present situation is thus peculiar in that the budget subsidizes the banks instead of the banking system aiding the process of development! Higher rates of interest would allow more non-governmental savings and might be at the cost of less taxation, not (absolutely) lower wages. The method of collecting savings would be improved if enterprises became more productive, thus financing themselves rather than requiring subsidies. Wages could be paid if output per man and per unit of investment could be made to increase. Productivity remains the central problem.

Enough has been said to indicate that the fact that monetary and budgetary policies are such close substitutes for each other means that higher rates of interest and lower taxation would neither reduce actual wage rates nor the total investments. It would certainly allocate the investments differently. It would lead to increased growth *and* employment, and would therefore be also a more equitable policy. But enough has been said also to indicate that expansionary monetary and fiscal policies would at least be made more easy to pursue if output per man and per unit of capital could be raised. The central importance of productivity cannot be over-stressed.

Obviously, the discussion presupposes that projects are in fact realistically analyzed and that decisions are made on the basis of economic criteria,

rather than primarily by administrative decisions. We have simply argued in favor of raising and allocating the available resources in a more rational way. We feel that in Tunisia, growth would have been faster, if several white elephants of the past which raised investment ratios to such high levels had *not* been undertaken. We feel that this is likely to be true for some of the proposed investments, too. (Why build more dams *at this time* if acreages under irrigation could be doubled without further investments?)

Just as higher interest rates (accompanied by lower taxes) would not necessarily reduce total investments, but would allocate them differently internally, so exchange rate devaluation would not necessarily reduce imports, but ensure that imports are allocated more economically. Both measures would raise employment and domestic production even if they did nothing else.

It is not the purpose of this paper to calculate an equilibrium exchange rate. (See, however, Blake's contribution.) It is rather the purpose to point to two policy implications. The first is that balance-of-payments ease cannot be taken to imply that the exchange rate is correctly set; that is, that other criteria, primarily relative prices and international competitiveness should be taken into consideration. The second is that the purpose of an exchange depreciation should be seen not only to be an improvement in the balance of payments but also the internal effects. The internal effects are primarily two: an improvement in the budgetary situation and a better allocation of foreign exchange; that is, an *economic* import substitution and employment creation.

The Tunisian balance of payments is kept in an easy state by increased exports of goods and services, strict import controls, and abundant foreign aid and private capital inflows, much of which feeds the special funds that help keep the interest rate low. An overvalued exchange like a low rate of interest is defended on the grounds that it will keep investments cheap and hence stimulate them. But this is true only within limits. To be sure, the total amount of investments that it is economically desirable to put into place depends on the expected economic return which is influenced by the cost of the investments. But the manner in which the investments are put into place will also depend on relative factor prices.

Now it is clear even without measurements that a small country like Tunisia cannot influence the prices of the goods it buys or sells, except perhaps in special circumstances which we can neglect. Total foreign exchange earnings will depend on domestic supplies. The Dinar equivalent will depend on the exchange rate. The first effect that an exchange devaluation would have would be to leave total foreign exchange earnings unaffected, but to raise the Dinar income of exporters. Since the foreign exchange component of exports is only a part of the total cost, returns will increase. This is a very important matter for phosphate mines, which receive substantial annual (and socially defensible) subsidies from the budget. The budgetary effect of devaluation would clearly be healthy, even if we assume the worst possible case: a unit elasticity of demand for Tunisian exports.

If total export earnings in terms of foreign exchange are not affected by a devaluation or would rise, the amount of investments requiring imports clearly *could* be the same. The only effect would be to force domestic users of foreign exchange to use it more economically. The same amount of foreign exchange would be combined with more domestic resources, including labor.¹⁹ In

fact, domestic savings would rise (other things being equal, of course) so that on that account alone the balance of payments would improve. This would reduce the volume of capital inflows that were economically desirable and thus ease future debt burden problems.

The paradox remains that a devaluation is advocated even though the balance of payments is not in trouble. In strict equilibrium terms and allowing for long-term capital investments including foreign aid, the Dinar might not be considered to be overvalued. However, consider longer-term effects. The normal effect of an accumulation of foreign exchange beyond the needs of the Central Bank must be inflationary--indeed this is the chief reason why the German Bundesbank, for example, feels that the Deutsche Mark must be appreciated. Germany, however, has a powerful, productive, and highly sophisticated economy. Tunisia, like all underdeveloped countries, has not. A hypothetical appreciation of the Dinar would continue until not only would more and more imports be substituted for domestic factors for whatever is produced, but the specialization would continue in, say, tourism, and less and less industries would become domestically profitable to develop.

As the exchange rate is devalued from this hypothetical extreme value, more and more industries become economically feasible. The older approach to the definition of an equilibrium exchange rate of purchasing power parity has, therefore, something to recommend itself. The proper exchange rate becomes important not only in terms of using less foreign-exchange intensive methods of production, but also in terms of achieving a growing and more diversified economy, able to absorb its own resources into employment and of achieving an increasing standard of living.

The problem of the exchange rate and the large volume of capital inflows is linked to the productivity of the economy also in an indirect way. The lower the productivity of the economy, the less the capacity of the economy to generate resources for growth. More specifically, the less the productivity of major public investments, and the more the government is expected to do, the more pressure there is to raise budgetary resources by any means. When PL 480 wheat is imported, or when commodity loans are received, this has direct budgetary impacts, quite separate from any effects the imports might have in easing production or consumption bottlenecks. There will, therefore, be pressure to increase foreign borrowing in proportion to the failure of investments to generate budgetary resources. With an adjustment of the exchange rate, some of this pressure can be alleviated, and this will, of course, have an impact on the future debt burden. Thus, from the balance-of-payments standpoint, too, attention to productivity becomes a central concern.

(3) Price Distortion, Import Substitution, and Productivity

Because Blake deals in detail with the extent of price distortion, this section is kept very brief. Blake has calculated effective rates of protection for three years. The variations in the rates may be due either to Tunisian tariff policies, or to fluctuations in world market prices, or a combination of the two. Thus Blake finds an effective rate of protection in 1968 for steel bars of 424.87%, a rate that is likely to have diminished by 1972 as the world market price of steel has increased.³⁰

Blake's calculations show substantial price distortions (as measured by rates of effective protection) precisely in the industries that received

major investments. A comparison of effective rates with output per man in 1971 is instructive. We take only effective rates of protection in 1969 of 100% or more.

TABLE 10
Effective Rates of Protection (1969) and Output per Man (1971)

	Effective Rate* %	Output per Man D
1. Sugar refining	471.43	5238
Tobacco	194.43	1004
2. Tires	137.91	2751
3. Batteries, electrodes	354.33	1558
Steel bars	428.87 (1968)	705
Hardware	212.82	563
Metal containers (cans)	124.99	1381

Source: Blake, Table XIV, Appendix Table A.3.

Notes: Effective rate: nominal, before allowance for possibly overvalued exchange rate, too high wages, etc.

*Output per man in Tunisian prices of 1966.

Readers not familiar with the concept of an effective rate of protection may be startled by the high rates. For details see Blake's discussion. The effective rate of protection tries to allow for the fact that protected final goods use inputs that may also be protected. The effective rates may and usually do differ greatly from nominal rates.

The high rates of effective protection raise serious questions about the real cost of the industries to the Tunisian economy, and the real rates of growth. (See Blake.) We note two points here. Tobacco and sugar are government trading monopolies. There is a government owned sugar refinery which received substantial investments, as well as a privately owned sugar pressing plant. Certainly in the case of tobacco, and partly also with sugar, the high effective rates reflect only in part a protective intent; they reflect a tax policy. Tobacco, like salt, is in many countries a traditional *Régie*. But at least output per man is reasonably high.

With the other manufacturing industries there is no tax (revenue) element in the protective policy. For batteries there is total import prohibition, so there are not even nominal offsetting government tax revenues. Three of the industries are private, two public. In all cases, value added in world market prices must be presumed to be substantially smaller than the figures we have calculated in Tunisian prices of 1966. But we note that the private industries have at least been able to translate their protection into a high output per man; the public industries have not. The production of hardware is inefficient even in Tunisian prices, current or constant, so inefficient that there is no point calculating the real resource cost. The manufacture of batteries, tires, steel or sugar is also inefficient in the real cost sense (see Blake, Table XV), i.e. when an adjustment is made for a possible over-valuation of the Dinar, etc.

It will be noted, however, that this real inefficiency measured by real as against monetary effective protection is relatively small for steel rods and tires, while it is enormous for batteries, electrodes and spark plugs suggesting that the former might yet contribute to Tunisian growth and welfare.

Blake has calculated negative rates of protection for nine products, one, crude oil, being less than 1% (Blake, Table XIV). All but two are export products, including olive oil (-14.79%), phosphates (19.47%), superphosphate fertilizer (-5.39%) and lead smelting (-20.50%). The two exceptions are cement (-6.15%) and bricks (-3.31%). (A third, leather, has a negative value added in world prices.) These figures leave no doubt that Tunisian policy went beyond import substitution and actively discouraged exports, though this obviously was not done by design.

Import substitution policies were quite in fashion at the time at which Tunisian planning started, and it is understandable that at the beginning of the industrialization process one should at first attempt to produce for a domestic market behind a protective wall. Yet import substitution, particularly in a small market, turns out to be short-lived and frequently self-defeating, and it need in no case be accompanied by a policy of discouraging exports. Early criticisms of the import substitution policies were met with supposedly factual references to low export elasticities and the impossibilities of breaking into foreign markets, and the actual policies were made intellectually respectable by referring to the infant industry argument, but also to factor and goods price distortions, and the possible differences between social and private profitabilities of investments. The significance of the developments of the theory of commercial policy,³¹ of shadow-pricing³² and of effective protection³³ is precisely to point out that trade is an objective possibility and international prices are a "technological" datum,³⁴ that proper shadow-pricing will get us to real resource cost, and will make use of international prices,³⁵ and that the extent of effective protection will frequently show that growth of individual sectors or industries cannot be equated with growth of the economy or increased welfare.³⁶ Modern theoretical developments while modifying the old free-trade arguments, hardly turn out to be a defense of import substitution.

Even the one major exception, cement, fits into the pattern. Cement normally would rank high on the list of industries to be developed at home. The negative rate of effective protection is due in large part to the fact that the government controls the price at a level below the world market, the *rationale* being similar to that of keeping interest rates low and the exchange overvalued. Cement is an important investment good; hence a low cement price will lower the cost of investments.

The effects are, however, quite different and totally undesirable. Imports of cement are in the hands of a monopoly which for various reasons finds it impossible to supply the domestic market at the controlled price. The result is twofold. The supply difficulties raise the investment cost by contributing to the delays of execution and starts of new projects. A "parallel" market arises which hurts mostly private investments and housing. The reduced rate of housing construction immediately reduces private savings and investments;³⁷ it prevents the increased employment of precisely the kind of labor in abundant supply in all underdeveloped countries. It reduces the growth rate and has undesirable income distribution effects.

Because of its size, the steel mill is a special case. However, it shares with all industries, whether producing or assembling, common problems which become particularly obvious in the case of the assembly industries. Particularly with assembly industries it turns out that the import content is very high, and value added very low. In some countries, Pakistan among them, it can be established that in fact there was no import saving. Moreover, in order to protect the new industry the government is frequently induced to give a complete monopoly to a plant. Prices as a consequence are high, and the product is likely to be inferior. With final consumer goods this may be considered a tax to pay for "learning by doing".

With consumer goods, variety and quality may be considered a "luxury", desirable to be sure but not essential. With producer goods this is not the case. They tend to be more frequently special purpose goods. The higher prices and frequently inadequate suitability penetrate further into the economy, raising the cost of investment and of other productions. Hence they set up counterpressures for government to relax the degree of protection. When the counterpressures are successful, the production of the industry falls or may cease altogether. A case in point is the assembly of tractors by International Harvester which was abandoned after competing imports were permitted. Cases of total import prohibition are batteries or spark plugs.

The problem of too high an import content and too low a value added is not a characteristic of only assembly industries. It is no different for producing industries proper. Virtually no industry transforms only domestic resources. And the Tunisian market is just as small for producing as for assembling industries. The recent change in government policy in attracting export industries obviously sees the problem in the right context. Tunisia, being both a small and a Mediterranean economy, has an interest in international economic integration. Instead of concentrating on producing for the domestic market and exporting what is left over, one now produces as efficiently as possible and sells either abroad or at home. Tunisian exports of manufactured goods are still small. But in 1972 they were 4.64% of total exports, compared to only 2.12% in 1960. Exports of textiles produced in the private sector contrast with the inability of the capital intensive public textile sector to produce at reasonable prices for the domestic market.

(4) Efficiency in the Public Sector: The Institutional Problem

The central problem of adequate productivity is particularly acute in the public sector. In Section (2) we discussed interest rate and related policies, assuming for the time being, that the allocation of factors would in fact be influenced by whatever factor prices happened to be. Even in that section it was pointed out to what great degree government tax policy had it in its power to influence factor prices, not necessarily in a desirable way. The present section makes the central point that *in fact* factor prices affect factor allocation in the public sector only to a limited degree. It asserts that in fact it is in the nature of the present institutional framework of the Tunisian economy that factor allocations are made independently of the factor price signals which the planners give to the executors, and that is this fact that explains the difference in the behavior of the public and the private sector. In that sense this section deals with problems which it is now fashionable to characterize as within the realm of "political economy".

It is possible that detailed bureaucratic interference in the manage-

ment of public enterprises is inherent in government ownership, both in socialistic and non-socialistic countries, but experience in both suggests that there is no necessary logical or factual connection between public ownership and centralized and essentially administrative decision making.

There are, of course, efficient public enterprises: STEG, the electricity corporation, or SIAPE, the public fertilizer firm. But the former is a public utility with special problems, the latter is subject to international competition: the bulk of its sales is abroad.

The definition of what is "public" and what is "private" is in all underdeveloped countries somewhat arbitrary. We have taken the definition of the Ministry of the Plan. A public enterprise is either completely owned by the government, or the government has a majority interest directly or through other government institutions. It receives its investment funds through the budget (Titre II) or the capital market. There is a responsible ministry, a Ministère Tutelle. However, the major effect is that the enterprise depends for its funds, both operating and investment, not only on sales of its output or the capital market, but that *it has access to the budget*. And this is the central trouble.

Virtually all enterprises, whether public or private, have some government protection. The "private" sector--i.e. those firms that must get their funds through loans or equity, even if both are governmental, and through sales of their product--may get special privileges through tax relief, protection, total import prohibition. All of these privileges work essentially through the market mechanism, which is of course rigged in favor of the enterprise. The latter includes also easier access to foreign capital markets and export markets, which is indeed a major reason why foreign capital is invited to participate in Tunisian development.

This means that, however rigged in their favor, the market signals of wages, interest rates, customs duties, tax rates, etc. must be taken seriously by the private enterprises. Given the smallness of the Tunisian market and the nature of the protection which reduces or eliminates imports, there is no pressure to maximize profits. But the enterprises must at least not make losses by the standards set to them by government policies. If they make losses they must restrict production and eventually cease production. However the market signals are set, they will exert the necessary allocative functions. Although private managers are also subject to governmental decisions of an administrative sort, for example in such matters as import licenses, they nevertheless make their decisions essentially on the basis of market events. It, therefore, makes a difference to them whether interest rates are 9% or 12%, and just what the tax regulations are.

By contrast, public enterprises cannot go bankrupt,³⁸ and they have for all practical purposes unlimited access to public funds, either directly through the budget--openly as operating subsidies in Titre I, hidden operating subsidies in investment subsidies through Titre II--or indirectly through bank credits which in turn are fed by the budget, by special funds, or by the "profits" of government trading monopolies which are substantively a form of taxation. (The movement of funds is discussed in detail by Kleve.)

The result is that public enterprises that perform poorly are not

forced into economic behavior by having to pay 9% interest, for example; nor do high prices granted them translate themselves into higher profits rather than higher cost. If they pay no attention to the 9% rate--and government trading monopolies are no more likely to use that rate as an internal accounting device for the internal use of their own funds than large oil companies elsewhere--it means that investment decisions are made essentially on technological and, one is tempted to add, esthetic grounds. The design of a factory or hotel becomes much too capital intensive. Factor proportions get distorted not merely because factor prices are wrong. They get distorted because prices make no difference at all! Even if the most labor-intensive technique available were used, capital would still cost too much, thus producing the worst of all possible worlds.

For, it cannot be stressed enough, that factor proportions in these circumstances are *not* determined *only*, or perhaps not even mainly by the technology employed. Even if for a particular product only *one* technology existed--and this is most emphatically not the case--there still are different potential suppliers of similar machines with different prices and payment conditions;³⁹ there are more or less economic ways to construct buildings. In one factory, the building cost four times what had been planned. The machinery, too, cost more than anticipated, partly because of errors in estimation, partly because of the devaluation of the Dinar in 1964, but the difference was of the order of 50%, not 400%. Similarly inefficient disregard of economic design can be found in hotels, brick factories, and others. It is these factors which increase capital intensity even when the technology chosen is labor intensive; it is these factors that explain much (though not all) of the higher capital/output ratios in the public than in the private sector, and which have made it impossible for the available funds to have created as many jobs as was possible.

It is even likely that the difficult capital position of some public enterprises which is too much distorted towards short-term credits has been partly caused by the knowledge that, as the enterprises have unlimited access to public funds whenever they need them, it makes obviously no difference to them how much things cost (within the overall ceiling determined by the Ministry--formerly the Secretariat--of the Plan and of Finance and the Central Bank) and what payment charges are. This is reinforced by the knowledge that, once started, an enterprise is not likely to be stopped.⁴⁰

This problem is, of course, well known, and it has been frequently discussed, though not to our knowledge in the context of the technology employed, factor proportions as they develop independently of technological requirements, employment creation and productivity. The real problem is not merely one of determining the proper "shadow prices" for the factors of production and making them real through monetary, fiscal, wage, foreign exchange and related policies. The real problem is the institutional one of how to make public investments responsive to these prices as determined by public policy.

The problem seems inadequately described as one of incentives. The problem is being tackled in a double manner: by a restructuring of the capital structure (*assainissement*) which essentially means by pumping more and long-term funds into enterprises in the hope of making them more viable. The other is essentially a system of contracts, which is still in the discussion stage, and which in essence means an attempt at decentralizing decisions.

The following comments tread on sensitive ground. This is partly because the decisions on what to do have not yet been taken, partly because our comments necessarily offend sensibilities, partly because being outsiders no matter how sympathetic we cannot pretend to the final feelings and sensitivities which only a citizen and insider can have. But the issue seems too important for the understanding of the past and the difficulties of solving the problems in the future, to be simply dropped.

Many, perhaps most, managers of public enterprises are perfectly competent to run them. They can point out with considerable justice that they are hampered in their decisions by having to deal with too many authorities, that decisions do not arrive quickly enough, that they have had no say in the original design of many factories, that they cannot control prices at which they sell, or in some cases, when their inputs are to arrive, etc.

The system within which they must operate has grown over the past decade or so. To decentralize now, i.e. to move from a system of direct intervention to an economic framework within which they can and must make their decision is a much more drastic change than appears at first, because it involves at least the same and possibly even greater power in the top political and administrative economic decision makers, the President, the Ministers, the Governor of the Central Bank, but a loss of power all down the line. Special targets special permits and licenses, and the rest are eliminated and at least reduced in importance. The "*grandes lignes*" become more important; administrative permits and petty decision at lower levels are reduced or eliminated as managers are encouraged and forced to decide how to meet the overall requirements.

It takes little imagination to see that this loss of power is likely to be resisted. We grant that everybody is patriotic, has Tunisian welfare at heart, and is equally socialistic. No one suggests selling public enterprises. Nevertheless there are bound to be internal struggles of various degrees of bitterness. They are not likely to be as bitter in Tunisia as in Russia or China,⁴¹ but they are nevertheless inevitable, they will force a gradual approach. And they help to explain perhaps why the poor experiences of the past with massive public investments have not deterred similar investments in the present,⁴² now that the resource situation has become easier, even though private enterprises are also encouraged. And it is difficult to imagine that the government will liquidate AMS, or write down the capital of the steel mill to economic levels.

(5) A Final Appraisal

Unless one takes a completely deterministic line that everything that happened had to happen it is legitimate to sum up with the questions: Could some of the problems have been avoided? Were there alternatives to what actually was done? It is, of course, impossible to know what would have happened if...; it is not always possible to find out what actually *did* happen. The following remarks, though based on detailed studies and a ten-year association with Tunisian developments, must necessarily be somewhat personal and beyond strict proof.

There is no doubt in our minds that the initial efforts to get the

economy moving after independence was logical and justified. This is so even if the available data suggest that the economy was not altogether stagnating between independence and the beginning of planning, and even though, as Blake points out, Tunisia was not all that little industrialized, given its size. The issue can only be the specific manner in which the effort was carried out.

Tunisian planning was sophisticated and very much in the spirit of the times. It was nevertheless obvious even then

- (i) that planning for import substitution in a small economy made little sense and had obvious and narrow limitations;
- (ii) that planning was heavily influenced by physical planning (an almost inevitable consequence of relying on coefficients, technical and otherwise, to construct the planning models) and paid inadequate attention to project preparation and economic cost-benefit analyses of individual projects. This is, of course, the Achilles heel of planning everywhere, including North Viet Nam;
- (iii) that planning without adequate attention to budgetary and other financial limitations proceeded in a vacuum. This observation led in fact to the formulation in 1965 of the First Economic Budget for 1966;
- (iv) that exports were viewed simply as an afterthought to get rid of excess production while imports were "technically" determined by what one could not produce. The statement shows the essential meaninglessness of the procedure, even when covered by sophisticated input-output tables and commodity balances. For the answer to what would be in excess or what would be needed could sensibly be answered only after making careful individual cost-benefit analyses;
- (v) that the reliance on technical coefficients and sophisticated techniques led to an underestimation of the importance of policy formulation, that is to an inadequate recognition of what had to be done to ensure that planned relationships would in fact become real;
- (vi) that projects were at times put into place simply to get things done. The reasons are not always clear. Energy and the overwhelming desire to change the structure of the economy were certainly predominant. Ideology *may* have played a part, but if so, a rather peculiar one. For in Marxist theory, ideology does not really determine the course of events, but reflects the underlying productive relationships and conditions;
- (vii) that the underlying productive conditions were insufficient productivity of projects and that the belief that essentially juridical changes like cooperatives, or increases of capital--i.e. essentially inputs--would raise productivity turned out to be somewhat overoptimistic, particularly in the face of experience already then quite overwhelming in its testimony to the contrary;

(viii) that inadequate productivity would inevitably lead to fundamental difficulties. It meant that projects would require inputs--read: budgetary resources--without increasing taxable capacity and producing outputs--read: budgetary receipts and savings. Hence, there would be inevitable pressure to raise government income and savings by further taxation and by increasing foreign borrowing at almost any price. But foreign aid from international donors or foreign friends can be had primarily for projects and only secondarily for budgetary support pure and simple. Hence there is pressure to generate projects just to get budgetary receipts, and pressure to shift to other "easier" sources of foreign exchange, like contractor finance. Hence, balance-of-payments pressure will build up, and the process becomes self-reinforcing until it collapses of its own weight;

(ix) that inadequate productivity would put pressure on social policy. There is no question but that political and social aims have priority over economic means. But virtually no political and social aims exist that do not require economic resources; some, like schools and hospitals, require enormous economic resources. Hence, inadequate productivity of those investments that are essentially economic in the sense of generating the resources to be used for social purposes will interfere with the achievement of social purposes, and raising productivity becomes crucial also for social and political development. This, too, became obvious by 1969.

The list could be enlarged. It will be observed that it is applicable to many underdeveloped countries. It is difficult not to blame an essentially inward-looking policy that neglected economic criteria and economic policy for such failures as existed. The Tunisian experience is, however, almost unique in one respect: when problems became obvious, Tunisians did not hesitate to reverse gears and try to solve the problem:

- (i) the budgetary difficulties led not merely to changes in planning techniques, but also to adjustments in the volume of investments;
- (ii) the balance of payments difficulties which had reduced net reserves below zero, led initially to more import controls, of course, but also to successful attempts to raise exports;
- (iii) the trouble with forced cooperatives led to their abandonment, not without internal problems, of course;
- (iv) the original lack of policy formulation was remedied by attention to these problems and by a move to greater indirection.

None of these is self-evident. Most countries react to mistakes by assuming that the initial mistake that led to troubles was not big enough. It is fashionable to speak of "learning by doing". But if this phrase means anything it surely must mean that one abandons methods and policies that do not work and substitutes methods and policies that do. In that sense there has been "learning by doing".

Of course, the effects of major past errors that have involved major

misallocation of resources will persist for some time, and new problems will arise. But it is impossible not to feel admiration for what was achieved and even more for the unparalleled courage to discontinue or even reverse policies that did not work and substitute policies that do. In that sense it seems likely that history will see in the 'sixties and 'seventies more continuity than the worm's eye view of the participants and contemporary analyst perceives.

V. Appendix: The Individual Sectors

1. Agriculture

Because of its importance, agriculture is analyzed in a separate chapter. Agriculture has received substantial investments, mostly in dams, but during the period of cooperation also in other areas, without showing a commensurate return. Some of the investments, like the tree planting program through LCSD⁴³ were not expected to have quick payoffs and were intended mainly to create useful employment. But others were intended to raise production within a reasonable period, e.g. dams or tractors. Fluctuations in agricultural output are usually blamed on the weather and generally attributed to acts of God. The last three years have been good in this respect. However, attributing all failures or successes to the weather overdraws the picture somewhat. The *raison d'être* for irrigation is precisely to make the crops independent of rainfall. This is also true for pesticides and intermediate inputs. If lack of rainfall reduces crops because available water was not fully utilized for one reason or another (administrative failure, wrong price structure, lack of incentives) we deal with acts of man, not of God.

2. Mining

The chief innovation in the recalculation of value added for the mining sector is that it was calculated not by product, but by mine. Because of substantial differences in the quality of the mines, this method allows for the changing composition of output within each subsector.

The mining sector is entirely state owned. Two enterprises in three mines produce phosphates, two enterprises produce iron ore, two enterprises produce various non-ferrous metals and one enterprise produces salt both for domestic and for industrial purposes. Phosphate and iron ore are old industries. The production of non-ferrous metals is mainly the result of recent developments.

The mining industry presents special problems. The phosphate and iron ore mines are old and require enormous investments just to maintain productivity. They earn substantial foreign exchange. They are also located in the poorest regions with substantial unemployment and no visible alternatives except emigration to other parts of the country or abroad. For all these reasons there is substantial pressure to invest in mining. Such investments are undertaken almost as much for social as for economic reasons. Moreover, even when there is no explicit regional investment policy, mining investments reflect *de facto* such a regional distribution of investments.

As Table A.3 shows, there are substantial differences in the level of value added per man in the four subsectors. Salt throughout produces about twice to three times the value added per man than the average, while the new non-ferrous metal industry gradually moves up from about 44% of the average to about 73%. Except for salt, the old phosphates have consistently the highest value added per man.

During the First Plan, 1962-64, 61% of the mining investments went to phosphates; during the Second Plan a little more than 47%; and during the Third Plan until 1971 about 57%. These investments have paid off in the maintenance of the tonnage produced, though the changed terms of trade have reduced the real value of the output in terms of imports. The investments have fulfilled their social objective in providing increasing employment in disadvantaged regions of the country.

By contrast, iron ore received very little investment and actual investments fell substantially short of plans. During the First Plan period less than 5% of mining investments went to iron ore and that presented only 21% of what had been planned. The performance was somewhat better during the Second Plan period 1965-1968; iron ore investments were just under 12% of the total and about half of what had been planned. But during the Third Plan period to the end of 1971, we are back to only 2% of total investments and 12% of planned investments. The investments that were not executed refer to projects that were postponed from Plan to Plan. The lack of investments shows both in the small increase in employment and in the falling productivity.

Non-ferrous metals, as a rather new industry, present a special case. As noted, value added per man is less than in the other subsectors, but as also noted it has increased most rapidly. Direct investments in the sector started only during the Second Plan period when, as Table A.3 shows, productivity began its rise. However, the substantial investments in mining research were virtually all directed to exploration for non-ferrous ores, and should be counted as part of that sector's investment. They were just 50% during the First Plan period, 36.7% (16.9% direct + 19.8% research) during the Second, and 33.5% (23.1% direct + 10.4% research) during the Third Plan period to the end of 1971. The rise in productivity as well as in employment suggests that the investments were successful, even though output per man still is below the other subsectors.⁴⁴

Salt investments were small throughout, though they were almost as big as iron ore investments during the First Plan period and twice as big during the Third Plan period. Employment hardly rose, and output per man certainly did not improve.

3. Energy

The energy sector contains two of the fastest growing industries. Electricity generation grows everywhere in the world at very rapid rates. Petroleum production depends, of course, on discoveries. Its rate of growth has leveled off by the end of the decade. Petroleum refining, being mostly for the domestic market, depends after its initial growth mainly on how the economy grows and how its structure changes. Value added of the sector as a whole increased almost 10 times between 1961 and 1971, with employment increasing by about 65%. Value added per employee increased almost sixfold.

Most, though by no means all, of this development was due to petroleum.

(i) Petroleum

In 1961, the contribution of this sector was due entirely to a small production of natural gas. Actual production of crude oil began in 1966. Between 1966 and 1971, output of crude oil rose, measured in tons, more than $6\frac{1}{2}$ times and so did its value added. Refining started already in 1964. Between 1964, the first year of operation, and 1971, the tonnage refined increased by about 85% to capacity operation of a little over 1 million tons.

Employment in the industry was until 1969 about 70% above 1961, but it hardly fluctuated between 1964, when refining started, and 1969. In 1970, however, it dropped sharply to only 24% above the 1961 level, and to about three-fourths the 1964 level. This drop appears to be associated with a drastic decline in exploration activities.⁴⁵ Value added, on the other hand, rose tenfold between 1964 and 1970. Value added per worker as well as total value added rose in fact faster than output measured in tons, as the industry reached capacity operations. With a value added of 33,557 D (in constant prices of 1966) per employee, this industry shows by far the highest productivity of any.

It is possible to separate refining from other activities. Unfortunately, it is not possible to separate the employment in the production of crude from employment in exploration. We have noted the sharp drop in the value added of the refining in 1971. Value added is calculated from balance sheets. In 1971, the price of crude was raised sharply while the price of refined gasoline remained constant, thus reducing value added in current prices which was deflated to arrive at value added in constant prices. Output per man measured in tons of gasoline refined remained essentially constant since 1968.

Value added per man in petroleum production proper increased steadily to 1968. The sharp increase in 1970 is due to the decline in oil exploration which may have led to the substantial decline in employment. Total investments in petroleum between 1960 and 1969 in *constant* prices is estimated as 97.6 mil D, of which 66.2 mil D were made between 1965 and 1969. The 775 jobs generated by 1970 required 125,935 D (about 250,000 at the pre-dollar devaluation rate) per job, much the highest of an industry.

(ii) Electricity, Other Energies, and Water

Value added of this subsector has increased about $3\frac{1}{5}$ times between 1961 and 1971, employment about $2\frac{1}{5}$ times. Productivity doubled. The physical measures also indicate a vigorous growth for electricity (268% of 1961), water (210% of 1962, no figure for 1961 being available), and less vigorous one of city gas (108.6% of 1961) which is also produced by the electricity company. Energy is also a very capital intensive sector. Between 1960 (really 1962) and 1970, total investments in electricity, water and other energies was (in constant prices) 56.7 mil D, or 25,437 D per additional job created in 1971.

4. Manufacturing Industries

The value added of manufacturing industries, exclusive of the artisanal production of carpets, little less than doubled between 1961 and 1971.

Employment in industrial manufacturing also roughly doubled. Output per man seems to have not quite held its own, despite the fact that capital intensity has increased very much. It is, however, necessary to go into the detailed figures for individual industries and subindustries.

The structure of the manufacturing sector changed substantially. In 1961, the food industries accounted for 70.4% of the value added of the sector, and even in 1962, when the small olive crops resulted in a drastic fall of olive oil production, it amounted to 56%. In 1971, with olive oil production of 2½ times the 1962 level, it nevertheless accounted for only 41%. The industrial production of textiles, fifth in 1961, had become the second most important industry with 14.3% (4.1% in 1961). The mechanical and electrical industries accounted for 11.2% (5.1%) and the chemical industries for 9.9% (5.8%). (Table 11)

The largest amount of investments went to the mechanical and electrical industries: 42 MD, or 27.1%, which justifies the intensive discussion which this branch will receive. But food industries and the industrial production of textiles also received 17.8% of investments each, with paper (13.1%) and construction materials (11.5%) the next biggest recipients. We have already shown that the increases in employment and particularly in value added can be attributed to investments to only a very limited extent.

(i) Food, Drink, and Tobacco

The statistics of this sector distinguish between 12 branches. Only one of them, the production of olive oil, depends directly on agricultural production. In all other cases, with the possible exception of canning, domestic inputs can be supplemented by imports, and fluctuations in exports mitigate fluctuations in supplies to domestic producers.

The structure of the industry falls naturally into three categories. On the one end are the many small enterprises producing olive oil, baking bread, or providing meat. Employment estimates depend in these cases on special investigations for one year. For the other years, it is assumed that employment and output move in a parallel manner. No inferences about productivity are possible for this group of producers, which in 1961 accounted for 74.2% of value added, and in 1971 for 59.2%.

On the other end of the scale are such industries as sugar, milk and milk products, or tobacco, in which there are only one or a few enterprises. In between are the many small enterprises producing flour,^{4b} canned goods, or cookies. For these categories, employment data are available by firm, and inferences about productivity are possible.

Except for the sudden increase in 1971, total output of the industry including olive oil has not changed. When olive oil is excluded, however, there has been a fairly steady growth by 1971 to 156% of 1961, the largest growth being registered by sugar (1,167%) and milk and milk products (840%). These industries received 20.3% and 14.1% of total investments and in that respect, the investments have paid off. The (public) sugar refinery doubled its value added between 1963 when it started operations and 1971; the private sugar pressing plant by 147% between 1961 and 1971.

TABLEAU - TABLE 11

Industries Manufacturières - Manufacturing Industries

Investissements 1960-1970, Valeur Ajoutée 1961, 1971, Prix Constants, Emploi, Par Secteur
 Investments 1960-1970, Value Added 1961, 1971, Constant Prices, Employment, by Sector

	Investissements		Valeur Ajoutée - Value Added				Emploi - Employment			
	Investments		1961		1971		1961		1971	
	MD	%	MD	%	MD	%	No.	%	No.	%
IAA - Food Industries	27.6	17.8	21.743	70.4	25.368	41.1	18822	49.4	22065	27.2
MCCV - Construction Material	17.9	11.5	1.892	6.1	5.913	9.6	2797	7.3	5617	6.9
IME - Mech. Elect. Industries	42.0	27.1	1.568	5.1	6.924	11.2	1601	4.2	7980	9.8
Chimiques - Chemicals	12.3	7.9	1.801	5.8	6.127	9.9	2086	5.5	4280	5.3
Textiles - Industr.	27.6	17.8	1.266	4.1	8.831	14.3	3108	8.1	15635	19.3
Tapis - Carpets	4.5	2.9	.919	3.0	2.220	3.6	7069	18.6	17077	21.0
Bois, Liège, Meubles - Wood, Cork, Furniture	3.0	1.9	.680	2.2	2.320	3.8	1222	3.2	3740	4.6
Papier, Impression, Divers - Paper, Printing, Misc.	<u>20.3</u>	<u>13.1</u>	<u>.991</u>	<u>3.2</u>	<u>4.058</u>	<u>6.6</u>	<u>1339</u>	<u>3.6</u>	<u>4801</u>	<u>5.9</u>
TOTAL	155.2	100.0	30.870	99.9	61.761	100.1	38044	99.9	81198	100.0

Note: Detail may not add to 100% because of rounding.

By far the highest value added per man is produced in sugar pressing (13,907 D) followed by sugar refining (5,274 D). The only industries showing significant increases in output per man are the sugar industries, milk and milk products, coffee, and biscuits and chocolates. In all other industries productivity has been essentially stagnant.

The productivity of the private sugar pressing plant rose steadily between 1961 and 1971 to 259% of the earlier level. Productivity in the refinery fluctuated violently, but was in 1971 also 243% of the 1963 level. However, it is noteworthy that the highest value added per man in the refinery, achieved in 1971 is lower than the lowest output per man achieved by the pressing plant in 1961. Employment in the refinery was gradually pared down from the high of 681 in 1962, the year before output started, to 422 in 1971, when it was about ten times the employment of the private plant. Total investments in the sugar mill between 1960 and 1970 was 5,682 MD in current prices, or an estimated 7.6 MD in constant prices. This means that it cost about 18,000 D in constant, and 13,500 in current prices, for each job created. Most of the investments in the sugar mill were made in 1961 and 1962.

The biggest investment in STIL, the milk monopoly, was made in 1970, and may not yet have had time to translate itself into output and employment. If we take investments from 1960 to 1969 only, STIL received 1,655 MD (3.175 MD to 1970). With the employment in 1970 this means that 7,227 D have been invested per additional job. (It has taken, to 1970, 9,311 D to create an additional job.)

The tobacco monopoly also received substantial sums: 2,648 MD between 1960 (really 1962) and 1970. This is 2,346 D per job existing in 1971, or 13,124 D per additional job created. Considering that productivity has not changed, this is a substantial sum. The remaining investments went essentially to the Office de Peche (6.3 MD) and the new Tunis slaughter house (2.6 MD).

(ii) Building Materials, Ceramics, Glass

The changes in the structure of the industry are shown in table 12. Cement remains the most important industry, accounting for 38.7% of value added in 1961 and a third of employment, for 27.1% of both output and employment in 1971. Bricks manufactured received more investments than any other product. As a result, its relative position rose from third to second place. New industries produce faience tiles, glass and sanitary articles. Almost all are governmental.

Even this breakdown does not yet tell the whole story. Cement is produced in two factories. Both received substantial investments. Yet, productivity in one, CPB (investments: 1.568 mil D) more than doubled, while it remained essentially constant in the other CAT (Investments: 4.181 mil D) where, however, it had been high throughout the period. Yet CAT received 2½ times the investments that CPB did. It took 9,635 D to create an additional job.

By contrast, it took 5,183 D to create a job in the factory producing sanitary goods, and 6,522 D in the glass factory. Only in the industry producing faience tiles is the C/O ratio with 2.1 low, and it took only 3,000 D to create a job. At the same time, output per man in the production of cement

TABLEAU - TABLE 12

MCVV - Building Materials, Ceramics, Glass

Investissements 1960-1970, Valeur Ajoutée 1961, 1971, Prix Constants, Emploi 1961, 1971
 Investments 1960-1970, Value Added 1961, 1971, Constant Prices, Employment 1961, 1971

	Investissements		Valeur Ajoutée - Value Added				Emploi - Employment			
	Investments		1961		1971		1961		1971	
	MD	%	MD	%	MD	%	No.	%	No.	%
Ciment, Chaux - Cement, Lime ²	5.8	32.4	.732	38.7	1.602	27.1	928	33.2	1530	27.2
Carreaux de Mosaïques - Mosaic Tiles	.3	1.6	.252	13.3	.486	8.2	506	18.1	575	10.2
Autres Ouvrages en Ciment - Other Cement Products	.7	3.9	.419	22.1	1.467	24.8	513	18.4	945	16.8
Céramique Rouge - Bricks	6.9	38.5	.321	17.0	1.253	21.2	664	23.8	1500	26.7
Carreaux de Faïence - Faïence Tiles	.6	3.4	-	-	.291	4.9	-	-	200	3.6
Articles Sanitaires - Sanitary Articles	1.7	9.5	-	-	.336	5.7	-	-	328	5.8
Verre - Glass	1.5	8.4	-	-	.299	5.1	-	-	230	4.1
Marbre - Marble	.4	2.2	.152	8.0	.132	2.2	156	5.6	261	4.6
TOTAL ¹	17.9	99.9	1.892	99.1	5.913	99.2	2791	99.1	5617	99.0

Notes: ¹Plâtrières Tunisiennes aussi ont investi la somme négligeable de 3000 D. Ils ont employé 30 et 48 employés en 1961 et 1971, et produit 16 000 D et 47 000 D.

Platrières Tunisian invested a negligible 3000 D, employed 30 and 48 people respectively, and produced 16 000 D and 47 000 D in 1961 and 1971 respectively.

²Ciment et Chaux sont considérés comme produits joints.

Cement and Lime are treated jointly since CPB and CAT produce both. Neither investment nor employment can be allocated by product.

tiles in 1971 is much the highest of any branch, despite the relatively low investment.

Bricks are a special case. The marginal C/O ratio is with 7.4 very high, and it took 8,254 D to create an additional job. Although productivity increased by 73% over the years, output per man remains despite the heavy investments below all but two products. In faience tiles, productivity though higher in 1971 than in 1967 when the industry started producing, was nevertheless a fourth below the level already reached in 1968 and 1969; and productivity in sanitary goods declined from 1967 to 1970 by 46% to recover in 1971 to 72% of the 1967 level. The fluctuation in productivity of the new industries is sharp and may well be due to the difficulties of learning a new operation.

(iii) Mechanical and Electrical Industries

Industrialization is frequently associated with the development of an iron and steel industry and of associated metal working industries. In Tunisia special efforts were made in this direction, with the iron and steel industry El Fouladh being the center piece of that effort.

Overall developments

Value added in constant prices of 1966 rose by 1971 to 442% of 1961, a rise that was briefly interrupted in 1968. Employment rose to 498% of the 1961 level during the same time span. Productivity, defined as value added per worker, fell to 60% of the 1961 level in 1966 but after 1968 it recovered and by 1971 it had recovered to 89% of the 1961 level. Much of the total rise in output was contributed by the steel complex.

Total investment in constant prices was 42.0 MD, 27.1% of investment in manufacturing. Three public firms--El Fouladh (Steel), STIA (Car Assembly) and AMS (Hardware) can be estimated to have received 36.8 MD of that sum. Thus, 88% of total investments measured in constant prices went to those three firms, the first two of which established new industries. Until 1966, private investment was very small. Only in 1967 was it about 30% of the total and in 1969 even 60%. The rise of private investments from 1968 on reflects a policy change and will show up in future output.

The industrial structure has become more complicated. In 1961 the statistics distinguish thirteen industries; in 1971 there are 21 industry groupings. True, many consist only of one or a few enterprises. Nevertheless, the industrial structure has broadened. Omitting steel whose growth rate becomes astronomical because of the small base in 1965, the fastest growing industries are radio and television assembly (since 1963) car assembly, razor blades (since 1964) iron products other than iron pipes, and lead products. Two of these industries were started during the period under investigation; the others are old industries. It is, however, not possible to generalize the picture. Some fast growing industries are new but some are old established. And some new industries, e.g. piston motors, iron and steel have grown less than the average since 1966.

Problem Areas

This bright picture is marred by a number of flaws. The basic problem is an inadequate growth of productivity defined as value added in constant

prices per worker per year. In some industries not only the growth but also the level of productivity is unsatisfactory.

Taking 1971 as our reference year, the highest level of value added per worker has been achieved in the manufacture of lead products, followed by razor blades, spark plugs and batteries, etc. All of these industries produce more than 1000 D per worker. The industries which in 1971 produced more than 1000 D per worker also included car assembly, radio and TV assembly, iron pipes, piston motors. Since the average for the sector as a whole is 868 D all other industries except electric motors fall below it; some like agricultural implements and foundry products, very much below it. The industries whose productivity is above the average account for 43% of value added and 27% of employment.

More disturbing than the differences in output per man of the different industries which must after all be expected, are the different growth rates of productivity. We draw attention to two aspects of the problem: the level of productivity in 1971 compared to 1961; and the movement over time.

Productivity in the following industries was significant, i.e. by more than 10-15% higher in 1971 than in 1961: steel compared to 1966, radio and TV assembly since 1963, agricultural implements, grill work, razor blades (since 1964), nails and screws, piston motors, electric motors (1967), and lead products. Each of these industries presents its special aspects which we discuss in greater detail below. These industries accounted for 29% of value added and 29% of employment in 1971. Only three of them produced more than 1000 D of value added per worker and those do not include the most capital-intensive industries. *All except steel are small industries*; none except steel received substantial investments.

On the other hand, in the following industries productivity was significantly lower in 1971 than in 1961 (or the appropriate date of comparison); vehicle assembly, lead smelting, foundry products, iron pipes, metal containers, iron products other than pipes, cables and wires, ship building. These industries accounted for 52% of value added and employed 54% of the people. *All but one* of these industries are *fairly large* in the sense of employing more than 400 persons, and two of them have received substantial investments. The remaining industries showed small changes in output per man.

Productivity of the sector as a whole was in 1971 about 12% below 1961, despite the massive investments that have been undertaken during the decade. It had fallen by 1966 to about 60% of 1961. All of the decline occurred after 1963, when the massive industrialization effort started. After 1966 there is again an increase but between 1967 and 1971 productivity has remained essentially unchanged. Some of these fluctuations can probably be attributed to the difficulties of starting a new industry. But many industries show the average pattern for the sector. This is true both for those industries that do better in 1971 than in 1961 and those that do worse and even for those that show no trend over the decade: productivity in scaffolding declines to 1964 then bounces back; grill work declines to 1966, then moves back rapidly; nails and screws fluctuate around a constant level to 1967, then increase. Spark plugs, etc., which do well to 1964 have two bad years in 1965 and 1966 then bounce back to the old level. Only aluminum products do not fit this pattern of deterioration in the mid-sixties and later improvements; its productivity

increases to 1967 and then declines to the level of 1961. The significant difference in output per man between public and private enterprises within the same industry have already been discussed in Section IV.

The public sector has invested between 1960 and 1969 33.9 MD in current prices. The private sector is estimated to have invested during the same period 3.347 MD respectively. Employment in the publicly owned and mixed enterprises in 1971 was 4,705 persons, an increase of 4,365; in the privately owned enterprises 3,275, an increase of 2,034. This means on a rough calculation and allowing for a two-year lag between investment and employment that total investments per job created in the public sector was 7766 D compared to 1646 D in the private sector. It has certainly taken in the public sector a multiple of what it took in the private sector to create one additional permanent job. For the three major public enterprises in this sector which received the major investments we can present the three basic measures on which our analysis rests: the C/O, C/L and O/L ratios.

TABLE 13

Capital Output, Capital Labor and Output-Labor Ratios:
El Fouladh (Steel), STIA (Car Assembly) and AMS (Hardware), 1971

	<u>Current Prices</u>		<u>Constant Prices</u>
	<u>C/O</u>	<u>C/L</u> <u>D</u>	<u>O/L</u> <u>D</u>
El Fouladh	26.7	18,844	705
STIA	2.5	3,560	1,406
AMS	13.1	3,991	304

Because of the central importance of this sector, we turn now to more detailed analysis by industry.

The Individual Industries

For purposes of the more detailed analysis we group the twenty-one⁴⁷ subsectors into seven, each of which appears to have a common set of problems:

1. The steel mill
2. Assembly industries:
 - Vehicle assembly
 - Radio, television, household machines
 - Heating apparatus
 - (Railway cars)
 - Electric and piston motors
3. Lead smelting
4. Foundry products
5. Scaffolding
6. Producing sectors proper:
 - Metal containers
 - Agricultural implements
 - Shutters and grills

- . Razor blades
- Nails and screws
- Electrodes, sparkplugs and batteries
- Iron pipes
- Other goods made of iron, lead and aluminum
- Wire and cables
- 7. Ship building

(a) The Iron and Steel Complex

The steel mill is a government owned plant which produces pig iron, steel, rods for reinforced concrete (*rods de beton*) and wire. By 1969 it had reached a production of 130,700 tons of pig iron, 102,400 tons of steel and 87,100 tons of rods. All figures were substantially lower in 1971, but pig iron production was still 95,000 tons, steel production 851,000 and rods 70,000 tons. In 1972 there has been a substantial improvement. Value added was positive in all years. However, it did not meet the wage bill in four of the seven years 1965 to 1972.

Engineers remain enthusiastic about the mill; economists are more reticent on the benefits to be derived. It must be expected that running-in problems take longer than in an industrialized country. The engineers say that, as far as the basic steel and rolling mill are concerned, these troubles are over. The wire drawing mill, started in 1969, has still to overcome them. The mill's output is much higher than its rated capacity and it is expected to go higher still. The equipment is now used and maintained well from an engineering standpoint.

We note two economic questions:

- (a) Is the mill subsidized indirectly by being allowed to charge higher than world market prices for its output and paying less than world market prices for its inputs?
- (b) Is the mill socially profitable, or can it be made so?

Price Distortion

Blake has found a very substantial level of effective protection, both nominal and real, as we have already mentioned in Section IV. Blake's calculations are based on a world market price derived by adding to the Tunisian f.o.b. export price of the major product twice the freight charges from Tunis to Algiers and Italy. (In 1972, 21,413 t of various iron and steel products were exported to Italy, but 23,722 t to the USA, and 12,983 t to the UK.) We have also pointed out that the rising steel price must have reduced the level of effective production. Even so, there is no question that there has been substantial price distortion.

However, even if there were no price distortion on the Tunisian market in the sense that Tunisia could produce steel at the price at which it would have to import it, the economic argument for the steel mill would really require that the whole output could be sold domestically at the landed price. In fact, about half the output has to be exported at present at a price which is substantially below the landed price. As long as this is the case, we have exchanged the problem of price discrimination (dumping) for that of price distortion, and the economic value of the mill remains questionable if total output can be sold only at the expense of substantial export subsidies-- which seems to be the case.

output can be sold only at the expense of substantial export subsidies--which seems to be the case.

The Cost of the Mill and its Social Profitability

The total investment in the mill is high. We have already presented the figures on cost per job created and on the capital-output ratio. We only add that if the high costs are to be defended on social grounds that no alternative employment opportunities existed in the region (an argument we have used in the context of mining investments) or on educational grounds that the steel mill will teach new skills, further quantification of the cost and of the alternative ways of achieving these ends would have to be undertaken. This we have not done. We do not automatically rule out any of the reasons. The final assessment will also depend on whether the mill can be made internationally competitive if the investment, that has after all been irrevocably made, has been repaid and written down to a reasonable level and if it can be maintained at that level by the internal resources of the firm.

It may be worthwhile to expand briefly upon the last point. There are really three distinct questions. The first is whether the mill should have been established in the first place. The answer is probably "no", until either the domestic market has grown to sufficient size to absorb most of the output of the mill or unless a mill of viable size would have been internationally competitive so that it could export most of its output without subsidies. The second question is: Given the fact that the mill exists, is it better to operate it or to shut it down? The answer is "operate" if the mill pays at least for its operating cost, i.e. wages and salaries and all purchased inputs. This the mill appears now able to do, though it was not always so.

The third question may be formulated as follows: Suppose the mill were privately owned and could not rely on budgetary subsidies. In this case, it would be forced through bankruptcy proceedings, its capital would be written down perhaps even to zero, but it would continue to operate as long as it paid its variable costs. Suppose now that, being government owned, the government pays back all debts of the mill and accepts the total equity. Could the mill then pay for itself at internationally competitive prices in the sense that it could pay all variable cost, sufficient depreciation to maintain the economic life of the mill indefinitely, and pay the government, say, 9% on its equity (i.e. the interest rate the government charges), without, however, repaying the government equity?

In 1972, the mill earned a gross value added at factor prices which was about 822,000 D bigger than the wage bill. Total investments in current prices between 1960 and 1970 were 30.301 MD. The return in 1972 was, therefore, 2.7%, *before* an allowance for depreciation. Assuming a useful life of 50 years, we would have to allow 2% for depreciation for a net return of 0.7%. Capitalized at 9%, this amounts to a written down value of the mill of 9.1 MD.

It is clear, therefore, that the economic viability of the mill will depend economically on how fast the domestic market can be expanded at internationally competitive prices. In 1970 exports of steel products were 4.485 MD, domestic sales 3.151 MD, even though the domestic price before indirect taxes was much higher than the export price. Suppose all sales had been in 1972 domestic, and valued at, say, 14 MD, instead of the 11.3 MD which they actually were at factor cost. Suppose we deduct 10% for the price distortion and

assume no change in the value of purchased inputs. This would give us sales of 12.6 MD. Deducting the 8.7 MD for inputs, we would arrive at a gross value added of 3.9 MD, or about 2.3 MD above wage payments. Allowing 0.6 MD for depreciation (2% of 30.0 MD total investments) would leave a gross return of 1.7 MD on capital, or 5.6%. At 9% this would give a suitably written down value of the steel mill of about 18.9 MD. The calculations are, of course, only illustrative to indicate what would be involved to make the mill economically viable. The conditions are stringent but not impossible.

Only if international price rises eliminated the high rates of effective protection and the mill could sell 14 MD at international prices, while input prices did not rise, would the gross returns above wage payments rise to 3.7 MD, or about 3 MD after an allowance for depreciation, giving a return of 10% and requiring no write down of the investments.

If calculations show, and developments prove, that the mill can sell all or most of its output domestically at internationally competitive prices, replace and maintain the equipment and earn a reasonable return on a suitably written down value of the equipment, it will have justified itself. Otherwise it will continue to be a drain⁴⁰ on the economy which general and usually unquantified social and educational benefits would have great difficulty to convert into net benefits.

Productivity

Considering the capital intensity of the steel mill, output per man is very low. This is, of course, already evident in the fact that only recently has the mill been able to contribute to maintenance and amortization.

(b) The Assembly Industries

Car assembly is a small plant, government owned with private participation which assembles a wide variety of passenger cars, trucks, buses, in very small numbers. Total numbers assembled of all types reached 870 in 1971. The high value added per worker despite the fact that only two vehicles were assembled per man-year is explained by the elevated price of the vehicles. During the years 1965 through 1969, International Harvester assembled tractors. A combination of difficulties with spare parts and competition from imports resulted in the cessation of tractor assembly by 1970.

Radio and TV assembly is undertaken by one public and one private enterprise. The firms also assemble small household appliances. Employment in the industry had risen by 1971 to 258. The industry has been producing profitably and with substantially increased productivity. In 1970 and 1971, the value added per worker was substantially higher than in steel. As with vehicle assembly, the domestic price is higher than the import price (we refer to Blake's chapter).

Heating apparatus is produced by a publicly owned plant which started operating in 1966. The industry is small, employing even in 1971 only 77 people, and its value added is substantially less than 100,000 D.

Electrical and piston motors are assembled by two small plants, the first publicly, the second privately owned. Electric motor assembly started

in 1967. Output per man in 1971 was 62% above 1969. Output of piston motors since 1965, when operations started, has fluctuated widely, almost disappearing in 1969. On the other hand, output per man, which fluctuated as widely as production, was by 1971 $5\frac{1}{2}$ times that of 1965.

Lead smelting is undertaken in an older plant with government participation. The smelter employed in 1971 429 people. By 1971, value added per employee had fallen to 79% of the 1961 level. Since we deal here with a homogeneous product, it is permissible to compare value added with the tonnage per man produced. In no year did tonnage per employee reach the 1961 level, but in 1971 it was only 10% below the 1961 level. The fluctuations in output are, of course, determined by the supply of lead ore, and indeed a fairly close parallelism can be observed between lead ore production and tons of lead smelted. But value added per worker does *not* fluctuate significantly with the level of production. Being a mixed public-private enterprise, we believe that social and production considerations are mixed in deciding on the level of employment.

Castings are produced by five enterprises, three of them minute. A public enterprise, SOFOMEGA, employed in 1971 60% of the workers in the industry, and produced 46% of the value added. The big private firm, *Industries Réunies*, employed 36% of the workers and produced 49% of the value added. By 1971, value added per worker in this branch was only 57% of 1961. We have already presented the calculation for value added per employee in constant prices for the private and the public enterprises in each for six selected years for which the detailed data could be located (Table 7). Output per man is substantially less in the public than in the private enterprises. The slight overall improvement in both public and private enterprises over the years is not very significant.

Scaffolding (*Charpente et Chaudronnerie*) is entirely privately produced. Five firms produce an estimated 90% of total value added which fluctuates between 500 and 850 people. It is a substantial industry. Between 1961 and 1971 output per man has changed little.

(c) Manufacturing Industries Proper

Iron pipes have been produced since 1968 by a small private enterprise employing less than 100 people. Output per man was in 1971 only 90% of what it was in 1968, mainly because of a rapid rise in employment. The decline may be to some extent purely statistical because output figures refer to the year as a whole, while employment figures refer to the end of the year.

Metal containers. Three firms produce cans, drums for olive oil, and bottle tops, respectively. The factory producing cans dominates the industry. It accounts for over 80% of value added and employment of the industry. Value added in the industry rose steadily to 1964, fell to 68% of that output in 1968, but in 1971 was above 1961. Employment, however, rose continuously throughout the period and was in 1971 more than twice the 1961 level. As a result of these movements, value added remained more or less at the 1961 level until 1964, fell to about two-thirds of the 1961 level in 1968, and has since remained just about 20% below the 1961 level.

The production of agricultural implements is a small operation employing

37 people in 1971 in three firms. Output per man has since 1961 more than doubled, but remains the second lowest in the sector. Stores, shutters, grills, etc. are made by four private firms, employing in 1971 62 persons. Value added per man fell drastically to 1966, but has since risen to 168% of 1961. It still remains among the lowest in the industry. The production of razor blades was started in 1964. Employment in 1971 had risen to 58 persons from 20 in 1964. Output per man was in 1971 substantially above the 1964 level. There are two private firms producing nails and screws, employing by 1971 47 people. Output per man rose slightly to 1966 and faster since. Three private firms produce sparkplugs, electrodes and batteries. One was started only in 1965. Productivity declined substantially to 1966, and has since increased. But even in 1971 it was below 1961, and much below 1962 and 1963. Though value added per man is with 1,558 D among the highest in the industry, this fact loses much significance since the industries are protected by total prohibition of imports. As in the case of vehicle assembly, there is considerable price distortion (see Blake on price distortion). Two private firms produce aluminum goods. By 1970 they employed 337 people, compared to 150 in 1962. Total output increased 2½ times to 1971. Employment on the other hand continued to rise. Hence, productivity remained more or less constant and in 1971 was about 6% below 1961.

"Steel iron articles" present an instructive case. One private firm has been producing since 1961. In 1966, a publicly owned firm, AMS in Sousse, started producing after several years of excruciatingly slow construction. In 1967 a third plant, privately owned, entered the field. Employment in 1961 was 100 persons. In 1971 the industry employed 733 people, 572 in the AMS, whose gross value added recalculated on the basis of the balance sheets was in 1966 negative and in 1967, 1968, 1969 and 1971 substantially below wage payments.

For the first half of the sixties, when a single private enterprise produced about 30,000 D worth of articles, the data are not too meaningful. However, it is, however, certain that the private firm has a substantial productivity of between 560 and 1,300 D per man, while the public firm in 1971 was seen in producing only 304 D of value added per employee while in 1969 it was 200 D per man! (see tables 7 and 8.) The government invested in AMS between 1966 and 1971, 2.3 MD, almost all before 1966. Since Sousse is a tourism, tourist area and, unlike the mining areas, has alternative employment (and development) possibilities, it is difficult to justify this investment on social grounds.

Inspection of the balance sheet suggests another problem which might have been mentioned in Section 11. In all but one year stocks of finished products increased. In the first three years production for inventory was equal or greater than sales. This suggests a problem of unsaleable production which should be dealt with by an inventory adjustment in the national accounts. A similar problem is said to exist also with SOGITEX. We know of no national accounts of an underdeveloped country (or for that matter of a Soviet type economy) in which such inventory adjustments are made. In the case of AMS, it would reduce value added further, and might make it even negative in several years.

A small private firm employing less than 50 people produces lead pipes and other articles made of lead. By 1971 productivity has grown to more than eight times the level of 1961, and the value added per worker is the highest in the industry. In 1961 one, and since 1966 three private firms make wires,

electric and telephone cables. They employed 329 people in 1966, 408 people in 1971. Value added per worker in 1971 is satisfactorily high though it remained essentially constant since 1966.

The producing subsector can be summarized as follows: Productivity in the production of agricultural implements, shutters and grill work, blades, nails and screws, lead products, wires, etc. all developed well. All are private. Other iron products produced by private firms also developed satisfactorily. The public firm, AMS, can only be described as a catastrophe, which is hardly news to anyone. On the other hand, productivity in agricultural implements, aluminum products, iron pipes and metal containers all of which are also private, remained more or less constant and may even have declined slightly.

Ship building. Until 1964, a private firm employed less than a hundred people, and produced about 1,000 D of value added per employee. In 1964 a public enterprise was started which employed between 700 and 1000 people with a value added per employee of about 200-300 Dinars. The data suggest that private productivity was four to five times as high as public productivity.

The public shipyard was taken over from the old French naval base. The low productivity may be partly due to the fact that part of the labor force is used to produce minute amounts of forgery products and other mechanical goods with obsolete equipment left when the base was evacuated. Between 1964 and 1970 only 312,000 D were invested. At present, the yard is producing increasing numbers of fishing boats, and given some modernization of equipment, there is some reason to expect that productivity will increase.

By way of summary we present Table 14 ordering assembly, producing and other industries by value added per employee, and showing the percentage change between 1971 and 1961 or the appropriate starting date, shown in brackets.

(iv) Chemical Industries

Overall Developments

Though the chemical sector has grown vigorously and is one of the most important modern parts of the economy, its industrial structure has not changed as dramatically as that of the mechanical and electrical industries. Only three new industries have been established since 1961, one of them very small, and none of them approach the importance of the phosphate fertilizer industry which continues to be the mainstay of the sector. The most important change has taken place within the fertilizer industry: super-triple phosphates account now for over 90% of the value added of the fertilizer sector compared to three-fourths in 1962 and less than half in 1961. Fertilizers still account for three-fifths of value added of chemicals in 1971, and for almost half of employment.

The chemical industries other than fertilizers and soaps have nevertheless grown most vigorously since 1961. Their value added has increased more than 3½ fold, though their share in the total has remained essentially constant. Soap manufacturing has grown about a third to 1970 so that its relative importance has decreased by at least a half.

The fastest growing industry outside the fertilizer industry has been

TABLEAU - TABLE 14

Industries Mécaniques et Electriques - Mechanical and Electrical Industries

Valeur Ajoutée par Emploi, Prix Constants, 1971 -
Value Added per Man, Constant Prices, 1971

A. Industries Montage - Assembly Industries			
	VA/E 1971 D	Taux de Croissance %	
1. Montage - Radio, TV Assembly	1465	+ 25.5	(1963)
2. Montage Auto - Car Assembly	1406	- 4.7	(1963)
3. Moteurs à piston - Piston Motors	1344	+ 33.0	(1965)
4. Moteurs Electriques - Electric Motors	981	+ 9.4	(1967)
5. App. de Chauffage - Heating Apparatus	870	- 5.8	(1966)
B. Industries Fabric. - Producing Industries			
1. Matriçages en Plomb - Lead Products	2872	+ 19.9	
2. Lames - Razor Blades	1603	+ 22.0	(1964)
3. Bougies, Batteries - Spark Plugs, batt.	1558	- 0.5	
4. Emballages Métalliques - Metal Cont. in	1381	- 1.7	
5. Fil, Câbles Elect. Téléph. - Wires, Cables	136	- 1.0	(1962)
6. Tubes en Fer - Iron Pipes	809	- 3.2	(1968)
7. Stores, Grillages - Stores, Shutters	790	+ 13.0	
8. Ouvrages en Alum. - Aluminum Products	780	- 0.5	
9. Clouteries, Visseries - Nails, Screws	702	+ 5.5	
10. Autres Art. En Fer - Other Iron Prod.	563	- 2.2	
11. Outils Agricoles - Agric. implements	514	+ 8.3	
C. Autres - Others			
1. Plomb Métal - Lead Smelting	734	- 1.8	
2. Sidérurgie - Iron and Steel	705	+ 25.0	(1966)
3. Construction Navale - Ship Building	444	- 5.0	

detergents, followed by tires (since 1967). But the growth of the chemical industries was overwhelmingly due to the more than tenfold increase in the value added of the super-triple phosphate output, a product that is almost entirely exported and that is produced by two efficient enterprises, the one an old established public one, the other a new private one.

Investments, Output, Productivity

The developments and structural changes have been the result of an investment policy which is summarized on Tables 15 and 16. The chemical industries received an estimated 12.3 MD of investments in constant prices, 7.9% of the total investment in manufacturing industries. Half of the total went into existing fertilizer production, overwhelmingly into the extension of super-triple capacity. Another 30% went into the establishment of ICM which by 1971 had not yet started to produce. The only other important investment, 9.2% of the total went to the establishment of a tire factory.

Developments in this industry have been throughout favorable. The C/O ratio for the sector as a whole is only 2.0. It is, of course, dominated by fertilizer investments. For SIAPL, we can estimate a marginal C/O ratio of only 1.6. For MPK the marginal and total C/O ratios are the same with 3.0. It has taken 5,606 D to create an additional job in the industry. At the same time, productivity has risen by 75% and is with 1,508 D in 1971 much the highest of any branch of the manufacturing industries, and is in fact topped only by the energy sector.

That the large investments in fertilizers were effective is shown by the fact that output per man in SIAPL, the major recipient of public investments, rose more than 6¹ times, and was higher than in MPK. This excellent showing has been arrived at, it will be recalled, by deflating value added in current prices by an index of import prices. If output had been deflated by the export prices of fertilizer, it would have risen almost ninefold. The other industries that increased productivity were detergents, linseed oil, tires (since 1966) and paste. On the other hand, productivity in pharmaceuticals has been essentially constant, despite a new factory.

Public and Private Performance

Because not sufficient detail is available before 1968, we must remain satisfied with a general public-private sector analysis (except in the case of fertilizers). Between 1960 and 1970, total public investments outside ICM were 4.660 MD: total private investments were 4.786 MD, both figures in current prices. There were 816 more jobs in the public sector in 1971 compared to 1961, and 1519 more jobs in the private sector. It took thus 5,711 D to create an additional job in the public sector, 3,151 D in the private sector.

There was a change in governmental policy towards the private sector. This change is shown by the fact that except for MPK most private investments occurred after 1968. Because almost the whole fertilizer industry is public --and apparently efficiently so--output and employment in the chemical industry remain heavily influenced by the public sector.

Employment in the private sector which in 1961 was 87% of employment in the public sector, had by 1971 grown to be somewhat bigger without employment in the not yet producing ICM. Thus on the whole, from the standpoint of

TABLEAU - TABLE 15

Industries Chimiques - Chemical Industries

Investissements 1960-1970, Valeur Ajoutée 1961, 1971, Prix Constant, Emploi 1961, 1971
 Investments 1960-1970, Value Added 1961, 1971, Constant Prices, Employment 1961, 1971

	Investissements		Valeur Ajoutée - Value Added				Emploi - Employment			
	Investments		1961		1971		1961		1971	
	MD	%	MD	%	MD	%	No.	%	No.	%
Engrais Publiques - Fertilizers	3.267	26.6	.801	44.5	3.500	57.1	1036	49.7	1155	27.0
Engrais Privés - Fertilizers	(2.980)	24.2					-		492	11.5
Souffre Raffiné - Refined Sulfur	.157	1.3	.036	2.0	0.049	0.8	30	1.4	21	.5
Produits Pharmaceutiques - Pharmaceuticals	.857	7.0	0		0.428	7.0	-		706	16.5
Explosifs - Explosives	.089	0.7	.253	14.0	.237	3.9	174	8.3	206	4.8
Pneumatiques - Tires	(1.130)	9.2	0		.498	8.1	-		181	4.2
ICM	3.626	29.5					-		217	5.1
Autres Privés - Other Private	(.200)	1.6	.711	39.5	1.415	23.1	846	40.6	1302	30.4
TOTAL	12.308	(100.1)	1.801	100.0	6.127	100.0	2086	100.0	4280	100.0
Total excluding ICM	8.680									

Note: Total may not add to 100% because of rounding.

TABLEAU - TABLE 16

Industries Chimiques - Chemical Industries
C/O, C/L and O/L Ratios

C/O: Investissements, Prix Constants, 1960-1970: Accroissement de Valeur Ajoutée 1971-1961
Investments, 1960-1970, Constant Prices, Increase in Value Added 1971-1961

C/L: Investissements 1960-1970: Accroissement de l'Emploi 1971-1961, en Dinars
Investments 1960-1970: Increase in Employment 1961-1971, in Dinars

O/L: Valeur Ajoutée par Emploi - Value Added per Employee

	C/O	C/L	O/L	
			1961	1971
Engrais - Fertilizers ^(a)	2.1	9432	773	2125
SIAPE	1.6	35550	582	3332
NPK	3.0	5762	-	1933
Souffre Raffiné - Refined Sulfur	12.1	(b)	1200	2333
Produits Pharmaceutiques - Pharmaceuticals	2.0	1214	-	606
Explosifs - Explosives	(c)	432	1454	1167
Pneumatiques - Tires	2.3	6243	-	2751
Autres Privés - Other Private	<u>0.3</u>	<u>154</u>	<u>-</u>	<u>-</u>
TOTAL	2.0	5606	870	1612

Notes: (a) Exclusive of ICM - Sans ICM

(b) Employment in Refined Sulfur declined between 1961 and 1971

(c) Output in 1971 was smaller than in 1961

employment creation, the private sector has performed better than the public sector. On the other hand, value added in the public sector was in all years except 1970 higher than in the private sector.

In interpreting the figures, a word of caution must be added. Government investment has gone heavily into the fertilizer sector which is subject to international competition. Except for NPK, private investment has been stimulated essentially in industries producing for the domestic market, perhaps with occasional exports. (See Blake on effective protection.) In the one case in which we could make a direct comparison in value added per man in the private and the public sector, that comparison favored the public sector. Only in the manufacture of explosives do there exist side-by-side public and private production, and there too, comparison of the last two years favors the public sector (see Tables 17a-17c).

Total employment in the chemical industries has about doubled between 1961 and 1971. While the growth of employment has been fairly steady over the years, total value added and hence value added per man shows a cycle to 1966 and another growth to 1971. Most industries show a substantial improvement in productivity over the years.

(v) Textiles, Leather and Shoes

Preliminary Comments

This sector consists of two disparate subsectors. On the one hand, the statistics consider only the industrial production of textiles, leather and shoes. On the other hand, carpet production is entirely artisan-produced and sold to a considerable extent through the Office Nationale de l'Artisanat (ONA) which also supervises the quality. Employment for the industrial production of textiles is directly estimated. On the other hand, employment figures for carpets are based on a single enquiry which found in 1968 that the value added per person in carpet weaving was 130 D. This figure has been applied to the value added independently estimated, and the result rounded off to the nearest hundred.

The single dominant enterprise in the industrial sector is SOGITEX, a government owned firm with several plants, created out of a number of different enterprises and producing primarily thread and clothes. No separate figures exist for the value added for spinning, weaving, clothing and hosiery produced by SOGITEX. However, employment figures which are separately available for spinning, weaving, and clothing, suggest that less than 10% of employment was in 1970 producing clothing. The dominant output, probably more than 90%, of SOGITEX is spinning and weaving. The value added figures are derived as far as possible from balance sheets, and both they and the employment figures are firm.

The other textile categories are essentially private, producing all kinds of products in numerous small and middle-sized firms. For most of these firms output and employment data are known. The total has been estimated and rounded off. Both employment and value added data are somewhat less firm than those of SOGITEX, but nevertheless are substantially reliable. For leather and shoes, there is a government tannery. The rest of the sector is private. Employment figures are firm. Investment in the industry in current prices between 1960 and 1971 is estimated at 31.4 MD, in constant prices at 32.1 MD.

TABLEAU - TABLE 17a

Industries Chimiques - Chemical Industries

Valeur Ajoutée dans le Secteur Publique et Privée, 1961, 1962, 1970, 1971
 Value Added Originating in the Public and Private Sector, 1961, 1962, 1970, 1971

	(1.000 D)							
	Publique - Public				Privé - Private			
	1961	1962	1970	1971	1961	1962	1970	1971
Engrais - Fertilizers	801	1640	1916	2549	0	0	695	951
Souffre Raffiné - Refined Sulfur	36	18	56	49				
Savons - Soaps					404	418	542	400
Détergents - Detergents					51	109	320	380
Peinture, Vernis - Paints, Varnishes					180	208	480	382
Huile de Lin - Linseed Oil					20	23	36	42
Colle - Paste					0	0	71	70
Produits Pharmaceutiques - Pharmaceuticals	0	0	401	428				
Explosifs - Explosives	87	97	163	96	167	162	217	140
Pneumatiques - Tires					0	0	481	499
Huiles Essentielles - Essential Oils					53	53	118	128
Insecticides					3	9	8	13
TOTAL	924	1755	2536	3122	877	992	2968	3005

TABLEAU - TABLE 17b

Industries Chimiques - Chemical Industries

L'Emploi dans le Secteur Publique et Privé - Employment in Public and Private Sector

	<u>Publique - Public</u>				<u>Privé - Private</u>			
	<u>1961</u>	<u>1962</u>	<u>1970</u>	<u>1971</u>	<u>1961</u>	<u>1962</u>	<u>1970</u>	<u>1971</u>
Engrais - Fertilizers ¹	1036	1127	1212	1155	0	0	452	492
Souffre Raffiné - Refined Sulfur	30	24	22	21				
Savons - Soaps					504	532	665	499
Peintures, Vernis - Paints, Varnishes					104	110	225	240
Détergents - Detergents					83	91	178	190
Huile de Lin - Linseed Oil					41	31	38	36
Colle - Paste					0	0	43	52
Produits Pharmaceutiques - Pharmaceuticals	0	0	602	706				
Explosifs - Explosives	62	68	91	79	106	103	132	127
Pneumatiques - Tires					0	0	166	181
Huiles Essentielles - Essential Oils					113	113	271	282
Insecticides					<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>
TOTAL	1128	1219	1927	1961	954	983	2173	2102

Note: ¹Sans ICM - Excluding ICM, which employed 217 people, but did not yet produce.

TABLEAU - TABLE 17c

Industries Chimiques - Chemical Industries
 Valeur Ajcutée par Emploi - Value Added per Man

	<u>Publique - Public</u>				<u>Privé - Private</u>			
	<u>1961</u>	<u>1962</u>	<u>1970</u>	<u>1971</u>	<u>1961</u>	<u>1962</u>	<u>1970</u>	<u>1971</u>
Engrais - Fertilizers ¹	773	1455	1581	2207	0	0	1538	1933
Souffre Raffiné - Refined Sulfur	1200	750	2545	2333				
Savons- Soaps					802	786	815	802
Détergents - Detergents					2168	2286	2697	2011
Peintures, Vernis - Paints, Varnishes					1731	1891	2133	1592
Huile de Lin - Linseed Oil					488	742	947	1167
Colle - Paste					0	0	1651	1346
Produits Pharmaceutiques - Pharmaceuticals	0	0	666	607				
Explosifs - Explosives	1403	1426	1791	1215	1575	1573	1644	1102
Pneumatiques - Tires					0	0	2898	2757
Huiles Essentielles - Essential Oils					469	469	435	454
Insecticides					<u>1000</u>	<u>3000</u>	<u>2667</u>	<u>4333</u>
TOTAL	819	1440	1316	1592	919	1009	1366	1430

Note: ¹Sans ICM - Exclusive of ICM

Industrial Production of Textiles

Value added of industrial textile production has increased tenfold between 1961 and 1971. Employment increased about $6\frac{1}{2}$ fold by 1971, but value added per employee moved erratically and was in 1971 62% above 1961. Only mining and the food industries among the manufacturing industries employed more people than textiles. SOGITEX which in 1961 produced less than 6% of value added and employed 8.2% of the people, in 1971 accounted for 45.4% of value added and 35% of employment. These figures imply that value added per person was higher in SOGITEX than in the private sector.

Since clothing and hosiery are of minor importance for SOGITEX, a more meaningful comparison is between SOGITEX and other spinning and weaving (*filature et tissage*). In 1961, output of SOGITEX was about half of that of the private subsector, and value added per person about the same: 250 D. In 1971 the private firms produced half the value added of the public sector, and their value added per man was about 80% of that of the public firm.

Total SOGITEX investment between 1960 and 1970 was 19.817 MD in current prices. This is about 4,763 D per additional job created between 1961 and 1971. There are substantial uncertainties about the amount of private investments in textiles. Unfortunately, we can separate investment in leather and shoes only for 1970. But even if we attribute arbitrarily all private investments during the decade to textiles, except the 652,000 D known to have been invested in Bata in 1970, we get a total investment of only 6.653 MD, which is certainly too high. These investments between 1961 and 1970 may be considered to have created 6,281 additional jobs. This means that at most about 1,059 D were needed to create an additional job. Thus the public sector required about $4\frac{1}{2}$ times the investment needed to create an additional job in the private sector.

Private investments in textiles increased substantially in 1969 and 1970. In 1970 they were, for the first time since 1961, bigger than public investments, reflecting the change in government policy. Their production is destined for exports.

Leather and shoes increased their output $2\frac{1}{2}$ times between 1961 and 1970, employment went up 90%. Productivity, therefore, increased substantially.

Rugs and Carpets

Rugs and carpets undoubtedly employ more people than the industrial production of textiles. But the relative employment has changed very much towards industrial production. In 1961 rug making is estimated to have employed 3.7 times as many persons as the industrial production of textiles; by 1971 only about 50% more. The data are too uncertain to allow further analysis. There has been substantial investment in this sector by the OVA: about 4.2 MD between 1960 and 1970. This large investment has undoubtedly contributed to the $2\frac{1}{2}$ fold expansion of rug sales between 1961 and 1971.

(vi) Furniture, Wood, Cork

Value added of the industry has risen fourfold. Value added per employee has on balance not changed very much over the years. It seems to have increased in 1970 and 1971. The individual branches of this industry have,

however, moved very differently. Value added of all industries has grown over the years. However, productivity of the wood furniture industry has moved erratically, with perhaps a slightly rising trend. It is in the other wood industries and the cork industry that productivity has risen substantially though with fluctuations which move with the ups and downs of output. The sharp increase in both value added and productivity is due to a new particle board plant which started producing in 1968. Total investment in the sector was relatively small: 2.3 MD in current prices.

Public investments in this industry are confined to SKANES, a wood furniture factory, and the Société Nationale de Liège, the cork industry. Total investment in SKANES between 1962 and 1970 was 362,000 D. Total investment in cork was between 1962 and 1970 297,000 D. Most investment was private: 1.6 MD between 1960 and 1970. For the industry as a whole, we can calculate a marginal capital-output ratio of 1.8, the lowest of any manufacturing industry. It took only 1,004 to create an additional job.

(vii) Paper and Printing

Total public investments of the industry between 1960 and 1970 were 14.395 MD in current prices, which may be estimated to be 16.6 MD in constant prices of 1966. The overwhelming part, 42.8% went to the pulp mill. The second public plant received 6.187 MD in current prices or 43.0%.

The structure of the industry has changed somewhat, but most of the change occurred already by 1964. The heavy investments have had a very minor impact on the structure of the industry. While printing accounts for about half the total output for most years it was back to 64% in 1971, compared to 68% in 1961. Paper pulp accounts for only 16% of the total output in 1971. The production of paper which was essentially private and received only minor investments, increased in importance during most of the decade but in 1971 was hardly more important than in 1961. The structure of the industry is shown in Table 18.

Value added per man in 1971 was hardly bigger than in 1961 despite the heavy investments. This was, however, mainly due to a negative value added in the production of printing paper in 1971 which may be temporary. The pulp mill produced in 1971 as much value added in constant prices as in 1965, but less than in any other later year except 1969. It is ironic that the product of the industry having received most of the investments should have the lowest output per man in 1971!

(viii) Miscellaneous Industries

The miscellaneous industries consist of a group of small private industries which, however, have grown more than eightfold since 1961. Output per man in the industry also has risen steadily to about 1.78 times the level of 1961, and compares with 1,186 D in 1970 and 1,254 D in 1971 very favorably with output per man in such capital intensive industries as steel, or paper pulp. About 78% of total value added are contributed by the production of plastic articles. The only other significant industry is the manufacture of bedding. The other products are extremely small.

Total investment before 1966 seems to have been negligible. Between

TABLEAU - TABLE 18

Structure de l'Industrie de Papier, Pâte à Papier et Imprimeries
Structure of the Paper and Printing Industry

Constant Prices of 1966 - Prix Constants 1966

	<u>Total VA</u>	<u>Total Papier</u>		<u>Pâte à Papier Pulp</u>		<u>Autres - Others</u>		<u>Imprimeries Printing</u>	
	000 D	000 D	%	000 D	%	000 D	%	000 D	%
1961	844	270	32	-	0	270	32	574	68
1962	1021	342	34	-	0	342	34	678	66
1963	1098	520	43	58	5	470	43	572	52
1964	1516	783	52	253	17	530	35	733	48
1965	1501	817	54	383	25	434	29	683	46
1966	1868	1033	55	554	30	479	25	835	45
1967	2130	1028	48	524	25	504	23	1103	52
1968	2519	1263	50	670	27	593	23	1256	50
1969	2262	847	37	171	8	676	29	1415	63
1970	3371	1556	46	629	19	927	27	1815	54
1971	2853	1017	36	470	16	567	20	1836	64

TABLEAU - TABLE 19

Papier, Pâte à Papier, Imprimeries - Paper, Pulp and Printing

	Investissements		Valeur Ajoutée - Value Added				Emploi - Employment			
	Investments		1961		1971		1961		1971	
	1960-1970		MD	%	MD	%	No.	%	No.	%
Pâte à Papier - Pulp	6.172 (a) 7.943 (b)		-	-	0.470	16.4	-	-	617	17.2
Autres Papier - Other Paper			.270	32.0	0.547	19.2	312	29.0	1050	29.3
Imprimeries - Printing	1.480 (a) 2.133 (b)		.574	68.0	1.836	64.4	763	71.0	1912	53.4
TOTAL			.844	100.0	2.853	100.0	1075	100.0	3579	99.9

	Coefficient de Capital Capital-Output	Capital/Emploi Capital-Labor D	Output/Labor 1961 Productivité D	Output/Labor 1971 Productivité D
Pâte à Papier - Pulp	13.1 (a) 16.9 (b)	10005 (a) 12874 (b)	-	761 (b)
Autres Papier - Other Paper			312	521
Imprimeries TOTAL - Printing			752	960
Publique - Public Imprim. Officielle			119	2023

Notes: (a) Prix Courants Publique Seulement - Current Prices Public Only
 (b) Prix Constants Publique Seulement - Constant Prices Public Only
 Detail may not add to 100% because of rounding.

1966 and 1970, the industry invested 1.393 MD in current prices employing 1,394 people. Thus investment per person is about 1,000 D, and it cost about 3,349 D to create an additional job between 1966 and 1971. Even if we were to assume that a total of 2 MD was invested over the eleven years 1960 through 1971, the marginal capital-output ratio would be only about 1.9. This industry has clearly contributed efficiently both to income and employment creation.

(5) Non-governmental Services

Non-governmental services are estimated to have contributed in 1971 255.2 MD to GDP, about 41% of GDP at factor cost including and 48.3% excluding governmental services. We will discuss in detail only Transport/Telecommunications and Tourism, because only in these two sectors has employment been estimated independently of value added. It is estimated that Transport and Telecommunications have received 13.5 MD worth of investments (in constant prices), Tourism 17.8 MD, and Trade and other Services 22.3 MD.

(i) Tourism

Tourism has been among the fastest growing industries in the country: it grew by 1456% between 1961 and 1971. Since value added is calculated as only the foreign exchange earnings of the industry, the value added is almost certainly understated. Employment is estimated by assuming a ratio of 2 persons per five beds provided. Employment is assumed to move parallel to the capacity of the total industry, rather than to output. On this basis, value added per man in 1971 is higher than in 1961, and has remained constant with severe fluctuations between 1962 and 1972. Not too much can be made of this figure. A slight improvement in output per man is consistent with the fact that the number of beds occupied has risen slightly faster than the number of beds provided.⁴⁹

The industry is estimated to have received investments of 80.5 MD in constant prices between 1960 and 1970, and 79.638 D in current prices. We can identify public investment between 1962 and 1970 of 22.150 MD in current prices, and 57.488 MD private investments between 1965 and 1970. Private investments before 1965 either did not exist or were very small. The marginal capital output ratio is thus about 3.3 when investment is measured in current prices, and slightly higher when it is measured in constant prices. We have been unable to estimate separately the value added attributable to privately and publicly owned hotels. It is known, however, that particularly the earlier publicly constructed hotels were rather lavishly built, presumably to break more easily into the international tourist market.

Since obviously very little capital stock existed in 1960, we may equate investment with capital stock. It took 7,408 D to create an additional job, and investment per person may be estimated at 7,030 D. The figure does not appear low, but it is known that some hotels were overbuilt. Because of the method of estimating employment not too much significance can be attached to it. Output per man is with an estimated 2,270 D in 1971 among the highest in Tunisia.

(ii) Transport and Telecommunications

The transport sector, which includes the Post Office and the oil pipeline (TRAPSA) is public except for the oil pipeline, whose investments are

included among the private investments, and for road transport, which is mixed and which is the largest single employer followed closely by the railway.

The Railway System

Value added of the railway system has increased substantially since 1961. In 1971 it was 31% above 1961. Even in the flood years 1969 and 1970 it was 11% above 1961 and the floods of 1964 and 1965 do not show in the statistics. Employment fluctuated but not with value added. Until 1966, value added per worker increased. In 1966 it was 41% above 1961. It then fell with the reduction in transport miles and the floods. In 1970 it was just below and in 1971 just at the 1961 level. Because of the undoubtedly very large portion of investments that must have gone into maintenance we refrain from calculating an estimated investment per worker. The marginal capital output ratio is about 8.1.

There are continuing complaints particularly from the mines that the railway is inadequate and that its efficiency must be improved. Total tonnage moved has, however, increased since 1961 and was 41% above the 1961 level in 1971. Except for 1962 and 1963 the increase in value added remained below the increase in tonnage handled.

Road Transport

In all countries, road transport (which includes taxis and urban transit) has increased faster than rail transport. In Tunisia the increase in value added was 120%. Employment increased by about 150%. As with rail transport the decline in the value added per man started in 1967. No measure of the quantity of road services is available. Value added per employee which in 1961 was about 4% below that of the railway had fallen to 30% below that of the railway in 1967, but in 1971 it was again only 16% below it. Both rail and road produce less than 1,000 D value per employee.

We have systematic and complete investment figures (in current prices) only for the public sector. The private investment figures are sporadic. The investment figures exclude, of course, expenditures on roads and bridges. Public investments have been undertaken by two major transport enterprises and twelve localized enterprises all over the country. The total public investment between 1960 and 1970 amounted to 16,221 MD, about 22% more than the investment by the railway system during the same period.

Airways

The airways expanded almost four times since 1961. Employment almost quintupled. While value per employee in 1971 is still 3,221 D, it is 21 1/2% below 1961 (in real terms) and only half the value added per employee reached in 1964. Personnel policy seems to have changed after 1964. With an employment of 1,003 people the airline employs as many people as, say, the production of "Other Iron Products", but with a multiple productivity. Total investments between 1960 and 1970 in current prices was 8,701 MD.

Since the creation and maintenance of the road system and the airports is financed directly by the budget, the investment figures given present only part of the total. We refrain, therefore, from making our usual calculation of capital-output and capital-labor ratios.

Ocean Transport

Value added per man in ocean transport has developed satisfactorily. It is in 1971 60% above 1961, even though employment itself has risen almost by 50% between these two years. The value added data for this sector are further broken down by sea transport, ports services, and handling (*accouage et manutention*). The employment data are available only for the subsector as a whole. We cannot therefore analyze the performance further.

To achieve this on the whole satisfactory development, major investments were undertaken. A new port was built in Tunis and other ports were improved. Between 1960 (really 1965) and 1971, ports investments amounted to 10.029 MD in current prices. In addition 5.539 MD were invested in port handling, 0.574 MD in stevedoring and 1.6 MD in shipping, all made in 1971 by Gabès Chimie for specialized vessels.

Although there were some port installations in 1960, the investments present a substantial addition. The marginal C/O ratio of 2.8 does not appear high. It took 9,382 D to create an additional job. The output-labor ratio, our measure of productivity, increased as the result of the investments by almost 60%.

PTT

By 1970, value added per employee of PTT was 27.6% above the 1961 level. This is due to the expansion of the automated telephone system. No physical measure of output exists which might be compared to the development of value added, such as numbers of pieces of mail handled by the post office, or number of telephones installed. We only note that the PTT has succeeded in holding the increase in employment to about 25%. Total investment between 1960 and 1970 was 13.124 MD (all from 1962 on).

Oil Pipelines

The oil pipeline (TRAPSA) presents a special case. Its precise employment is not known. It is estimated at a constant 250. The revenues from the pipeline fluctuate both with the amount of oil flowing through the line, and the price received which in turn depends on the amount. Value added, and hence also value added per (constant number of) employees was in 1970 239% of 1961, but for the reasons alluded to, fell in 1971 to only 135% of 1961. Total investments between 1968 and 1970 were 2.451 MD. In 1960 and 1961 approximately 11 MD were invested.

Footnotes

¹See J. G. Kleve, "The Control of Annual Plans: The Experience of Tunisia," *The Journal of Modern African Studies*, Vol. V, No. 2, 1971.

²Nothing said here is unknown to Tunisian planners as a quick perusal of the *Rétrospectives Décennales 1962-1971* (Tunis, January 1972, mimeo), particularly Part I, "Prévisions et réalisations globales de la décennie 1962-1971," shows.

³If "real" savings are measured as a residual by taking the Sources and Uses aspects of GDP, "real" savings, i.e. those derived from national accounts in constant prices can be interpreted as measuring what savings would have been if prices had been constant. "Real" savings derived by deflating savings in current prices--a less usual procedure--would have a very different meaning.

⁴This is perhaps the only point in which there is disagreement with the assessment given by the *Rétrospectives Décennales*, *op. cit.* The *Rétrospectives* distinguish between directly productive investments and others, which are either indirectly productive or productive only with a big time lag. They argue that it would be difficult to achieve the planned growth rate with such a large proportion of investments not being directly productive (e.g. *Rétrospectives...*, *op. cit.*, Introduction, p. 12). As will be shown--and this is the major reason for the detail to be given--this is *not* the problem. The problem is, rather, that those investments that *are* directly productive, were for various reasons not sufficiently so, and that this was true particularly for the major industrial investments.

⁵During the period 1962-1971, a total of 1,245.5 Million Dinars were invested. 18.8% went to Agriculture, 29.3% to Industry (11.9% to manufacturing industry), 50.8% to Services, with 1.1% unidentified, probably in small-scale production. Manufacturing received as much as Transport and Communications (11.8%). Ministère du Plan, *Rétrospectives Décennales 1962-1971*, Tunis, January 1972, mimeo, p. 26. *Rétrospectives*, p. 27, divides investments into directly and indirectly productive investments. The former are 51% of the total. Industrial investments are 57.3% of productive investments.

⁶The actual method of estimating agricultural employment had a constant and a fluctuating element. For example, employment in olive production depended both on the number of trees that had to be trimmed, or where weeding was required, on the actual crop, which depending on size might require more or less labor. The figures arrived at, reproduced in Appendix Table A2, are probably the best compromise possible, short of an actual annual census or at least an annual sample.

⁷The document in which the basic data are published and which forms the basis also of our calculations is: Ministère du Plan, *Production et Valeur Ajoutée par Branche 1961-1971*, mimeo, n.d.; as modified for the year after 1968 by Ministère du Plan, *Annexe Statistique au Rapport sur le Budget Economique de l'Année 1972*, mimeo, Sept. 1971, and Ministère du Plan, *Tableaux Annexes au Rapport sur le Budget Economique 1973*.

⁸We have simply compared the terminal year with the base year. If the rate of growth had been calculated by means of a trend value, it would have been lower.

⁹The figure refers to manufacturing including the artisan production of carpets. Without carpets, growth was slightly less.

¹⁰*Rétrospectives, op. cit.*, p. 4 of "Introduction," calculates a 4% p.a. compound rate of growth. The difference to our figure is twofold: we have included the new official recalculation of the agricultural sector that were available only by the middle of 1973, and we have made a few recalculations as indicated (though based on the same official material). We have taken simply the percentage change between 1961 and 1971, while *Rétrospectives* has taken a trend value.

¹¹See for example, Ian Little, Tibor Scitovsky, and Maurice Scott, *Industry and Trade in Some Developing Countries. A Comparative Study*, Oxford University Press, 1970, Table 2.13, p. 75, which suggests that in Pakistan growth between 1950-52 and 1964-66 was 3.2% after allowing for protection, instead of 3.8% as conventionally measured. Growth in Brazil falls from 5.3% to 5.0% or in the Philippines from 5.6% to 5.3%. In the case of Pakistan, the development of large-scale industry contributed nothing to growth when allowance is made for protection, compared to 0.6% (i.e. about 16% of the total) when conventionally measured.

¹²Gross Fixed Capital Formation in 1966 prices was 159.5 MD (Tableaux Annexes au Rapport sur le Budget Economique 1973, Oct. 1972, Table 1a). GDP at market prices of 1966 was 719.343 MD (Table A1).

¹³See the chapter on the Financing of Investments for annual figures and their analysis by J. G. Kleve.

¹⁴Our investment figures in constant prices are based on official estimates. *Rétrospectives, op. cit.*, p. 26, gives the following figures for the total sectoral distribution of investment in current prices for 1962 through 1971: Agriculture: 18.8%; Industry, 29.3% (of which manufacturing 11.9%); Non-governmental Services, 33.6% (of which housing 12.3%); "equipment collectifs", 17.2%; and unidentified, 1.1%.

¹⁵See *Rétrospectives, op. cit.*, Part I, p. 6, for figures.

¹⁶All C/O ratios tend to be erratic, particularly those for agriculture which depends so much on weather. But in making 10 year projections planners must assume that good and bad years will average out. If we had used the average of 1961/62 and 1971/72, results would have been not much different.

¹⁷The rate increase in electric power which raised prices to more realistic levels occurred only in 1969, and has therefore no influence on a measurement in 1966 prices.

The importance of the earlier discussion on how precisely output in constant prices was measured, should now be apparent. If mining output of phosphates had been deflated by export prices of phosphates, output per man in the mining sector as a whole would have been 663 D in 1971 compared to 699 D in 1961, only about 5% less.

¹⁸For reasons mentioned before, the C/O ratio is a hybrid.

¹⁹The reader is reminded, however, that for large parts of the transport sector, and for the tourism sector it was not possible to develop totally independent employment data. To that extent the constancy of output per man may be spurious. But the reader is reminded also that for large sections, i.e., the railways or air traffic, independent employment data do exist, and that in tourism, employment is assumed to vary with capacity, not with output.

²⁰The reader may wish to look at the figures of Table A.10-B which gives for the manufacturing sector only, broken down by private and public and by subsector, Investment (Capital) per employee in 1971, and Investment per additional employment created between 1961 and 1971.

²¹Obviously, Tunisia cannot be expected to solve any problems once and for all, any more than more advanced countries can, but, as the chapter on the Financing of Investments shows, these problems were successfully tackled.

²²Public ship building uses the facilities of the old French naval base at Bizerte. Attempts to utilize the dry docks have begun seriously only in 1972-73.

²³However, virtually all investment in NPK is net investment. We cannot guess what proportion of SIAPE has created additional capacities.

²⁴With per capita income of \$200 or so in Tunisia, and less than \$100 in most African countries south of the Sahara, the present discussion of sacrificing growth, i.e. output, for employment seems almost immoral. The policy obviously should be to produce a lot more overall, to produce a lot more per worker because that means that he will have a "meaningful" job and yet more income, and to see to it that the increase in production gets to as many people as possible. Sacrificing productivity and growth is not a policy, but an abdication of responsibility.

²⁵Space forbids a discussion of the population problem which remains of central importance.

²⁶A recent publication of an International organization uses this argument in the interest of both employment creation and income distribution. The poor consume mostly labor intensive goods; the rich, capital intensive goods. Produce goods for the poor and presto!, you solve the employment and distribution problems. Christian forbearance forbids quotation, particularly as the document contains also many important and sensible suggestions, such as not interfering too much with the "unorganized" urban sectors!

How about starting with electricity? It is produced by capital intensive methods, usually consumed only by the rich in urban centers, where it rarely reaches the poor section in their houses. (Streets may or may not be lit.) Moreover, it could be produced with a bicycle dynamo, worked by hand or foot. Now there is surplus labor, the shadow price of labor is 0, so why not do it that way? The poor could afford it that way, employment would rise, etc.

This is no more silly than what has been suggested.

²⁷Attempts to measure the marginal productivity of capital usually assume the level of savings and of taxation as given. If the level of taxation is predetermined, and if the available savings are administratively allocated, the marginal productivity of capital may, of course, diverge from the rate of interest, leading perhaps to excess profits if everything else goes well. If the available funds are, however, allocated economically so that every borrower at the established rate can be satisfied, the two must coincide as did the "natural" and "money" rates of interest of another theoretical era. The real issue seems, therefore, to be how the available savings are to be raised, how big they should be in the aggregate, and how they are to be allocated. With sufficient taxation, foreign finance and administrative allocation, any rate of interest can be maintained--well, almost any.

²⁸Provided, of course, that there is no (Stanley) Pleasure Effect, that is, that the additional taxation will not simply raise public consumption, as, of course, it frequently does.

²⁹See W. F. Stolper, "Internal Effects of Devaluation," in *Africa and Monetary Integration*, Rodrigue Tremblay, ed., Montreal, 1972, pp. 411-419, for a slightly more extended discussion of these points.

³⁰Blake's calculations are, with a few exceptions, based on the same sources as ours. The details are explained in his paper. Crude calculations for 1970 based on the four-digit classification of the foreign trade statistics suggest that domestically produced steel was sold in Tunisia at an ex-factory price before indirect taxes that was roughly comparable to the landed price of similar products. However, Tunisia received in 1970 only about two-thirds of the landed price for its exports. The difference is too large to be explained by freight cost and suggests that a more expensive kind of rods, etc. was imported than exported, hence that there was some price distortion. In 1972, however, the differential for the landed price and the export price of products subsumed under the same customs classification (731,000) was only 10% which could be explained by freight charges and in any case suggests a substantial narrowing of the gap and hence a reduced rate of effective protection.

³¹For example, J. Bhagwati, *The Theory and Practice of Commercial Policy: Departures from Unified Exchange Rates. Special Papers on International Economics, No. 8*, Jan. 1968, Princeton University, 1968. See the many writings of H. G. Johnson.

³²See particularly, Ian M. D. Little and James A. Mirrlees, *Manual of Industrial Project Analysis in Developing Countries. Vol. II, Social Cost Benefit Analysis*, O.E.C.D., Paris, 1969.

³³See the writings of M. Corden, B. Belassa, H. G. Johnson, et al. For references see Blake's chapter.

³⁴"... I have found it useful ... to tell my Indian students that even a 'Soviet-type' economic system, which may decide to avoid the use of prices to guide domestic allocation of resources, cannot afford to ignore *international* prices, the reason being that they really represent, from the welfare point of view, a 'technological' datum." J. Bhagwati, *op. cit.*, p. 4, note 3. Italics in the original.

³⁵Little and Mirrlees, *op. cit.*, pp. 143 ff.

³⁶Ian Little, Tibor Scitovsky, Maurice Scott, *Industry and Trade in Some Developing Countries*, Oxford University Press (for OECD), 1970, and also the separate studies on Brazil, Mexico, India, Pakistan, Taiwan and the Philippines by various authors, summarized in the cited volume. See the references made above.

³⁷In the Tunisian national accounts, household savings are defined as changes in liquid assets and housing construction only.

³⁸Although in market economies, too, it is extremely rare that public projects are abandoned after huge sums are spent on them, the example of the SST shows that it happens. And although there are cases in which private firms are saved from bankruptcy by government loans, e.g. Lockheed, there are other cases in which they are allowed to go bankrupt, e.g. Rolls Royce. In any case, there is a qualitative difference in the hold which government enterprises have on the public purse, compared to what even powerful private firms can do.

³⁹In the case of the extension of the steel mill, bids varied 100%, guarantees for the mill varied from one year for the expensive to ten years for the low bidder. Where loans are tied, or there is political influence, the low bidder may not get the project. In this case, neither bidder was American.

⁴⁰We remind the reader that in Section 11(B), we have pointed out that value added measured as the difference between outputs and purchased inputs frequently differs from value added measured by factor payments, though logically they should not do so.

⁴¹The speech of Mr. Chou En Lai at the Tenth Party Congress in Peking, as reported in the official translation by the *New York Times* of Sept. 1, 1973, predicts that though at present the Mao line has won over the Lin Pao line, the struggles over "correct" policy will reappear again and again. There are always reports about arguments between the "hardliners" and the "liberals" in Russia. No one is capitalist. But "*L'état c'est moi*" seems to refer to every petty official in a communist economy!

⁴²Examples are SOTUPALFA or ICM, which have started producing in 1973. Their gestation periods were longer than anticipated, and both have required very big short-term financing.

⁴³LCSD: *Lutte contre le sous-développement*.

⁴⁴It may contribute to the low output per man of this sector that the price of lead ore is kept low.

⁴⁵Exploration activities resumed again in 1972.

⁴⁶An investigation showed that in 1971 1800 flour mills grinding flour for customers employed 3600 workers, and produced 235,000 tons of flour. These mills are not included in the statistics which cover only commercial mills.

⁴⁷We neglect the production of railway cars during a few years.

⁴⁸The proof is implied in Blake's calculations of the real rate of effective protection, which suggest a substantial loss of real resources to the economy.

⁴⁹*Rétrospectives, op. cit.*, pp. 86-87, gives figures on hotel capacity, measured by number of beds--4,077 in 1962, 46,362 in 1971--and number of tourist nights--396,000 in 1962, 5,080,000 in 1971.

PRODUIT INTERIEUR BRUT AUX PRIX CONSTANTS

TABLEAU A.1

Page 1 0000

	1961	1962	1963	1964
<u>AGRICULTURE ET PECHE</u>	(75900)	75700	105500	90700
Agriculture	(73200)	73000	102900	88100
Pêche	(2700)	2700	2600	2600
<u>INDUSTRIE</u>	75885	73461	84267	93958
<u>Mines</u>	7602	7758	8038	9250
<u>Energie</u>	4013	4261	4712	8454
Produits Pétroliers	129	129	129	2590
Electricité				
Eau et autres Energies	3884	4132	4583	5864
<u>Industries Manufacturières</u>	30870	25742	30597	37154
Industries Agricoles et Alimentaires	21743	14331	17438	21467
Matériaux de Construction, Céramique, Verre	1892	2062	2106	2282
Industries Mécaniques et Electriques	1568	1939	1960	2254
Chimie et Caoutchouc	1801	2767	3028	3257
Textile, Habillement, Cuir (indust.)	1266	1683	2523	3265
Tapis Artisanat	919	1006	1243	1480
Bois, Liège, Ameublement	690	782	1073	1380
Papier, Imprimeries	845	1021	1098	1516
Divers	146	151	128	253
Bâtiment, Travaux Publics	33400	35700	39300	39100
<u>SERVICES (NON ADMINISTRATIFS)</u>	156000	168300	179500	188300
Transport, Télécommunication	11000	29895	31828	36217
Tourisme	2000	2700	3200	3800
Loyer	1000	42300	42800	43600
Commerce	4000	50700	57500	59500
Services Domestiques	2500	2600	2700	2800
Autre Services	37700	40100	41500	42400
<u>PRODUCTION INTERIEURE BRUTE AUX COUT DES FACTEURS</u>	308085	317461	367467	372958
Services Administratives - Government	55300	59600	60500	60400
<u>PRODUIT INTERIEUR BRUT AU COUT DES FACTEURS -- GDP AT FACTOR COST</u>	363385	377061	427967	433358
Droits et Taxes Indirects - Indirect taxes				
Nets de Subventions - Net of Subsidies	60000	59300	63200	70800
<u>PRODUIT INTERIEUR BRUT AUX PRIX DU MARCHE --GDP AT MARKET PRICES</u>	423385	436861	491167	504158
P.M. Industries Manufacturières moins Tapis - Manufacturing less carpets	29951	24736	29354	35674

GROSS DOMESTIC PRODUCT, CONSTANT PRICES

TABLE A.1

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Page 2

1965	1966	1967	1968	1969	1970	1971	
103800	92600	82900	96400	87600	93000	115100	<u>Agric & Fish</u>
101100	89600	79000	92900	84200	90100	111800	Agriculture
2700	3600	3900	3500	3400	2900	3300	Fish
95537	111100	121250	129833	144856	144486	157483	<u>Industry</u>
9174	11425	8568	9853	9479	8323	8816	<u>Mining</u>
8543	13206	23805	30369	33193	38409	37966	<u>Energy</u>
2476	6113	15165	20109	22486	26007	24166	Petroleum
6067	7093	8640	10260	10707	12402	13800	Electr. Others
39720	43269	46177	48311	54784	53354	61761	<u>Manufact. Ind.</u>
20239	21063	18480	20314	22266	19293	25368	Food
2487	3422	4171	5090	5389	5333	5913	Constr. Mat.
3073	3604	5557	5163	6577	6516	6924	Mech. Electr.
5244	3955	4968	6118	5656	5503	6127	Chem. Rubber
3915	5608	7061	4737	7621	7864	8831	Textiles, etc
1480	1628	1776	1776	1924	2072	2220	Carpet
1489	1781	1628	1954	2136	2267	2320	Wood, etc.
1501	1868	2131	2519	2162	3371	2853	Paper, Printing
291	340	405	640	953	1135	1205	Misc.
38100	43200	42700	41300	45400	44400	49300	Constr. PWD
190700	201600	203200	212700	224200	240000	255200	<u>Non-Gov. Service</u>
33392	39298	39994	43401	44845	50990	44971	Transp. Comm.
5600	7900	9600	14300	15700	17700	26200	Tourism
44400	45100	45700	46200	46700	47400	48300	Rental
63100	63000	63200	63800	68100	74400	83100	Trade
2900	3000	3200	3300	3500	3600	3900	Domest. Serv.
41300	43300	41500	41700	45400	45900	48700	Other Serv.
390037	405300	407350	438933	456656	477486	528143	<u>Gross Domestic</u>
63800	72200	77600	83900	87400	96700	96400	<u>Production</u>
							Government
453837	477500	484950	522833	544056	574186	624543	<u>GDP Factor Cost</u>
67800	74100	72000	70400	83700	88200	94800	Taxes, Subsidies
521637	551600	556950	593233	627756	662386	719343	GDP, Market Price
38240	41637	44401	46535	52860	51282	59541	P.M. Manufact. less current

Tableau - Table A-1a

Ressources et Emplois des Biens et Services, Prix Constants-
Sources and Uses of GDP and per capita Consumption, Constant Prices

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
<u>Ressources - Sources</u>											
GDP market prices - PIB, prix marché	423.4	436.9	491.2	504.2	521.6	551.6	557.0	593.2	627.8	662.4	719.3
+ Importations de biens et services non-facteur - Imports of goods and non-factor services	142.5	145.6	145.7	156.8	168.2	167.1	178.0	154.2	184.2	198.6	229.0
= Total des ressources et des emplois - Total Sources and uses	565.9	582.5	636.9	661.0	689.6	718.7	735.0	747.4	812.0	861.0	948.3
<u>Emplois - Uses</u>											
Consommation privée - Private Consumption	323.2	314.5	351.8	353.1	378.2	376.9	387.5	381.6	424.9	433.0	480.4
Consommation publique - Public Consumption	72.2	74.5	75.0	78.0	82.1	91.7	98.2	107.5	110.5	122.9	121.4
Formation brute de capital fixe - Gross fixed capital formation	91.6	96.4	110.1	121.3	127.4	128.4	124.7	124.7	135.3	145.7	173.4
Variation des Stock - Inventory Accumulation	- 9.0	+14.8	+10.4	+ 5.6	+ 0.6	+ 7.4	+ 8.2	+ 5.9	+ 3.1	+ 9.7	+ 2.2
Exportations de bien et services non-facteurs - Exports of goods and non-factor services	87.9	82.3	89.6	103.0	101.3	114.3	116.4	127.7	138.2	149.7	170.9
Population (million)	4.259	4.329	4.417	4.519	4.617	4.718	4.825	4.928	5.027	5.126	5.232
Consommation par tête, D.	75.9	72.6	79.6	78.1	81.9	79.9	80.3	77.4	84.5	84.4	91.8

Notes: All figures except indicated from: Ministère au Plan, Direction de la Planification Générale, Tableaux de Synthèse, 1962-1971, mimeo, Sept. 1972, Tableau 4. Changes: We have substituted our estimate of GDP, recalculated private consumption and added the population as well as per capita consumption figures. The original contains also growth rates for each row.

Tableau - Table A-1b

PIB par Sous Secteur, Prix Constants - GDP by Subsector, Constant Prices

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	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Mines - Mining	8751	8430	8791	9772	10932	11691	10461	12958	10483	11434	12341
Phosphates	5904	5868	6129	7140	7927	8502	7599	9797	7043	8148	8597
Fer - Iron Ore	1392	1181	1304	1286	1423	1648	1287	1391	1327	1101	1382
Non-Fer - NF Metal.	702	821	791	688	936	968	974	1105	1581	1725	1742
Sel - Salt	753	560	567	658	646	573	601	665	532	460	620
Petroleum, Crude	-	-	-	-	-	3443	12591	17483	19965	23108	23576
Pet. Ref.	-	-	-	2462	2347	2540	2431	2497	2398	2855	590
Food Industries - IAA	21743	14331	17438	21467	20239	21063	18480	20314	22266	19293	25368
IAA Moins Huile d'Olives	11604	11601	13783	14286	15173	16795	16909	16208	17796	17279	18098
Huilleries - Olive Oil	10139	2730	3655	7181	5066	4268	1571	4106	4470	2014	7270
Boulangeries - Bakeries	4001	3749	3960	4086	4455	4717	5070	4851	7188	5634	5722
Minoteries - Flourmills	662	708	469	371	427	480	556	562	767	748	753
Boucheries - Butchershops	1992	1760	2308	2106	2377	3072	3038	2997	2697	2484	2005
Conserves - Canning	1515	1758	2092	1764	1863	2065	1860	1296	1709	1738	2005
Biscuit., Chocol. Confis.	434	531	498	546	698	523	544	549	591	701	811
Sucre - Sugar - Total	242	294	1368	2194	2225	2560	2413	2413	1668	2623	2824
a. Raffinerie - Refinery	-	-	1104	1921	1816	2125	2103	2172	1098	1985	2226
b. Agglomération - Pressing	242	294	264	273	409	435	310	241	570	638	598
Lait - Milk	62	88	127	153	219	310	317	324	369	445	521
Boissons- Drinks	1587	1670	1856	2024	2020	1936	1980	2051	1585	1682	2188
Café - Coffee	277	261	266	184	210	228	210	253	244	247	247
Tabac- Tobacco	815	767	823	843	661	888	903	896	954	956	1004
Divers - Misc.	17	15	16	15	18	16	18	16	18	21	12
MCV - Building Materials	1892	2062	2106	2282	2487	3422	4171	5090	5389	5333	5913
Ciment- Cement	571	618	604	750	737	780	759	1218	1447	1256	1216
Chaux- Lime	161	163	177	213	225	228	250	330	332	382	386
Plâtre et Gypse - Plaster	16	19	25	29	20	33	21	30	37	40	47
Carreaux de Mos. - Tiles	252	251	270	338	365	431	425	457	434	484	486
Autr. Ouvr. en Ciment	419	498	494	405	560	941	1042	960	1006	898	1467
Céramique Rouge - Bricks	321	345	373	396	428	620	713	792	1071	1258	1253

Tableau - Table A-1b (page 2)

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Carreaux de Faïence - Tiles	-	-	-	-	-	-	129	243	279	281	291
Articles Sanitaires	-	-	-	-	-	-	171	346	361	267	336
Verre - Glass	-	-	-	-	-	225	376	446	178	304	299
Marbre - Marble	152	168	163	151	152	164	285	268	244	163	132
IME - Mechan. & Elect. Ind.	1568	1939	1960	2254	3073	3604	5557	5163	6577	6516	6924
Siderurgie - Iron and Steel	-	-	-	-	(007)	389	1252	365	2118	1372	1133
Montage Auto. - Car Assembly	36	252	244	194	300	233	602	831	544	651	779
Montage Tele. Radio	-	-	12	46	88	140	242	283	263	322	378
Plomb Metal - Lead Smeltg.	286	209	194	275	473	391	203	227	346	299	315
Articles de Fonderie - Casting	142	117	129	138	239	284	420	489	339	350	392
Charpentes, Chaudronnerie - Echafaudage, Scaffolding	364	377	355	389	697	554	673	648	569	658	701
Tubes en Fer - Iron Pipes	-	-	-	-	-	-	-	9	12	60	72
Emball. Met. - Metal Containers	427	534	512	545	499	461	453	372	496	580	729
App. de Chauffage - Heating	-	-	-	-	-	56	55	49	87	63	67
Outils Equip. Agric.	13	13	15	19	16	17	14	15	18	25	19
Wagons - Ry. Cars	-	-	-	-	-	7	117	-	-	23	-
Volets, Grillages- Shutters, Grills	8	6	6	6	5	6	31	37	60	43	45
Lames - Razor Blades	-	-	-	8	13	15	51	66	66	130	93
Clouteries - Nails, Screws	12	14	13	13	17	18	22	41	29	35	33
Bougies, Electrodes, Accum.	49	112	174	159	107	110	220	252	217	237	254
Moteurs à Piston	-	-	-	-	17	41	135	67	2	93	82
Moteurs Electriques	-	-	-	-	-	-	24	29	55	91	102
Autr. Art. En Fer- Other Iron	33	45	27	28	30	- 32	305	488	170	450	413
Ouvr. en Plomb - Lead Products	14	25	26	49	34	44	115	139	197	116	135
Ouvr. en Aluminium - Alum. Art.	103	126	141	149	136	140	193	170	222	205	263
Fils, Cables Elect. & Teleph.	-	41	43	58	86	429	269	392	394	430	563
Constr. Navale	81	68	69	173	316	301	171	199	273	283	352
Industries Chimiques	1801	2767	3028	3257	5244	3955	4968	6118	5656	5503	6127
Engrais - Fertilizers	801	1640	1796	1844	3682	2050	2821	3749	2948	2611	3500
a. Hyperphosphates	218	110	349	451	428	221	9	81	235	114	29
b. Supersimple	155	170	289	296	177	210	198	216	210	208	228

Tableau - Table A-1b (page 3)

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
c. Super triple	332	1198	1063	961	2866	1404	2018	3195	2251	2121	3117
d. Eng. Composés - Compound	96	137	49	54	110	124	436	127	146	91	114
e. Acide Phosphor.	-	25	46	82	91	79	119	127	106	77	12
f. Sulfate of Ammonia	-	-	-	-	10	12	41	3	-	-	-
Savons - Soaps	404	418	476	452	460	536	488	466	526	542	400
Souffre Raffinée - Ref. Sulphur	36	18	22	33	13	48	58	57	68	56	49
Detergents, etc.	51	109	170	136	136	179	239	236	248	320	380
Peintures, Vernis - Paints, Var.	180	208	253	283	300	350	370	344	420	480	382
Huile de Lin - Linseed Oil	20	23	19	44	49	40	61	54	35	36	42
Insecticides	3	9	Negl.	10	7	6	8	5	6	8	13
Colle - Paste	-	-	-	-	-	-	27	51	68	71	70
Prod. Pharmaceutical	-	-	84	159	164	246	332	327	381	401	428
Explosifs	253	259	211	220	330	382	387	353	347	380	237
Pneus - Tires	-	-	-	-	-	-	83	370	497	481	498
Huiles Essentielles	53	53	57	76	102	119	95	100	112	118	128
Indus. Textiles, Leather, Shoes	1266	1683	2523	3265	3916	5608	7061	4737	7621	7864	8831
Indus. Textiles Only	701	1036	1493	2381	2891	4598	5973	3663	6399	6479	7343
Tapis - Carpets	919	1006	1243	1480	1480	1628	1776	1776	1924	2072	2220
Sogitex	40	52	169	386	444	1965	3392	1025	3239	2897	3334
All Other Textiles	661	984	1324	1995	2447	2633	2581	2624	3160	3582	4009
a. Spinning, weaving	83	97	235	506	858	883	847	780	982	1197	1566
b. Clothing	332	564	693	856	1000	1041	956	1079	1157	1340	1374
c. Hosiery	246	323	396	633	589	709	778	759	1021	1045	1069
Leather, Shoes - Cuir, Chauss.	565	647	1030	884	1025	1010	1088	1088	1222	1385	1488
Bois, Liege, Meubles -											
Wood, Cork Furniture	690	782	1073	1380	1489	1781	1528	1954	2136	2267	2320
Minuiserie Sât. Build. Parts	58	98	111	153	159	173	204	249	269	313	359
Meubles en Bois, - Wood Furn.	229	237	363	520	520	593	531	700	671	807	694
Autres Bois, Liege - Other	44	80	77	182	221	229	200	334	428	563	569
a. Erball. en Bois - Pack.Mat.	18	44	43	75	101	104	105	46	46	54	115
b. Liege - Cork	133	152	261	305	267	340	195	314	282	335	416
Meubles Metall. - Metal Furn.	252	251	295	327	342	571	593	500	519	395	380
Particle Board	-	-	-	-	-	-	-	145	349	343	353
Paper, Pulp, Printing -											
Papier, Pâte, Imprimeries	845	1020	1100	1516	1500	1868	2131	2519	2262	3371	2853

Tableau - Table A-1b (page 4)

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Imprimeries - Printing	574	678	571	733	683	835	1103	1136	1415	1815	1836
Paper and Pulp - Papier, Pâte	270	342	528	783	817	1033	1028	1263	847	1556	1017
a. Pâte à Papier - Pulp	-	-	58	253	383	554	524	670	171	629	470
b. Pap. d'emball. - Packing P.	60	59	57	59	63	65	73	90	108	114	125
c. Emball. de Pap. - Packaging	204	277	405	402	312	350	370	333	378	422	434
d. Pap. d'Impress. - Printing Paper	-	-	-	-	-	-	-	-	-	102	-383
e. Autres Pap.- Other	7	7	7	69	60	64	61	170	190	289	371
Industries Divers - Miscellaneous Industries	146	151	128	253	291	340	405	640	953	1135	1205
Ouvr. en Plastiques	116	125	103	205	221	237	244	449	768	850	934
Horlogerie - Watches											
Brosses - Brushes											
Literie - Bedding	28	26	25	48	70	103	161	191	185	285	271
Disques - Records											
Autres - Others											
Transport, Telecommunication	25157	29895	31828	36217	33392	39298	39994	43401	44845	50990	44971
Chemins de fer - Railways	5172	5373	5641	5990	6413	6729	6086	6761	5733	6744	6819
Tr. Routier - Road Transport.	5140	5640	7115	7302	7551	8989	9866	9693	10485	10704	11275
Avions - Air	1025	1215	1428	2275	2143	2563	2146	2645	3412	3853	3881
Services Maritimes	3086	3177	2946	3434	3801	4409	4813	4647	5435	5903	7286
Trapsa - Pipeline	8250	12130	12374	14700	13949	13601	14974	15916	16352	19727	11159
PTT	2484	2360	2324	2516	2535	3007	2909	3529	3428	4059	4551

EMPLOI

TABLEAU A.2

Page 1

	1961	1962	1963	1964
<u>AGRICULTURE ET PECHE</u>	261400	292400	366000	388000
Agriculture	247000	278000	352000	324000
Pêche	14400	14400	13920	13920
<u>INDUSTRIE</u>	93782	94813	106519	115883
Mines	12528	12733	12473	13890
Energie	3710	3868	4367	4853
Produits Pétroliers	623	631	753	1047
Electricité	2222	2363	2637	2686
Eau et autres Energies	865	874	977	1120
Industries Manufacturières	38044	36112	43479	50940
Industries Agricoles et Alimentaires	18822	14990	17198	17766
Métaux de Construction, Céramique, Verre	2797	2668	2798	2848
Industries Mécaniques et Electriques	1601	1754	1965	2873
Caoutchouc et Cuir	2086	2302	2476	2716
Textile, Habillement, Cuir (Indust.)	3108	3757	5753	8637
Tapis Artisanat	7069	7738	9562	11385
Bois, Liège, Ameublement	1222	1408	1819	2373
Papier, Imprimeries	1075	1228	1640	1992
Divers	264	267	268	350
Bâtiment, Travaux Publics	39500	42100	46200	46200
<u>SERVICES (NON ADMINISTRATIFS)</u>	119602	127731	140292	147597
Transport, Télécommunication	17909	18782	19485	20148
Tourisme	1053	1087	1531	2020
Commerce	52700	56300	63900	66100
Services Domestiques	22500	24000	25500	27000
Autres Services	25440	27562	29876	32329
<u>S/Total</u>	474784	514944	612817	651480
<u>SERVICES ADMINISTRATIFS</u>	86500	92000	97500	103000
<u>TOTAL</u>	561284	606944	710317	754480
P.M. Industries Manufacturières moins Tapis Manufacturing less Carpets	30975	28374	33917	39555
P.M. Industry and Productive Services Only	213384	222544	246877	263480

Tableau - Table A-2a

Emploi par Sous Secteur - Employment by Subsector

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
<u>Mines- Mining</u>	12528	12733	12473	13890	14958	15383	15355	15580	16571	17564	18627
Phosphates	7917	7785	7714	8489	9761	10373	10093	10248	11086	11676	11368
Fer - Iron Ore	1632	1923	1689	1968	1889	1969	2069	2032	1920	1915	1940
Non-Fer. Metal. - NF Metal.	2659	2675	2720	3005	3010	2741	2800	2869	3082	3667	5019
Sel - Salt	320	350	350	428	298	300	393	431	483	306	300
<u>IAA - Food Industries</u>	18822	14990	17198	17766	15923	19203	17951	19884	19742	18552	21400
<u>IAA Moins Huile d'Olives</u>	13322	13130	15678	13706	11623	16603	16671	17344	17542	17052	17300
Huile d'Olives - Olive Oil	5500	1860	2720	4060	4300	2600	1280	2540	2200	1500	4100
Boulangeries - Bakeries	3380	3230	3210	3470	3780	4050	4110	3950	5120	4750	4692
Minoteries - Flourmills	1890	1905	1860	1775	1794	1813	2003	1911	1991	2091	(2200)
Boucheries - Butcher Shops	2352	2103	2709	2422	2711	3500	3430	3350	3056	2809	2596
Conserves - Canning	2701	3227	3174	2995	3332	3820	3251	3791	3200	2988	3237
Biscuit. Choc. Confis.	375	445	478	487	495	580	529	555	555	552	555
Sucre - Sugar	94	728	607	500	463	521	540	512	480	482	465
a. Raffinerie - Refinery	49	681	509	447	455	479	491	463	431	431	422
b. Agglomération - Pressing	45	47	47	45	(45)	45	46	46	43	43	(43)
Lait - Milk	131	116	147	176	226	152	267	252	270	360	372
Boissons - Drinks	1349	1315	1267	789	845	1088	1447	1882	1689	1842	1950
Café - Coffee	207	179	164	136	133	126	120	142	153	153	(153)
Tabac - Tobacco	783	822	802	886	816	885	905	915	945	945	(1000)
Divers - Miscellaneous	60	60	60	70	28	68	69	84	83	80	(80)
<u>MCCV - Building Materials</u>	2797	2668	2798	2848	3370	3708	4607	5291	5575	5613	5617
Ciment, Chaux - Cement, Lime	928	738	1028	1017	1345	1083	1259	1459	1575	1518	1530
Plâtre, Gypsum	(30)	(30)	30	(30)	(30)	31	(30)	(30)	34	33	48
Carreaux de Mos. - Tiles	506	505	494	483	487	496	523	633	568	626	575
Autr. Ouvr. en Ciment	(513)	513	312	(350)	474	608	864	903	948	923	945
Céramique Rouge - Brick	(664)	(710)	767	(813)	(878)	1088	(1250)	1352	1491	1510	1500
Carreaux de Faïence - Tiles	-	-	-	-	-	-	(100)	124	141	169	200
Articles Sanitaires	-	-	-	-	-	-	(120)	286	371	345	328
Verre - Glass	-	-	-	-	-	234	(251)	284	226	225	230
Marbre - Marble	(156)	(172)	167	(155)	(156)	168	210	220	221	264	261

Tableau - Table A-2a (page 2)

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
<u>IME - Mechan. & Electrical</u>	1601	1754	1965	2873	4522	6090	6218	6887	7720	7740	7980
Siderurgie - Iron & Steel	-	-	-	-	944	1658	1322	1631	1791	1773	1608
Montage Auto - Assembling	(30)	(95)	98	(98)	(220)	226	(326)	439	441	419	554
Montage, Tele. radio	-	-	48	(70)	(90)	103	(153)	171	208	224	258
Plomb Metal. - Lead Smelting	(310)	(300)	290	(290)	(290)	290	(300)	361	412	517	429
Art. Fond. - Castings	(155)	(135)	149	(148)	(312)	463	508	556	765	591	747
Charpent. - Scaffolding	452	443	537	667	688	691	681	684	677	826	841
Tubes en Fer - Iron Pipes	-	-	-	-	-	-	-	10	15	77	89
Emball. Metal - Metal Containers	(253)	(303)	303	(325)	(346)	346	(346)	353	358	457	528
App. Chauffage - Heating App.	-	-	-	-	-	44	(44)	41	61	61	77
Outils Agric. - Tools	56	59	56	55	56	56	49	46	46	52	37
Volets, Persiennes, Stores	17	17	17	34	34	34	40	45	55	60	62
Lames - Razor Blades	-	-	-	(20)	(30)	30	(40)	43	46	46	47
Clouteries - Nails, Screws	29	29	29	34	36	37	37	38	44	46	47
Electrodes, Bougies, Accum.	(30)	(50)	78	(78)	(110)	129	(129)	141	148	155	163
Moteurs à Piston	-	-	-	-	(70)	70	(70)	70	47	53	61
Moteurs Electriques	-	-	-	-	-	-	(35)	35	91	100	104
Autr. Art. en Fer	44	46	47	47	45	531	741	790	706	654	733
Ouvr. en Plomb - Lead Art.	(30)	(30)	33	(41)	(39)	41	(41)	42	45	47	47
Prod. Aluminum	(125)	(150)	182	(180)	(180)	178	(204)	204	252	329	337
Fils, Cables Elec. Teleph.	-	(27)	(28)	(38)	(57)	329	(329)	364	323	379	408
<u>Indust. Chim. - Chemicals</u>	2086	2302	2476	2716	3305	3668	3827	3686	4212	4000	4280
Engrais - Fertilizers	1036	1127	1270	1183	1638	1628	1707	1595	1618	1664	1864
Souffre Raffinée	(30)	(24)	24	(24)	(24)	27	(35)	36	22	22	21
Savons - Soaps	504	532	560	539	532	605	609	567	644	665	499
Paint., Vernis - Paints, Varn.	104	110	144	158	171	186	207	220	220	225	240
Detergents, etc.	83	91	100	103	110	115	129	144	150	178	190
Linseed oil - Huile de Lin	41	31	21	26	36	34	44	32	25	38	36
Colle - Paste	-	-	-	-	-	-	41	41	41	43	52
Prod. Pharmaceutical	-	-	60	340	395	477	297	514	550	602	706
Explosifs	174	171	171	175	178	179	181	187	223	223	206
Pneus - Tires	-	-	-	-	-	-	70	133	144	166	181
Huiles Essen. - Essential Oils	(113)	(113)	121	(162)	(215)	(255)	(204)	214	264	271	282
Insecticides	(3)	(3)	4	(3)	(3)	(2)	(3)	3	2	3	3

Tableau - Table A-2a (page 3)

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
<u>Indus. Textiles, Leather, Shoes</u>	3108	3757	5753	8637	9365	10310	12544	13699	14953	16042	14750
Indus. Textiles Only	1908	2517	3553	6937	7415	8360	10523	11670	12921	13842	12350
Carpets - Tapis	7069	7738	9562	11385	11385	12523	13662	13662	14800	15938	17077
Sogitex	158	337	748	2407	2035	2400	3133	3468	3721	4112	4319
All Other Textiles	1750	2180	3105	4530	5400	5960	7390	8210	9200	9730	8916
a. Filature, Tissage-Spin Weave	330	470	855	1250	1600	1750	2300	2710	2600	2800	2506
b. Confection - Clothing	980	1130	1530	2080	2500	2530	2590	3240	3700	4000	3597
c. Ecnneterie - Hosiery	440	580	720	1200	1300	1680	2500	2800	2900	2930	2813
Cuir, Chauss. - Leather, Shoes	(1200)	(1240)	(1900)	(1700)	(1950)	(1950)	(2021)	2021	2032	2200	2400
<u>Meubles, Bois, Liège - Furniture, Wood, Cork</u>	1222	1408	1819	2373	2643	3134	3454	3544	3791	3801	3517
Minuiserie, Bât - Bldg. Parts	169	289	391	499	519	671	732	749	833	845	849
Meubles en Bois - Wood Furn.	516	517	782	869	959	1239	1383	1441	1530	1549	1466
Autre Bois, Liège - Other	286	324	324	640	669	691	684	786	802	797	597
a. Wooden Packing Material	36	74	74	94	123	123	123	123	116	110	110
b. Liège - Cork	250	250	250	546	546	568	561	562	596	580	487
Meubles Metal. - Metal Furn.	251	278	322	365	496	533	686	678	626	616	605
<u>Paper, Pulp, Printing - Papier, Pâte, Imprimeries</u>	1075	1228	1640	1992	2054	2346	2473	2773	2828	3365	3579
Imprimeries - Printing	763	886	948	1037	1027	1198	1274	1474	1507	1798	1912
Pâte et Papier -Pulp & Paper	312	342	602	955	1027	1148	1199	1299	1321	1567	1667
a. Pâte - Pulp	-	-	(300)	(450)	(520)	(620)	(650)	664	664	602	617
b. Packing paper	(108)	(108)	112	(114)	(114)	112	(109)	98	102	113	122
c. Emball. de Papier	182	211	256	256	257	274	306	336	353	387	402
d. Papier d'Impression	-	-	-	-	-	-	-	-	-	254	305
e. Other Paper - Autres Papier	22	23	24	135	136	142	134	201	202	211	211
<u>Industries Divers - Miscellaneous Industry</u>	264	267	268	350	410	487	586	676	724	957	1225
Ouvr. en Plastique	176	186	190	250	280	309	346	395	491	597	745

Tableau - Table A-2a (page 4)

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Transport, Telecommunication	17909	18782	19485	20148	21445	22595	23639	26899	28857	30320	31205
Chemins de Fer - Railways	5300	5333	4683	4894	5090	4884	4793	6627	6726	7160	6980
Tr. Routier - Road Transport	5500	6300	7400	7785	8215	9306	10262	11053	12403	13123	13716
Avion - Air	250	261	299	360	417	512	615	756	888	1003	1205
Services Maritimes	2600	2629	2719	2725	3339	3450	3382	3581	3504	3648	3862
PPT	4009	4009	4134	4134	4134	4193	4337	4632	4986	5136	5198
Trapsa - Pipeline	(250)	(250)	(250)	(250)	(250)	(250)	(250)	(250)	(250)	(250)	(250)

VALEUR AJOUTEE PAR EMPLOI - PRIX CONSTANTS - EN DINARS

TABLEAU A.3

PAGE 1

	1961	1962	1963	1964
<u>1. MINES - MINING</u>	605	609	645	666
a. Phosphates	601	667	697	780
b. Mines de Fer - Iron Ore	853	614	772	653
c. Min. Met. autres que Fer - NF Ores	264	307	291	229
d. Sel - Salt	2353	1600	1620	1537
<u>2. ENERGIE - ENERGY</u>	1082	1102	1079	1742
a. Pétrole et Gaz Naturel - Petrol, Nat. Gas	207	204	171	2474
b. Pétrole Raffiné - Petrol. Refining	-	-	-	7791
c. Pétrole Brut - Crude	-	-	-	-
d. Electricité, Gaz, Eau - Elect., Gas, Water	1258	1276	1268	1541
<u>3. IND. MANUFACT. MANUFACTURING</u>	811	713	704	729
<u>4. IND. MAN. SAUF TAPIS - WITHOUT CARPETS</u>	967	872	866	902
<u>5. I.A.A. - FOOD INDUSTRIES</u>	1155	956	1014	1208
<u>6. I.A.A. MOINS HUILLERIES - LESS OIL</u>	871	884	879	1042
a. Minoteries - Flourmills	350	372	252	209
b. Conserves - Canning	561	545	659	599
c. Biscuiteries, Chocl. Confis.	375	445	478	487
d. Sucre - Sugar	2574	404	2254	4388
e. a) Raffinerie - Refinery	-	-	(2169)	(4298)
f. b) Agglomération - Pressing	(5378)	(6225)	(5617)	(6067)
g. Lait - Milk	473	757	864	869
h. Boissons - Drinks	1176	1270	1465	2565
i. Café - Coffee Roasting	1338	1458	1622	1353
j. Tabac - Tobacco	1041	933	1062	951
<u>7. MCCV - BUILDING MATERIALS</u>	676	773	753	801
a. Ciment, Chaux CPB - Cement - Lime	524	621	355	513
b. Ciment, Chaux CAT - Cement - Lime	1071	1651	1463	1713
c. Chaux Potinville - Lime	308	328	328	347
d. Plâtre - Plaster	537	570	840	973
e. Carreaux Mosiques - Mosiac Tiles	498	497	547	700
f. Céramique Rouge - Bricks	483	486	486	487
g. Carreaux de Faïence - Tiles	-	-	-	-
h. Prod. Sanitaires, etc.	-	-	-	-
i. Verre - Glass	-	-	-	-
j. Marbre - Marble	974	977	976	974

VALUE ADDED PER MAN - CONSTANT PRICES - IN DINARS

TABLE A.3

Page 2

	1965	1966	1967	1968	1969	1970	1971
1.	611	743	558	633	510	472	473
a.	632	794	565	653	545	428	446
b.	753	837	622	685	691	575	712
c.	311	353	348	385	513	470	347
d.	2168	1910	1529	1543	1101	1503	2067
2.	1609	2288	3897	4750	5260	6346	6231
a.	2416	5772	14781	18348	21375	33557	30746
b.	7289	8247	7645	8041	7289	7931	1634
c.	-	4585	17784	22215	27614	55681	44992
d.	1416	1505	1700	1937	2036	2350	2596
3.	750	704	707	686	736	700	761
4.	919	851	859	820	887	851	929
5.	1271	1097	1029	1022	1128	1040	1195
6.	1288	1012	1015	935	1014	1013	1046
a.	238	265	278	294	385	358	342
b.	559	541	572	342	534	582	619
c.	495	580	529	555	555	552	555
d.	4806	4914	4469	4713	3475	5442	5328
e.	(3991)	(4436)	(4283)	(4691)	(2548)	(4606)	(5274)
f.	(9089)	(9667)	(6739)	(5239)	(12256)	(14837)	(13907)
g.	969	2039	1187	1286	1367	1236	1401
h.	2391	1779	1368	1090	938	913	1122
i.	1579	1810	1750	1782	1595	1614	1614
j.	810	1003	998	979	1009	1012	1004
7.	738	923	905	962	967	950	1053
a.	431	805	532	1180	1259	1013	1214
b.	1140	1189	1171	1468	1179	1211	1042
c.	361	373	373	531	541	660	665
d.	670	1071	703	1007	1094	1218	973
e.	749	869	813	722	764	773	845
f.	487	570	570	586	718	833	835
g.	-	-	1290	1960	1979	1663	1455
h.	-	-	1425	1210	973	774	1024
i.	-	962	1498	1570	788	1351	1300
j.	974	976	1357	1218	1104	617	506

VALEUR AJOUTEE PAR EMPLOI - PRIX CONSTANTS - EN DOLLARS

TABLEAU A.3

PAGE 3

	1961	1962	1963	1964
8. <u>IME - MECHANICAL AND ELECTRIC.</u>	979	1105	997	785
a. Sidérurgie - Iron and Steel	-	-	-	-
b. Montage Auto - Auto Assembly	-	-	2490	1980
c. Montage Télé Radio - Radio Assembly	-	-	250	657
d. Plomb Métal.- Lead Smelting	923	697	669	948
e. Articles de Fondérie - Foundry Articles	916	867	866	932
f. Charpentes, Chaudron.- Scaffolding	805	851	661	583
g. Tubes en Fer - Iron Pipes	-	-	-	-
h. Emball. Métal.- Metal Containers	1687	1762	1690	1677
i. App. de Chauffage - Heating Apparatus	-	-	-	-
j. Outils, Equip. Agric. - Agr. Tools	232	220	268	345
k. Volets, Grillages - Grillwork, etc.	471	353	353	176
l. Lames - Razor Blades	-	-	-	400
m. Clouteries - Nails, Screws	414	483	448	529
n. Electrodes, Bougies, Accumulateurs	1633	2240	2231	2038
o. Autres Art. en Fer - Other Iron Prod.	750	978	574	596
p. Moteurs à Piston - Piston Motors	-	-	-	-
q. Moteurs Electr. - Electr. Motors	-	-	-	-
r. Ouvr. en Plomb - Lead Articles	467	833	788	1195
s. Ouvr. en Alum. - Alum. Prod.	824	840	775	828
t. Fils, Câbles Electr. Tél, - Cables	-	1519	1536	1526
u. Construction Navale - Ship Building	1157	971	986	231
9. <u>CHIMIE, CAOUTCHOUC - CHEMICALS, RUBBER</u>	863	1202	1223	1199
a. Engrais - Fertilizers	773	1455	1414	1559
b. Soufre Raffiné - Ref. Sulfur	1200	750	916	1375
c. Produits Pharmac. - Pharmaceuticals	-	-	1400	468
d. Peintures, Vernis - Paints, etc.	1731	1891	1757	1791
e. Colle - Paste	-	-	-	-
f. Pneumatiques - Tires	-	-	-	-
g. Détergents	614	1198	1100	1295
h. Huile de Lin - Linseed Oil	488	742	905	1692
i. Explosifs - Explosives	1454	1515	1234	1257
j. Huiles Essentielles - Essent. Oils	469	469	467	466
10. <u>TEXTILES, CUIR - TEXT. LEATHER</u> <u>(INDUSTRIELLES)</u>	407	448	439	378

VALUE ADDED PER MAN - CONSTANT PRICES - IN DINARS

TABLE A.3

Page 4

	1965	1966	1967	1968	1969	1970	1971
8.	680	592	894	750	852	842	868
a.	-	235	947	224	1183	774	705
b.	1364	1031	1847	1893	1460	1554	1406
c.	978	1359	1582	1655	1264	1438	1465
d.	1631	1348	677	629	840	578	734
e.	766	613	827	879	443	592	525
f.	1013	802	988	947	840	797	834
g.	-	-	-	900	800	779	809
h.	1442	1332	1309	1054	1385	1269	1381
i.	-	1273	1250	1195	1426	1033	870
j.	286	304	286	326	391	481	514
k.	147	176	775	822	1091	717	790
l.	433	500	1275	1534	1435	2826	1603
m.	472	486	595	1079	659	761	702
n.	973	853	1705	1787	1466	1529	1558
o.	667	- 60	412	618	241	688	563
p.	243	586	1929	952	43	1755	1344
q.	-	-	688	829	604	910	981
r.	872	1073	2805	3310	4778	2468	2872
s.	756	787	946	833	881	623	780
t.	1509	1304	818	1077	1220	1135	1380
u.	325	361	208	242	231	335	444
9.	1587	1078	1298	1660	1343	1376	1508
a.	2248	3264	1653	2350	1822	1569	1878
b.	542	1778	1657	1583	3091	2545	2333
c.	263	516	668	636	693	666	606
d.	1754	1882	1787	1564	1834	2133	1596
e.	-	-	659	1244	1659	1651	1346
f.	-	-	1086	2842	3451	2898	2751
g.	1236	1557	1853	1639	1653	1798	2000
h.	1391	1176	1386	1688	1400	947	1167
i.	1854	2134	2138	1888	1556	1704	1150
j.	468	467	466	467	424	435	454
0.	418	544	563	346	510	490	564

VALEUR AJOUTEE PAR EMPLOI - PRIX CONSTANTS - EN DINARS

TABLEAU A.3

PAGE 5

	1961	1962	1963	1964
a. Sogitex	253	154	226	160
b. Autres Filature, Tissage - Other Spinning Weaving	252	206	275	405
c. Autres Confections - Other Clothing	339	499	453	412
d. Bonneterie - Hosiery, Knitwear	559	557	550	528
e. Cuir, Chausseurs - Leather, Shoes	497	522	542	520
11. MEUBLES, BOIS, LIEGE, - FURNITURE, ETC.	565	555	590	582
a. Menuiserie p. Bâtiment - Building Parts	343	339	284	307
b. Meubles en Bois - Wood Furniture	444	458	464	598
c. Emballages en Bois - Wooden Packing	500	595	581	798
d. Liège - Cork	504	608	1044	559
e. Meubles Métalliques - Metal Furniture	1046	903	916	896
f. Panneaux Particules - Particle Board	-	-	-	-
12. PAPIER, IMPRIMERIE - PAPER, PRINTING	786	831	670	761
a. Imprimeries - Printing	752	765	602	707
b. Pâte à Papier - Pulp	-	-	193	520
c. Papier d'Emballage - Packing Paper	555	546	509	518
d. Emballage de Papier - Paper Packing Material	1121	1312	1582	1570
e. Papier d'Impression - Printing Paper	-	-	-	-
f. Autres Papiers - Other Paper	318	304	292	511
13. INDUSTRIES DIVERSES- MISCEL. INDUSTRIES	553	566	478	723
a. Ouvrages en Plastiques - Plastic Goods	568	672	542	520
b. Autres - Others	320	320	320	480
14. SERVICES NON-ADMIN. - NON GOVERNMENT SERV.	1307	1318	1279	1276
15. TRANSPORT (MOINS - LESS TRAPSA)	957	959	1110	1081
a. Chemins de Fer - Railways	976	1008	1205	1224
b. Transp. Routiers - Road Transport.	935	895	962	938
c. Transport Aérien - Air Transport	4100	4655	4766	6319
d. Services Maritimes - Ocean Transport	1187	1209	1083	1260
e. P.T.T.	620	589	562	609
16. TOURISME - TOURISM	1709	2484	2090	1881

VALUE ADDED PER MAN - CONSTANT PRICES - IN DINARS

TABLE A.3

Page 6

	1965	1966	1967	1968	1969	1970	1971
a.	220	819	1083	296	871	705	772
b.	536	505	368	362	378	428	625
c.	400	412	369	333	313	335	382
d.	453	422	311	271	352	357	380
e.	526	518	538	538	601	630	620
11.	563	568	467	522	554	572	620
a.	306	258	279	281	286	329	402
b.	542	479	384	486	439	521	501
c.	821	846	854	489	529	667	1045
d.	672	607	348	566	481	542	677
e.	690	1071	864	737	829	641	628
f.	-	-	-	1539	3878	3206	2758
12.	731	796	862	908	800	1002	797
a.	665	697	866	862	939	1009	960
b.	737	894	845	1009	258	1045	702
c.	553	580	670	918	1059	1009	1025
d.	1214	1277	1209	1073	1286	1261	1469
e.	-	-	-	-	-	402	-1256
f.	441	451	455	846	941	1370	1679
13.	710	721	691	945	1316	1186	984
a.	789	720	705	1137	1564	1424	1254
b.	538	652	670	680	794	792	565
14.	1224	1238	1229	1237	1208	1199	1177
15.	917	1150	1070	1031	1007	1040	1092
a.	1260	1378	1270	1020	852	942	977
b.	919	966	864	877	845	816	822
c.	5139	5006	3489	3499	3842	3841	3221
d.	1138	1278	1423	1298	1508	1618	1887
e.	613	717	671	764	688	790	876
16.	2184	1736	1867	2170	1858	1785	2270

TABLEAU A.4 - TABLE A.4

Investissements 1960-1970; PIB 1961 et 1971, Emploi 1961 et 1971, Prix Constants, Secteurs Productifs
 Investments 1960-1970; GDP 1961 and 1971 Employment 1961 and 1971, Constant Prices, Productive Sectors
 Coefficients de Capital -- Capital- Output Ratio

Secteur Sector	Investissements Investments		GDP - PIB				Emploi - Employment				
	MD	%	1961 MD	%	1971 MD	%	1961 000's	%	1971 000's	%	C/O
<u>AGRICULTURE</u>	261.6	25.7	75.9	24.8	115.1	22.0	261.4	57.8	331.0	49.1	6.7
<u>INDUSTRIES - INDUSTRY</u>	349.6	34.3	75.9	24.8	157.8	30.1	93.8	20.7	164.5	24.4	4.3
Mines - Mining	31.7	3.1	7.6	2.5	8.8	1.8	12.5	2.8	18.6	2.8	26.4
Energie - Energy	162.7	16.0	4.0	1.3	38.0	7.2	3.7	0.8	6.1	0.9	4.8
Indust. Manufact - Manufacturing	155.2	15.2	30.9	10.1	61.8	11.8	38.0	8.4	81.2	12.0	5.0
<u>CONSTRUCTIONS</u>	- (a)		33.4	10.9	49.3	9.4	39.5	8.7	58.6	8.7	
Services Prod. *	240.7	23.6	112.1	36.7	203.0	38.8	97.1	21.5	179.3	26.6	2.6
<u>PROD. SERVICES</u>											
Transport	138.9	13.6	25.2	8.2	45.0	8.6	17.9	4.0	31.2	4.6	7.0
Tourisme - Tourism	92.5	9.1	1.8	0.6	26.2	5.0	1.1	0.2	11.5	1.7	3.8
<u>LOYER - HOUSING</u>	167.0	16.4	41.7	13.6	48.3	9.2					(25.3)
T O T A L	1018.9	100.0	305.6	99.6	524.2	100.1	455.1	100.0	674.8	100.1	8.0

* Sans loyer et services domestiques - Without housing and domestic services

(a) Le Bâtiment est considéré comme produit intermédiaire. L'investissement dans l'industrie "Bâtiment" dans tous les pays est insignifiant.

(a) The Tunisian national accounts treat construction essentially as an intermediate good; all its output becomes investment. In fact, investment in the construction industry in all countries has been small in the past.

Detail may not add to 100% because of rounding.

TABLEAU - TABLE A.5

Coefficients de Capital Sectorielles - Sectoral Capital-Output Ratios

	Investisse- ments	Accroissem. PIB	C/O		Investisse- ments	Accroissem. PIB	C/O
	Investments 1960 - 1970 MD	Increase in GDP 1961 - 1971 MD			Investments 1960 - 1970 MD	Increase in GDP 1961 - 1971 MD	
<u>MINES - MINING</u>	31.7	1.2	26.4				
<u>ENERGIE - ENERGY</u>	162.7	34.0	4.8				
Pétrole - Petroleum	106.0	24.0	4.4				
Autres Energie- Others	56.7	9.9	5.7				
<u>MANUFACTURING</u>	155.2	31.1	5.0				
1. IAA - Food Indust.	27.6	3.8	7.3	6. Bois, Liège			
STS	7.6	1.1	6.9	Meubles -			
2. MCCV - Const. Mat.	17.9	4.0	4.5	Wood, Cork,	3.0	1.6	1.9
Ciment - Cement	5.9	0.6	9.8	Furniture			
Céram. Rouge - Bricks	3.6	0.9	4.0	So. Nat. de			
3. IME - Mechan. Elect.	42.0	5.4	7.8	Liège - Cork	.3	0.3	1.0
AMS	2.7	.2	13.5	SKANES	.4		
STIA	2.1	0.7	3.0	Autres - Others	2.7	1.1	2.8
EL FOULADH	31.3	1.1	28.5	7. Papier, Imprim.			
4. Prod. Chimiques - Chemicals	12.3	5.1	2.4	Divers - Paper	20.3	2.1	9.7
SIAPE	3.2	1.9	1.7	Printing, Misc.			
ICM	3.6	-	-	SNC	7.7	0.2	38.5
NPK	3.5	1.0 ¹	3.5	SOTUPALFA	6.6	.	.
Autres Priv. - Other Priv.	1.7			8. Transport. PTT	138.9	19.8	7.0
5. Textiles, etc.	32.1	8.9	3.6	SNCFT+STEG(RY)	13.3	1.7	7.8
SOGITEX	20.3	3.3	6.2	Tunis Air	9.6	1.9	5.1
ONA	4.6	1.3	3.5	PTT	13.9	2.1	6.6
Autres Tex. - Other Tex.	7.2	4.3	1.7	9. Tourisme - Tourism	80.9	24.4	3.3
				10. Autres, Commerce - Others, Trade	22.3	46.7	.48

NOTES: Investissements estimés en Prix Constants -
Investments estimated in Constant Prices

¹ PIB 1971 - PIB 1964
GDP 1971 - GDP 1964

TABLEAU - TABLE A.6

Investissement 1960-1970, Prix Courants; Valeur Ajoutée 1961, 1971, Prix Constants,
Emploi, 1961, 1971, par Secteur Public et Privé, Industries Manufacturières
Investments, 1960-1970, Current Prices; Value Added 1961, 1971, Constant Prices,
Employment, 1961, 1971, by Public and Private Sector, Manufacturing Industries

	Investissements - Investments 1960 - 1970 000 D.			Valeur Ajoutée - Value Added 1961 1971 000 D. 000 D.						Emploi - Employment 1961 1971					
	TOTAL	PUBL.	PRIV.	TOTAL	PUBL.	PRIV.	TOTAL	PUBL.	PRIV.	TOTAL	PUBL.	PRIV.	TOTAL	PUBL.	PRIV.
1. I.A.A. - Food	25142	20504	4638	11604	877	10727	18098	3751	14347	13322	963	12359	17300	1794	15506
2. MCCV - Bldg. Mat.	13011	16958	1053	1892	1678	214	5913	5296	617	2797	2307	490	5617	4829	788
3. IME - Mech. Elec.	40053	35788	4265	1568	322	1246	6924	2962	3962	1601	340	1261	7980	4705	3275
4. Chimiques - Chemicals	12459	7673	4786	1801	924	877	6127	3122	3005	2086	1134	952	4063	1961	2102
5. Textiles, Cuir, Chaussures - Text. Leather, Shoes	27416	20111	7305	1266	40	1226	8831	3334	5497	3108	158	2950	15635	4319	11316
6. Bois, Liège, Meubl. Wood, Cork, Furn.	2305	659	1646	690	133	557	2320	869	1451	1222	250	972	3740	1016	2724
7. Papier, Impr. - Paper, Printing	16384	14395	1989	845	119	726	2853	604	2249	1075	93	982	3365	1387	1978
8. Divers - Misc.	1393	-	1393	146	-	146	1205	-	1205	264	-	264	1225	-	1225
TOTAL	143163	116088	27075	19812	4093	15719	52271	19938	32333	25475	5245	20230	58925	20011	38914

- NOTES:** 1. IAA sauf huile d'olive - Food without olive oil
4. Emploi sans ICM - Employment without ICM
5. Industrielles seulement - Industries only
6. Valeur Ajoutée Publique : Emploi Publique : Toute l'industrie de liège
Value Added Public : Employment Public : all cork industries
7. Valeur Ajoutée et Emploi de l'Imprimerie Officielle et de STD inclus avec Secteur Privé
Value Added and Employment of Printing Official plus STD, Private Sector included.

TABLEAU - TABLE A.7

Le Secteur Public dans les Industries Manufacturières. Valeur Ajoutée par Emploi
 Importance of Public Sectors in Investments, Value Added and Employment, Manufacturing Industries Only

	Investissements	Valeur Ajoutée		Emploi	
	Investments % Public 1960 -1970	1961	1971	1961	1971
1. IAA - Food	81.6	7.6	20.7	7.2	10.4
2. MCCV - Building Materials	94.2	88.7	89.6	82.5	86.0
3. ME - Mech. Elect. Indust.	83.3	20.5	42.8	21.2	59.0
4. Ind. Chimiques, Caoutchouc - Chemicals, Rubber	67.5	51.3	51.0	54.4	53.6
5. Textiles, Cuir - Textiles, Leather	73.4	3.2	37.8	5.1	27.6
6. Bois, Liège, Meubles - Wood, Cork, Furniture	28.6	19.3	37.5	20.5	27.2
7. Papier, Imprimeries - Paper, Printing	87.9	14.1	21.2	8.7	41.2
8. Divers - Miscellaneous	0	-	-	-	-
TOTAL	81.1	20.7	38.1	20.6	34.0

TABLEAU - TABLE A.8

Industries Manufacturières, Distribution des Investissements, Valeur Ajoutée
 Emploi par Secteur Publique et Privé, Prix Constants -
 Percentage Distribution, Investments, Current Prices, 1960-1970; Value Added 1961, 1971
 Constant Prices, Employment 1961, 1971 by Public and Private Sector, Manufacturing Only

	Investissements Investments 1960-1970			Valeur Ajoutée - Value Added						Emploi - Employment					
	TOTAL	PUBL.	PRIV.	1961		1971		1961		1971		TOTAL	PUBL.	PRIV.	
1. IAA - Food	17.6	17.7	17.1	58.6	21.4	68.2	34.6	18.8	44.4	52.3	18.4	61.1	29.4	9.0	39.8
2. MCCV - Bldg. Mat.	12.6	14.6	3.9	9.5	41.0	1.4	11.3	26.6	1.9	11.0	44.0	2.4	9.5	24.1	2.0
3. IME - Mech. Elect.	28.0	30.8	15.8	7.9	7.9	7.9	13.2	14.9	12.6	6.3	6.5	6.2	13.5	23.5	8.4
4. Ind. Chimiques - Chem., Rubber	8.7	6.6	17.7	9.1	22.6	5.6	11.7	15.7	9.3	8.2	21.6	4.7	6.9	9.8	5.4
5. Textiles, Cuir- Textiles, Leather	19.2	17.3	27.0	6.4	1.0	7.8	16.9	16.7	17.0	12.2	3.0	14.6	26.5	21.6	29.1
6. Bois, Liège, Meubl. Wood, Cork, Furn.	1.6	.6	6.1	3.5	3.2	3.5	4.4	4.4	4.5	4.8	4.8	4.8	6.3	5.1	7.0
7. Papier, Imprimerie Paper, Printing	11.4	12.4	7.3	4.3	2.9	4.6	5.5	3.0	7.0	4.2	1.8	4.9	5.7	6.9	5.1
8. Divers - Misc.	0.9	0	5.1	.7	-	0.9	2.3	-	3.7	1.0	-	1.3	2.1	-	3.1
TOTAL	100.0	100.0	100.0	100.0	100.0	99.9	99.9	100.0	100.1	100.0	100.1	100.0	99.9	100.0	99.9

NOTES: 1. Ligne : IAA sans huile d'olive
 Row 1 : Without olive oil

4. Ligne : Emploi sans ICM
 Row 4 : Employment without ICM

5. Ligne : Production Industrielle Seulement (sans tapis)
 Row 5 : Only industrial production (without carpets)

Detail may not add to 100% because of rounding.

TABLEAU - TABLE A.9 (page 1)

Investissements, 1960-1970, Prix Courants, Valeur Ajoutée, 1961, 1971, Prix Constants
 Emploi, 1961, 1971, Industries Manufacturières, par Secteur Publique et Privé, Par
 Branche et par Entreprises Publiques
 Investments, 1960-1970, Current Prices, Value Added, 1961, 1971, Constant Prices
 Employment, 1961, 1971,

1.000 D

	Investissements Investments 1960 - 1970			Valeur Ajoutée - Value Added						Emploi - Employment					
	TOTAL	PUBL.	PRIV.	1961			1971			1961			1971		
	TOTAL	PUBL.	PRIV.	TOTAL	PUBL.	PRIV.	TOTAL	PUBL.	PRIV.	TOTAL	PUBL.	PRIV.	TOTAL	PUBL.	PRIV.
1. I.A.A. - Food	25142	20504	4638	11604	877	10727	18098	3751	14347	13322	963	12359	17300	1794	15506
(a) STIL		3175			62			521			131			372	
(b) STS		5682			-			2226			49			422	
(c) RNTA		2848			815			1004			783			1000	
2. MCCV - Bldg. Mat.	18011	16958	1053	1892	1678	214	5913	5296	617	2797	2307	490	5617	4829	788
(a) CAT/CPB		5729			676			1481			746			1345	
(b) Autres Ciment Prod. -		809			419			1467			513			945	
(c) Faïence		642			-			291			-			200	
(d) Céram. Rouge - Bricks		5611			321			1253			664			1500	
(e) Sanitaires - Sanitary		1741			-			253			-			211	
(f) Verre - Glass		1518			-			299			-			230	
(g) Mosaïques		278			94			73			204			119	
(h) Marble - Marbre		627			(152)			(132)			(150)			231	
(i) Plâtre - Plaster		3			16			47			30			48	

TABLEAU - TABLE A.9 (page 2)

	Investissements Investments 1960 - 1970			Valeur Ajoutée - Value Added						Emploi - Employment					
	TOTAL	PUBL.	PRIV.	1961			1971			1961			1971		
	TOTAL	PUBL.	PRIV.	TOTAL	PUBL.	PRIV.	TOTAL	PUBL.	PRIV.	TOTAL	PUBL.	PRIV.	TOTAL	PUBL.	PRIV.
3. <u>IME - Mech. Elect. Indus.</u>	40053	35788	4265	1568	322	1246	6924	2962	3962	1601	340	1261	7980	4705	3275
(a) AMS		2283			-			174			-			572	
(b) EL FOULADH		30301			-			1133			-			1608	
(c) STIA		1972			36			799			30			554	
(d) SOCOMENA		244			-			216			-			698	
(e) SOFOMECA		217			-			179			-			447	
(f) SACEM		177			-			102			-			104	
(g) EL ATHIR		69			-			292			-			216	
(h) SOTACER		78			-			67			-			77	
(i) PENAROYA		246			286			315			310			429	
4. <u>INDUSTRIES CHIMIQUES</u>	12459	7673	4786	1801	924	877	6127	3122	3005	2086	1134	952	4063	1961	2102
(a) SIAPE		2844			382			2166			570			650	
(b) ICM		3466			-			-			-			(217)	
(c) Autres Engrais		84			469			383			466			505	
(d) Souffre Raffin.		131			36			49			30			21	
(e) SOTEMU		173			87			96			68			79	
(f) Pharmacie Centrale		975			-			428			-			706	
(g) NPK			(2835)		-				951		-				492
(h) FIRESTONE			(931)		-				498		-				181
(i) Autres Privés			(1020)			877			1556			952			1429

TABLEAU - TABLE A.9 (page 3)

	Investissements Investments 1960 - 1970			Valeur Ajoutée - Value Added						Emploi - Employment					
	TOTAL	PUBL.	PRIV.	1961		1971				1961		1971			
	TOTAL	PUBL.	PRIV.	TOTAL	PUBL.	PRIV.	TOTAL	PUBL.	PRIV.	TOTAL	PUBL.	PRIV.	TOTAL	PUBL.	PRIV.
5. <u>TEXTILES, CUIR, CHAUSSURES</u>	31425	24120	7305							10177			31827		
<u>Text. Industriel</u>	27416	20111	7305	1266	40	1226	8831	3334	5497	3108	158	2950	15635	4319	11316
(a) SOGITEX		19907			40			3334			158			4319	
(b) Autres			7305			1226			5497			2950			11316
(c) ONA	(4009)	(4009)	-												
6. <u>BCIS, LIÈGE, MEUBL.</u>	2305	659	1646	690	133	557	2320	699	1631	1222	250	972	3740	1063	2677
(a) Liège - Cork		297			133			419			250			619	
(b) SKANES		362						270						444	
(c) Autres			1646			557			1631						2677
7. <u>PAPIER, IMPRIM.</u>	16384	14395	1989	845	119	726	2853	604	2249	1075	93	982	3579	1387	2192
(a) SNC		6173			-			470			-			617	
(b) SOTUPALFA		6182		-	-			-			-			-	
(c) IMPRIM. OFF.		452			119			267			93			225	
(d) STD		1573						-							
(e) Autres			1989			726		-133*	2249			982		545	2192
8. <u>IND. DIVERS</u>	1393	-	1393	146	-	146	1205	-	1205	264	-	264	1225	-	1225

NOTES: *Papier d'Impression -383
 SIL +250
 -133

TABLEAU - TABLE A.10-A

Coefficients de Capital Ratios, Capital-Emploi et Production-Emploi, par Secteur Publique et Privé

Capital-Output Ratios, Capital-Labor Ratios, and Output-Labor Ratios by Public and Private Sector

Capital : Prix Courants - Current Prices; Production : Prix Constants;

Output : Constant Prices

A. Coefficient de Capital - Capital-Output Ratios

	Investissements		C/O
	Investments 1960 - 1970 MD	Change in VA 1971 - 1961 MD	
1. IAA - Food TOTAL	25.142	6.494	3.9
Public	20.504	2.874	7.1
Private	4.638	3.620	1.3
2. MCCV - TOTAL Bldg. Material	18.011	4.021	4.47
Public	16.958	3.618	4.68
Private	1.053	.403	2.61
3. IME - TOTAL Mech. Elect. Indust.	40.053	5.356	7.48
Public	25.788	2.640	13.6
Private	4.265	2.716	1.6
4a. CHEM. TOTAL	12.459	4.326	2.9
Public	7.673	2.198	3.5
Private	4.786	2.128	2.2
4b. CHEM. less, moins ICM	8.993	4.326	2.1
Public	4.207	2.198	1.9
5. TEXTILES TOTAL	27.416	7.565	3.6
Public	20.111	3.294	6.1
Private	7.305	4.271	1.7
6. Bois, Liège, Meubles - Wood, Cork, Furniture	2.305	1.630	1.4
Public	.659	.736	0.9
Private	1.646	.894	1.8
7. Papier, Imprim. - Paper, Printing	16.384	2.008	8.2
Public	14.395	.485	29.7
Private	1.989	1.523	1.3
8. DIVERS (Private)	1.393	1.059	1.3
9. TOTAL	143.163	32.459	4.41
PUBLIC	116.088	15.845	7.33
PRIVATE	27.075	16.614	1.63

TABLEAU - TABLE A.10-B

B. Capital-Emploi - Capital-Labor Ratios

	Invest. 1960-70 MD	1971 E	Change 1971-61 E	C/ΔE D
1. IAA - FOOD	25.142	17300	3978	6320
Public	20.504	1794	831	24674
Private	4.638	15508	3147	1474
2. MCCV - Bldg. Material	18.011	5617	2820	6387
Public	16.958	4829	2552	6645
Private	1.053	788	298	3534
3. IME - Mech. Elect. Ind.	40.053	7980	6379	6279
Public	35.788	4705	4365	8199
Private	4.265	3275	2014	2118
4. CHEMICALS	8.993*	4063	1977	4549
Public	4.207*	1961	827	5087
Private	4.786	2102	1150	4162
5. TEXTILES AND SHOES (without carpets)	27.416	15635	12527	2189
Public	20.111	4319	4161	4833
Private	7.305	11316	8366	873
6. WOOD	2.305	3740	2518	915
Public	.659	1016	766	860
Private	1.646	2724	1752	939
7. PAPER	16.384	3365	1290	7155
Public	14.395	1387	1294	11124
Private	1.989	1978	996	1977
8. DIVERS (Private)	1.393	1225	961	1450
9. TOTAL	139.697*	58925	33450	4176
PUBLIC	112.622	20011	14766	7627
PRIVATE	27.075	38914	18684	1449

NOTES: *Sans ICM - Without ICM

TABLEAU - TABLE A.10-C

C. Produit par Emploi - Output-Labor Ratios

	1961 D	1971 D	1971 as % of 1961
1. IAA - FOOD	871	1046	120
Public	911	2091	230
Private	868	925	107
2. MCCV - Bldg. Materials	676	1053	156
Public	725	1097	151
Private	437	783	179
3. IME - Mech. Elect. Indus.	979	868	89
Public	947	412	44
Private	988	1209	122
4. CHEMICALS	863	1508	175
Public	815	1592	194
Private	921	1430	155
5. TEXTILES	407	565	139
Public	253	772	305
Private	416	486	117
6. Bois, Liège, Meubles - Wood, Cork, Furniture	565	620	110
Public	532	855	161
Private	573	533	93
7. Papier, Imprim. - Paper, Printing	786	848	108
Public	1280	435	340
Private	739	1137	154
8. DIVERS - Miscellaneous	553	984	178
9. TOTAL	778	887	114
PUBLIC	780	996	128
PRIVATE	777	831	107

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