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10 Alternative Trade Policies and Employment in Tunisia

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Tunisia is a relatively small North African country that gained independence from France in 1956.[1] Since independence, it has had two distinct phases in its trade policies. In the 1960s it followed a clear import substitution policy that, while resulting in a significant degree of industrial development, contributed little to employment generation. In the 1970s it has reversed its policy direction, liberalizing trade and providing some support for exports with the explicit goal of increasing employment opportunities. These two phases of trade policies, coupled with a trade pattern oriented almost exclusively toward Europe, make Tunisia a relatively uncomplicated and interesting case study of the relationships between trade strategies and employment.

The focal year for my analysis is 1972. The reasons for this choice are two. The first is data availability, especially the existence of an input-output (I-O) table and a census of manufactures allowing us to estimate factor requirements of trade.[2] The second is that 1972 is a transition year between the import substitution and export promotion policies. As described below, the trade regime begins to change in 1969, and by mid-1972 policies promoting exports were instituted. However, at the time this study was undertaken, relevant data for a careful appraisal of the export promotion policies were not available. My results must there-

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fore be viewed as providing a picture of factor proportions under an import substitution regime, with only a glimpse at the sort of potential that export promotion may have.

10.1 Overview of the Tunisian Economy

10.1.1 Growth and Structure

At independence, Tunisia had all the characteristics of a colonial, less developed country. Gross domestic product (GDP) per capita was 70 dinars (1957 prices), or U.S. $170.[3] Agriculture was the predominant activity, employing the bulk (57 percent) of the labor force and generating one-third of GDP. Agriculture had a dualistic structure: modern, highly productive agriculture remained in the hands of the colonials, while traditional agriculture, carried out on less fertile land, occupied most of the Tunisian population. Manufacturing (mainly food processing) was relatively unimportant. It employed about 8 percent of the labor force and generated less than 2 percent of GDP. The economy was open, with the ratio of imports to GDP varying around 30 percent. Trade was centered upon France, the former colonial power, which provided three-fourths of its imports and absorbed slightly more than half of its exports. The major exports were minerals (of which phosphates made up half), wines, and olive oil.

Economic policy in the early years of independence (1956–61) was characterized by a laissez-faire, noninterventionist approach. Real GDP increased at an irregular and moderate rate, with an annual average of 3.7 percent or 1.6 percent per capita. This slow rate of growth, coupled with a rapid deceleration of capital accumulation and an acceleration in population growth,[4] motivated a policy shift in 1961. Centralized economic planning was adopted as a basic framework for conducting economic policy, and a ten-year perspective plan and a three-year medium-term plan[5] were introduced. A major aim of economic policy became the reduction of Tunisia's economic dependence upon foreign conditions; this was to be accomplished primarily by promoting import substitution activities. Accompanying these changes was an increase in the government's role in the economy. Most economic activities became, directly or indirectly, regulated by the government. These policies were in turn abruptly abandoned in September 1969 after the emergence of strong resistance to the extension of the cooperative system of agriculture. The new policy that has evolved since 1970 places more reliance upon the market system and attempts to minimize the direct role of government, which remains, however, the main economic agent and still controls most economic activity.

Table 10.1 gives values for total and per capita GNP and industrial output for selected years since 1961. For the periods 1962–65, 1966–69

Table 10.1 Selected Economic Indicators, 1961–75

Year	Real GNP (Millions of Dinars)[a]	Real Industrial Output[b] (Millions of Dinars)[a]	Population (Thousands)	Real GNP per Capita (Dinars)[a]
1961	425.9	67.7	3,970	107.3
1965	521.5	86.4	4,438	117.5
1969	610.5	116.0	4,867	125.4
1972	883.4	151.6	5,216	169.4
1975	1,079.0	199.8	5,577	193.5

Sources: Real GNP and real industrial output: Ministry of Planning, unpublished sources; population: author's estimates based upon interpolation of results of 1956, 1966, and 1975 censuses.

[a]In 1966 dinars.

[b]Industry includes food processing (except olive oil, wines, and several other small activities), utilities, manufacturing (except petroleum refinery), mining (except crude oil), and construction.

and 1970–75, the growth rates of real GNP averaged 5.2, 4.1 and 10.1 percent. The slowdown in the growth rate from 1961 to 1969 and its acceleration again after 1970 are explained to a large extent by the behavior of agricultural output, which was affected by a series of drought years in 1966–68 and good rainfall afterward. Industrial output grew more steadily, with average rates of 6.3, 7.8, and 9.6 percent for the respective three periods. Annual per capita GNP growth rates for the same periods were 3.0, 1.7, and 7.6 percent. From 1961 to 1975, real GNP per capita increased by about 80 percent and reached 194 dinars, or about U.S. $460, in 1975.

Significant changes in the structure of economic activity accompanied this growth. The average share of agriculture and food processing in GDP decreased from 27.5 percent in 1962–65 to 22.2 percent in 1966–69 and 23.0 percent in 1970–75. The share of manufacturing in GNP rose from 3.4 percent to 5.3 and 6.2 percent, respectively. The new industries of tourism and petroleum became significant, with shares about 3.5 percent each in the early 1970s.

These structural changes in the Tunisian economy were due in part to the major role played by the government in increasing the rate of capital accumulation. Direct investment by government, including social overhead and other direct investment in agriculture, transportation, and services, constituted about 36–40 percent of total investment during 1961–69 but declined after the policy shift of 1970 to 19 percent in 1973 and 1975. In addition to direct government investment, investment by public firms, which in 1961 accounted for 22 percent of total gross fixed capital formation, rose to 46 percent in 1965 but declined afterward. The share of investment undertaken by private firms and households declined from 37 percent in 1961 to 17 percent in 1965 but has

been increasing since and reached 50 percent in 1973 and 47 percent in 1975. This direct control by the government allowed it to determine, to a large extent, the sectoral allocation of investment. Emphasis was placed during the 1960s on the development of infrastructure and social overhead. Investment in manufacturing also increased considerably, reaching more than 19 percent of total investment in 1965 when some major projects were being carried out in the metallurgy and mechanical industries.

Money stock growth was moderate in Tunisia by other developing countries' standards. Money stock M1 increased at a compound annual rate of 7.5 percent between 1960 and 1970 and accelerated to 21.3 percent for 1970–75, while the figures for M2 were 9.7 percent and 21.6 percent, respectively. Major reasons for the acceleration of money growth after 1970 are an acceleration of real GNP growth on the demand side and substantial increases in foreign reserves on the supply side. The Central Bank has almost complete control over the money stock, essentially through the discount window and quantitative regulation of credit. There is practically no money market, and monetary authorities regulate to a large extent the portfolio of the banks as well as all interest rates.

With respect to fiscal policy, the ratio of taxes to GNP has remained almost constant at about 20 percent during 1960–75. Indirect taxes make up about three-fourths of total taxes (excluding petroleum royalties). Major taxes are a production tax retained by the producer, a consumption tax on "luxury goods," and import taxes. Various taxes on imports including duties were about 50 percent of total indirect taxes in 1975.

The only reliable information on income distribution is on the distribution of expenditure from household surveys. From surveys for 1965–68 and 1975 it appears that the proportion of total expenditure accruing to the poorest 20 percent of the households was 6.3 percent and did not change. However, the proportion accruing to the richest 20 percent was 49.5 percent in 1965–68 and about 43 percent in 1975 (35 percent and 28 percent for the richest decile). These figures show a fairly unequal distribution of expenditure in spite of some improvement during the decade 1965–75. The poorest segment of the population has a very low income compared with the richest: for instance, the expenditure per year per person of the 25 percent poorest is lower than 66 dinars, while that of the 25 percent richest is higher than 210 dinars in 1975 and the average is 147 dinars.

10.1.2 The Trade Regime

During the early independence years, 1956 to 1958, Tunisia remained aligned with the French franc zone, and the colonial system remained

almost entirely in effect, with a formal customs union agreement with France and Algeria. The first step in the emergence of a Tunisian foreign exchange regime was taken in September 1958 with the creation of a Tunisian Central Bank and a national currency (the dinar) pegged to the French franc. Soon after, the French franc was devalued. Tunisia decided not to devalue the dinar for considerations of political sovereignty and in the naive belief that the exceptionally good performance of exports in 1958 would continue. Exchange control was extended to relations with France, and a new tariff code was promulgated with a structure designed to discourage imports of finished and "nonessential" consumer goods. Tariff rates were generally low, averaging less than 10 percent for intermediate goods and equipment, 28 percent for food products, and 20 percent for other consumer goods.

The balance of payments situation worsened after 1958 (see table 10.2). Quantitative restrictions (QRs) were introduced to limit imports while maintaining a fixed exchange rate. The administrative control system depended on the category of the import and its origin.[6]

The trade deficits in the early 1960s resulted from several factors: the de facto revaluation of the dinar with respect to the franc in 1958, a series of bad harvests, and increased imports of capital goods resulting from the ambitious industrialization program that was adopted when planning began in 1961–62. The balance of payments difficulties led naturally to the following reinforcements of foreign exchange control within the existing framework: imposition (in November 1961) of guarantee deposits on imports[7] and of quotas on imports of some products

Table 10.2 **Balance of Payments, 1958–75 (Values in Millions of Current Dinars)**

	1958	1961	1965	1969	1972	1975
Imports	64.9	108.2	168.0	180.3	282.9	629.7
(as percentage of GNP)	(23.3)	(30.6)	(32.5)	(27.2)	(26.4)	(36.2)
Exports of goods and services	64.4	73.2	99.1	149.9	270.6	545.6
Net transfers	8.5	2.3	−10.8	−19.8	− 8.5	− 5.9
Current account balance	37.2	−32.7	−79.7	−50.2	−20.2	−90.0
Long- and medium-term capital flows	−.4	22.0	77.5	59.6	66.5	78.7
Changes in reserves	8.0	− 7.9	− 4.4	9.8	37.7	−11.1
Net gold and foreign exchange reserve holdings	39.0	30.7	− 6.7	− 2.1	92.9	146.2

Source: 1961–75, Ministry of Planning, unpublished national accounts; 1958, IMF *International Financial Statistics.*

from France (in 1962); introduction of a requirement to repatriate exchange receipts from service exports; and reinforcement of administrative restrictions on almost all imports. Despite these measures, balance of payments difficulties persisted, and in 1964 the dinar was devalued by 25 percent,[8] with some measures of liberalization. But liberalization did not proceed very far.

The period 1965–69 was characterized by the development of very tight and comprehensive exchange control. The import controls were part of an increasingly centralized economic system where licensing was the dominant feature along with price controls. The approval of import licenses was also centralized, as all had to be approved by the Direction de Commerce and the Central Bank. This phase ended in 1969–70 with the fall of the government that pursued the increasingly interventionist policies.

The present government economic policy is characterized by greater reliance on markets. New procedures were introduced to encourage imports, and a new tariff code was introduced in 1973.[9] The relaxation of administrative controls led to decreasing quantitative restrictions and elimination of most shortages. It appears that premiums on import licenses have fallen sharply since 1970, especially for food products and consumer manufactures.[10] This liberalization policy, however, did not completely do away with QRs. Imports still have to be licensed, the exchange rate is thought to be overvalued, and balance of payment deficits are chronic.[11]

Until 1972 there were no systematic policies to encourage exports, and currency overvaluation served as a deterrent. A number of ad hoc measures existed in the 1960s to promote exports such as a reduction of one percentage point in the discount rate for export-related commercial paper. The only consistent feature of export policy was the decision to increase domestic processing of primary products previously exported as raw materials (phosphate, lead, and alfa).[12] In 1972 new legislation was enacted to promote exports and to attract direct foreign investment. These new measures provide a number of benefits to export-oriented industries, such as duty-free entry of intermediate and capital goods and various other tax exemptions.

Tunisian authorities have made little use of the exchange rate instrument. With the exception of the 1964 devaluation, changes in the exchange rate came about mostly through effective revaluation of the dinar when foreign currencies were devalued, such as the franc in 1970 and the dollar in 1971. Inflation was relatively mild over the period studied, averaging about 3.8 percent annually from 1961 to 1973 and 11.3 percent from 1974 to 1977. Thus, given the relative stability of the official nominal rate, the price level deflated rate decreased by about 26 percent

between 1965 and 1971 and 46 percent between 1965 and 1974. The purchasing power parity nominal exchange rate (PPP-NER) decreased by 10.7 percent between 1965 and 1971. It increased afterward and in 1974 was slightly higher than the 1965 rate (see table 10.3). During the intensive development of the import control system and the import substitution policy, therefore, the exchange rate increasingly favored importers and penalized exporters.

Moreover, during this period tariff rates and taxes remained stable. Minor changes occurred only in 1973. Therefore, effective exchange rates (EERs) exclusive of premiums on imports essentially reflect changes in the nominal exchange rate. The evolution of EERs for import commodity categories is shown in table 10.3, where no account is taken of QRs in their calculation. For exports, there was little difference between nominal and effective rates, so the PPP-NER can be taken as the export PPP-EER. It is clear that imports fall into two major categories: consumer goods, which have high EERs, and intermediate and capital goods. Effective exchange rates were not calculated for exports, since they have been very close to the official rate.

Table 10.3 Nominal and Effective Exchange Rates, 1961–75

	1961	1965	1969	1972	1975
Official rates					
Dinars per 10 francs	.850	1.063	1.010	.946	.943
Dinars per U.S. dollar	.420	.525	.525	.420	.423
PLD-NER[a]					
Dinar/franc rate	1.024	1.073	.931	.779	.584
PPP-NER[b]					
Dinar/franc rate	.912	1.049	1.005	.965	1.011
EERs[c] (dinars per 10 francs)					
Foodstuffs	1.229	1.537	1.460	1.368	1.345[d]
Consumer manufactures	1.125	1.407	1.337	1.253	1.236[d]
Industrial equipment	.957	1.197	1.137	1.065	1.029[d]
Agricultural equipment	.915	1.144	1.087	1.018	.973[d]
Intermediate products	.962	1.203	1.143	1.071	1.039[d]
Energy products	.952	1.191	1.131	1.060	1.031[d]

Source: Nabli (1978).

[a]Official rate divided by GDP deflator.

[b]PLD-NER multiplied by the wholesale price index of industrial products in France (1966 = 100).

[c]Calculated as $EER_j = OR\ (1 + t_j + t_j \cdot T_j)$, where OR = the official exchange rate; t_j = tariff rate on import category j; T_j = indirect tax rate of import category j. (Indirect taxes are levied on imports valued inclusive of tariffs, and the term $t_j \cdot T$ accounts for differential taxation on imports relative to domestic production.)

[d]Refers to 1974.

10.1.3 International Trade and the Tunisian Economy

As described above, a major aim of economic policy in the 1960s was to reduce the dependence of the Tunisian economy on foreign conditions. This explains the choice of the import substitution policy as a means of reducing imports in the face of uncertain foreign exchange receipts from exports of primary products. However, the massive effort at industrialization and development of infrastructure resulted in a rapid increase of imports, particularly capital and intermediate goods. The economy remained highly open, with imports averaging about 30 percent of GNP, and the current account deficit remained high until 1967, ranging between 10 and 15 percent of GNP. During 1968–73, the import substitution policy and foreign exchange controls had the effect of reducing the ratio of imports to GNP to about 26 percent, but this ratio rose very fast again in 1974 and 1975. The ratio of the current account deficit to GNP, however, dropped significantly—and it seems permanently—to less than 7 percent after 1967.

A sizable part of the investment effort was financed through external borrowing and foreign aid. The foreign capital inflow also served to offset partially the increasing trade deficit, as is evident in table 10.2. Foreign capital inflows were mainly grants and long-to-medium-term official aid loans. Private commercial loans and direct foreign investment were small during most of the period. Despite these capital receipts, the net gold and foreign exchange position deteriorated dramatically from 1961 to 1967, reaching a negative position of 21 million dinars. The reserve situation has improved since then, and export revenue, tourism, and workers' remittances from abroad have increased.

The direction of Tunisia's trade has not changed significantly since independence. About 80 percent of exports are destined for developed countries, mainly France and the EEC, while 85 percent of imports originate in developed countries, again mainly the EEC.

On the other hand, the structure of Tunisia's trade has changed since the introduction of import substitution policies in the early 1960s. As one would expect, the share of manufactured consumer goods and foodstuffs in total imports fell from 50 to 35 percent from 1961 to 1969. Since then, they have stabilized at about 30–32 percent. The relative share of intermediate capital goods rose from 40 to 56 percent of total imports in the same period and has stayed at that level. On the export side, from 1961 to 1975 the share of foodstuffs and minerals (excluding crude oil) fell from about 80 percent to less than 35 percent as industries were developed to process materials previously exported raw. Oil exports became a major foreign-exchange earner in the late sixties and now generate more than one-third of Tunisia's export earnings. The share of manufactured exports increased steadily throughout the period,

with most growth occurring in processed minerals. From 1961 to 1975, the share of manufactured exports including processed minerals in total exports rose from 17 to 21 percent; excluding processed minerals, the share rose from about 4 percent to 11 percent in the same period. However, most of the increase in the share of manufactured exports came after 1971 (in 1971, their share was only 6 percent).

A comparison of export growth rates from 1961 to 1969 and 1970 to 1975 highlights the different emphases of the trade policies in each period. From 1961 to 1969, all exports grew at an annual rate of about 9 percent. If crude oil is excluded, the annual average was about 5 percent; manufactured exports rose from a small base at an annual rate of about 20 percent. Comparable average annual growth rates of exports from 1970 to 1975 were 35 percent (all exports), 28 percent (excluding oil), and 32 percent (manufactures).

Table 10.4 shows the structure of merchandise trade by trade category (discussed below in section 10.3) for 1972, my reference year.[13] Observe that HOS goods constituted 75 percent of total imports, of which

Table 10.4 **Structure of Foreign Trade by Trade Category, 1972 (Thousands of Dinars)**

	Imports, c.i.f.		Exports, f.o.b.	
Trade Category	Value	%	Value	%
Exports	16,792	7.6	139,684	91.6
HOS (excluding refined oil)	3,867	1.7	37,026	24.3
NRB mining (including crude oil)	7,917	3.6	53,976	35.4
NRB agriculture and related food processing	682	0.3	46,743	30.7
Refined oil	4,326	2.0	1,939	1.2
HOS imports	66,455	30.0	4,888	3.2
Foods[a]	9,335	4.2	158	0.1
Manufactured consumer goods	16,517	7.4	3,454	2.3
Intermediate goods[b]	24,115	10.8	1,108	0.7
Capital goods	16,488	7.4	168	0.1
NRB imports (agriculture and marble)	19,483	8.7	2,375	1.5
Noncompeting imports	116,885	52.0	—	—
HOS[c]	101,175	45.0	—	—
NRB	15,710	7.0	—	—
Other sectors (sectors classified as home goods, handicrafts, miscellaneous)	2,665	1.2	5,449	3.6
Total	222,280	100.0	152,397	100.0

Source: Nabli (1978).

[a]Includes soybean oil.

[b]Includes linseed oil.

[c]Including sectors listed in the input-output table but having no domestic production; i.e., codes 40, 114, 140, and 164.

imports directly competing with Tunisian production were 30 percent and noncompeting imports were 45 percent. NRB imports formed 16 percent of total imports, and the remaining imports came from activities classified as export sectors. Competing imports were dominated by manufactured consumer goods and intermediate products, but capital goods were also significant. On the export side, NRB products made up two-thirds of total exports versus 24 percent for HOS products (the remaining exports came from import-competing activities). HOS exports were, for the most part, related to NRB production—for example, phosphoric acid and fertilizers (based on phosphates) and steel and lead (based on iron ore and lead mining).

10.1.4 Factor Markets

As I mentioned above, Tunisia is one of the many developing countries that, at the time of gaining independence, had a very sizable proportion of the economically active population engaged in agriculture and a fairly rapid rate of population growth. In 1956, 57 percent were in the agricultural sector, and the rate of population growth was over 2 percent and rising. It averaged 2.8 percent over the decade 1956–66 and 2.3 percent from 1966 to 1975. During that period there was significant out-migration of Tunisians to Europe and Libya in search of employment. Since these persons are not counted in the Tunisian population, the growth rate (and rate of growth of the labor force) is understated. Thus, Tunisia must foster rapid growth of employment opportunities in nonagricultural sectors if the growing numbers in the labor force are to be employed. The urban population has been growing at an average annual rate of about 3.5 percent.

A lack of data on wages and characteristics of the labor force makes detailed analysis of the labor market in Tunisia difficult. Nonetheless, available statistics suggest that, in spite of a fairly rapid rate of growth of manufacturing employment and sizable out-migration of workers (estimated to be 5 to 10 percent of the labor force), the problem of urban unemployment is fairly severe. The official statistics put the total rate at about 14 percent in 1975, and the urban rate was even higher with respect to the male population.

Manufacturing employment grew from 33,400 in 1961 to 106,300 in 1975. This represented an employment elasticity with respect to value added in manufacturing of 0.8 as manufacturing value added rose at an average rate of 10.4 percent annually.[14]

There appear to have been distortions in the labor market between manufacturing sectors in Tunisia, which are analyzed in section 10.4.1 of this chapter. However, an overall minimum wage does not appear to have been binding in Tunisia, and the significant distortion appears to have been between the public and the private sectors. Table 10.5 gives

data on the labor force, manufacturing employment, urban and rural minimum real wages, and the average real wage over the period 1960 to 1975. As can be seen, average real wages, based on 1966 = 100, did not rise even 5 percent over the entire period 1963 to 1973. The ratio of the urban to the rural wage fell from 1 to 0.8 over the same period, which is consistent with the notion that migration from rural to urban areas reduced the wage differential and simultaneously prevented significant increases in the real wage in an undistorted (unskilled) labor market. Thus, it does not appear that high and rising wages have been a major factor in private labor markets in Tunisia, and observed labor coefficients in the private sector were probably the outcome of cost minimization on the part of firms facing market-determined wage rates. To

Table 10.5 Labor Market Indicators in Tunisia

	Labor Force (Thousands) (1)	Manufacturing Employment (Thousands) (2)	Real Minimum Wage (1966 = 100)		Average Real Industrial Wage (1966 = 100) (4)
			Industry (3a)	Agriculture (3b)	
1960	—	—	102	92	—
1961	—	33.4	105	91	88
1962	—	34.7	107	92	101
1963	—	38.6	105	105	103
1964	—	44.8	100	100	96
1965	—	50.6 (100.3)	94	104	96
1966	1,093	55.5	100	100	100
1967	—	61.0	97	97	100
1968	—	65.6	95	123	99
1969	—	69.5	91	130	95
1970	—	73.8	90	128	99
1971	—	76.1	98	132	101
1972	—	80.2	103	130	101
1973	—	91.1	99	124	104
1974	—	98.9	118	159	115
1975	1,560	106.3 (244.2)	114	163	129

Sources: Column 1: Active population age fifteen or more from Census of Population data.

Column 2: Manufacturing includes food processing (except olive oil and wine) and rugs. Data are based on census of manufactures but are adjusted to include rugs and to account for limited coverage of food processing and are smoothed by taking averages of end-of-year data. These adjustments make the data comparable with National Accounts value-added data.

For 1966 and 1975 figures in parentheses indicate employment according to census of population data. They are larger than other estimates, which do not cover unorganized sector and less than fully employed.

Columns 3 and 4: Nabli (1978), table V-1.

the extent that individual processes were more capital-intensive than they might have been within the private sector, the driving force was probably implicit subsidization of machinery and equipment rather than labor market interventions.

There is reason to believe that there was underpricing of capital goods, principally owing to an overvalued exchange rate and low interest rates on bank loans. As I mentioned above, the exchange rate has probably been significantly overvalued since 1961. (For instance, Blake 1974 estimates the overvaluation in 1969 to range between 19 and 40 percent.) This implicit subsidy to imports of capital goods probably affected all sectors equally because of the limited substitution possibilities between domestic and imported equipment and the liberalized import procedures for the latter. As seen in table 10.3, EERs for industrial and agricultural equipment were fairly close to the official exchange rate. Credit was also strictly rationed, and the subsidy rate varied considerably, since access to credit was determined by personal relationships and nonmarket phenomena. It is likely that publicly owned firms, which had priority access to credit, benefited more than private firms.

10.2 The Structure of Protection

Tunisia followed a restrictive import substitution policy during the 1960s, began to relax these policies after 1969, and in 1972 adopted an export oriented policy. In this section, I provide ERP estimates that describe the protective system as it existed in the transitional period 1969–72. The discussion ignores the tariff reform of 1973 and the new export policy largely because we lack the relevant data to appraise their effects upon employment.

The main elements of protection in Tunisia are the tariff system, differential indirect tax treatment of imports and domestic production, QRs, and subsidies.[15] QRs were probably the most significant form of protection from 1969 to 1972. Import licenses were given if domestic production did not exist or if need for the import could be demonstrated. As I mentioned above, QRs were most restrictive in foodstuffs and consumer goods. The other forms of protection had varying degrees of effectiveness. Tariffs were low, with a ratio of tariff collections to the value of imports varying from 6 to 10 percent over 1961 to 1975. Some protection also originated in a higher indirect tax rate applied to imports than to domestic production. Finally, subsidies of various forms (differential pricing of utilities, preferential credit facilities, etc.) applied in an ad hoc fashion to various activities.

There are two studies of effective protection available for Tunisia (Ministry of Planning 1975; Blake 1974). The Ministry of Planning

(MP) study relates to 1972 and covers a wider range of industries than Blake's study, which relates to 1969. Both studies assume that elasticities of substitution between primary factors and intermediate inputs are zero and use the Balassa method, which assumes that the ERP on home goods is zero.[16] The two studies differ markedly in their method of estimating nominal protection. In the MP study, nominal protection estimates are based upon the tariff, with account taken of differential indirect tax treatment and subsidies. Blake uses direct price comparisons that should capture the effects of QRs and avoid redundant tariffs. The Blake study is theoretically superior and yields more reasonable estimates than the MP study.[17] However, though I use both sets of estimates in my analysis, I will tend to rely more upon the MP estimates because of their broader coverage. My results are generally insensitive to the set of ERPs chosen.

In addition to ERPs, I also present estimates of domestic resource costs (DRCs) from the MP study. These estimates are deficient in that they use market prices rather than shadow prices for factors of production. However, they complement the ERP estimates by providing indications of the variation in returns to domestic factors of production.

Table 10.6 summarizes these estimates by trade category (see discussion in section 10.3 for a description of these categories). The main conclusions to be drawn from this table are that protection is relatively high in Tunisia and that import substitution activities are favored relative to export activities. The unweighted average ERP[18] is 251 percent in the MP study (or 81 percent if ERPs greater than 400 are excluded from the estimates). The corresponding figures from Blake's study are 85 and 52 percent. ERPs on export activities are significantly lower than those for import-competing activities in both studies. In fact, many export sectors had negative ERPs. This pattern is a natural consequence of the absence of policies promoting exports in the period studied. Exporters sold their production at world prices and bought inputs at prices above the world level.

There is no clear pattern of protection among types of exports. However, a pattern emerges within the importable category. Those activities stressed under the import substitution program (food and consumer goods) received significantly greater protection than intermediate and capital goods.[19]

In addition to the obviously better treatment of import substitution activities, there is evidence that protection was not applied evenly within categories. The coefficient of variation among industries within categories always exceeds unity, reflecting a wide dispersion of protection rates within categories. For example, in the importable consumer goods category, ERP estimates ranged from —40,161 percent (footwear) to

Table 10.6 The Structure of Protection and Domestic Resource Costs by Trade Categories

Trade Category[a]	Ministry of Planning Estimates (1972)				Blake Estimates (1969)	
	Effective Rates of Protection %		Domestic Resource Costs (Dinar/Dollar)		Effective Rates of Protection %	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
All HOS tradables	250.6	713.5	1.107	0.422	85.2	125.8
	(81.0)	(90.7)	(1.029)	(0.346)	(52.2)	(59.9)
HOS exports	23.0	44.6	.868	0.202	−1.0[b]	22.2
Traditional	39.9	30.5	1.135	0.243	37.2	0.0[c]
Primary commodity based	1.1	37.2	0.768	0.160	−12.9	10.7
Manufactured products	42.0	54.8	.858	.133	−8.0	2.7
HOS import-competing goods	300.7	772.4	1.159	.436	90.3	110.8
	(95.9)	(92.7)	(1.070)	(.359)	(67.9)	(58.7)
Foods	737.4	1230.6	1.557	.293	471.4	0.0
	(188.4)	(99.4)	(1.437)	(.134)	(—)	(—)
Manufactured consumer goods	547.2	1148.4	1.465	.465	74.0	54.6
	(151.2)	(113.6)	(1.346)	(.393)	(—)	(—)
Intermediate goods	92.6	177.1	.901	.243	29.1	10.2
	(59.4)	(63.9)	(.885)	(.233)	(—)	(—)
Capital goods	70.3	70.4	1.058	.411	104.2	83.0
	(—)	(—)	(—)	(—)	(—)	(—)

Note: Means are unweighted averages of sectoral rates. The classification is that of table 10.A.3. The first figure in each category is for all sectors with $ERP > -100\%$, and the second figure (in parentheses) is for sectors with $-100\% < ERP < 400$ percent.

[a]For composition of trade categories see tables 10.A.1 and 10.A.3. Note, however, that tobacco (code 51) is excluded throughout.

[b]Excludes the steel mill sector (52), which has a high ERP.

[c]The standard deviation of zero is due to the fact that only one activity (canning) was included in Blake's estimates for this commodity category.

4,760 percent (perfumes). In the importable intermediate goods category, ERPs ranged from —605 percent (tanneries) to 888 percent (explosives).

Therefore protection created a highly differentiated incentive structure that was the result of the nonsystematic, piecemeal approach to trade policy. Within the general framework of import controls, specific advantages were accorded to public enterprises as well as to private firms. Pressure groups at the industry level and private individuals with personal influence were able to obtain differential treatment. In many cases monopoly positions and import limitations were obtained simply through administrative licensing of investment and imports. This structure must have had significant effects on resource allocation and efficiency, as well as on the commodity composition of trade.

The DRC estimates in table 10.6 follow the same pattern as the ERP estimates. DRCs are lower in exportable than in importable activities, indicating that more foreign exchange could be earned by transferring resources to export production. Within the importable category, the highest DRCs are found in food and manufactured consumer goods—those categories generally most favored by the import substitution regime. Again, there is a certain degree of dispersion within commodity categories, although not as large as that for ERPs. This dispersion is further evidence of the resource misallocation caused by the nonsystematic approach of the trade regime.

10.3 Factor Proportions in Tunisian Trade

10.3.1 Data

Data to obtain estimates of value-added and factor inputs were available at a highly disaggregated level (150 activities) in the 1972 input-output table and in the census of manufactures (101 activities). The census of manufactures provided a breakdown of workers into seven categories: management and engineers, white-collar employees, supervisory personnel, skilled and semiskilled labor, unskilled labor, apprentices, and seasonal workers.[20] Consistent domestic value added (DVA) and employment data were obtained from the two sources. International value added (IVA) data were obtained by combining the MP study of ERPs described in section 10.2 with the domestic value added data of the I-O table. IVA was calculated by dividing DVA by 1 + ERP.

I calculated three variations of direct and total (direct plus indirect in home goods) labor per unit of value added. The first is total man-years per unit of value added, either domestic or international (L/DVA or L/IVA). The second is man-years of unskilled labor per unit of value added (UL/DVA or UL/IVA). Unskilled labor includes all sea-

sonal employees, apprentices, unskilled labor, and a fraction of the skilled and semiskilled category.[21] Finally, an index of the skill content of the labor force, *SK*, was calculated which measures "pure skill" relative to total man-years.

SK is defined as $(LS - L)/L$, where $LS = \sum w_i S_i$, L is total man-years, S_i is man-years of skill category i, and w_i is a weight derived by dividing the average wage in skill category i by the average unskilled wage. The range of w_i was 0.36 (apprentices) to 6.77 (management and engineers).[22]

10.3.2 Trade Categories

The next step is to aggregate these individual requirements by commodity category. Following the procedure outlined in chapter 1 of this volume, I separated the 150 domestic production activities into HOS exportables and importables, NRB exportables and importables, home goods, and noncompeting production. In general, exportable activities had a negative T_i statistic, importables had T_i values between 0.0 and 0.8, and noncompeting production had a T_i in excess of 0.8. Several additional distinctions were made in the HOS categories: HOS exportables were separated into traditional production (mainly food processing), NRB production (industries such as fertilizer that transform raw materials), and manufactures (mainly new exports that do not correspond to the other two categories); HOS importables were divided into the four categories of food products, manufactured consumer goods, intermediate goods, and capital goods.

The distinction between trade with developed countries and trade with less developed countries is of no importance in Tunisia and will not be pursued here. For HOS exports, the share of trade with developed countries is greater than 75 percent for all but four activities.[23] These exports are olive oil related activities and construction materials (cement, ceramics, sanitary fixtures). All are mainly destined to Algeria and Libya. For HOS importables, competition is mainly with developed countries. The ratio of imports from developed nations to total imports in an activity is greater than 70 percent except for sugar, glazed tiles, and morocco leather.

The sheer number of activities would make a complete listing by commodity category very tedious. The interested reader can find a list of the activities and their SITC codes in appendix table 10.A.1 and a breakdown by category in appendix table 10.A.3. Text tables 10.7 and 10.8 give details on major HOS exportable and importable activities. The discussion below briefly describes the composition of the various categories.

There are 33 exportable activities, of which 22 are HOS and 11 are NRB commodities. In the HOS category, the three traditional export-

Table 10.7 Characteristics of Major HOS Exportable Activities, 1972

I-O Code	ISIC Number	Industry	Commodity Category	T_i	Exports in 1972 (Thousands of U.S. Dollars) Developed Countries	Developing Countries	Total
22	3113	Canning and preserving of fruit and vegetables	Traditional	— .43	6,337	224	6,561
23	3114	Canning, preserving and processing of fish	Traditional	— .93	2,000	73	2,073
52	3710	Iron and steel	NRB based[a]	— .03	5,665	1,760	7,425
53	3720	Nonferrous metal smelting	NRB based	— .89	2,746	1,794	4,540
63	3692	Cement, lime	Manufactures	.08	40	619	649
70	3691	Ceramics	Manufactures	— .59	—	2,101	2,101
71	3610	Sanitary fixtures	Manufactures	— .29	33	590	623
77	3319	Cork and products	NRB based	— .94	1,278	25	1,303
78	3512	Fertilizers	NRB based	—1.06	16,483	6,479	22,962
138	3511	Phosphoric acid	NRB based	—8.17	7,289	—	7,289
89	3523	Household soaps	Traditional	— .20	2,007	28	2,035
99	3411	Paper pulp	NRB based	—1.93	3,585	233	3,818

Source: Nabli (1978), appendix tables I-A-1972-2 and III-4.
[a]NRB is used here in the sense of PCB-HOS as described in the Introduction.

Table 10.8 Characteristics of Major HOS Importable Activities, 1972

I-O Code	ISIC Number	Industry	Commodity Category	T_i	Imports in 1972 (Thousands of U.S. Dollars) Developed Countries	Developing Countries	Total
29	3118	Sugar refining	Foods	.51	7,757	6,194	13,951
51	3140	Tobacco and products	Foods	.02	1,159	4	1,161
56	3710	Foundries	Intermediate goods	.67	9,531	34	9,565
57	3813	Scaffolding, containers, etc.	Capital goods	.43	3,064	65	3,129
59	3819	Iron and metal products	Capital goods	.47	14,901	340	15,241
61	3843	Motor vehicle assembly	Capital goods	.56	13,394	232	13,626
97	3551	Rubber products	Consumer goods	.34	4,172	115	4,287
101	3419	Articles of paper and cartons	Intermediate goods	.17	1,255	26	1,281
102	3420	Printing, except newspaper	Intermediate goods	.29	2,083	745	2,828
104	3211	Spinning yarn, except jute	Intermediate goods	.51	11,897	2,314	14,211
105	3211	Weaving, except jute	Consumer goods	.14	7,210	156	7,366
108	3212	Wearing apparel	Consumer goods	.07	1,477	6	1,483

Source: Nabli (1978), appendix tables I-A-1972-2 and III-1.
Note: Industries listed had 1972 value added of more than 1,000 dinars (2,380 U.S. dollars) in 1972.

ables are canned foods, canned fish, and household soap. The HOS activities processing raw materials include among others refined petroleum, steel, cork, phosphoric acid, and fertilizer. Manufactures include cement and ceramics. NRB processing industries are the most important HOS exportable activities. NRB exportables include traditional olive oil and wine production plus minerals (phosphates) and crude oil.

There are 66 HOS and 4 NRB importable activities. The predominant categories among HOS importables are food and consumer goods, which together generate 80 percent of value added. Major HOS importable products are sugar, tobacco, rubber products, clothing, paper, textiles, and motor vehicles. The NRB importable category includes most traditional agricultural activity. It will be ignored in the remainder of this study.

The remaining categories consist of 29 home goods (including construction, utilities, and nontraded products such as bread) and 10 noncompeting activities, for which domestic production exists in 6. Additionally, there are two other categories that will not be considered here. One is handicrafts; the other is services that generate foreign exchange (mainly tourism and transportation).

10.3.3 Estimates of Labor Requirements by Activity

Appendix table 10.A.2 gives a complete listing of labor requirements for all activities. Text tables 10.9 and 10.10 give direct estimates for selected important activities in HOS categories. Inspection of appendix table 10.A.2 indicates first that direct and total estimates of L/DVA and UL/DVA and SK are nearly identical. Correlation coefficients between the direct and total measures were greater than 0.98 for L/DVA and UL/DVA and about 0.90 for SK. Therefore I base my discussion in the remainder of this section upon the direct coefficients. Incidentally, correlation analysis also found a strong positive relationship between L/DVA and UL/DVA and a negative correlation between those indexes and the skill level.[24]

A second conclusion from table 10.A.2 is the wide range of variation of the labor coefficients. Total labor coefficients range from 0.016 (man-years per 1,000 dinars of domestic value added [DVA]) for crude petroleum to 5.00 for toy manufacturing. Other activities with labor coefficients lower than 0.30 are tobacco, sugar processing and refining, oil pipeline and oil refining, coffee preparation, iron and steel, sulfur refining, rubber products, paper and paper carton products, and air and sea transportation. For all these sectors, the unskilled labor coefficient is smaller than 0.20. In addition, the following activities have an unskilled labor coefficient smaller than 0.15: utilities, vanilla, lead transformation, sewing-machine manufacturing, industrial gases, chemicals of dyes, paints, inks, insecticides, toilet products, and phosphoric acid. It is clear

Table 10.9 **Factor Intensities of Major HOS Exportable Activities, 1972 (Man-Years/Thousand Dinars)**

Industry	L/DVA	UL/DVA	SK
Canning of fruit and vegetables	1.848	1.656	.181
Canning of fish	.513	.440	.274
Iron and steel	.263	.134	.749
Nonferrous metal smelting	.819	.583	.395
Cement	.923	.615	.412
Ceramics	1.313	1.033	.345
Sanitary fixtures	1.935	1.146	.479
Cork products	1.113	.734	.374
Fertilizers	.537	.300	.687
Phosphoric acid	.382	.096	1.479
Household soap	3.855	2.765	.469
Paper pulp		Negative DVA	

Source: Appendix table 10.A.2.

Note: Direct requirements only.

Table 10.10 **Factor Intensities of Major HOS Importable Activities (Man-Years/Thousand Dinars)**

Industry	L/DVA	UL/DVA	SK
Sugar refining	.299	.188	.541
Tobacco and products	.055	.029	.636
Foundries[a]	1.096	.691	.498
Scaffolding, containers[a]	1.096	.691	.498
Iron and metal products	.808	.464	.548
Motor vehicle assembly	.977	.392	.959
Rubber products	.235	.097	1.021
Articles of paper and cartons	.283	.163	.657
Printing, except newspaper	1.161	.594	.699
Spinning yarn, except jute[b]	.869	.451	.586
Weaving, except jute[b]	.869	.451	.586
Wearing apparel	2.279	1.295	.512

Source: Appendix table 10.A.2.

Note: Direct requirements only.

[a]The census of manufactures aggregated these two industries into one activity. We applied aggregated labor requirements to each industry.

[b]Spinning and weaving were aggregated in the census data. The same procedure was followed as for foundries and scaffolding.

that most chemicals, oil, rubber, and paper products use relatively little labor. On the other hand, these activities have high skill content coefficients (greater than 0.80 in most cases).

Activities that have high labor coefficients (greater than 1.5 for total labor and greater than 1.00 for unskilled labor) are mining, canning of fruits and vegetables, bakeries, electrical and electronic machinery, mechanical and electrical repairs, wood mills, furniture, cement, tiles and sanitary fixtures, hosiery, wearing apparel, toys, chalk, and jewelry. The skill index is lower than 0.8 for all these activities and lower than 0.6 for most of them.

10.3.4 Estimates of Factor Requirements by Commodity Category

Table 10.11 presents weighted average labor coefficients for the trade categories outlined above. Only direct coefficients are presented, since, as with the estimates by individual activity, the differences between direct and total coefficients were minor. The weights are: exports—the value added content of actual exports; and imports—the value added

Table 10.11 **Indexes of Relative Factor Proportions in Exportable and Importable Activities (HOS Import-Competing Sectors Excluding Those with Negative IVA = 1.0)**

	Direct Requirements		
Trade Category	L/DVA	UL/DVA	SK
I. All exports[a]	0.66	0.76	0.78
A. HOS exports (excluding refined oil)	1.28	1.58	0.81
1. NRB exports	0.79	0.76	1.23
2. Traditional exports	2.41	3.58	0.45
3. Manufactured products	2.08	2.69	0.65
B. NRB exports			
1. Excluding crude oil	3.31	3.82	0.69
2. Including crude oil	0.56	0.63	0.77
II. HOS importables			
A. All activities	1.24	1.20	1.05
B. Excluding activities with negative IVA	*1.00*	*1.00*	*1.00*
1. Food products	0.18	0.18	0.96
2. Food products, excluding tobacco	0.55	0.61	0.90
3. Manufactured consumer goods	1.42	1.35	1.06
4. Intermediate goods	1.22	1.22	1.08
5. Capital goods	1.70	1.76	0.81

Source: Nabli (1978).

[a]For composition of trade categories, see tables 10.A.1 and 10.A.3.

content of domestic production and competing imports.[25] For ease of interpretation, the table is presented in index form, the base being the category HOS importables excluding those with negative IVA. That is, a value less than (more than) one means that the labor coefficients for that commodity category is less than (more than) that in the HOS importable category excluding negative IVAs.

The most important conclusion to be drawn from this table is that HOS exports have higher total labor requirements (L/DVA) and unskilled labor requirements (UL/DVA), but lower skill contents (SK) than HOS importables. This is the general result one would expect from HOS model. However, when NRB exports, particularly crude oil, are added to HOS exports, the pattern reverses, at least as regards L/DVA and UL/DVA.

Within the HOS exportable category, traditional and manufactured exports have higher total and unskilled labor requirements than those in NRB-based exports that actually have a lower labor requirement than most importables. It is also important to distinguish among subcategories of the import-competing group. Including tobacco (which has an extremely low labor coefficient with a value of 0.05 for L/DVA) tends to lower the average considerably. When we compare the factor intensities of the manufactured consumer goods, intermediate products, and capital goods (lines II.B.3, 4, and 5), with HOS export sectors (line I.A), we observe that on the average, exports are not more labor-intensive than imports.[26] On the other hand, if we compare the traditional exports and manufactured exports (lines I.A.2 and 3) with the last three subgroups of HOS importables, the evidence is strong that exports are more total and unskilled labor-intensive than importable activities. Moreover, the category "HOS NRB exports" (line I.A.1) yields labor coefficients lower than those for the import-competing group and a skill index that is higher. These activities are mostly the processing of primary products previously exported in raw forms: iron ore, phosphate, lead, alfa, and cork. These activities are borderline cases between NRB and HOS activities, and it is not obvious how their labor coefficients should be interpreted.

The existence of some industries with a negative IVA among importable activity poses some difficulties. Estimates are given for import-competing sectors including and excluding such sectors. Even though including such activities tends to yield higher L/DVA estimates, the general pattern of differences between exports and importables is not greatly affected. Notice, in this regard, that the skill content index, which does not depend for its interpretation on differences in DVA, is much less sensitive to the inclusion or exclusion of such sectors.[27]

Thus far I have not mentioned labor requirements for noncompeting imports. These cannot be estimated from the country's observed data

but must be inferred from some partner country's data. Since France is Tunisia's main trading partner, estimates of labor requirements are based on a 1972 French input-output table.[28] The data for output and value added are available with a ninety-one-sector breakdown, and those for total employment at a forty-four-sector breakdown. Noncompeting imports were allocated to the corresponding categories of the French I-O table; then the value-added content of those imports was calculated.[29] Then I calculated the labor content of one unit of value added of noncompeting imports, using the sectoral labor coefficients, for total imports and for commodity categories. It should be noted here that I am considering the labor input that would be used per unit of value added if such noncompeting imports were produced domestically, but only up to a first round of substitution for such imports. I do not consider the production of noncompeting goods indirectly imported in other noncompeting imports.

Another problem is whether factor intensity in the domestic production of such goods would be the same as that observed in France. Presumably, owing to the overall differentials in factor prices and factor endowments, the domestic labor intensity in such industries would be higher than that observed in France. I assume here that labor intensity would be x times higher in Tunisia than in France, where x is the ratio of labor coefficients in Tunisia and France for a given commodity produced in both countries. I estimated x by comparing labor coefficients in textiles and footwear in the two countries. It was found that the Tunisian coefficient was 2.6 times higher for both sectors. Thus the calculated labor requirements using French labor coefficients are all adjusted by this factor.[30]

In table 10.12 the coefficients are compared with those of exportables and import-competing activities. The calculations were carried out for the baskets of noncompeting imports both from France and from all developed countries, and the results were very similar in all respects.

The results show clearly that noncompeting imports are significantly less labor-intensive than either exportables or competing imports. HOS exports are about 55 percent more labor intensive than noncompeting imports, while import-competing goods are 20 percent more labor-intensive. The latter figure is low because of the low labor intensity of foodstuffs, and the differential in labor intensity is much higher (50–100 percent) for manufactured consumer goods and intermediate and capital goods.

The labor intensity differential for intermediate and capital goods is, however, probably underestimated. In fact, to obtain the adjusted figures for noncompeting imports I used the same adjustment factor for all industries. As I noted above, that factor was based on the differential in textiles and footwear, which are manufactured consumer goods. Apply-

Table 10.12 **Factor Proportions in HOS Export and Importable Activities Compared with Factor Proportions in Noncompeting Imports (Index Values with Noncompeting Imports = 1.00)**

Trade Category[a]	Direct Requirements—L/DVA—in Trade	
	France	All Developed Countries
HOS exports (excluding refined oil)	1.55	1.57
HOS Importables (using Tunisian data)		
All	1.21	1.22
Foods (excluding tobacco)	0.88	0.91
Manufactured consumer goods	1.60	1.54
Intermediate products	1.44	1.54
Capital goods	1.88	2.02
Noncompeting imports	1.00	1.00

Source: Nabli (1978).

[a]For composition of trade categories see tables 10.A.1 and 10.A.3.

ing the same adjustment factor to all industries implies an assumption of identical elasticities of substitution. But if there are greater factor substitution possibilities in consumer manufactures than in capital and intermediate goods production, the adjustment factor should be smaller for the latter industries, implying a lower labor intensity for noncompeting imports.

10.3.5 Net Labor Content of Trade

Given Tunisia's level of development, one would expect it to be a net exporter of labor. I have already mentioned that there was net outmigration of labor in the 1960s. However, my first net labor content estimates were somewhat ambiguous (see table 10.13). Lines 1 and 2 give the case of equal expansions of exports and imports in sectors classified either as exportables or importables. A comparison of the export and import labor requirements computed this way indicates that, on average, the net labor content of Tunisian trade is negative. I suspect that this is probably a spurious result due to the inadequacy of the MP ERP estimates used to calculate IVA. In fact, note that the labor coefficients increase as the ERP increases, which would indicate either that IVA is undervalued owing to the use of unduly high ERPs or that there are economically inefficient import-competing activities using more labor as well as more capital per unit of IVA.

As an alternative approach to measuring the net labor content, I considered a uniform expansion of all exports of HOS goods (line 3) and of all imports of HOS goods (line 4) regardless of whether classified in

Table 10.13 **Labor Requirements per Unit of International Value Added and Skill Content by Trade Categories (Man-Years/Thousand Dinars)**

Trade Category	Direct Requirements			Direct Plus Home Goods Indirect Requirements		
	L/IVA	UL/IVA	SK	L/IVA	UL/IVA	SK
1. HOS exports	0.793	0.556	0.472	0.848	0.534	0.552
2. HOS Importables	1.194	0.675	0.579	1.120	0.606	0.637
Activities with $ERP \leq 50$ percent	0.578	0.330	0.599	0.632	0.355	0.616
Activities with $50 < ERP \leq 125$	1.585	0.916	0.555	1.309	0.707	0.642
Activities with $125 < ERP \leq 200$	2.364	1.394	0.533	1.830	1.037	0.585
Activities with $ERP > 200$	5.225	2.799	0.598	2.225	1.149	0.660
3. Bundle of all HOS exports	0.918	0.601	0.481	0.933	0.561	0.550
4. Bundle of all HOS importables (Tunisian data)	1.012	0.576	0.574	1.001	0.547	0.627
5. Bundle of HOS importables (French data)	0.575	—	—	—	—	—
6. Bundle of HOS noncompeting imports	0.528	—	—	—	—	—
7. Bundle of all HOS imports	0.541	—	—	—	—	—

Source: Nabli (1978).
Note: These are not index values, as in table 10.12, but rather refer to actual man-years, except for SK, which is itself an index.

the exportable or the importable category. With this broader composition of export and import flows, the results still indicated that Tunisia is a net importer of labor, although not as much as in the first case. Furthermore, with this exercise, exports now became more unskilled labor-intensive.

One way to avoid the problem presented by faulty ERP estimates in deriving IVA coefficients is to rely on French data not only, as one must, for noncompeting imports but also for import-competing products. This practice was adopted with the French data adjusted as discussed earlier. Lines 5 to 7 give these adjusted direct requirements[31] for HOS importables, noncompeting imports, and all HOS imports. These values now show clearly that Tunisia is a net exporter of labor, with exports (line 3) about 70 percent more labor-intensive than imports (line 7).

10.3.6 Factor Intensities and Effective Protection

To conclude this section, I will analyze the relationship between the height of protection and labor intensities. Krueger (1977) suggests that they should be negatively correlated in a labor-abundant country. This hypothesis follows from the HOS model, which predicts that, to induce domestic production of a commodity that would not be produced with no protection, protection must be higher the further away the production of this commodity would be from its comparative advantage. I tested this hypothesis in several ways. The results suggested that there was a weak (negative) relationship between protection and total labor requirements and a stronger (negative) relationship between protection and unskilled labor requirements.

The first test involved computing simple (Pearson) correlation coefficients between the various indicators of factor intensity and effective rates of protection, using both MP and Blake estimates. Activities with negative IVAs and those with extremely high ERPs (more than 400 percent) were excluded from the calculations. The resulting correlation coefficients showed no significant relationship between total labor intensities and ERPs, but there was some evidence of negative correlation between unskilled labor intensity and ERPs.

A weakness of this analysis is that it is based on the assumption that ERPs and labor requirements are measured correctly and precisely on an interval scale. However, this assumption may not be warranted given all the measurement problems that are encountered in measuring ERPs. So, rather than using point estimates of ERPs, I classified activities into seven groups according to their level of protection.[32] (That is, I assume that the point estimate is only roughly indicative of the level of protection.)

For each group, I computed the weighted average labor requirements per unit of DVA. A close examination of these group averages suggests

results about the same as those obtained from the correlation analysis. There is weak evidence of a negative relationship between the height of effective protection and total labor requirements but stronger evidence of a negative correlation between the height of effective protection and unskilled labor content.[33] For example, the average unskilled labor requirement in the two least protected groups is 37 percent greater than that of the two most protected groups.

Summary

The analysis performed in this section indicates first that Tunisia's export production is more labor-intensive than its importable production. This is especially true for traditional and manufactured exports, but it is not true for those HOS export activities processing raw materials. Second, my results imply that Tunisia is a net exporter of labor, especially unskilled labor. Finally, there is evidence, although weak, that suggests that protection is negatively correlated with labor requirements. This result implies that the trade regime has been biased against labor. That is, those activities receiving high protection tend to have low labor requirements.

10.4 Factor Market Distortions and Their Effects upon Factor Proportions

I mentioned in the overview that there was reason to believe that distortions existed in both labor and capital markets. In this section I will provide more detail on the nature of these distortions, then analyze their effects upon factor utilization in Tunisia.

10.4.1 Labor Market Distortions

One needs detailed data on wage rates, by activity, for homogeneous units of labor to determine if labor market distortions exist. Unfortunately, the only wage data available in Tunisia are average wage payments per man year for sixty-eight HOS tradable activities in the 1972 census of manufactures.

I have calculated average wages for several different categorizations of these sixty-eight activities (see table 10.14) that seem important in Tunisia. These categorizations are: (1) public versus private—the public group includes activities consisting of only public firms or where public firms predominate in terms of employment; (2) monopolistic versus nonmonopolistic—the monopolistic group includes activities that do not have more than three establishments (given the level of disaggregation of my analysis this may not be too gross an approximation, though it is true that some activities classified as nonmonopolistic may be made up of monopolistic firms producing relatively nonhomogeneous

products); and (3) large versus small firms—the first group includes activities with firms having fifty employees or more, and "small firms" are activities with firms having fewer than fifty employees; activities with firms in both size groups are omitted.

From table 10.14, it is immediately apparent that the public, monopolistic, and large-firm groups pay significantly higher average wages than the private, nonmonopolistic, and small-firm groups. There is a differential of about 45 percent for the public-private and for the monopolistic-nonmonopolistic dichotomies. The differential between large and small firms is about 25 percent, but it is obscured by the fact that both groups include mostly monopolistic sectors. Column 3 of table 10.14 also indicates that wage differentials are sizable within each group (coefficients of variation range between 32 and 49 percent). A comparison of coefficients of variation between public and private firms, monopolistic and nonmonopolistic firms, and large and small firms shows that wages vary more in private, nonmonopolistic, or smaller firms than in public, monopolistic, or larger firms. This suggests that the labor market can be dichotomized into large, public, monopolistic nucleus paying higher wages with a smaller degree of variability than the small, private, nonmonopolistic group.

The average wage data can be combined with other information to investigate the extent by which wage differentials can be explained by nondistortionary and distortionary factors. We first estimate the following regression equation for all activities and for the various groups mentioned above.

Table 10.14 **Wage Structure in Industry, 1972 (HOS Tradables)**

Groups	Number of Activities (1)	Mean Wage (Thousand Dinars/Man-Year) (2)	Coefficient of Variation % (3)	Residual Coefficient of Variation[a] % (4)
Total	68	0.794	47.9	37.0
Public	28	0.973	42.0	32.6
Private	40	0.669	45.0	38.7
Nonmonopolistic	37	0.664	48.6	31.2
Private	28	0.574	31.8	23.3
Monopolistic	31	0.950	40.5	34.7
Public	19	0.987	38.8	29.1
Private	12	0.891	46.5	45.8
Large firms	19	0.960	38.9	29.8
Small firms	12	0.798	44.0	48.0

Source: Nabli (1978).

[a]Column 4 is obtained by dividing the standard error of regression of appropriate equations in table 10.15 by the mean of the dependent variable.

$$\text{WAGE}_i = a_o + a_1 \text{SSK1}_i + a_2 \text{SSK2}_i + b \text{SEX}_i + u_i,$$

where i is an activity index, and

$$\text{WAGE} = \frac{W}{L}$$

L is total man-years,
W is total wage bill paid by firms in the ith activity and includes:
gross wages inclusive of taxes,
payments in kind,
charges, which include social security payments, insurance premiums, family allowances, and other social benefits. These benefits are included in wage rate calculations because they are additional costs to employers that significantly affect real wage payments. For most activities they make up between 15 and 25 percent of total wage payments, and they even exceed 30 percent in a few cases.
SSK1 is the proportion of white-collar employees[34] in total employment,
SSK2 is the proportion of skilled and semiskilled workers,
SEX is the proportion of female labor, and
u_i is the error term.

We do not have any information on educational levels, age, and experience of workers, but presumably a major part of these effects is reflected in the occupational groupings. If so, then in addition to errors in measurement, the error term would capture mostly distortionary effects related to union strength and to size and ownership of firms, while the independent terms should capture the nondistortionary effects.

The regression results are given in table 10.15. From equation (1) it is seen that a significant part of the interindustry wage differentials can be explained by skill and sex-composition differentials. The residual coefficient of variation is 37 percent compared with the total coefficient of 48 percent. A significant part of the differential is explained by the white-collar composition of the labor force. The sex-composition variable is also significant.[35] However, a large share of interindustry wage differentials is not explained by either skill or sex differences. Other factors, mostly distortionary, also contribute to the variance of the wage structure in industry.

Next, we investigate whether there are significant differences in wage structures between different components of the labor market.

A dummy variable for public sector was incorporated in regression equation (2). It had a significant effect. But, according to this specifica-

Table 10.15 **Factors Influencing Wage Differentials in Industry—Regression Results (Dependent Variable: WAGE = Total Wage Payments per Man-Year)**

Regression Equation	Groups	Number of Sectors	Constant	SSK1	SSK2	SEX	PUBLIC	MONO	R^2	S	Mean	F	SSR
1	All	68	0.398*	1.685*	0.156	−0.591**			0.43	0.294	0.794	16.46	5.560
			(3.63)	(6.62)	(0.76)	(2.55)							
2	All	68	0.342*	1.557*	0.140	−0.428***	0.182**		0.48	0.283	0.794	14.82	5.075
			(3.17)	(6.21)	(0.71)	(1.84)	(2.45)						
3	All	68	0.298**	1.527*	0.297	−0.586**		0.184**	0.48	0.283	0.794	14.82	5.075
			(2.64)	(6.02)	(1.44)	(2.62)		(2.45)					
4	Public	28	0.312	2.010*	0.581	−1.759			0.48	0.317	0.973	7.55	2.412
			(1.58)	(4.39)	(1.53)	(1.07)							
5	Public	28	0.281	2.006*	0.610	−1.750		0.032	0.48	0.323	0.973	5.45	2.407
			(1.15)	(4.29)	(1.49)	(1.04)		(0.23)					
6	Private	40	0.453*	1.345*	−0.048	−0.380***			0.33	0.259	0.669	6.04	2.420
			(3.67)	(3.81)	(0.21)	(1.75)							
7	Private	40	0.388*	0.975*	0.158	−0.474**		0.261*	0.45	0.238	0.669	7.28	1.985
			(3.35)	(2.78)	(0.71)	(2.34)		(2.76)					
8	Monopolistic	31	0.543*	1.183*	0.481	−0.797***			0.36	0.330	0.950	5.04	2.950
			(3.22)	(3.33)	(1.45)	(1.83)							
9	Monopolistic	31	0.551*	1.185*	0.481	−0.815	−0.012		0.36	0.336	0.950	3.64	2.949
			(2.83)	(3.27)	(1.42)	(1.69)	(0.09)						
10	Monopolistic public	19	0.256	1.866*	1.057**	−2.685			0.53	0.287	0.987	5.69	1.236
			(1.28)	(3.63)	(2.50)	(1.40)							
11	Monopolistic private	12	0.840**	0.678	0.042	−0.924			0.29	0.408	0.891	1.12	1.331
			(2.54)	(0.92)	(0.07)	(1.50)							

Table 10.15—*continued*

Regression Equation	Groups	Number of Sectors	Constant	SSK1	SSK2	SEX	PUBLIC	MONO	R^2	S	Mean	F	SSR
12	Non-monopolistic	37	0.248**	2.482*	−0.125	−0.236			0.63	0.207	0.663	18.81	1.424
			(2.09)	(7.29)	(0.53)	(1.07)							
13	Non-monopolistic	37	0.269**	2.245*	−0.244	−0.81	0.244*		0.72	0.182	0.663	21.01	1.064
			(2.58)	(7.31)	(1.17)	(0.40)	(3.28)						
14	Private	28	0.315*	1.640*	−0.053	−0.184			0.52	0.134	0.574	8.66	0.431
			(3.64)	(4.69)	(0.29)	(1.19)							
15	Large	19	0.307	1.524*	0.807	−0.786			0.53	0.286	0.960	5.72	1.234
			(1.00)	(3.30)	(1.66)	(1.65)							
16	Small	12	0.519***	1.097	0.182	−0.887			0.20	0.383	0.798	0.70	1.174
			(2.25)	(0.99)	(0.15)	(0.61)							

Notes: Explanatory variables:
SSK1, SSK2: proportion of white-collar workers and of skilled and semiskilled workers, respectively.
SEX: proportion of female labor.
PUBLIC: dummy = 1 if sector is public or predominantly public,
= 0 otherwise
MONO: dummy = 1 if sector includes no more than 3 establishments,
= 0 otherwise
Numbers in parentheses are Student's t-ratios.
*$p < .01$ for a two-tailed test;
** $p < .05$ for a two-tailed test;
***$p < .10$ for a two-tailed test.
Summary statistics are:
R^2: coefficient of determination unadjusted for degrees of freedom;
S: standard error of the regression;
Mean: Mean of dependent variable;
F: F-statistic;
SSR: Sum of squared residuals.

tion, only unskilled workers would be paid differently in public and private sectors. A Chow test for homogeneity of wage structure between public and private sector, based on the results of equations (1), (4), and (6), yielded results suggesting that, though the public sector may be paying higher wages for unskilled labor, there is no significant difference for skilled labor wage payments.

Comparison of regression equations (4) and (6) shows that skill and sex composition explain a larger share of the wage variance in the public sector than in the private sector. In fact, the residual coefficient of variation is higher for the private than for the public sector by 20 percent, while for the total coefficient of variation it is higher by 7 percent only.

A dummy variable for monopolistic activities was significant in regression equation (3). A Chow test rejected the null hypothesis of structural homogeneity at the .01 level of significance. Therefore it seems that the wage structure is significantly different between the monopolistic and nonmonopolistic sectors. Moreover, from regression equations (8) and (12) we see that skill and sex differentials explained a much larger share of the wage variance in the nonmonopolistic sector.

These results indicate that distortionary effects are much stronger in the labor market within the monopolistic groups. This is further supported by comparing the results for large-firm and small-firm groups in regression equations (15) and (16). Most of the sectors in these two groups also belong to the monopolistic set. The results are significantly different, and the small-firm group differentials are not explainable to any significant degree by skill and sex-composition differences. The poor results of the small group may, however, be due to serious errors in measurement, since we are dealing with single small firms, and their reported data may be unreliable.[36]

Regression equations (9) and (13) in table 10.15 also indicate that the dummy variable PUBLIC is highly significant for the nonmonopolistic group, although not for the monopolistic group. This suggests the need to separate the nonmonopolistic private and public sets. In fact, the nonmonopolistic private group exhibits the lowest degree of wage variation. On the other hand, the monopolistic private group (11) exhibits a much higher degree of variation that is not explainable by skill differentials.

My analysis suggests the following tentative conclusions regarding the labor market in Tunisia:

1. The skill composition of the labor force explains a significant part of interindustry wage differentials.

2. There is some evidence, though not very strong, that female labor is paid less than male labor, but it cannot be determined whether this is

due to sex discrimination or to male/female productivity and skill differences.

3. The labor market may be categorized in three ways.

a. The nonmonopolistic private component, exhibiting the smallest degree of distortions in the labor market, with the largest share of interindustry wage differentials explained by skill differentials.

b. The public sector, which exhibits a higher degree of wage variation that is not explainable by skills. The evidence is also that the public sector pays higher wages for unskilled labor.[37]

c. The monopolistic private component, which exhibits a highly variable wage structure that is not explainable by skill differentials and that pays very high average wage rates.

I introduced size and labor intensity of firms as two additional explanatory variables in the final stage of the analysis (Nabli 1978).[38] The results confirm all the conclusions obtained above, with the following additional findings:

1. Size of firm and labor intensity explain a significant part of interindustry wage differentials.

2. Labor intensity is associated significantly with lower wages in the public sector, but not in the private nonmonopolistic groups.

3. Larger firm size is significantly associated with higher wages in the private nonmonopolistic group but not in the public sector.

To sum up this analysis of interindustrial wage structure, the evidence suggests the existence of significant distortions in the labor market, which exhibit the regular patterns described above.

10.4.2 Capital Market Distortions

In addition to labor market distortions, there were significant capital market distortions, caused either by the underpricing of capital goods owing to an overvalued exchange rate or by low interest rates on bank loans. It is believed that the exchange rate was significantly overvalued throughout the period. For instance, Blake (1974) estimates that the overvaluation for 1969 ranges between 19 and 40 percent. I observed earlier that QRs were prevalent and that tariff rates ranged from 10 to 28 percent according to import categories. From table 10.3 it appeared that EERs were higher for foodstuffs and consumer manufactures than for industrial equipment by 28 percent and 18 percent, respectively. The estimation of these EERs did not account for QRs, which were less restrictive for capital goods. I estimate the premium on QRs for foodstuffs and manufactures at about 25 percent (Nabli 1978). With these values the EER differentials between consumer and capital goods would be about 50 percent. This percentage is an upper bound to exchange rate overvaluation.

If the demand for the liberally imported capital goods is price-elastic, the overvaluation would be smaller. It follows that imports of capital goods were underpriced to the extent of overvaluation, probably by about 30 percent. Owing to limited substitution possibilities between domestic and imported equipment and the liberalized import procedures for the latter, this subsidy affected the costs of capital in all sectors equally, except possibly for special exemptions and treatment. However, credit was strictly rationed, and the total subsidy must have varied considerably among sectors and firms depending on access to credit, which was determined by personal relations, nonmarket phenomena, and government policy. It is probably true that public firms, which had priority access to credit, benefited almost uniformly from subsidized credit on medium- and long-term loans.

The net result of my review of distortions in the labor and capital markets is that the public sector pays higher wages than the private sector and benefits from large subsidies on imported capital and credit. Therefore the public-sector wage/rental ratio is higher than that of the private sector. From analysis of the labor market it appears that unskilled labor wage rates are on the average about 20 percent higher in the public sector. If we assume a conservative rate of 10 percent for the real opportunity cost on capital, the rate of subsidy on capital use in the public sector is 6 percent, assuming a 4 percent maximum real interest rate on credit. If we assume that all public investment is credit financed, that a private firm's investment is half financed through credit, and, in addition, that only the public firm has access to imported capital equipment, the wage/rental ratios in the public sector will be 2.4 times higher than in the private sector.[39]

Within groups, there is a more homogeneous wage/rental ratio in the public sector, while for the private nonmonopolistic group I conjecture that the degree of variability is much higher, with the larger firms facing higher wage/rental ratios.

10.4.3 Effects upon Factor Proportions

The pattern of distortions described above implies that the public sector should use more capital-intensive techniques than private monopolistic or nonmonopolistic sectors at any given level of protection. One way to test this hypothesis is to calculate average labor intensities within each group for the seven levels of protection introduced in section 10.3. These calculations, shown in table 10.16, tend to confirm this hypothesis. The public sector has lower labor requirements than the nonmonopolistic private sector in all but two categories of protection (1 and 4). Likewise, the public sector has lower labor requirements than the monopolistic private sector for any level of protection except the first and sixth.[40]

Table 10.16 **Factor Proportions in Importable Activities Grouped by Level of Protection and Type of Factor Market (Direct Requirements in Man-Years per Thousand Dinars of DVA)**

Level-of-Protection Group	Nonmonopolistic Private		Monopolistic Private		Public	
	L/DVA (1)	UL/DVA (2)	L/DVA (3)	UL/DVA (4)	L/DVA (5)	UL/DVA (6)
1	0.455	0.223	0.500	0.178	0.802	0.358
2	1.264	0.755	0.789	0.466	0.468	0.296
3	1.130	0.734	0.413	0.141	0.316	0.186
4	0.831	0.509	—	—	0.875	0.465
5	1.208	0.696	—	—	0.817	0.479
6	1.020	0.599	0.528	0.255	0.600	0.321
7	2.156	1.149	2.194	1.548	0.945	0.406

Source: Nabli (1978).

Note: Groups are defined in terms of their range of *ERP*s as follows:
Group 1, −75%–0%
Group 2, 0%–50%
Group 3, 50%–75%
Group 4, 75%–125%
Group 5, 125%–200%
Group 6, larger than 200%
Group 7, negative IVA.

In turn, the nonmonopolistic private labor intensities are higher, or approximately the same as, those of the monopolistic private sector for any level of effective protection.[41]

Another approach to this issue is to repeat the correlation analysis between the ERP and my indicators of labor intensity (L/DVA and SK) separately for public and private activities. (Recall that this approach was applied in section 10.3 with results generally supporting the notion that protection was biased against employment.) This was done using both MP and Blake ERPs. The results are given in table 10.17. The most striking result to be observed from the table is the consistently highly significant relationship (with expected signs) for the public sector, but not the private sector. This implies that there was a very strong association between the import substitution thrust of the trade regime and public sector industrial development. Public sector firms were mainly involved in import substitution activities; the participation of public firms in exports was largely confined to those industries processing natural resources, which, as I observed earlier, had low labor coefficients. The same was true for the monopolistic private sector. However, the nonmonopolistic sector was more involved in exports. Thus, the trade regime favored the development of the capital-intensive public (and to a lesser degree private monopolistic) sectors.

The absence of any negative relationship for the private sector estimates is puzzling. I suspect it is due to an uneven application of factor market distortions in the private sector. Recall that we saw earlier that factor prices were more distorted but less variable in the public than in the private sector. This is particularly true in view of capital market fragmentation and the significant effect of firm size on wage rate differentials in the private sector. Thus, more variable factor price differentials may have had a significant effect upon factor intensities and therefore washed out any association between factor intensities and protection.

Distortions in the factor markets appear to have generally hindered employment creation. These distortions were partly of domestic origin and partly due to the trade regime. The import substitution strategy was implemented to a large extent through the expansion of the public sector. This fact, together with the higher wage/rental ratio in the public sector, led to the development of relatively capital-intensive industries and/or the adoption of capital-intensive production techniques. In the absence of such distortions the average labor intensity of HOS activities probably would have been higher.

10.5 Alternative Trade Policies and Employment

The policies pursued during the 1960s did not reverse the optimal pattern of trade (as evidenced by my net labor content estimates). How-

Table 10.17 Correlation Coefficients between Factor Intensity Indicators and Effective Rates of Protection in Public and Private Sectors

	Number of Sectors	L/DVA	UL/DVA	SK
Ministry of Planning ERPs				
Public sectors only	13	−0.037	−0.381*	0.662**
		−0.025	−0.386*	0.642**
Public and predominantly public sectors	16	−0.084	−0.431**	0.652**
		−0.082	−0.432**	0.615**
Private sectors only	14	0.060	0.083	0.054
		0.041	0.043	0.220
Private and predominantly private sectors	27	0.038	0.039	0.061
		0.011	−0.000	0.195
Blake ERPs				
Public and predominantly public sectors	7	−0.637*	−0.570*	0.093
		−0.627*	−0.588*	0.003
Private and predominantly private sectors	13	0.727**	0.501**	−0.044
		0.643**	0.402*	−0.018

Note: For each group the first line is relative to direct requirements coefficients, and the second to direct plus indirect requirements. Only sectors with ERP $\leq 400\%$ and no negative IVA are included in the calculations.

*$p < .10$, one-tailed test.

**$p < .05$, one-tailed test.

ever, neither did they expand employment as rapidly as alternative policies might have done. Labor absorption in manufacturing was quite low. The elasticity of employment with respect to output was about unity in 1961–65, then fell dramatically to 0.8 in 1965–69 and 0.5 in 1969–72. It increased afterward to more than unity between 1972 and 1975.[42] This is consistent with my findings that import substitution industries were less labor-intensive than exportable industries, and that, within the import substitution group, the industries that received more protection were less labor-intensive (especially unskilled labor) than the other. This was particularly true within the public sector.

To see some of the biases of the trade regime, I have calculated the distribution of value added and employment for the public and private sectors by level of effective protection (table 10.18).[43] Note first that groups 5 and 6 (the highly protected industries)[44] contributed 40 percent of total value added in all importable industries. Most value added and employment (about two-thirds) in the public sector originated in these groups. In contrast, only 13 percent of value added and employment in the private sector originated in these groups. Second, the public

Table 10.18 **Value Added and Employment in Importable Activities in Public and Private Sectors by Level of Protection**

	Nonmonopolistic Private			Monopolistic Private			Public Sector			Total		
		Direct Requirements			Direct Requirements			Direct Requirements			Direct Requirements	
Group	Value Added (1)	L (2)	UL (3)	Value Added (4)	L (5)	UL (6)	Value Added (7)	L (8)	UL (9)	Value Added (10)	L (11)	UL (12)
1	371	169	83	28	14	5	972	780	348	1,371	963	436
2	3,992	5,046	3,014	221	174	103	1,183	554	350	5,396	5,774	3,467
3	2,126	2,402	1,560	335	138	47	1,173	371	218	3,634	2,911	1,825
4	3,760	3,125	1,914	—	—	—	1,777	1,555	0,826	5,537	4,680	2,740
5	1,898	2,293	1,321	—	—	—	3,629	2,965	1,738	5,527	5,258	3,059
6	801	817	480	206	109	053	8,639	5,183	2,773	9,646	6,109	3,306
7	5,779	12,460	6,640	36	79	56	1,481	1,400	601	7,296	13,939	7,297
Total	18,727	26,312	15,012	826	514	264	18,854	12,808	6,854	38,407	39,634	22,130

Source: Nabli (1978).

Note: Value added: thousand dinars; employment: man-years. Labor requirements, both L and UL, were obtained by multiplying the appropriate value added column by the corresponding labor column in table 10.16.

and nonmonopolistic private sectors each accounted for about 49 percent of total value added in importable activities. However, the public sector accounted for only one-third of total man-years (and even less for unskilled man-years), while the private sector accounted for two-thirds of employment. Finally, public sector firms falling in groups 5 and 6 accounted for one-third of total importable value added yet provided only one-fifth of total importable employment.

The development of the public sector was the major instrument of the import substitution strategy. It is obvious that its growth has clearly been associated with (if it did not cause) the development of capital-intensive industries and high protection.

This section provides estimates of the likely order of magnitude of two hypothetical policy alternatives. The first policy limits Tunisia to an import substitution strategy but investigates the employment effects of a different choice of import substitution industries. The second investigates the employment effects of an export oriented policy.

10.5.1 Alternative Import Substitution Policies

My findings indicate that an import substitution strategy aimed at labor-intensive industries would have generated more employment growth during the sixties. I analyze the employment effects of the following three strategies: an expansion of existing labor-intensive industries, the use of more labor-intensive techniques, and the development of new industries that are labor-intensive.

Expansion of Labor-Intensive, Low-ERP Industries

I have identified seven importable industries to expand and fifteen importable industries to contract (so as to leave total value added unchanged) under a more efficient import substitution policy (see table 10.19). Each of the industries to expand satisfies the following conditions: (1) it is labor-intensive; (2) its ERP is less than 125 percent; and (3) expansion could increase value added by more than 100,000 dinars and be sold in the domestic market. All these activities are in the private nonmonopolistic group. The industries to contract are not classified as labor-intensive according to at least two of the three criteria.[45] Most fall in groups 6 and 7 in the ERP levels, and most are public firms.

I assume that each industry expands to the point where its production completely satisfies domestic demand at unchanged domestic prices (i.e., imports are eliminated). This expansion would increase importable value added by 7,241 thousand dinars (19 percent of value added in all importable industries) and increase employment by 9,429 man-years, of which 5,647 would be unskilled (see table 10.19).

Table 10.19 **Effects of a Reallocation of Resources in the Importable Industries (Based on Value Added and Employment Data for 1972)**

I. *Labor-Intensive, Low-Protection Activities to Expand*

Sector (I-O Code)	Imports (Thousand Dinars)	Value-Added Content of Imports[a] (Thousand Dinars)	Percentage Increase in DVA	Employment Created[b] (Man-Years)	
				L	UL
56 Foundries	4,253	2,411	180	2,628	1,630
57 Steel structures and containers	1,789	1,014	98	1,102	674
66 Glazed tiles	240	103	41	154	109
72 Glass and products	1,970	989	140	918	563
76 Fishing vessels	2,511	2,041	356	3,624	2,155
102 Printing except newspaper	1,272	567	42	657	341
116 Merceries and jewelry	924	116	102	346	185
Total	12,959	7,241	135	9,429	5,647

Table 10.19—*continued*

II. *Non-labor-Intensive, High-Protection Activities to Contract*

Sector (I-O Code)	Value Added (Thousand Dinars)	Employment (Man-Years)	
		L	UL
29 Sugar refining	1,474	564	343
32, 33 Vanilla, yeast, bakery products	11	9	2
35 Margarine	19	14	7
41 Alcoholic beverages	55	65	30
55 Lead processing	194	106	58
61 Electrical and electronic machinery	1,075	1,073	490
83 Explosives	233	197	143
86 Paints and varnishes	834	378	183
88 Glues	141	83	45
92 Toilet articles	114	70	29
94 Perfumes	283	179	90
97 Rubber products	1,724	643	290
137 Paper	1,099	438	228
Total	7,256	3,819	1,938

[a]Assuming the same value-added/output ratio as for existing domestic production.

[b]Using direct plus indirect in home goods requirements coefficients.

The elimination of the fifteen nonlabor intensive, higher-ERP activities would almost exactly offset the gain in value added (7,256 versus 7,241). Employment would fall by 3,819 man-years, of which 1,938 are unskilled. The net employment effect of this reallocation is employment growth of 5,610 man-years (9,429–3,819), of which 3,719 are unskilled (5,647–1,938). This growth represents increases of 14 percent and 17 percent,[46] respectively in total and unskilled employment in the importable category as a whole.

Use of More Labor-Intensive Techniques and Expanded Production

As a second alternative, I consider the possibility of using more labor-intensive techniques. I identified eleven industries that are classified as labor-intensive by either Lary (1968) or Banerji (1975) but whose labor coefficients are lower than the average of the importable group in Tunisia. In 1972 these industries (see table 10.20) produced about 37 percent of total value added in import-competing industries.[47] About three-fourths of their value added originated in activities classified as being public or monopolistic private. Most of these industries were highly protected.

Assume that the labor coefficient increases by 25 percent for each activity. Under competitive conditions and assuming a Cobb-Douglas production function, this increase would require a 36 percent decrease of the wage/rental ratio, entailing a decrease of that magnitude in the wage rate, or a 56 percent increase in the rental rate or some combination of the two.[48] Alternatively, this could be achieved through the use of appropriate shadow prices in project evaluation, particularly for the public sector.

The effect of the increase in labor intensity is illustrated in table 10.20. The actual labor coefficients are increased by 25 percent for all sectors[49] to obtain those indicated in column 8 for total labor. I assume, furthermore, that all employment gains per unit of value added are unskilled labor. The coefficients of column 10 are computed accordingly.[50] Altogether, employment in these industries would rise by about 2,690 man-years. This growth represents a 25 percent increase in employment in these industries and a 48 percent increase in their unskilled labor forces.

In addition, for a given capital stock used in the subset of industries, total value added could be increased; that is, there would be scope for more import substitution. In fact, under the above assumptions and a Cobb-Douglas production function, the possible increase in value added is 25 percent. If additional import substitution is undertaken in sectors 59, 104, and 105,[51] for the amount of 3,512 thousand dinars of value added the additional gain in employment would be 3,860 man-years, of which 2,353 would be unskilled.[52]

Table 10.20 Effects of Use of More Labor-Intensive Techniques

Sector (I-O Code)	Value Added in Domestic Production (Thousand Dinars) (1)	Competing Imports		Actual Labor Coefficients and Employment[a]				Assumed Labor Coefficients and Employment[a]			
		Value (Thousand Dinars) (2)	Value Added Content (Thousand Dinars) (3)	Total Labor		Unskilled Labor		Total Labor		Unskilled Labor	
				L/DVA (4)	L (5)	UL/DVA (6)	UL (7)	L/DVA (8)	L (9)	UL/DVA (10)	UL (11)
58 Sewing machines	194	111	60	0.488	95	0.134	26	0.610	118	0.256	50
59 Iron and metal products	3,351	7,389	2,397	0.830	2,781	0.461	1,545	1.038	3,477	0.669	2,242
73 Wood sawing	523	14	9	0.680	356	0.430	225	0.850	445	0.600	314
93 Floral essence oils	371	10	4	0.541	201	0.266	99	0.676	251	0.401	149
96 Candles	30	—	—	0.695	21	0.552	17	0.869	26	0.726	22
98 Plastics	991	1,184	516	0.625	619	0.385	381	0.781	774	0.541	536
101 Paper and carton products	1,856	645	399	0.382	709	0.212	393	0.478	886	0.308	572
104 Cotton and wool spinning	1,670	6,946	2,000	0.876	1,463	0.426	711	1.095	1,829	0.645	1,077
105 Weaving	4,738	4,133	1,199	0.894	4,236	0.444	2,104	1.118	5,295	0.668	3,165
106 Jute spinning and weaving	265	14	4	0.901	239	0.460	122	1.126	298	0.685	181
115 Lighting fixtures	62	—	—	0.576	36	0.265	16	0.720	45	0.409	25
Total	14,051	20,446	6,588	0.765	10,756	0.401	5,639	0.957	13,444	0.593	8,333

Sources:
Cols. 1, 2: From I-O table, 1972.
Col. 3: Col. 2 times ratio of value added to production.
Cols. 4, 6: Appendix table 10.A.2.
Cols. 5, 7: Col. 1 times col. 4 and 6 respectively.
Cols. 8, 10: See text.
Cols. 9, 11: Col. 1 times col. 8 and 10 respectively.
[a]Direct plus home goods indirect requirements.

The total increase in employment from both changes would be 6,550 man-years, of which 5,043 would be unskilled. These increases represent gains of 17 and 23 percent, respectively, of the labor force employed in importable activities.

A Program for Additional Import Substitution

As a final alternative, I consider the possibility of encouraging new labor-intensive import substitution manufacturing activities. This program would not pose major capital financing problems, as is shown below.

First, scrutiny of the level of actual imports[53] indicates that there is further scope for substitution[54] in seven activities, particularly in the electrical and electronic industry (see table 10.21). These activities fall in the groups of highly protected industries, especially group 7 or industries with negative IVA. This seemed to indicate that it would be undesirable to expand their output. However, all these industries are those usually considered labor-intensive, for which an LDC would have a comparative advantage.[55]

French value added to output ratios were used to compute the potential value-added gain from substituting domestic production for imports. The Tunisian value added figures are likely to be low, because of inefficiency in these industries. Likewise, the observed labor coefficients are likely to be too high. So the employment effect was measured by applying the average labor coefficients in all importable industries. The employment gain from eliminating these imports would be 3,778 total man-years, of which 2,166 are unskilled.

Next, there is scope for substitution in noncompeting imports. We identified a number of products of which there was no domestic com-

Table 10.21 **Additional Substitution for Competing Imports, 1972 (Thousand Dinars)**

Input-Output Code and Product	Value of Imports (c.i.f.) (1)	Value-Added Content of Imports (2)	Domestic Production (3)
62 Electrical and electronic machines	7,199.6	3,240.0	4,184
75 Furniture and pleasure boats	355.0	148.7	1,981
107 Hosiery	186.0	81.1	5,306
108 Wearing apparel	623.0	271.6	6,680
109 Tanneries and leather	104.3	22.5	2,116
110 Footwear (leather)	179.1	84.4	2,310
117 Morocco leather	209.6	82.8	597
Total	8,856.7	3,931.1	23,174

peting production in 1972 but which are classified as labor-intensive by Lary (1968) and Banerji (1975). These products are shown at the three-digit SITC classification in table 10.22. To obtain this list I con-

Table 10.22 Substitution for Noncompeting Imports (Thousand Dinars)

SITC Code	Product (1)	Value of Imports (2)	Substitutable Imports (3)	Value-Added Content (4)
611	Leather	148.0	148.0	31.4
642	Paper and paperboard	175.8	105.5	31.5
651	Textile yarn	156.5	123.4	45.5
657	Special textile fabrics and related products	2,564.7	2,457.5	926.5
663	Mineral manufactures	672.3	443.2	231.7
664	Glass	266.2	132.0	85.4
666	Pottery	251.5	251.5	96.5
693	Wires	171.1	167.9	91.5
695	Tools for use in the hand or machines	664.8	558.6	304.6
697	Household equipment of base metals	130.8	—	—
699	Manufactures of base metals	337.2	—	—
741	Heating and cooling apparatus	2,597.7	2,333.5	1,343.2
742	Pumps for liquids	1,832.0	1,765.1	1,016.0
743	Other pumps and compressors	2,236.9	2,236.9	1,287.6
745	Other nonmetallic machinery, etc.	921.2	769.0	442.6
751	Office machines	947.8	882.1	591.4
764	Telecommunications equipment	3,588.5	3,349.1	2,075.2
775	Household equipment	178.6	113.3	69.4
778	Electrical machinery and apparatus n.e.c.	2,035.3	1,770.5	779.9
784	Parts and accessories of motor vehicles	3,538.3	3,537.8	1,477.8
785	Motorcycles, etc.	577.2	527.5	222.1
791	Railway vehicles	605.7	455.1	190.7
884	Optical goods	117.0	—	—
885	Watches and clocks	197.6	—	—
894	Baby carriages, toys, games	159.0	—	—
895	Office and stationery supplies	127.1	—	—
899	Miscellaneous manufactures	194.1	—	—
Total		25,392.8	22,157.7	11,340.5

Note: Col. 2: c.i.f. values.

Col. 3: part of relevant col. 2 for which the six-digit trade nomenclature element is larger than 100,000 dinars.

Col. 4: obtained by applying French 1972 VA/output ratios to col. 3, after correcting import values for freight-insurance charges to make them comparable with the French production figures.

sidered items at the six-digit level whose value of imports was larger than 100,000 dinars.[56] This limitation requires new industries to be significantly large enough to allow them to take advantage of minimal economies of scale. The relevant figures are given in column 3 of table 10.22. This import substitution program would result in about 22 million dinars of output and 11 million of value added, and the employment effect is 11,100 total man-years, of which 6,500 would be unskilled.[57]

Assuming a capital/value-added ratio of 3.0,[58] this program would have required capital expenditure of about 46 million dinars in 1966 prices. The contraction of a number of sectors considered in table 10.19 would have released a significant amount of capital for the expansion of new industries. More capital could have been obtained by refraining from the development of two major projects, the steel mill, and the pulp and paper plant.[59] Therefore the financing of the additional import substitution program would have required merely a reallocation of resources to these more labor-intensive industries.

The total employment effects of the three import substitution programs are summarized in table 10.23. If all three had been implemented, total employment would have increased by 27,000 man-years, or by 68 percent of the 1972 importable employment, or alternatively, by 17 percent of total HOS employment. Unskilled employment would have increased even more, by 82 percent. Finally, total output would have been 49 percent larger. These impressive output and employment gains would

Table 10.23 **Employment Effects of an Alternative Import Substitution Program**

Component of Program	Value Added (Thousand Dinars)	Employment Gain Man-Years	
		L	UL
Expansion of labor-intensive and low effective protection industries, and contraction of capital-intensive, highly protected industries	—	5,610	3,719
Use of more labor-intensive techniques and expanded production			
Change in labor intensity	—	2,690	2,690
Expansion of production	3,512	3,860	2,353
Additional import substitution			
For competing imports	3,931	3,778	2,166
For noncompeting imports	11,340	11,100	6,500
Total	18,783	27,038	17,428
Increase as percentage of 1972 total for import-competing industries	49	68	82

have required only a reallocation of resources in favor of the more labor-intensive industries, with no additional capital. The estimated employment gains would have been much larger if account were taken of indirect employment effects. In my calculations, I assumed that all intermediate inputs (except home goods) in the expanded industries would be imported. To the extent that such inputs could be domestically produced, the employment implications would be larger. Income multiplier effects would have generated additional indirect employment.

While the employment gains from such an alternative import substitution program are impressive and significant, it is also quite clear that no import substitution program would be able to significantly relieve the employment problem. It is sufficient to compare the 27,000 man-years gained to 95,000 persons less than fully employed[60] in the total nonagricultural labor force of 850,000 (1975 census) and to the 140,000 persons estimated to have migrated to other countries in recent years. Therefore it is clear that industrialization aimed at absorbing urban unemployment must be based on a policy of encouraging exports of labor-intensive manufactures.

10.5.2 Export Promotion Policies

The import substitution policies of the 1960s were clearly biased against employment. Overall, and for individual activities, employment elasticities with respect to value added (see table 10.24) fell, manufactured exports grew slowly, and employment created through exports was negligible throughout the period. I estimate that fewer than 5,000 man-years were employed in manufacturing for export in 1972 by producers classified as export industries.[61] In addition, there were about 2,000 man-years involved in export production by activities classified as importables. These 7,000 man-years are a small amount representing less than 10 percent of total employment in manufacturing in 1972. Moreover, the major part of export employment was created in processing raw materials that have low labor intensities.

The poor employment performances of both manufactured exports and import substitutes, coupled with a change in government, led to the export promotion scheme of 1972. In April 1972, new legislation provided incentives to encourage export-oriented industries and to attract direct foreign investment. These incentives included duty-free entry of intermediate and capital goods, tax benefits, and foreign exchange facilities.

I do not have data to fully appraise this policy change. However, the existing data indicate that Tunisia has not yet been able to benefit substantially from exports to absorb its growing labor force. Beginning from a small base, the value of manufactured exports increased more than fourfold from 1971 to 1975; the share of manufactured exports (exclud-

Table 10.24 Employment Elasticities with respect to Value Added, and Incremental Employment/Value Added Ratios, 1961–76

Activity	Employment Elasticities with Respect to Value-Added[a]				Incremental Employment/ Value Added[d] Ratios 1972–76	Increase in Employment (Man-Years), 1972–76
	1961–65	1965–69	1969–72	1972–75		
Manufacturing exclusive of food processing and rugs	1.121	0.785	0.455	1.087	1.056	35,894
Electrical and mechanical industries	1.549	0.629	0.398	2.036	0.939	6,200
Construction materials—glass	2.296	0.455	0.327	1.095	1.113	5,900
Chemicals—rubber	0.701	0.620	0.453	0.675[b]	—[e]	2,050
Wood, cork, paper, miscellaneous	1.207	0.792	0.395	1.141	1.140	5,700
Textiles, clothing, leather	1.187[c]	0.652[c]	0.738[c]	0.603[c]	1.321	26,284
Spinning and weaving	—	—	—	—	0.681	2,044
Apparel	—	—	—	—	0.872	10,380
Hosiery	—	—	—	—	1.156	2,080
Leather	—	—	—	—	1.540	1,540
Rugs	—	—	—	—	4.655	10,240

[a]Employment elasticities are based on compound annual growth rates for the various subperiods, as reported in Nabli (1978), table VI.2. Employment data are from Institut National de la Statistique, and real value added (at 1966 prices for 1961–69 and 1972 prices for 1969–75) are from Ministry of Planning national accounts.

[b]For the period up to 1974 only. In 1975 output was very low, owing to slack international demand.

[c]Excluding rugs.

[d]Based on change in value added (million dinars) and changes in employment (thousand man-years). (See Nabli 1978, table VII.5.)

[e]Negative change in value added.

ing processed minerals) in total exports rose from 6 to 10 percent in the same period. Growth was heavily concentrated in textiles, particularly apparel, which provided over 60 percent of the increase; their share in total manufactured exports[62] increased from about 9 percent in 1970–71 to 25 percent in 1974–75. Other major exports were paper products, foodstuffs, and products from the mechanical industries.

Total manufacturing employment[63] rose by about 36,000 from 1972 to 1976, with about 45 percent (16,000) caused by expansion of textile production. Export-related direct employment increased by only 5,500 workers,[64] which is small relative to the country's employment problem but large relative to initial exportable employment. This small increase is due to the continued decrease in textile's employment elasticity and the small incremental labor/value added ratio in the fastest growing textile industries (spinning-weaving and apparel). In all other manufacturing activities, employment elasticities improved (rose) after 1972; that for textiles fell (see table 10.24). Thus, while there were significant employment gains, these gains would have been larger had output or export growth or both been concentrated in other industries.

The low incremental L/DVA in textiles after 1972 was due either to the use of fairly capital-intensive techniques or to high rates of profit in the industry. It cannot be attributed to improvements in the rate of capacity utilization. Most of the increased output and employment in textiles was due to increased capacity. Until 1972, capital formation was practically stagnant, and the existing capital stock was located principally in the spinning and weaving industries. Capital formation increased rapidly after 1972, with new capacity created mainly in the apparel and hosiery industries.

A final problem was that export growth was heavily concentrated in one activity—wearing apparel—and oriented toward France and other European countries. This factor made the new export activity highly vulnerable to possible restrictions by the importing countries, as is shown by recent experience.

To summarize, Tunisia's limited experience with export promotion has not yet been as successful as anticipated. Employment growth has been concentrated largely in a limited number of activities, which makes it vulnerable to market conditions. These activities use capital-intensive techniques, enjoy high levels of profits, or both.

10.6 Conclusions

This study has evaluated the implications of trade policies for employment of skilled and unskilled labor in Tunisia. It has focused largely upon the import substitution policies of the 1960s, although some effort was made to analyze the export promotion policies recently enacted.

Its results were broadly consistent with the HOS explanation of trade. Despite commodity markets distortions caused by protection, Tunisia was a net exporter of labor; that is, the labor content of its exports was larger than that of its imports—both competing and noncompeting. When manufactured exports and manufactured imports only were compared, however, the evidence was ambiguous, with results generally indicating that the country was a net exporter of unskilled labor and a net importer of skills. Also, I found evidence of a negative association between unskilled labor intensity and height of effective protection.

The factor market analysis showed that significant distortions existed in the labor and capital markets. The major dichotomy was between the public and private nonmonopolistic sectors, with the public sector facing a higher wage/rental ratio and having smaller variability within groups. This result suggested that distortions are larger and more evenly applied in the public sector than in the private sector. Labor intensities in the public sector were found to be significantly lower than those in the private sector at most levels of protection.

I also found that advantages associated with capital goods imports and credit policies tended to bias the choice of production techniques against labor creation. However, I was not able to quantify the employment effects of this bias with precision.

These findings have major employment implications. The low labor absorption performance of Tunisian manufacturing during the 1960s can be explained to a large extent by its import substitution policy. This policy tended to protect the development of more capital-intensive activities to produce for the domestic market. Moreover, the development of the public sector was a major instrument of the import substitution policy and was associated with the development of capital-intensive industries, industries using capital-intensive techniques of production, and industries benefiting from high effective protection.

The system of incentives did not promote faster growth of the more labor-intensive sectors. Rather, it favored the creation of less labor-intensive industries, which had a negative effect on employment. I estimated that an alternative import substitution program, implemented through a different system of incentives, could have generated a more efficient allocation of resources and about 27,000 more man-years of employment in 1972. This would have represented a 68 percent gain over total employment in import substitution industries.

Even though alternative import substitution policies would have generated relatively large increases in employment, I found that such policies would not have significantly helped to reduce the unemployment problem. Tunisia would have had to follow more export-oriented policies in order to have a significant amount of employment creation through trade.

During the 1960s the Tunisian trade policy provided very few incentives for promotion of exports and even discriminated against them, thereby preventing any significant employment creation through that avenue. A more efficient resource allocation could probably have induced the development of a significant export sector that would have generated more employment in labor-intensive industries.

Since 1972 the Tunisian trade policy has been aimed at expanding exports to create more jobs. To date its results have been modest, especially because exports have been concentrated in a few goods, particularly wearing apparel. However, I was not able to fully evaluate the consequences of this recent policy in this study. Further research, based along lines followed here, is warranted.

Appendix

Table 10.A.1 I-O Table Sectors, SITC Correspondence, and Trade Category

I-O Code Number (150 × 150)	SITC Code (1975)[a]	Name of Sector	Classification[b]
1	041, 043, 044, 045, 0542, 05482, 121, 263	Cereals, industrial crops	NRB–IC
2	0541, 0544, 0545, 05798	Vegetables	NRB–IC
3	0571, 0572, 0574, 0575, 0576, 05774, 0579, 2238, 292	Horticultural crops (including olives and grapes)	NRB–Export
4	0811	Animal feed	NRB–Export
5	244, 245, 246, 247, 248	Forestry	NRB–Export
6	001, 0223, 025, 0616, 268	Livestock	NRB–IC
7	0341, 0360, 29197	Fishing	NRB–Export
8	*	Irrigation	H
9	2713	Phosphate rock mining	NRB–Export
10	281	Iron-ore mining	NRB–Export
11	287, 52216	Nonferrous metals mining	NRB–Export
12	27312	Marble extraction	NRB–IC
13	27311, 27313, 27323, 2733, 2734, 27821, 6613	Quarrying, except marble	H
14	2783	Salt	NRB–Export
15	333, 341	Crude petroleum and natural gas	NRB–Export

Table 10.A.1—*continued*

I-O Code Number (150 × 150)	SITC Code (1975)[a]	Name of Sector	Classification[b]
16	334	Oil refining	HOS–Export
17	351	Autoproduction of electricity	H
18	351	Electricity	H
19	*	Gas manufacture and distribution	H
20	*	Water supply, except for irrigation	H
21	011, 211	Slaughtering of meat	H
22	056, 058	Canning: fruits and vegetables	HOS–Export
23	0342, 035, 0360, 037	Canning: fish	HOS–Export
24	046, 047	Cereal-grain milling	H
25	04841	Bakery	H
26	04842	Pastry, biscuits	H
27	062, 072, 073	Chocolates, sugar confectionery	H
28	0481, 0483	Cereal-food preparation	H
29	061	Sugar factories, refining	HOS–IC
30	061	Sugar pressing	HOS–Export
31	061	Vanilla sugar	HOS–IC
32	09806	Yeast	HOS–IC
33	09806	Baking powder	HOS–IC
34	022, 023, 034	Milk and products	HOS–IC
35	09141	Margarine	HOS–IC
36	1123	Breweries	H
37	1110	Mineral water and soda drinks	H
38	*	Manufactured ice	H
39	1121	Wineries	NRB–Export
40	5121	Pure alcohol	NCI
41	1124	Liquors and spirits	HOS–IC
42	*	Boukha (dried fig alcohol)	H
43	09807	Vinegar	H
44	071	Coffee preparation	H
45	4235, 08135	Crude olive oil	NRB–Export
46	4235	Olive oil refining	HOS–Export
47	08134, 4241	Linseed oil refining	HOS–IC
48	4232	Soya oil refining	HOS–IC
49	08139	Other vegetable oil refining	HOS–Export
50	0813, 0814,	Feed preparations for animals	HOS–IC
51	122, 57211, 64241, 89932	Tobacco and products	HOS–IC
52	671, 672, 673, 677	Iron and steel	HOS–Export
53	52241, 52247,	Nonferrous metals smelting	HOS–Export

Table 10.A.1—*continued*

I-O Code Number (150 × 150)	SITC Code (1975)[a]	Name of Sector	Classification[b]
	6811, 6821, 6851		
54	69401	First transformation of iron	HOS–IC
55	6852	First transformation of non-ferrous metals (lead)	HOS–IC
56	678, 679, 6842	Foundries	HOS–IC
57	691, 69211, 69243, 7415, 7868, 8121	Scaffolding, containers, radiators, etc.	HOS–IC
58	7243, 7245	Sewing machines	HOS–IC
59	693, 6940, except 69401, 695, 696, 69731, 69732[c]	Ferrous metal products	HOS–IC
60	69213, 69735, 69743, 684, 69913	Aluminum products	HOS–IC
61	713, 781, 782, 783, 77831	Motor vehicle assembly	HOS–IC
62	761, 762, 763, 764, 771, 772, 778, 7754, 873	Electrical and electronic machinery	HOS–IC
63	6611, 6612	Cement, lime	HOS–Export
64	27324	Plaster	HOS–IC
65	66182	Cement and mosaic tiles	HOS–IC
66	66245	Glazed tiles	HOS–IC
67	66332	Pipes and canals of cement	H
68	66183	Articles of absesco cement	HOS–IC
69	66332	Other cement products	HOS–IC
70	66241	Ceramics	HOS–Export
71	8122	Sanitary fixtures	HOS–Export
72	664, 665	Glass and products	HOS–IC
73	247, 248, 6351	Sawmills and wood mills, local wood	HOS–IC
74	63441, 6353, 63542, 8211, 82192, 85103	Wood mills, foreign wood	HOS–IC
75	79321, 8211, 82192	Furniture and pleasure boats	HOS–IC
76	79324	Fishing vessels, construction, repairs	HOS–IC
139	63442	Panels of marquetry and inlaid wood	HOS–IC
77	633	Cork and products	HOS–Export
78	52222, 562	Fertilizers	HOS–Export
138	52224	Phosphoric acid	HOS–Export
140	52214, 52311	Fluor products	NCI
79	27892, 52324, 52393, 52394	Barium sulfate and calcium carbonate	NCI

Table 10.A.1—*continued*

I-O Code Number (150 × 150)	SITC Code (1975)[a]	Name of Sector	Classification[b]
80	52327	Soda silicates	HOS–IC
81	52215	Sulfur refining	HOS–IC
82	52211, 52218, 52399	Industrial gases	HOS–IC
83	57212, 5722	Explosives	HOS–IC
84	5723	Pyrotechnic products	NCI
85	531, 532	Dyes, colorants	HOS–IC
86	533, except 5332	Paints, varnishes	HOS–IC
87	5332	Printing inks	HOS–IC
88	592	Glues	HOS–IC
89	431	Household soap	HOS–Export
90	5542, 5543	Detergents	HOS–IC
91	591	Insecticides, disinfectants, deodorants	HOS–IC
92	553, 5541	Toilet products	HOS–IC
93	551	Floral essential oils	HOS–IC
94	553	Perfumes	HOS–IC
95	541	Pharmaceuticals	HOS–IC
96	89931	Candles	HOS–IC
97	625	Rubber products	HOS–IC
98	82122, 893	Plastics	HOS–IC
99	2519	Paper pulp (alfa)	HOS–Export
137	6412	Paper	HOS–IC
100	6413	Packing paper	HOS–IC
101	642	Articles of paper and carton	HOS–IC
102	8921, 8924, 8928	Printing, except newspaper	HOS–IC
103	8922	Newspaper printing	H
104	2633, 651	Spinning except jute	HOS–IC
105	652, 653, 654, except 6545, 658, 847	Weaving, except jute	HOS–IC
106	65198, 6545	Spinning, weaving of jute	HOS–IC
107	655, 844, except 8441, 8451, 846	Hosiery	HOS–IC
108	842, 843, 8441, 845, except 8451	Wearing apparel	HOS–IC
109	611	Tanneries and leather finishing	HOS–IC
110	85101, 85102	Footwear, leather	HOS–IC
111	89972	Brushes, brooms	HOS–IC
112	8942, except 89421	Toys	NCI
113	27891	Chalk	NCI
114	883	Movie films	NCI
115	8124	Lighting fixtures, lusters	HOS–IC

Table 10.A.1—*continued*

I-O Code Number (150 × 150)	SITC Code (1975)[a]	Name of Sector	Classification[b]
116	8998, 8933, 897	Merceries, jewelry, ornamental articles	HOS–IC
117	831	Morocco leather	HOS–IC
118	Hand 6512	Hand spinning of wool	NC
119	Hand 652, 65433	Handicraft weaving	NC
120	Hand 6592	Carpets	HOS–Export
121	Hand 6576	Chechias (hats)	HOS–Export
122	Hand 851	Handicraft shoemaking	NC
123	Hand 821	Handicraft furniture	NC
124	Hand 6597	Mats and mattings	NC
125	Hand 6595	Scourtins	NC
126	Hand 666	Pottery	NC
127	*	Construction	H
128	*	Hotels	HOS–Export
129	*	Tourist nonhotel restaurants	HOS–Export
130	*	Air transportation	HOS–Export
131	*	Pipeline	HOS–Export
132	*	Port services	H
133	*	Wholesale, retail trade	H
134	*	Mechanical, electrical repairs	H
135	*	Telecommunications	H
136	*	Other services	H
161	*	Financial services	H
164	6623	Refractory bricks	NCI
165	*	Rail transport	H
166	*	Sea transport	HOS–IC
167	*	Road transport	H
169	82122	Bed products	HOS–IC
171	*	Miscellaneous products	H
181	89584	Typewriter ribbons	NCI
182	885	Watches	HOS–IC
183	*	Dummy variables	

[a]Standard International Trade Classification, Revision 2, Series M, no. 34/Rev. 2, United Nations, 1975.

[b]The symbols are:
H: home goods
IC: import competing
NCI: non-import-competing goods
HOS: Heckscher-Ohlin-Samuelson goods
NRB: Natural resource based goods
NC: not classified
*: no corresponding SITC.

[c]Includes also: 69241, 69242, 69734, 6975, 6978, 699, 8219, 89421.

Table 10.A.2 **Labor Requirements per Unit of Domestic Value Added (Man-Years per Thousand Dinars) and Skill Content**

	L/DVA		UL/DVA		SK	
I-O Code[a]	D	D + I	D	D + 1	D	D + I
9	2.389	1.850	1.589	1.182	.418	.464
10	2.193	1.463	1.628	1.008	.280	.359
11	1.780	1.539	1.053	.894	.387	.404
12	1.254	1.163	.794	.709	.691	.662
13	.795	.807	.551	.551	.450	.463
14	.678	.701	.336	.346	.824	.797
15	.016	.137	.005	.080	1.562	.605
16	.117	.216	.039	.096	1.162	.888
18	.300	.381	.090	.142	1.396	1.175
19	.300	.401	.090	.154	1.396	1.132
20	.373	.415	.205	.228	.608	.612
22	1.848	1.555	1.656	1.254	.181	.308
23	.513	.603	.440	.466	.274	.374
24	.852	.877	.532	.511	.602	.647
25	1.809	1.598	.922	.818	.684	.685
26	.873	.904	.564	.544	.580	.628
27	.597	.700	.372	.408	.665	.687
28	.892	.939	.489	.501	.815	.781
29	.299	.383	.188	.233	.541	.561
30	.030	.237	.058	.129	.412	.662
31	.818	.818	.181	.181	2.000	2.000
32	.818	.950	.181	.331	2.000	1.490
33	.818	.818	.181	.181	2.000	2.000
34	.462	.587	.307	.355	.469	.563
35	.631	.730	.315	.374	.966	.864
36	.436	.624	.270	.363	.545	.588
37	1.199	1.155	.800	.742	.617	.623
38	.436	.567	.270	.335	.545	.580
41	1.254	1.185	.536	.549	1.061	.919
42	1.254	1.229	.536	.591	1.061	.877
44	.268	.386	.171	.217	.839	.836
50	.803	.890	.647	.573	.368	.523
51	.055	.064	.029	.033	.636	.640
52	.263	.399	.134	.198	.749	.759
53	.819	.804	.583	.512	.395	.517
54	1.200	1.173	.900	.840	.516	.543
55	.335	.547	.194	.298	.895	.771
56	1.096	1.090	.691	.676	.498	.516
57	1.096	1.087	.691	.665	.498	.532
58	.427	.488	.095	.134	.927	.903
59	.808	.830	.464	.461	.548	.592

Table 10.A.2—*continued*

	L/DVA		UL/DVA		SK	
I-O Code[a]	D	D + I	D	D + 1	D	D + I
60	.808	.895	.464	.495	.548	.604
61	.977	.998	.392	.456	.959	.830
62	2.965	1.952	1.418	.945	.798	.779
63	.923	.852	.615	.522	.412	.535
64	1.000	.959	.852	.690	.405	.490
65	1.777	1.470	1.350	1.051	.329	.397
66	1.777	1.493	1.350	1.063	.329	.399
67	.452	.553	.288	.350	.440	.473
68	1.003	.972	.794	.660	.283	.461
69	1.008	1.007	.794	.742	.283	.358
70	1.313	1.196	1.033	.869	.345	.432
71	1.935	1.394	1.146	.771	.479	.583
72	.906	.928	.003	.570	.611	.650
73	.637	.680	.426	.430	.583	.622
74	1.649	1.503	1.038	.916	.496	.532
75	2.026	1.789	1.102	.956	.597	.623
76	1.870	1.776	1.126	1.056	.372	.384
77	1.113	1.083	.734	.678	.374	.447
78	.537	.699	.300	.376	.687	.675
80	.821	.830	.688	.655	.332	.374
81	.290	.420	.168	.235	.879	.780
82	.493	.699	.187	.340	.890	.718
83	.821	.847	.688	.613	.332	.449
85	.355	.409	.169	.205	1.053	.955
86	.355	.454	.169	.219	1.053	.949
87	.355	.479	.169	.237	1.053	.910
88	.390	.588	.212	.316	.761	.710
89	3.855	3.019	2.765	2.104	.469	.492
90	.656	.787	.430	.480	.623	.630
91	.500	.822	.178	.393	2.320	1.110
92	.500	.614	.178	.253	2.320	1.747
93	.455	.541	.223	.266	1.175	1.049
94	.455	.633	.223	.319	1.175	.939
95	.802	.860	.354	.399	.824	.780
96	.666	.695	.600	.552	.379	.500
97	.235	.373	.097	.168	1.021	.837
98	.547	.625	.368	.385	.440	.540
			Negative Domestic Value Added			
100	.778	.843	.394	.444	.605	.609
101	.283	.382	.163	.212	.657	.670
102	1.161	1.159	.594	.601	.699	.688

Table 10.A.2—*continued*

I-O Code[a]	L/DVA		UL/DVA		SK	
	D	D + I	D	D + 1	D	D + I
103	.583	.680	.227	.296	1.178	1.013
104	.869	.876	.451	.426	.586	.702
105	.869	.894	.451	.444	.586	.677
106	.869	.901	.451	.460	.586	.638
107	2.793	2.124	1.515	1.131	.532	.573
108	2.279	1.888	1.295	1.042	.512	.559
109	1.190	1.110	.767	.656	.551	.626
110	1.126	1.079	.636	.581	.463	.553
111	1.310	1.259	.565	.544	.725	.736
112	5.000	5.000	4.000	4.000	.900	.900
113	4.500	4.500	3.000	3.000	.811	.811
115	.516	.576	.241	.265	1.199	1.116
116	3.853	2.983	2.073	1.598	.525	.544
117	.996	.984	.567	.541	.625	.663
127	1.444	1.304	1.200	.992	.256	.354
130	.214	.582	.061	.292	1.140	.719
131	.028	.246	.006	.146	1.250	.532
132	.902	.904	.734	.733	.264	.269
133[b]	.922	.919	.341	.352	1.034	.995
134	2.289	2.168	1.527	1.432	.402	.415
135[b]	.761	.810	.236	.287	1.038	.960
136[b]	1.129	1.149	.609	.627	.638	.626
137	.273	.399	.151	.203	.802	.701
138	.382	.614	.096	.263	1.479	.897
139	.637	.631	.426	.432	.583	.616
161[b]	.922	.927	.341	.354	1.034	1.003
165	.964	.973	.464	.474	.594	.605
166	.125	.189	.042	.075	1.576	1.253
167	.695	.730	.385	.400	.510	.536
169	.640	.712	.263	.304	.892	.866
182	3.176	2.085	2.323	1.400	.460	.534

Note: The variables are:
L/DVA: total man-years per thousand dinars of DVA
UL/DVA: unskilled man-years per thousand dinars of DVA
SK: index of "pure skill" content relative to total man-years
D: indicates direct requirements and D + I direct-plus-indirect in home goods requirements.

[a]For manufacturing sectors not appearing in this table the census of manufactures does not provide information, and such sectors are ignored in the analysis. They are not, however, quantitatively significant.

[b]For these home goods producing sectors factor requirements estimates have been derived independently, since the census of manufactures does not provide information on them.

Table 10.A.3 Partition of Activities among Commodity Categories

Commodity Category	I-O Code Numbers of Sectors Included[a]
All exportables	9, 10, 11, 14, 15, 16, 22, 23, 30, 52, 53, 63, 70, 71, 77, 78, *89*, 99,* 138
HOS exportables (excluding refined oil)	22, 23, 30, 52, 53, 63, 70, 71, 77, 78, *89*, 99,* 138
Traditional exportables	22, 23, *89*
NRB exportables (excluding refined oil)	52, 53, 77, 78, 99,* 138
Manufactured exportables	30, 63, 70, 71
NRB	
Excluding crude oil	9, 10, 11, 14
Including crude oil	9, 10, 11, 14, 15
HOS importable activities[b]	*12*, 29, 31, 32, 33, 34, *35*, *41*, 50, 51, 54, 55, 56, 57, 58, 59, *60*, *61*, *62*, 64, 65, 66, 68, 69, 72, 73, 74, 75, 76, 80, 81, 83, 85, 86, 87, 88, *90*, 91, 92, 93, 94, 95, 96, 97, 98, 100, 101, 102, 104, 105, 106, *107*, *108*, *109*, *110*, *111*, *115*, 116, 117, 137, 139, *169*, *182*
Foods	29, 31, 32, 33, 34, *35*, *41*, 51
Manufactured consumer goods	*62*, 66, 74, 75, *90*, 91, 92, 93, 94, 96, 97, 98, 105, 106, *107*, *108*, *110*, 111, 115, 116, 117, *169*, *182*
Intermediate products	50, 54, 55, 56, 64, 65, 68, 69, 72, 73, 80, 81, 82, 83, 85, 86, 87, 88, 95, 100, 101, 102, 104, *109*, 137, 139
Capital goods	57, 58, 59, *60*, *61*, 76

[a]Italic numbers indicate sectors having negative IVA according to Ministry of Planning estimates. Sector 99, which is starred (*), has negative DVA and is not included in computations.

[b]Sector 12, marble, even though it is based on a natural resource, is included here because the resource is domestically available, and because the sector covers finishing of both domestic and imported raw marble. It is, however, excluded from the commodity group classification in the lower part of the table.

Notes

1. There is no recent complete survey of the Tunisian economy. Blake (1974) gives a detailed discussion of the trade regime; Duwaji (1967) gives an account of Tunisian development through the mid-sixties. The complete study upon which this chapter is based may also be useful to the general reader. It is available for the cost of reproduction from the National Bureau of Economic Research.

2. The input-output table is from Institut d'Economie Quantitative Ali Bach-Hamba, Tunis, and the census of manufactures is from the Institut National de la Statistique, Tunis.

3. The exchange rate in 1957 was 1,000 old French francs to the dinar (making one dinar equal to approximately 2.4 dollars).

4. It is estimated that the ratio of gross capital formation to GDP fell from about 20 percent in 1950–51 to 10 percent in 1956–58 and that the average rate of population growth increased from 2.1 percent in 1946–56 to 2.8 percent in 1956–66, then declined to 2.3 percent in 1966–75.

5. Secrétariat d'Etat au Plan et Finances, "Perspectives Décennales de Développement, 1962–71," and "Plan Triennal, 1962–64."

6. Imports were divided into four categories: the liberalized regime without QRs mostly for raw materials and capital goods, the quota regime for consumer goods, relative prohibition for goods that could be imported only if domestic supply was deficient, and total prohibition for some goods. Import licenses were required for all imports, but the procedure depended on whether the import originated in France.

7. Their values ranged from 25 to 100 percent of the value of imports to be held for up to three months.

8. The exchange rate changed from 0.420 dinars to 0.525 dinars to the dollar.

9. Law of 23 July JORT, 13 September 1973.

10. This can be seen by comparing rates of change in c.i.f. and wholesale prices of restricted and unrestricted imports. From 1970 to 1973, both sets of prices for unrestricted goods generally changed at the same rate. However, for restricted goods, a different pattern emerged. In 1970–71, both sets of prices moved at the same rate; in 1972–73, c.i.f. prices rose more rapidly than wholesale prices. These changes in price behavior indicate importers began to absorb c.i.f. price increases as restrictions were being relaxed.

11. In 1974 both the current account balance and merchandise balance were positive because there was a large increase in the price of oil and phosphates. However large deficits reappeared in 1975 (see table 10.2).

12. Alfa is a plant used to make paper pulp.

13. Note that the values given in table 10.4 refer to merchandise trade only. They therefore differ from the values of table 10.2, which include trade in goods and services. Service trade is important to Tunisia. In 1972 service exports (mainly tourism and transportation) were 41 percent of total exports of goods and services. Likewise, service imports were 17 percent of total imports of goods and services in 1972.

14. For these estimates, food processing (except for olive oil and wines) and rugs were treated as manufacturing activities. Excluding food processing and rugs gives an elasticity of 0.9.

15. A detailed presentation of these is given in the Ministry of Planning (1975) study of effective protection.

16. The Corden procedure, which should be used, cannot be used from these studies.

17. A detailed comparison of the two studies is found in Nabli (1978).

18. In all calculations, sectors with ERP < -100 percent are excluded.

19. The large figure for capital goods in the Blake estimates is due to the inclusion of mechanical and electrical industries (sectors 61 and 62), which have large ERPs.

20. The number of seasonal employees was converted from man-days to man-years, assuming 1 man-year = 250 man-days. Also, all estimates of employment are averages of the number of workers as of 2 January 1972 and 2 January 1973. This helps reduce the sampling error of estimates.

21. It was assumed that half the workers in this category were semiskilled and the rest were unskilled. This division was inferred from other survey data and is thought to be reasonable.

22. The weights, w_i, were 6.77, 2.23, 2.95, 1.41, 1.00, 0.36, and 1.00 for the seven labor categories in the text. Two other indexes for unskilled labor and two for skill content were calculated with results generally the same. Results with other indexes are given in Nabli (1978).

23. Sector 30, pressed sugar, had zero exports in 1972 but is classified as an export sector. Traditionally, output from this sector has been exported to Algeria.

24. The correlation coefficients are as follows: 0.95 for L/DVA and UL/DVA, -0.342 for L/DVA and SK, and -0.514 for UL/DVA and SK.

25. For details of calculations see Nabli (1978).

26. It should be noted in this respect that inclusion or exclusion of sectors with negative IVA does not affect the results.

27. If one were willing to assume that physical capital and skills were complementary, the skill content indicator would be a good indicator of capital intensity. In this regard, note in table 10.11 that exportables are less skill-intensive and therefore perhaps less capital-intensive than importables.

28. The data are unpublished and were obtained from the Institut National de la Statistique et des Etudes Economiques, Paris. No skill breakdown of the labor force or wage bill was available, so skill indexes could not be calculated.

29. I also made a gross adjustment for the value of imports in order to make the figures comparable with those of the I-O table for production, which are at producer's values. I subtracted freight and insurance charges on imports at a uniform rate (8 percent), and also domestic (in France) trade margins.

30. Direct plus indirect home goods requirements were not calculated but would not be very different from the direct only estimates, since the labor coefficients in home goods are close to the average of all sectors in France.

31. Again here I am considering only the labor content of noncompeting imports that are directly imported and ignoring indirectly imported noncompeting goods. A more appropriate procedure would be to calculate the labor content of "direct plus indirect in noncompeting" noncompeting imports, but this would be a difficult empirical task.

32. Most sectors are in the interval of -25 to $+100$ percent, but a large number of sectors are highly protected: 15 have ERPs of 200 percent or more, and 16 have negative IVA. The ranges of ERPs are as follows for groups 1–6, respectively: -75 to 0; 0 to 50; 50 to 75; 75 to 125; 125 to 200; and ≥ 200. The seventh group includes sectors for which IVA is negative according to the Ministry of Planning study. The results of the analysis are not changed when using the effective protection estimates of Blake and are not reported here.

33. The evidence is even stronger using other unskilled labor indexes with a narrower definition of unskilled labor.

34. This category includes managers, engineers, salaried employees, and supervisory personnel.

35. The coefficient of SEX could be interpreted as the premium (negative) of a female unskilled worker relative to a male unskilled if the differential affects only unskilled female labor. But the large coefficient of SEX is evidence that this interpretation is not valid and that differentials are present at all skill levels.

36. There is a high degree of data variability for these firms. It is well known that the accounting practices are weak, and they are often unable to provide accurate information.

37. Comparing the constant terms of regression equations (4) and (14) of table 10.15 suggests that such a differential does not exist. But this comparison is misleading, since the constant term a_0 includes also the average effect of the omitted elements in the determination of wages; that is, $a^*_0 = a_0 + E(u)$, when $E(u) \neq 0$.

38. Size is the proportion of employment in firms of fifty employees or more in the sectoral totals, and labor intensity is measured by the labor/domestic value added ratio.

39. I also assume a 30 percent currency overvaluation, no tariffs or taxes on capital goods, and a 40 percent import content of investment. Note that the ratio of wage/rental ratios in the public and private sectors is $1.2/[(1 - .3 \times .4)4/7] = 1.2/.5 = 2.4$. The ratio of wage/rental ratios is $1.2/x$ where the ratio of rental rates is $x = \dfrac{(1 - 0.3 \times 0.4)4}{7}$.

40. The first group of the public sector includes two labor-intensive activities: pharmaceuticals and animal feed.

41. Results based on UL/DVA are only slightly different from the ones outlined here (see table 10.16).

42. See table 10.24.

43. The level-of-protection groups were defined in the preceding section. See table 10.16 and note 32.

44. Account is not taken of group 7 in these comments.

45. The labor intensity criteria were: (1) L/DVA higher than 0.961 for direct plus home goods indirect, or UL/DVA higher than 0.551; (2) the activity was included in Lary's (1968, table C–1) list of labor-intensive manufactures; or (3) the activity was on Banerji's (1975, table A–11) list of labor-intensive manufactures.

46. Here and throughout the rest of this section, employment figures cited refer to direct plus indirect labor.

47. They accounted for only 27 percent of total man-years and 25 percent of unskilled man-years.

48. With a Cobb-Douglas production function $Y = AK^{\alpha}L^{1-\alpha}$, and a change in the wage/rental ratio from

$$\frac{w_0}{r_0} \text{ to } \frac{w_1}{r_1} = (1 + \rho)\frac{w_0}{r_0}, \text{ we have } \frac{K_1}{L_1} = (1 + \rho)\frac{K_0}{L_0} \text{ and}$$

$$\frac{L_1}{Y_1} = \left(\frac{1}{1 + \rho}\right)^{\alpha}\frac{L_0}{Y_0},$$

with $w_1 = w_0$, $r_1 = 1.56\, r_0$, $\rho = -0.36$, $\alpha = 0.5$, and $\left(\dfrac{1}{1 + \rho}\right)^{\alpha} = 1.25$.

49. Strictly speaking, the argument above applies to direct requirements. Since in almost all the sectors considered the direct plus indirect coefficients are larger than the direct-only coefficient, the required increase in the direct coefficients should be larger than 25 percent, but the difference should be small, because the indirect requirements are generally small.

50. That is, column 10 = column 6 + (column 8 — column 4). This would imply, in fact, an average increase in unskilled labor-intensity of 48 percent.

51. Mechanical industries and textiles.

52. Applying average total and unskilled labor ratios of 1.100 and 0.670, respectively.

53. Total imports of the activity are larger than 100,000 dinars (c.i.f.). The large amount of imports in each activity may be due to aggregation problems; that is, the imports may be qualitatively different from domestic production. For sector 62 there are fifteen import categories from the six-digit Trade Nomenclature. Six of them make up 77 percent of the total, and eleven have value added greater than 100,000 dinars and account for 98 percent of imports in the sector. The pattern is similar in other sectors. Generally, two or three import categories predominate. Exceptions are sectors 109 and 117.

54. That is, in addition to the actual import substitution and to that considered above.

55. It is likely that the high rates of effective protection for those industries (according to Ministry of Planning estimates) are due to measurement errors and to existing inefficiencies. And these industries did not in fact expand because priority in investment was given to other capital-intensive projects.

56. Some SITC groups were not considered even when satisfying this condition, because they involve mostly machinery production where the 100,000 dinar minimum may not be strict enough, since taking advantage of economies of scale would require a much larger value of output; those SITC groups are 721, 723, 724, 725, 727, 728, 736, 737, 774, 793, 874, 881, and 882.

57. The labor coefficients were calculated using the average labor coefficients of the most similar domestic industry or the average coefficients of the import-competing industry.

58. The marginal capital value added ratio for manufacturing for the period 1961–72 was about 2.8.

59. The pulp and paper plant had negative DVA.

60. That is, who worked one to four days during the week before the census.

61. This estimate includes direct employment plus direct and indirect requirements in home goods production; see Nabli (1978).

62. Excluding olive oil and wine.

63. Excluding the artisanal carpet-weaving activity.

64. Calculated on the basis of incremental export-output ratios and employment created: construction materials (none), electrical, mechanical (584), chemicals-rubber (about 500 from new projects), wood, paper, miscellaneous (244), textiles (4,000 excluding carpets).

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