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9. ABSTRACT

The primary purpose of this study is to examine some of the possible effects of gradual liberalization of trade with the EEC, which would take place if Turkey moved toward full membership in the EEC, upon the Turkish economy. The second objective of the study is to estimate Turkey's gain (or loss) from free trade with the EEC. The reader is presented with background information about the Common Market, Turkey's membership in the Common Market, and the Turkish Economy during the 60's and early 70's. First, the Common Market -- its nature, [redacted], its formation, and its common economic policies-- is reviewed. Second, the Turkish economy of the 60's and 70's is examined, including the foreign trade regime and foreign trade.

In a later section of this chapter, the objectives of the study are presented in a more systematic manner. The methodology of the study is also explained. In the last section, the contents of the remaining chapters are summarized.

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By

TERCAN BAYSAN

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
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CHAPTER I

INTRODUCTION

Turkey is an associate member of the EEC, and according to the terms of the protocol signed by both parties, she has about twenty years before she becomes a full member of the EEC, assuming that there will be no changes in the time schedule.

Attempts of the Turkish government to join the Common Market faced some opposition from politicians and economists. Even after the establishment of associate membership, this opposition has continued. It was argued that Turkey should develop her own manufacturing industries because, the argument goes on, industrialization is necessary for economic development. As is often argued in LDC's, continued reliance on agriculture for economic development and for earning badly needed foreign exchange was seen as detrimental to economic independence. Relating this to the membership in the Common Market, the opposing group argued that the newly established manufacturing industries will not be able to compete with highly developed European industries, even considering the adjustment period which precedes

the full membership date; and, as such, Turkey's entry into the Common Market was considered a damaging factor to the achievement of industrialization. Thus, in the long-run, it was argued, Turkey will incur net losses from the membership.[1]

Furthermore, increases in the degree of protectionism in the second half of the 1960's and a continued indiscriminate emphasis on the import-substituting production during the Second Five Year Plan (1968-1972) made many people skeptical about the actual intentions of the Turkish government. In particular, the Common Market authorities made their concern clear, and raised questions as to whether or not Turkey wants to become a full member in the EEC.[2] Thus, there is some question as to whether in fact Turkey will abide by the protocol.

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[1]Numerous articles have been written (mostly in Turkish) by the proponents and opponents of Turkey's entry into the Common Market. However, the pro and con arguments presented are all impressionistic. For a brief review (in English) of some of these arguments, see Mükerrem Hiç, "Turkey's Entry to the Common Market: General Aspects of the Problem" in Problems of Turkey's Economic Development: Volume I, a publication of the Istanbul University, No. 1801 (Istanbul, 1972), pp. 563-601.

[2]A Common Market representative visited Turkey in June of 1972, and raised these questions with the government.

Despite the fact that Turkey's full membership in the EEC is still a controversial topic and there are doubts about it,[3] an examination of "What might happen if Turkey moved gradually toward full membership in the Common Market?" is a worthwhile study to undertake. In contrast to the present restrictionist regime, the gradual elimination of tariffs and other trade controls would establish free trade with the EEC countries. Already an important portion of Turkey's foreign trade takes place with the latter countries at the present. Of course, gradual liberalization of trade between Turkey and the EEC would (through changes in the relative commodity prices) affect the Turkish economy. The production structure and the income distribution (through the changes in value-added per unit of output in each sector), and the consumption and trade patterns through the changes in relative prices would be affected. These are some of the possible effects of formation of the EEC-Turkish customs union, and they could have important implications upon Turkey's industrialization and foreign trade.

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[3] Nonetheless, at the time of writing, Turkey is committed by a treaty and a subsequent protocol (annexed to the treaty) to eventual Common Market membership. Both the treaty and protocol signed by both parties are discussed later.

Thus, the primary purpose of this study is to examine some of the possible effects of gradual liberalization of trade with the EEC, which would take place if Turkey moved toward full membership in the EEC, upon the Turkish economy. The second objective of the study is to estimate Turkey's gain (or loss) from free trade with the EEC.

An important aspect of the study is that it is basically a study of the effects on the economy of a LDC of the formation of a customs union in general. One of the purposes of estimating Turkey's gain or loss from free trade with the EEC is to compare the estimate with the estimates of gains or losses of Great Britain from joining the EEC, derived in other studies. The comparison might lead to a general conclusion about the sizes of economic gains (or losses) that a LDC and an industrialized country might incur by joining a customs union formed by a group of industrialized countries.

In the remainder of this chapter, the reader is presented with background information about the Common Market, Turkey's membership in the Common Market, and the Turkish Economy during the 60's and early 70's. First, the Common Market -- its nature, its formation, and its common economic policies -- is reviewed. The implications to the Turkish economy of the

common economic policies of the EEC are discussed shortly, assuming Turkey will abide by the terms of the protocols signed. Then, the establishment of Turkey's associate membership in the EEC (i.e., the Ankara Agreement and its terms) and subsequent developments in the associate membership are discussed. Second, the Turkish economy of the 60's and 70's is examined, including the foreign trade regime and foreign trade. The purpose of this latter section is to familiarize the reader with the present structure of the Turkish economy and her protectionist trade regime. This would also enable the reader to compare the present restrictionist trade regime in Turkey and the trade policies of the EEC, policies which Turkey will adopt upon entry into the EEC.

In a later section of this chapter, the objectives of the study are presented in a more systematic manner. The methodology of the study is also explained. In the last section, the contents of the remaining chapters are summarized.

A. THE COMMON MARKET AND TURKEY'S MEMBERSHIP IN THE COMMON MARKET

1. The Common Market and Its Economic Policies

Six European countries -- France, West Germany, Italy, Netherlands, Belgium and Luxemburg -- joined in a series of meetings which started in June of 1955 and continued through

1956 and into some part of 1957. The purpose of the meetings was to discuss the possibility of moving toward a united Europe. The meetings were successful in creating the European Economic Community which was formally established by the signing of the Treaty of Rome on March 25, 1957. The participant countries listed above -- the Original Six -- agreed that the movement toward the economic integration of Europe is an essential first step toward creating a political unity in Europe.

The economic integration formed by the Original Six -- widely known as the Common Market -- is basically a customs union, in which member countries eliminate tariffs and other trade controls among[4] themselves and adopt a common and uniform tariff on imports from non-member countries. However, the Common Market has an additional feature that a customs union (as described in the literature) does not; that is, that the members, by the Treaty of Rome, also assumed the

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[4] In order not to disrupt the continuity of this chapter, a review of the basic developments in the theory of customs unions is avoided here. However, the reader who is not familiar with the theory of international economic integration could refer to the sources listed in Footnote 34 in Chapter II.

responsibility of eliminating restrictions on the free movement of labor and capital within the union.[5]

Although the political unity of Europe remains to be seen, it seems that the members of the EEC have been successful so far in keeping the union together and developing a degree of economic unity on some issues.[6] The Common Market countries, starting from 1957, gradually abolished all restrictions on intra-Community trade. By July 1968, customs duties with the EEC were completely abolished, while each member country's tariff on imports from the non-member countries was gradually aligned with the uniform common external tariff (CET) set by the Community.[7]

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[5]A customs union with this additional feature is generally called a "common market" in the economic integration literature.

[6]This does not mean that the Community is not having any economic problems. In fact, the Community has had disagreements over certain issues -- in the financing of certain projects (e.g., food aid to LDCs, nuclear research) and in the field of international monetary relations -- in the past. Certainly crises will continue to emerge from time to time in fields in which the interest of the community as a whole and the interest(s) of one or more members conflict. See The Commission of the European Communities, "The Progress of the European Communities" in P. Robson (Ed.), International Economic Integration (Penguin Books, 1971), pp. 387-402.

[7]For the timing of these gradual tariff changes see European Economic Community Commission, Eight General Reports on the Activities of the Community (1 April 1964-31 March 1965), June 1965, Table 1, p. 33.

The Common Market countries have also worked toward a common tax policy and a common agricultural policy. The value-added tax recently replaced the cascading turnover tax on production (they are both levied on sales transactions, but taxes paid by a producer for the purchases of inputs are credited to him in the case of value-added tax). The Community was successful in establishing the Common Agricultural Policy (CAP) which is highly protective in nature against agricultural imports from non-member countries (except for cotton and tropical products).[8] The main purpose of CAP has been to establish a "single unified market" for each agricultural product with the EEC. Such a unified market implies a uniform price, for the same agricultural product, for the entire Community, with differences resulting only from differences in transportation costs. Fixed uniform prices have been in force for most of the agricultural products, and the Community members have been able to move these products freely within the Union since July 1968.[9] Furthermore, the Community members have aligned their internal economic

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[8] For the details of CAP see Lawrence B. Krause, European Economic Integration and the United States, The Brookings Institution, Washington, D. C., 1968, pp. 88-94.

[9] The Commission of the European Communities, "The Progress of the European Communities," op. cit., p. 387.

policies in accordance with the principles laid down by the Treaty of Rome so as to create a free movement of labor and capital within the rules governing competition.

The Community members have also been working toward common policies[10] in other fields of economic life. Some of the issues that have been under consideration are: anti-trust laws, patents and trademark problems, and energy problems. However the developments which took place in these areas will not be discussed here. They have been discussed and analyzed in numerous studies.[11]

The implications[12] of the Common Policies of the EEC for Turkey -- From the brief review of the economic policies of the Common Market, it can be observed that there are two

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[10]The common policies of the EEC are regulated by the principles of the Treaty of Rome, and new economic policies are being introduced by the governing bodies of the community.

[11]For a thorough study of the EEC, see Krause, op. cit.

[12]The creation of the EEC changed the economic structure of Europe. The member and non-member countries have been affected by the common policies of the Community. Furthermore, the formation of the EEC prompted other European countries to form the European Free Trade Association. A detailed examination and analysis of the implications of the EEC for its original members and the rest of the world is outside the scope of this study. However, the reader who is interested in a comprehensive appraisal of the impact of the EEC (and the EFTA) upon the members and the rest of the world, in particular upon the United States, could refer to Krause, op. cit.

basic elements that Turkish economy would have to adjust to and, in the process of adjustment, be affected by, if Turkey moved gradually toward full membership in the EEC. One of them involves institutional adjustments: (i) Turkey would be required to harmonize her domestic economic policies gradually with those of the EEC, and this might necessitate a tax reform (the value-added tax is used by the Common Market countries), and a change in the price support policy of TMO (Soil Products Office) vis-a-vis the objectives of CAP (Common Agricultural Policy) of the EEC might be necessary; and (ii) since fixed exchange rates exist between the currencies of the member countries, it is important that overvaluation or undervaluation of the currency of a member country (in relation to other currencies in the Community) does not happen in the process of achieving domestic goals. This would require careful use of fiscal and monetary policies by the Turkish government, and probably an initial exchange rate realignment.

The second basic element involved in Turkey's membership in the EEC is the (bilateral) gradual elimination of tariffs and quantitative controls. As discussed earlier, an elimination of tariffs would affect the present production structure, and the consumption and trade patterns.

Later in this chapter these implications will be discussed when the objectives of the study are presented systematically. Also, a qualitative analysis of these implications is presented in Chapter II.

2. Establishment of Turkey's Associate Membership in the EEC and Subsequent Developments

The Ankara Agreement. Turkey applied to the Community for associate membership in July of 1959, and after several sessions of negotiations, both parties finally agreed on the terms of Association in June, 1963.[13] The Agreement was signed in September, 1963, and became effective in December, 1964.

Besides the political considerations[14] and a possibility of developing large scale manufacturing industries (in the products in which Turkey may have a potential competitiveness) to serve the European market, one of the factors that prompted the Turkish government to apply for association in the EEC and which affected the timing of application was the fact that Greece applied for

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[13] For a summary of the contents of the Ankara Agreement, see the Bulletin of the European Economic Community, sixth year, No. 8, August 1963, pp. 5-8.

[14] Political considerations centered around the presumption that being a member of an economically strong group of countries which, as a group, have an important weight in international politics might be beneficial.

association one month earlier -- in June, 1959.[15] This is because Greece is the main competitor of Turkey in her traditional export goods -- tobacco, cotton, fats and oils, oilseeds, and raisins -- and also in some of the non-traditional export goods such as citrus fruits, table grapes, peaches, and canned food. Furthermore, the EEC market is a major market for both countries' exports. In 1959, both Greece and Turkey exported 40 percent of their total exports to the EEC.[16] Thus, the possibility of losing her major export market to Greece was an important factor in Turkey's decision to apply for association with the EEC. Another factor which probably affected the decision to enter into the Community was the possibility of obtaining increased foreign aid from the EEC countries.

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[15] Greece and the Community signed an agreement -- the Athens Agreement -- in July of 1961, and the association became effective in November, 1962. There are some important differences between terms of the Ankara and Athens agreements: see Krause, op. cit., pp. 197-199.

[16] Also, both countries import a large amount of their imports from the EEC: Greece imported 38 percent of her total imports, and Turkey imported 36 percent of her total imports from the EEC in 1959; source: Krause, op. cit., Table 6-6, p. 198 (main source: U. N., Commodity Trade Statistics).

The Ankara Agreement provided three separate stages before the full membership date: the preparatory phase (first stage), the transitional period (second stage), and the definitive period (third stage).

The Preparatory Period: The preparatory phase, which was initially scheduled to last five years, ended in the second half of 1970 after several sessions of negotiations concerning the terms of the transitional period.[17] The purpose of the preparatory period was to give Turkey enough time to reorganize her internal and external economic affairs and evaluate her economic standing before the beginning of the transitional period. The Community would help Turkey in her economic development with unilateral trade concessions and financial aid during this period. Thus, with the signing of the Ankara Agreement, Turkey assumed the responsibilities of preparing herself for the obligations involved in the gradual establishment of a customs union with the EEC.

During the preparatory phase, Turkey enjoyed preferential treatment, granted by the terms of the Ankara Agreement, accorded to her exports by the Community. Tobacco, raisins,

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[17] The Bulletin of the European Communities, Vol. 4, No. 1, 1971, p. 101.

dried figs, and hazelnuts, which made up approximately 40 percent of Turkish exports to the EEC in the mid 60's, were accorded tariff quotas[18] (for about the quantities imported in 1963 or 1964). Duty rates on these commodities were lower than the common external tariffs, and tobacco and raisins were subject to the intra-Community rates.[19] The volumes of these tariff quotas did not stay at their 1965 levels; they were increased twice before 1970. The import quotas which were set on a yearly basis were: tobacco: 12,500 tons in 1965, 13,615 tons in 1966, and 17,615 tons in 1967 (also the same in 1968 and 1969); raisins: 30,000 tons in 1965, 33,000 tons in 1966, and 38,570 tons in 1967, 1968, and 1969; dried figs: 13,000 tons in 1965, 14,300 tons in 1966, and 18,900 tons in 1967, 1968, and 1969; hazelnuts:

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[18] A "tariff quota" is a device whereby imports, within certain fixed limits, are permitted duty free or at reduced duty rates, and any amount imported in excess of the fixed quotas is subject to the common external tariff.

[19] The author was unable to find these preferential tariff rates on Turkish exports of tobacco, raisins, dried figs, and hazelnuts; a search for these rates in the various issues of The Bulletin of the European Communities and in other Common Market publications proved unfruitful. However, from the examination of the common external tariffs and the time table of the gradual elimination of duties on the intra-Community trade, the following rough estimates of these rates were derived: 15-20 percent for tobacco, 5-7 percent for raisins, 4-6 percent for dried figs, and 2- or 3 percent for hazelnuts. (Sources: for the time table of the gradual eliminations, see footnote 8; for the common external tariffs, see Frances K. Topping, Comparative Tariffs and Trade: The United States and the European Common Market, (New York: Committee for Economic Development, 1963), Vol. I, pp. 43, 44 and 121).

17,000 tons in 1965 and 1966, 18,700 tons in 1967, 1968, and 1969.[20] The relative importance of the above figures can be indicated by the following percentages: the percentage shares of tobacco, raisins, dried figs, and hazelnuts in total Turkish export earnings were 22.6, 4.3, 1.4, and 16.1 percent in 1967 and the percentage shares of the EEC tariff quotas for these Turkish export goods in their respective total (Turkish) export volumes were 19, 54, 59, and 25 percent[21] in 1967. It should also be noted that cotton enters duty free into the EEC, regardless of the source of the supply. Thus, Turkish cotton exports entered into the EEC duty-free; furthermore, there was no quantitative restriction on the amount of cotton entering into the EEC countries. Cotton exports earnings made up about 25.2 percent of the total Turkish export earnings in 1967.

In December 1967, the Community granted tariff quotas for additional exports from Turkey. These products included sea fish and other sea products, quality wine, table grapes, citrus

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[20] Source: European Economic Community Commission, General Report on the Activities of the Community, various issues (starting with the Seventh General Report).

[21] U. S. AID, Economic and Social Indicators - Turkey, (Ankara, August, 1971), Table 9-b, p. 34; first set of these figures were taken from this source directly and the second set of figures were derived by dividing the 1967 commodity specific EEC tariff quota figures by the total export volumes of these commodities in 1967.

fruits, some household items from the textile industries, and hand-made carpets and rugs. In Table I, the amount of tariff quotas (in the second column) of these items, and the preferential tariff duties (in the third column) are listed. The total amount of tariff quotas for sea products was 4,500 tons, and the preferential tariff rates were set at either 50 percent of the common external tariff (CET) or at intra-Community rates (15-25 percent). The tariff quotas for the remaining items were 6,000 litres for quality wine (duty rate set at 50 percent of CET), 240 tons for textile items (duty rates set at 50 percent of CET). Table grapes, citrus fruits, and Turkish carpets and rugs were accorded tariff reductions without any quantitative restriction: duty rates were set at 50 percent of CET for table grapes, 20 percent of CET for citrus fruits, and 11-24 percent reductions from CET were accorded to carpets and rugs. However, the percentages of the export earnings from these commodities in the total Turkish export earnings have been very small. For example, in 1967, the percentage share of export earnings from sea fish and sea product exports in the total Turkish exports was .011 percent, and it was .0004 percent for quality wine, .0016 percent for table grapes, 1.3 percent for citrus fruits,

TABLE I. THE TARIFF QUOTAS ACCORDED TO TURKEY IN DECEMBER 1967.

Export Products	Yearly Tariff quotas	Preferential Tariff rate
i) Sea Products:		
(a) Mackerel	300 tons	50 percent of CET
(b) Other salt water fish (except anchovies)	900 tons	50 percent of CET
(c) Tunny, including "pelamides," "Tariks," and "Orkinos"	1,650 tons	Intra-Community rate (15-25%)[2]
(d) Lobsters and crayfish	750 tons	Intra-Community rate (15-25%)
(e) Crabs, shrimp, and pawns	850 tons	Intra-Community rate (15-25%)
(f) Cuttle-fish and squids	50 tons	Intra-Community rate (15-25%)
ii) Quality Wine:	6,000 hl.	50 percent of CET
iii) Table Grapes:	no limit	50 percent of CET
iv) Citrus Fruits:	no limit	50 percent of CET
v) Textiles:		
(a) Terry towelling and similar terry fabrics of cotton	75 tons	50 percent of CET
(b) Other woven fabrics of cotton	105 tons	50 percent of CET
(c) Other garments and other articles knitted or crocheted	30 tons	50 percent of CET
(d) Bed linen, table linen, toilet linen and kitchen linen; curtains and other furnishing articles	30 tons	50 percent of CET
vi) Handmade Turkish Carpets:		
(a) Carpets of wool or of fine animal hair, handmade	no limit	24 percent reduction from CET
(b) Carpets of silk, handmade	no limit	20 percent reduction from CET
(c) Carpets of other textile materials, handmade	no limit	12 percent reduction from CET
(d) Other handmade carpets		20 percent reduction from CET
(e) Handmade "kerim" rugs	no limit	10.5 percent reduction from CET

Footnotes from Table I.

Source: Bulletin of the European Communities, Vol. 1, No. 2, (Feb., 1968), pp. 71-72.

Notes:

[1] CET stands for the Common External Tariff.

[2] In the Bulletin cited above the specific rates are not recorded; the possible range of these rates were derived from the time table of gradual eliminations of the intra-Community rates (see footnote 8) and from Topping, op. cit., Vol. I, pages 12 and 17.

.002 percent for the textile items, and .003 percent for carpets and rugs.[22]

In accordance with the terms of the Ankara Agreement, Turkey was also granted financial aid, amounting to $175 million, through the European Investment Bank. This aid was to be used in financing the investment projects prepared within the framework of the goals (which are listed below) of the Turkish Development Plans.

Transitional Period: The gradual establishment of the EEC-Turkey customs union started with the beginning of the transitional period, the second stage; the protocol concerning this period was signed in November 1970 (Footnote 18). In principle, the transitional period will last twelve years.

The terms which regulate trade during this period were prepared according to the principles of Article XXIV of GATT:[23] the customs union will cover all trade, meaning that Turkey will

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[22] U. S. AID, "Turkish Exports 1962-1970," (mimeographed); SIS, Annual Foreign Trade Statistics: 1968, pub. no. 577 (Ankara, 1968).

[23] Article XXIV of GATT basically includes the principles under which customs unions and free trade areas can be established; for the full text of the article, see General Agreement on Tariffs and Trade, Basic Instruments and Selected Documents, Volume IV, Text of the General Agreement, 1969 (Geneva, March 1969), pp. 41-44.

gradually adopt the common external tariff of the Community (over a period of twelve years, and for some products over a period of twenty-two years). For the agricultural products, Turkey will realign her agricultural policies so that after a period of twenty-two years -- beginning with the transitional period -- Turkey will be able to adopt the common agricultural policy of the EEC.

The specific terms that were agreed upon in the November (1970) protocol are the following:[24] (a) to begin with, Turkey will reduce tariffs on industrial imports from the Community by 10 percent (which she did) and she will progressively eliminate all other custom duties on imports from the Community over a twelve year period. However, for some imports (which make up about 45 percent[25] of the Turkish imports from the Community) the period will extend over 22 years. (b) In return, the Community's concessions are the following: (1) with the start of the transitional period, Turkey was granted an intra-Community status for her exports of industrial products except for some

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[24] For details see: Bulletin of the European Communities, Vol. 3, No. 9/10, Sept./Oct. 1970, pp. 23-25.

[25] Ibid., p. 23.

textile items; (2) the Community reduced the tariff level on some cotton textile products by 75 percent with the beginning of this stage, and they also reduced tariff levels on machine-made carpets, cotton yarn and other woven fabrics of cotton by 25 percent (tariff quotas and duties on these last three items will be eliminated over a 12-year period[26]); (3) most of the Turkish agricultural exports were granted favorable terms, to be effective from the beginning of the transitional period; tobacco started to enter into the EEC duty-free, and most other agricultural products were accorded tariff reductions ranging from 50 to 75 percent;[27] (4) additional financial aid amounting to $195 million was provided to Turkey. (c) Free movements of workers will be gradually achieved between the 12th and 22nd years of the Ankara Agreement.

For other economic activities which are covered by the Treaty of Rome, required adjustments will be made according to the protocols signed, and Turkey will align her policies with those of the Community. The terms of the definitive phase, the last stage, will be determined by an additional protocol, after the completion of the transitional period.

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[26] Ibid.

[27] Ibid., p. 24.

B. TURKISH ECONOMY DURING THE 60'S AND EARLY 70'S

1. Growth and Structural Change.

Compared to past decades, the 60's was a period of planned economic development. After a military intervention in May 1960, which overthrew the government of Prime Minister Menderes after ten years of rule, a new constitution was prepared and adopted in 1961. The new Constitution stated that economic planning for the development of the Turkish economy was the responsibility of the government. The functions of preparing development plans and of coordinating economic activities of the public and private sectors were given to the State Planning Organization (SPO), established by the new Constitution.[28] Since the establishment of SPO,[29] two Five Year Plans have already been implemented

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[28] The new Constitution was accepted, after a referendum, on July 9, 1961. Thus, the "Constitutional" establishment of SPO coincides with the latter date. However, the work on a special law which would specify the functions and organizational structure of the SPO had started earlier, and a law -- Law No. 91 -- was enacted on September 30, 1960; thus, SPO was officially established by Law No. 91 and became functional on September 30, 1960. For the full text of Law No. 91, see Official Gazette, October 5, 1960.

[29] Law No. 91 (Footnote 28) defined the functions of SPO, and as specified in Article 2 of this law, they are: (a) "To assist the government in determining economic and social objectives and policies, . . ."; (b) "To make recommendations to and act in a consultative capacity for the ministries, . . ."; (c) "To prepare long and short-term plans for the realization of the objectives to be adopted by the government"; (d) "To advise on the improvement of the organization and functioning of the government offices and
(continued on the following page)

(the first for 1963-1967, and the second for 1968-1972). Implementation of the Third Five Year Plan (1973-1977) has started.

These plans have been prepared with a fifteen-year time perspective. The basic goals of the first fifteen-year planned development period (and also of the Five Year Plans) were: (1) a 7 percent annual growth rate; (2) gradual achievement of the self-sufficiency in financing investments necessary to sustain a 7 percent annual growth rate, such that by 1977 Turkey could reach a stage where a 7 percent annual growth rate could be maintained without further foreign aid;[30] (3) to change the

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(footnote 29 continued)
agencies as well as of local administrations concerned, to assure successful execution of plans"; (e) "To follow up the implementation of the Plan, evaluate it, and make revisions where necessary"; (f) "To propose measures which will encourage and regulate the activities of the private sector in harmony with the goals and objectives of the Plan"; (English translation is from S. Ilkin and E. Inanc (Eds.), Planning in Turkey, Middle East Technical University, (Ankara, 1967), pp. 311-316). It is clear that SPO does not have implementation responsibilities, and it was established with advisory capacity. Between 1967 and 1971, however, SPO had the responsibility of implementing investment and export incentives (including export rebates). Furthermore, in the late 60's applications for capital good import licenses had to be cleared with the SPO. Thus, despite its advisory status, SPO has had the means to influence the economic activity in Turkey, directly or indirectly.

[30] State Planning Organization, First Five Year Development Plan 1963-1967, (Ankara, Jan. 1963), p. 41 (references are made to the copy which is in Turkish); and SPO, Second Five Year Development Plan 1968-1972, (Ankara, 1968), p. 5. Henceforth, these two Five Year Plans will be referred to by FFYP, SFYP respectively.

present agricultural character of the Turkish economy through induced structural change (i.e., by setting a higher target rate of growth for industrial output than the growth rate of agricultural output);[31] and also, industrialization will emphasize investments in the areas of import-substituting production and in the production of (diversified) products with export potential.[32]

The two Five Year Plans were prepared within the framework of the basic goals listed above. The FFYP placed more emphasis upon the public sector's role in development efforts and in achieving the plan targets: it was pointed out that the government should regulate the economy (through direct intervention in the economy and by public investments) in order to secure the achievement of the Plan objectives.[33] The SFYP, on the other hand, emphasized more the use of price incentives and a reliance on market mechanisms.[34] This changing emphasis on the role of the public sector and price mechanisms in the two Five Year Plans is a reflection of the fact that the two major political parties -- first the Republican Peoples Party formed a coalition

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[31] FFYP, p. 39.

[32] FFYP, p. 42.

[33] FFYP, pp. 59-60.

[34] SFYP, pp. 111-112.

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foreign aid receipts (i.e., consortium credits plus project credits plus PL-480 surplus commodity imports) were less than the anticipated amounts, but also by the fact that aid was coming in on a yearly basis and there was a lack of prepared investment projects in the early years.[44]

b. The SFYP (1968-1972). As in the FFYP, the target for the annual growth rate during the SFYP period was 7 percent.[45] GNP was to increase by 40.3 percent above the 1967 level in 1972. The share of foreign savings was to be reduced from 2 percent in 1967 to 1.7 percent of GNP in 1972, and the share of domestic savings was to be increased from 17.9 percent to 22.6 percent of GNP during the same period. Thus, the share of investment would increase from 19.9 percent of GNP in 1967 to 24.3 percent of GNP in 1972. The planned annual rate of increase of public investment was 10.3 percent, and the projected growth rate of private investment was 12.6 percent; private consumption was projected to increase at an average rate of

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[44] SFYP, pp. 15-16. The Turkish Consortium assumed the responsibility of coordinating the foreign aid contributions of donor countries in 1963. For a more detailed examination of capital and foreign aid flows (gross and net) to Turkey during the 60's, and of foreign debt servicing, see Anne O. Krueger, Foreign Trade Regime and Development. Turkey (in press), Part III, Chapter V, pp. 15-20 (references are made to the final draft of this study).

[45] Targets are from SFYP, pp. 74-105.

5.1 percent annually. Sectoral growth rates were set with the continued view of changing the structure of the Turkish economy through industrial development: the target (average) growth rate was 4.1 percent for agriculture and 12 percent for industrial output per annum.

The data on implementation results in the final years of the SFYP period are not available yet. The available figures for the 1970 and 1971 realized production levels are provisional estimates of SPO. According to the published data,[46] during the first four years of the SFYP period, GNP -- at 1961 prices -- increased by 6.7, 6.4, 5.7, and 9.2 percent. Over the same years, agricultural output increased by 1.9, 0, 1.0, and 5.4 percent, and industrial output (including mining, manufacturing and utilities) increased by 9.7, 9.6, 2.7 and 8.7 percent. During the first three years, performance of the agricultural sector was poor due to bad weather conditions, and consequently, the growth rate of GNP was below the target level. The increase in the industrial output in 1970 was substantially below the

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[46]Sources: SPO, Annual Program(s); U.S. AID, Economic and Social Indicators -- Turkey, (Ankara, August 1971), Table 4-D, p. 16; Ministry of Finance, Monthly Economic Indicators, Feb./March, 1972, p. 50. It should be noted that the 1971 data are provisional estimates of the State Institute of Statistics, whereas the data listed for earlier years are those of SPO.

expectations. Likely explanations for this result are: (1) the "uncertainty"[47] caused by the political instability in Turkey during the late 60's, and (2) under-utilization of production capacities due to the lack of imported raw materials and other intermediate inputs, caused by the balance of payments difficulties of the late 60's.[48] However, the provisional estimates for 1971 indicate that the production activity recovered its speed after the August 1970 devaluation,[49] and the increase in GNP was 9.2 percent. Of course, the large increase in agricultural output in 1971, compared to earlier years, was also a crucial factor in the realization of an overall growth rate above the target level.

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[47] That is, the possibility of military intervention because of the clashes which took place between the rightist and leftist groups and the resulting uncertainty about the future course of the economic policies of the present (or a new) government.

[48] Although the Turkish lira was devalued in August 1970 (thus ending the pressure of recent years on the balance of payments), and steps were taken with the August devaluation to liberalize trade, economic recovery took some time after the devaluation.

[49] The August 1970 devaluation and its aftermath are discussed in detail, later in this chapter.

In Table III, the SFYP balance of payments projections and realized values are compared; the figures in parentheses are the projected values. Both exports and imports were below the planned levels during the first three years of the Plan. However, in 1971 they were above the target levels, and as will be seen below, the August devaluation was an important factor in the latter discrepancy between the planned and realized amounts. Workers' remittances were below the projected levels in 1968 and 1969, whereas in 1970 and 1971 they were substantially above them (actual amounts were $273 and $471 million, contrasted with the target levels of $160 and $165 million, respectively). Large increases in workers' remittances during the later years of the SFYP period were also due to the August devaluation (this point will also be discussed below).

During the first four years of the SFYP, foreign aid receipts, including surplus commodity imports, were $245 million in 1968, $311 million in 1969, $479 million in 1970, and $354 million in 1971, contrasted with the projected levels of $277 million for 1968, $290 million for 1969, $295 million for 1970, and $279 million in 1971 (see Table III). Thus, except for 1968, the amounts of foreign aid actually received were larger than the projected figures.

TABLE III. THE TURKISH BALANCE OF PAYMENTS (1968-1971): THE SFYP PROJECTIONS AND REALIZATION (Mill. $).[1]

	1968	1969	1970	1971[2]
I. Current Account				
A. Foreign Trade				
1. Exports (f.o.b.)	(540)	(575)	(615)	(665)
	496	537	588	677
2. Import (c.i.f.)	(-835)	(-900)	(-975)	(-1,040)
	-764	-801	-948	-1,171
Trade Balance	(-295)	(-325)	(-360)	(-375)
	-268	-264	-360	-494
B. Invisible Items				
(1. Interest payments on foreign debt)	(-49)	(-51)	(-55)	(-61)
	-34	-39	-47	-47
(2. Workers' remittances)	(140)	(150)	(160)	(165)
	107	141	273	471
Total Invisibles	(83)	(94)	(115)	(141)
	37	42	181	379
C. Infrastructure and off-shore receipts	(15)	(15)	(10)	(10)
	9	8	8	6
Balance on Current Account	(-197)	(-216)	(-235)	(-224)
	-222	-214	-171	-109

TABLE III. (continued)

	1968	1969	1970	1971[2]
II. Capital Account				
1. Foreign Debt Payments	(-102)	(-101)	(-93)	(-94)
	-72	-87	-158	-91
2. PL-480 (surplus comm.) imports	(277)	(290)	(295)	(279)
3. Project Credits	245	311	479	354
4. Consortium Credits				
5. Private Foreign Capital	(40)	(43)	(47)	(51)
	13	24	58	45
6. Imports with waiver and credits	(12)	(14)	(16)	(18)
	22	20	34	27

Notes:

[1] The figures in parenthese are the SFYP target levels. Some of the SFYP projected figures listed above were later revised in the subsequent Annual Programs.

Sources: SFYP, Table 57, p. 105 (for the target levels);
SPO, 1971 Annual Program, Table 7, p. 29 (for the actual figures);
Ministry of Finance, Monthly Economic Indicators, Feb./March, 1972, p. 50 (for the actual figures).

c. The 1962-1970 Period: An Overview: During the 1962-1970 planned economic development period, GNP increased at an average rate of 6.3 percent (evaluated at 1965 prices) per annum,[50] below the target level. Industrial output increased at a higher rate than agricultural output. Thus, some structural change, which was one of the basic goals of the Plan, did indeed occur during this period. As seen in Table IV, the share of agricultural output in NNP decreased from 40.9 percent in 1961 to 29.9 percent in 1970; during the same period, the shares of industry, construction, and of transportation and communications increased (from 16.3 percent to 19.6 percent for industry, from 6.1 percent to 7 percent for construction, and from 7.3 percent to 8.1 percent for transportation and communications).

During the early years of the 60's, the rate of inflation was relatively low -- about 4 percent per annum -- mainly due to the results of a stabilization program that accompanied the 1958 de facto devaluation. After 1964, however, growth efforts induced price increases. During the FFYP period, the general (wholesale) price level increased at an average rate of 6 percent annually, and in the late 60's (between 1968 and 1970) the average

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[50] SPO, 1971 Annual Program (Ankara; March, 1971), Table 2, p. 23.

TABLE IV. PERCENTAGE DISTRIBUTION OF AGGREGATE NATIONAL INCOME BY INDUSTRIAL ORIGIN (AT FACTOR COST OF 1961).

	1961	1962	1963	1964	1965	1966	1967[1]	1968[1]	1969[1]	1970[2]
1. Agriculture	40.9	40.7	40.7	38.9	36.1	36.3	34.6	33.1	31.2	29.9
a. farming	40.1	40.0	39.9	38.1	35.3	35.6	33.9	32.4	30.5	--
b. forestry	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	--
c. fishing	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	--
2. Industry	16.3	16.4	16.4	17.0	17.8	17.8	18.9	19.5	20.1	19.6
a. mining quarrying	1.6	1.6	1.5	1.6	1.7	1.6	1.6	--	--	--
b. manufacturing	14.1	14.2	14.4	14.7	15.5	15.6	16.7	--	--	--
c. electricity, gas, water works	0.6	0.6	0.5	0.7	0.6	0.6	0.6	--	--	--
3. Construction	6.1	6.1	6.0	6.2	6.4	6.5	6.6	6.8	7.0	7.0
4. Wholesale & retail trade	7.7	7.8	7.8	8.1	8.3	8.2	8.3	8.5	8.6	8.7
5. Transportation Communication	7.3	7.4	7.5	7.6	7.8	7.6	7.7	7.8	8.0	8.1
6. Financial Institutions	2.8	2.8	2.8	2.9	2.9	3.0	3.1	3.2	3.3	3.4
7. Private Professions and Services	5.1	5.2	5.1	5.3	5.5	5.3	5.4	5.4	5.5	5.6

TABLE IV. (continued)

	1961	1962	1963	1964	1965	1966	1967[1]	1968[1]	1969[1]	1970[2]
8. Ownership of dwellings	4.9	4.8	4.8	4.9	5.1	5.0	5.2	5.3	5.4	5.6
9. Government Services	9.5	9.3	9.3	9.5	9.8	9.6	9.9	10.1	10.1	10.7
10. Income from the rest of world	-0.6	-0.5	-0.4	-0.4	+0.3	+0.7	+0.3	+0.3	+0.6	+1.4
11. Net National Product (at factor cost)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[1] Provisional estimate

[2] Preliminary estimate

Source: State Institute of Statistics, National Income: Total Expenditures and Investment of Turkey, 1938, 1948-1970, Pub. No. 625, (Ankara, 1971), Table 4, p. 17.

annual rate of inflation was about 7.7 percent; for the 1963-1970 period, the average annual rate of price increase was 6.4 percent according to the wholesale price index.[51] Consumer price indices (of the Ministry of Commerce, for Istanbul) indicate, however, a higher rate of increase in the price level of consumer goods: the average annual rate of increase during the 1963-1970 period was about 8 percent.

Foreign Trade Projections and Realization: The two FYP's import and export projections and the actual levels are listed in Tables V-A and V-B for the 1963-1972 period.

In Table V-A, the import projections[52] and actual levels are compared. During the FFYP period, raw material imports were above the planned levels in each of the five years, whereas investment and consumption good imports, except for 1963, were less than the projected amounts. Earlier, it was stated that real investment increased less rapidly than planned, and total investment was below the target level during the FFYP period; consequently, imports of investment were below the target levels. In contrast with the FFYP projections, the SFYP

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[51] Central Bank, Bulletin Mensuel, several issues (main source: Ministry of Commerce, Conjuncture and Publication Department price indices).

[52] Some of the planned figures were revised in the subsequent annual programs.

TABLE V-A. THE FFYP AND SFYP IMPORT PROJECTIONS AND REALIZATION[1] (Mill. $)

	Raw Material Imports		Investment Good Imports		Consumption good Imports	
	Planned	Actual	Planned	Actual	Planned	Actual
1963	235	327	241	256	71	104
1964	262	296	274	197	76	44
1965	300	313	296	197	85	62
1966	325	365	333	289	87	64
1967	364	380	363	260	94	45
1968	418	394	332	325	85	45
1969	460	431	350	251	90	119
1970	510	527	370	284	95	137
1971	555	721	385	340	100	110
1972[2]	605	775	405	450	105	90

[1]PL-480 (U. S. agricultural surplus) imports are not included in the figures.

[2]Provisional estimates.

Sources: For the planned levels: FFYP, Table 375, p. 519; SFYP, Table 52, p. 99. For the actual levels: SFYP, Table 12, p. 29; SPO, Annual Programs, 1968 (p. 60), 1969, (p. 41), 1970 (p. 27), 1971 (pp. 30-31); SPO, Yeni Strateji ve Kalkınma Planı: Üçüncü Beş Yıl (1973-1977), pub. no. 1272, Table 46, p. 57.

TABLE V-B. THE FFYP AND SFYP EXPORT PROJECTIONS AND REALIZATION (Mill. $).

	Agricultural Exports		Industrial Exports		Mineral Exports	
	Planned	Actual	Planned	Actual	Planned	Actual
1963	270	284	56	73	22	11
1964	291	312	61	84	22	15
1965	298	352	72	91	24	21
1966	330	379	73	88	24	23
1967	349	421	82	81	26	21
1968	409	399	100	71	31	26
1969	427	403	114	99	34	35
1970	445	443	133	103	37	43
1971	465	491	160	145	40	40
1972[1]	481	525	197	188	42	37

[1] Provisional estimates.

Sources: For the planned levels: FFYP, Table 376, p. 520; SFYP, Table 53, p. 100. For the actual levels: SPO, Annual Programs, 1969 (p. 42), 1970 (p. 25), 1971 (pp. 35-36); SPO, Yeni Strateji ve Kalkınma Planı: Üçüncü Beş Yıl (1973-1977), pub. no. 1272, Table 45, p. 56.

raw material import projections were larger than those of investment good imports. This reflects the planners' reaction to the large discrepancies between the projected and actual imports of raw materials and investment goods during the FFYP period; i.e., actual raw material imports were above and investment good imports were below the projected levels except in 1963 (because of the large imports made for the construction of the Eregli Iron and Steel Mills[53]). During the SFYP period, raw material imports were less than the planned levels in 1968 and 1969, and more in 1970, 1971 and 1972. Investment good imports were below the projected levels during the first four years of the SFYP and above in 1972; consumption good imports were above the planned levels, except in 1968 and 1972.

The FFYP and SFYP export projections and actual figures, in three main categories, are listed in Table V-B. Comparison of the planned and actual export levels of agricultural products, during the FFYP period, shows that the planners underestimated Turkey's export potential in her agricultural products; actual exports of agricultural products exceeded the planned levels in

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[53] SFYP, p. 27.

each of the five years. Consistency of the underestimation is an indication of the export pessimism -- in regard to traditional exports -- that prevails among the planners. Except in 1967, industrial exports were more than the projected levels during the FFYP period, whereas mineral exports were below the planned levels during the same period. In contrast, during the first three years of the SFYP, agricultural exports were below the target levels, and they exceeded the target levels in 1971 and 1972. Industrial exports, however, were below the target levels in each year during the SFYP. Mineral exports were below the target levels in 1968 and 1972, and above them in the other three years.

Associate Membership in the EEC and the Plans: As mentioned earlier, Turkey signed the Ankara Agreement with the EEC in September of 1963, and it became effective in December, 1964, thus establishing Turkey's associate membership in the Community. Surprisingly, however, both Plans failed to discuss the possible economic implications of the membership upon the Turkish economy. The statements made in the Plans, in connection with Turkey's relationship with the EEC, merely stated thatTurkey is an associate member of the EEC.[54] It is

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[54]FFYP, p. 510; SFYP, pp. 136-137.

apparent that no consideration was given, in the preparation of both Plans, to the potential possibility that an EEC-Turkey customs union might be established before the end of the SFYP period. In the next section, the foreign trade regime of the two FYP periods is examined.

2. The Two FYP's and the Foreign Trade Regime, Exports, Imports.

Both Plans stressed the importance of foreign trade in achieving the plan targets and tried to formulate a foreign trade policy[55] which was to be instrumental in development efforts.

As mentioned earlier, one of the basic goals of the Plans was to bring about a structural change in the Turkish economy through industrial development. In addition to the higher growth targets set for the existing manufacturing industries, the industrialization policy of the Plans focussed on the development of new industries producing import-substitutes and new export commodities (so as to diversify Turkish exports). In selecting new industries, the basic criterion would be the long-term "competitiveness" vis-a-vis foreign products, and extensive utilization of domestic raw materials by these industries.[56]

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[55] Here only the basic principles of the trade policy, as defined in the two FYP's, are mentioned; for further details see FFYP, pp. 509-524, and SFYP, pp. 131-137.

[56] FFYP, p. 509; SFYP, pp. 132-134.

For the achievement of development goals, foreign trade policy was to be coordinated with industrialization policy. In this respect, foreign trade activities were to be directed toward closing the gap between the planned investment and projected domestic savings and aid. To achieve this goal, steps were to be taken to increase the supply and restrict the demand for foreign exchange. Thus, in utilizing scarce foreign exchange resources, priority would be given to the imports of capital goods and raw materials needed by the growing industries, and in order to reduce the demand for foreign exchange, the importation of luxury consumer goods would not be permitted.

Import-substituting production was projected to meet some part of the demand for imports. Industries producing import substitutes would be protected from foreign competition by import quotas: if the domestic production is enough to meet the demand, importation of the commodity will not be allowed, and in other instances where domestic production partially meets the demand, imports of the product will be controlled quantitatively[57] (the import regime of the 60's is examined below, in detail). The Plans also stated that

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[57]FFYP, pp. 521-522; SFYP, p. 134.

> . . . protection should be determined in a way which will stimulate the protected industries to reach competitive status and protection should be removed when this is attained.[58]

and

> . . . protection, however, will not be extended to the branches of industry which are not likely to gain a competitive position in the future.[59]

Both Plans acknowledged the fact that growth efforts would increase the demand for capital good and raw material imports. Furthermore, there were foreign debt obligations to be met (payable only in foreign currency) during the Plan period. Thus, successful implementation of the Plans depended on the growth of foreign exchange earnings and on the amount of foreign aid that could be obtained; as discussed earlier, foreign aid was deemed necessary (although dependence on it would be gradually reduced) during the two FYP periods in order to close the projected investment-saving gap. The two FYP's listed some measures which were to be implemented for fostering the growth of export earnings. Among them there were

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[58] FFYP, p. 522.

[59] SFYP, p. 134.

institutional reforms dealing with the export goods, such as quality control, standardization, packaging, and foreign market surveys. A second group of measures included financial incentives, directed mainly toward increasing the non-traditional manufactured and semi-manufactured exports and promoting new export industries; they are export tax rebates, and medium and long-term credits to exporters at favorable terms. Implementation of these financial incentives, including some additional incentives introduced in the second half of the 60's, are examined below (their timing, coverage, and effectiveness).

In the previous section, some of the implementation results (concerning foreign trade) of the Plans were already examined. In summary, it was stated that despite the increases in export earnings and workers' remittances (above the projected levels during most of the 1963-1970 period), Turkey faced balance of payments difficulties during the second half of the 60's. The origins of the balance of payments bottlenecks of the 60's lie in the growth efforts, which increased the demand for imports; actual imports were very close to the target levels due to the increased restrictions on imports. As will be seen below, new measures were taken to

suppress the ex-ante import demand in the second half of the 60's, in response to the balance of payments difficulties which emerged during the FFYP period and were intensified by the increased demand for capital good and raw material imports.

The industrialization policy of the two FYP's was biased toward import-substituting production, and as will be seen below, most of the investments were channeled to the industries producing import-substitutes. This bias toward import-substituting production is, to some extent, a product of the balance of payment difficulties experienced in the second half of the 60's. Although, both FYP's stated that foreign trade would be a policy tool in achieving the industrialization goals, in actuality this did not occur. In fact, foreign trade and particularly the balance of payments situation were important factors in shaping the Turkish industrialization policy in the second half of the 60's; in response to the balance of payments difficulties, the authorities (SPO) intensified the emphasis on import-substituting production, with the hope that this would decrease the demand for foreign exchange in the long-run.

As indicated earlier, one of the by-products of the growth efforts was inflation. Inflationary pressure was moderate during the early 60's -- the general price level rose by about 4 percent annually -- but during the second half of the 60's the rate of inflation was higher. In contrast, price levels were more stable in the Common Market countries, Turkey's major trade partners. During the 1963-1970 period, the price level rose at an annual rate of 2.3 percent in Germany, 4.5 percent in France, 4 percent in Italy, and 4.1 percent in the Netherlands, whereas it was about 8 percent in Turkey, according to the consumer price indices.[60] More importantly, however, was the fact that Greece -- also an associate member of the EEC and Turkey's major competitor in the EEC markets -- experienced even much greater price stability than other European countries during the same period (the average annual rate of inflation was about 2.5 percent). Thus, after the 1958 de facto devaluation, though Turkish prices were in line with the European prices during the early 60's, this soon changed, and Turkish prices were relatively higher than those of her trading partners -- at the existing fixed exchange rates -- during the rest of the 60's. This, of

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[60] IMF, International Financial Statistics, Vol. XXVI, No. 12, (December 1973), pp. 356-358.

course, affected the competitiveness of Turkish products adversely and discouraged the expansion of export sectors in Turkey.

Continuous inflation and pressures on the balance of payments (caused by the growth-generated excess demand for consumer goods, domestic and imported capital goods and raw materials) led to the gradual overvaluation of Turkish lira. The pressures on the balance of payments and overvaluation of the currency ended with the August, 1970, devaluation.

We now turn to the detailed examination of: (a) the structure of Turkish exports and the export regime, (b) the import regime, (c) the developments which were unfavorable to the export industries during the 60's, and (d) the August 1970 devaluation and its aftermath; the reasons for examining the devaluation episode are given in the section itself.

(a) The Structure of Turkish Exports and the Export Regime.

The majority of Turkish exports originates from the agricultural sector -- about 85 percent -- and the rest is made up by the manufactured and mineral exports (their

shares are 7 and 8 percent, respectively).[61] In Table VI, the amounts and shares of Turkish exports, broken down according to the above classification, from 1962 to 1970 are listed. Although it is difficult to derive any conclusions as to whether or not there is a changing trend in the share of a particular category of exports, it looks as if the shares of mineral and manufactured exports increased somewhat.

TABLE VI. STRUCTURE OF TURKISH EXPORTS (THE PERCENTAGE SHARE OF EACH EXPORT CATEGORY IN TOTAL TURKISH EXPORT EARNINGS).

	Agricultural Exports %	Exports of Manufacturers %	Mineral Exports %
1963	77	20	3
1964	76	20	4
1965	76	20	4
1966	77	18	5
1967	80	16	4
1968	80	15	5
1969	75	18	7
1970	75	18	7
1971	73	21	6
1972	70	25	5

Source: Table V-B.

[61] These figures are the averages for the 1962-1970 period; see Table VI.

An important aspect of the structure of Turkish exports is that the exports of cotton, tobacco, hazelnuts, and dried fruits (mainly raisins and figs) make up about 63 percent of the total exports. As seen in Table VII, these traditional exports have been the major source of foreign exchange for Turkey, and cotton has replaced tobacco as the major export good during the 60's.

TABLE VII. SHARES OF TRADITIONAL EXPORTS IN TOTAL EXPORTS (%).

	1962	1963	1964	1965	1966	1967	1968	1969	1970
Cotton	16.7	21.6	21.8	21.6	26.2	25.2	28.0	21.2	29.4
Tobacco	25.2	18.1	21.9	19.5	21.9	22.6	19.1	15.2	13.4
Hazelnuts	14.7	14.7	12.2	13.3	11.6	16.1	15.3	20.0	14.8
Dried fruits	6.1	6.2	6.0	6.5	6.1	6.0	6.4	6.0	5.2
Total	62.7	60.6	61.9	60.9	65.8	69.9	68.8	62.4	62.8

Source: U. S. AID, Economic and Social Indicators - Turkey, Table 9-D, p. 34; (original source: State Institute of Statistics, Annual Foreign Trade Statistics).

Export Regulations. Most Turkish exports are controlled by the government or by a designated authority (such as the exporters' unions, commodity specific sales cooperatives, or producers' associations, and the local Chamber of Commerce). Export controls are regulated by the "Decree on Foreign

Trade Regulation," prepared annually by the Ministry of Commerce; these decrees appear in the Official Gazette.

The two major means of control[62] are registration (with or without price control) by the designated authorities, and licensing by the Ministry of Commerce after registration. The export prices of the traditional export goods are controlled by the authorities.[63] Tobacco and hazelnut export prices are controlled directly (by the State Monopoly and the exporters' union in the case of tobacco, and by Fiskobirlik -- the hazelnut sales cooperative -- in the case of hazelnuts); cotton and fig prices are controlled indirectly, at the time of registration, by their respective union of sales cooperatives, and for the rest of the exports, exporters are required by the government to register their export prices at the time of registration.[64] The purpose of price registration is to check whether or not the

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[62] For a detailed examination of the export regime (i.e., the regulations and incentives), see U. S. AID, Institutional Reforms for the Development of Turkish Exports, (Ankara, June 1968).

[63] As mentioned earlier, the Turkish authorities believe that foreign demand for the traditional Turkish exports has low income and price elasticities (less than one). Thus, it has been assumed that if prices were lowered, export earnings would not increase.

[64] U. S. AID, Institutional Reforms for the Development of Turkish Exports, op. cit., pp. 31-33.

export price is "reasonable" and, thus, prevent under-invoicing by exporters.[65] During the 60's, export price checks through price registration were not applied as forcefully as in the 50's.

The Turkish government has a monopsony (in buying tobacco) and monopoly power (for the sale of tobacco products), through the State Monopoly in the domestic tobacco market. Private sectors can buy tobacco only for exporting. The government sets buying prices for each year's tobacco crop, depending on geographical regions, and these prices become minimum prices which are usually higher than the market clearing prices. This policy increased the size of land used for tobacco production and consequently the amount of production. That is why the State Monopoly usually ends up with extra and costly stocks.

The sales cooperatives for hazelnuts, raisins and figs control (directly or indirectly) the domestic and export prices of these commodities. In the case of hazelnuts, Fiskobirlik purchases all hazelnuts supplied at the support price which is set by the government. A minimum export price is also set

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[65] In countries where foreign exchange controls exist and domestic currency is overvalued, exporters might be tempted to under-invoice their sales with the intention of keeping some part of their foreign exchange earnings in foreign banks.

for hazelnuts, and the cooperative is responsible for financing subsidies in export sales when they are needed. During the 60's, in some years, minimum export prices were set higher than international levels, and as a result, sales were affected adversely.[66]

The sales cooperative for raisins affected the domestic market through price intervention, and growers have been usually subsidized. A trade agreement among Turkey, Greece, and Australia (with the cooperation of California growers) has determined the export prices for raisins since 1964.

Export Incentives. The major export incentive[67] during the 60's was the tax rebates for exports. The export tax rebate system was first introduced in 1963. The provisions of Law No. 26 (June 27, 1963) gave authority to the Council of Ministers

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[66] 1966 is an example; see U. S. AID, Turkish Exports: Prospects and Problems, (Ankara, 1967), pp. 12 and 25.

[67] There were other export promotion measures which were introduced in the second half of the 60's. However, they were of minor importance due to their quantitative ineffectiveness. These included export credits (Decree 5/3644 of Sept. 24 and Decree 6/10649 of Sept. 13, 1968) to exporters at preferential rates, limited efforts of the investment and Export Promotion Department of SPO in helping export goods penetrate foreign markets, and import replenishment scheme (Decree 6/10649 of Sept. 13, 1968) which introduced provisions under which exporters can retain certain portions of their foreign exchange earnings for importing inputs. For details of the export credit and import replenishment schemes, see SPO, Yatırımların ve İhracatın Teşviki ve Uygulama Esasları, Pub. No. 774, (Ankara, June 1969), pp. 40-45.

to encourage the export of manufactured goods, by allowing the Council to set rates at which taxes, duties, and other charges that enter into the price of manufactured exports can be refunded (partially or in whole) to the exporter. Some specific rates were established for a limited number of commodities in 1963, which were then converted to advolerem rates in 1964 (as a percentage of f.o.b. earnings).[68] The main criterion in setting the rebate rates was that the amount refunded should not exceed the total amount of taxes, duties, and other charges that enter into the value of the exported commodity.

In the early years of application, the rebate system was not very effective because of its limited coverage and lower rates. Over the years, however, the number of export goods eligible for rebates and the rebate rates has been increased. In 1967, the authority of administering the rebate system, which had been held by an ad hoc commission -- the Export Tax Rebate Commission -- was given to a newly established department in the State Planning Organization, the Investment

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[68] Decree No. 6/2453, effective Dec. 5, 1963; Decree No. 6/3071, effective May 13, 1964.

and Export Promotion Department.[69] Then, in 1968, some major changes were introduced into the tax rebate system (with Decrees 6/9535 of Feb. 21, 1968, 6/9863 of April 30, 1968, 6/10609 of Sept. 11, 1968; and 6/10649 of April 16, 1968). New changes enlarged the coverage of the system and also increased the rebate rates substantially.[70] In 1969, some of the traditional and non-traditional agricultural export goods were also granted tax rebates.

Effects of the Export Regime. Before examining the implementation results and effectiveness of the rebate system which covered mainly non-traditional manufactured export goods, first let us examine the effects of export regulations on the traditional exports. As discussed above, export regulations and particularly direct and indirect price interventions were directed toward traditional exports. As a result, in addition

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[69] This department was empowered with the authority of implementing the export rebate system and the incentive program for investments and export promotion.

[70] Commodity specific rebate rates can be found in SPO, Annual Programs (1969, 1970, and 1971), in addition to the SPO publication cited in Footnote 67. A sample of these rates is presented in Appendix A (Table 1). The list of taxes refundable under the rebate system, effective as of August 12, 1967, (Decree 6/8749), appeared in the Official Gazette, No. 12713 (also in the study cited in Footnote 63).

to the adverse effects of the overvaluation of Turkish lira, the volumes of traditional exports were also affected adversely by these controls.

Turkey's share in the world production and exports of tobacco, chrome and copper[71] has decreased over time: chrome's production share fell from 20 percent in 1957 to 12.3 percent in 1969, copper's production share fell from .7 percent in 1957 to .5 percent in 1969, tobacco's export share fell from 12 percent in 1957 to 7.7 percent in 1969; and the share of total Turkish exports in the world has also decreased from .29 percent in 1960 to .21 percent in 1970.[72] However, cotton exports increased steadily during the 60's -- $63.6 million in 1962, $100.2 million in 1965, and $173.1 million in 1970[73] -- and, as shown earlier, its share in Turkish total exports increased also. Furthermore, the volume of cotton exports was high in years in which production levels were also high, indicating that increased cotton production can lead to

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[71] Besides the high export pricing policies of the government, high production and internal transportation costs are the major reasons for the poor performance of mineral exports during the 60's.

[72] Krueger, op. cit., Part Four, Chapter VII, Tables VII-1 and VII-3, pages 2 and 6.

[73] U. S. AID, Economic and Social Indicators - Turkey, (Ankara, August 1971), Table 9-D, p. 34.

increased exports of cotton. One of the reasons for the better performance of cotton exports (better than the other traditional exports) during the 60's was the fact that cotton exports were not subject to the same degree of price intervention, and its production and export volumes were more or less determined by market forces. Professor Krueger's findings show that the volume of traditional exports (excluding cotton) was not sensitive to changes in relative export prices, and this led her to conclude that the government policies (price and other direct interventions) determined the volume of traditional exports such as tobacco, chrome and hazelnuts.[74] She also found that export of cotton and non-traditional export goods are sensitive to changes in export prices.

The basic element of the export regime which could have affected the export of manufactured goods during the 60's was the tax rebate system. By allowing tax refunds at different rates, this system generated a multiple exchange rate system for these exports; the official exchange rate was TL 9 = $1 until August 1970, but rebates increased the "effective"[75]

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[74] Krueger, op. cit., Part Four, Chapter VII, p. 40.

[75] "Effective exchange rate" -- a term used by Professor Krueger -- defined as the amount of Turkish lira obtained by the exporter for per dollar's worth of export (valued at f.o.b. prices); Krueger, op. cit., Part Two, Chapter II, and Part IV, Chapter VII.

exchange rates for exporters of manufactured items above the official rate after 1963. However, it is very unlikely that the rebate system had been effective in significantly increasing the volume of manufactured exports until 1969 since the eligible items were few and the rates were low. Even after 1969, it is doubtful that rebates were instrumental in increasing these exports substantially, except perhaps a few cotton textile items (for which rebate rates were relatively high -- 40 to 50 percent -- and these items are potentially more competitive in the international markets than other exportable manufactured products). This can be explained by, in addition to the overvaluation of Turkish lira during the 60's, the fact that the basic problem of the Turkish manufacturers is high production costs, compared to the production costs in other competing countries, and rebate rates were not high enough to make up the difference between high unit production costs and low f.o.b. export prices. There are many reasons for high production costs: (1) Turkish producers have to pay more for the same quality or even poorer quality investment goods and raw materials than their foreign competitors. Import duties have kept the cost of these

imported items high. The cost of locally obtained investment goods and raw materials are also high, e.g., domestically produced iron and steel, plastics, cement (due to production costs and indirect taxes added to the production costs). Tin plate is available only from domestic sources since importation is not allowed, and the Turkish producers of canned food have to pay almost twice (for poorer quality tin plate) the international price of tin plate.[76] Thus, even though fresh fruits and vegetables are relatively cheap in Turkey, Turkish producers of canned food have been unable to increase their exports. (2) Lack of competition, due to the import regime (mainly through quantitative controls), among the Turkish producers caused inefficient production, thus leading to high unit production costs. (3) Other factors which have affected the production costs negatively, by causing inefficient production, are the lack of skilled and competent people at managerial levels, and the lack of skilled labor. Furthermore, Turkish

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[76] U. S. AID, Institutional Reforms for the Development of Turkish Exports, op. cit., p. 59. This study offers an impressionistic view of the high cost production structure of the Turkish industry (pp. 52-61).

producers also lack, when selling abroad is concerned, quality control, standardization, better packaging, and effective marketing.[77]

In Table VIII, total exports (column 1), the value of exports benefitted from rebates (column 2), and total rebates (column 3) for the 1964-1969 period are listed. Figures in column four and five indicate the relative coverage of the rebate system and overall rebate rates, respectively. The amount of the total rebates refunded was TL. 12.2 million in 1964, and TL. 29.3 million in 1965; then it decreased to TL. 27.5 million in 1966 and to TL. 24.8 million in 1967. Mainly due to the changes that took place in 1968 and 1969 (i.e., the number of eligible items and rates were increased), the volume of the total rebates was much larger in 1968 (TL. 57.9 million) and particularly in 1969 (TL. 208.3 million). In column four, the figures give the values of the ratio of the amount of eligible exports to the value of total exports. As shown in the table, this ratio was considerably small until 1969, taking values ranging between 2.8 and 7.3 percent.

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[77] As mentioned earlier, inflation and overvaluation of the currency also reduced the potential competitiveness of Turkish manufactured goods in the second half of the 60's.

TABLE VIII. TOTAL EXPORTS, THE AMOUNTS OF EXPORTS WHICH WERE ELIGIBLE FOR TAX REBATES, AND TOTAL REBATES PAID DURING THE 1964-1969 PERIOD (TL. millions).

	Total Exports (1)	Amount of exports which benefitted from rebates (2)	Total Rebates (3)	$\left(\frac{\text{Eligible Exports}}{\text{Total Exports}}\right)$ % (2/1)	$\frac{\text{Total Rebates}}{\text{Eligible Exports}}$ % (3/2)
1964	3,697	103.6	12.2	2.8	11.8
1965	4,174	303.4	29.3	7.3	9.7
1966	4,415	219.7	27.5	5.0	12.5
1967	4,701	249.0	24.8	5.3	10.0
1968	4,467	247.8	57.9	5.5	23.4
1969	4,832	1,426.8	208.3	29.5	14.6

Sources: (Columns (1), (2), and (3)): SPO, Annual Programs, 1969 (p. 392), 1970 (p. 527), 1971 (p. 711).
The figures in columns (4) and (5) were derived from the first three columns: figures in column (4) were obtained by dividing the figures in column (2) by the figures in column (1), and values in column (5) were derived by dividing the figures in column (3) by the corresponding figures in column (2).

In 1969 the ratio rose to 29.5 percent, mainly because of the inclusion of major agricultural export goods into the rebates system. The ratio of total rebates refunded to the amount of exports which benefitted from tax rebates was, in percentage terms, 11.8 in 1964 (column 5), the first year of complete application. This ratio decreased to 9.7 in 1965, rose to 12.5 in 1966, and declined again to 10 in 1967. It increased sharply to 23.4 in 1968, then declined to 14.6 in 1969; the average ratio, indicating the overall effective rebate rate, was 13.7 percent for the 1964-1969 period. Thus, the decline in the amount of total rebates until 1968 indicates that the rebate system was not very effective in increasing the exports of manufactured goods. This result is also supported by the decline, after 1965, in the amount of eligible exports, despite the fact that the number of eligible items and rebate rates were increased continuously. Increases in the amount of total rebates and eligible exports after 1967 were caused by the enlargement of the rebate system in 1968 and 1969.

However, as stated earlier, the rebate program was not effective in significantly increasing manufactured exports (except cotton textile items) even after 1968. This can be evidenced by comparing the total values of manufactured

exports during this period. Manufactured exports (excluding mineral exports) amounted to $40.1 million in 1964, and the amount decreased in later years[78] -- $27.5 million in 1965, $24.3 million in 1966, $20.9 million in 1967, and $24.5 million in 1968 -- until 1969. Then, the amount rose to $50.8 million in 1969, and to $61.8 million in 1970.[79] However, increases in 1969 and 1970 resulted mainly from the increases in the textile exports and to a lesser degree, in exports of food products, which were subject to high rebate rates. Textile exports (mostly cotton textile) increased sharply after 1966 $2.6 million in 1966, $3 million in 1967, $8 million in 1968, $16 million in 1969, and $26.5 million in 1970 -- whereas food product exports did not increase steadily ($10.6 million in 1966, $11.7 million in 1967, $6.9 million in 1968, $20.7 million in 1969, and 12.8 million in 1970[80]).

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[78] Most probably caused by the high rate of inflation after 1956. As discussed earlier, Turkey experienced relatively much higher inflation than her trading partners during the second half of the 60's. This, of course, reduced the potential competitiveness of Turkish manufactured products which at the time, due to high production costs, were not very competitive in international markets anyway.

[79] U. S. AID, Economic and Social Indicators - Turkey, op. cit., Table 9-D, p. 34, (main source: State Institute of Statistics, Annual Foreign Trade Statistics).

[80] Ibid.

Thus, it was shown that the tax rebate system which was the most important export incentive program implemented in the 60's has not been very effective, especially in the early year of application. After 1968, rebates were helpful in increasing mostly cotton textile exports because of the high rebate rates applied to these products. The basic reason for the ineffectiveness of the rebate system, as stated earlier and supported by the findings listed above, lies in the fact that rebate rates were not high enough to fill the difference between the high unit production costs and f. o. b. export prices. Rebates helped the exporting producers to recover (partially or fully) the indirect taxes paid on imported and/or locally purchased investment goods and raw materials, and for most manufactured goods this was not enough for exporting without any loss. It should be noted, however, that after the 1968 and 1969 changes in the rebate rates, the rebate system might have been more effective if Turkey did not experience inflation in the late 60's; but then in the absence of inflation the government would probably not have introduced the latter changes in the rates.

b. Import Regime.

The actual imports of the two FYP periods were already examined and compared with the target levels of the Plans. In this section, the import regulations and import duties of the same period are discussed.

Import Programs. Since 1958, Turkish imports have been regulated by the import programs. These programs have contained detailed information about the government restrictions and bureaucratic details involved in importing each commodity category. They have been prepared and put into effect on a semi-annual basis. After 1968, however, the import programs included some import lists (to be discussed below) which were valid for a year, and in recent years they have been prepared on an annual basis.

The State Planning Organization and certain ministries (generally the Ministries of Commerce, Finance, and Industry) have cooperated in preparing these programs. Preparation of the import programs has always involved lengthy discussions and negotiations in which the private sector was represented by the Union of Chambers of

Commerce and Industries.[81] The Central Bank data and SPO projections were the main sources for the necessary information on the existing and anticipated supply of foreign exchange.

Each import program included two main lists, the Quota List and the Liberalized List. Each list contains the names (and value of quotas if it is in the Quota List) of the commodities eligible for importing during that period; commodities which were not included in either list could not be imported. A separate program concerning the imports from bilateral agreement countries[82] has accompanied the import programs. The commodities which were included in either of the two lists mentioned above could also be imported from the countries with which Turkey had a bilateral agreement.

Investment goods, raw materials, and other intermediate goods which were assumed essential for the achievement of economic development targets were listed under the Liberalized List. However, there have been quota categories for some

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[81] The Union of Chambers of Commerce and Industries stopped performing this function in 1971-1972.

[82] Generally Eastern European countries.

investment goods; if domestic production existed for some of the above mentioned commodities and partially met the domestic demand, they were included in the Quota List. Furthermore, if the domestic import-substituting production met the domestic demand for an importable item, the relevant commodity was not included in the lists; thus, in effect, prohibiting the importation of the commodity.[83] PL 480 (U. S. agricultural surplus) imports and investment good imports which were financed by the project aids have been included in the Self-Financed Imports, a separate list.[84]

Import Procedures.[85] Industrialists and wholesalers, after obtaining an Importer's Certificate[86] and Ministrial

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[83] As protection tools, import prohibitions and quotas were used intensively in the 60's.

[84] For a detailed examination of the preparation of the import programs and complex import procedures, see Krueger, op. cit., Part Three, Chapter VI.

[85] Import procedures have always involved complex details, and complexity increased in the second half of the 60's. Here only the important aspects of the import procedures are mentioned.

[86] These certificates were obtained from local Chambers of Commerce or Industry and allowed the holder to apply for import licences. The certificates have been commodity specific, hence the holder could not apply for a different commodity when he applied for an import license at the Central Bank.

Approval when it was necessary, applied to the Central Bank for import licenses.[87] With the application, they were also required to deposit a certain percentage of the c.i.f. value of the commodity as a "guarantee deposit." Guarantee deposits did not carry any interest earning and were kept for as long as 4 to 8 months. The rates of guarantee deposits ranged from 10 to 50 percent for the Quota List imports. They have been higher for the Liberalized List imports, ranging from 10 to 30 percent in the 1961-1965 period and from 70 to 150 percent in the 1966-1970 period.[88]

The length of time that an applicant had to wait for the import license depended on the availability of foreign exchange. This was especially important for the importers of the Liberalized List items since the values of the Quota List items were fixed beforehand. Importers place their orders after they receive the import license and present a letter of credit. Commodities arriving at the ports are checked against their description, and they are cleared after all duties and taxes are paid.

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[87] In the late 60's, SPO checked the import license applications for investment good imports before such licenses were approved, thus making sure that forthcoming investments were in accordance with the Plan targets.

[88] Krueger, op. cit., Appendix A, Table A-8, p. 30.

In the late 60's, during which pressures on the balance of payments increased, long delays in the issuance of import licenses were common, and they were issued as foreign exchange became available. As mentioned above, this mainly affected the Liberalized List items. The rates of guarantee deposits were also increased for the importable items included in the latter list in the second half of the 60's. These rates were raised to (1) soak up wind-fall profits (which were accruing to traders) resulting from the sharp increases in the domestic prices of these products, and (2) cut down ex-ante demand for these import items.

Indirect Taxes Levied on Imported Goods. An important integral part of the restrictionist Turkish import regime has been the indirect taxes levied on imports. In 1964, tariff rates were changed across-the-board[89] and the new rates were generally higher than the previous rates (some rates were reduced). Since 1964, minor changes have taken place in the tariff rates of some commodities,[90] but basically rates

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[89] Law No. 474 of May 14, 1964 (became effective on May 25, 1964).

[90] Tancı, Muhittin, et al. İçtihatli ve En Son Değişiklikleri Muhtevi Gümrük Kanunu ve İstatistik Pozisyonlarına Bölünmüş Gümrük Giriş Tarife Cetveli (Ankara, 1968), p. 127.

remained at their 1964 levels. Tariff duties were levied on the c.i.f. value of imports, and rates were different for different commodities. Other import duties were the municipality share, wharf duty, stamp duty, and production tax. Except for the stamp duty, these taxes have cascading structures. The municipality share (tax) has been 15 percent of the customs duty paid on imports since 1947 (and throughout the 60's). Since the tariff rates were not the same for each commodity, the municipality tax rate (as a percentage of the c.i.f. value) differed among imported goods, and the rate was relatively higher on commodities for which the tariff rates were higher due to the cascading nature of the tax. A wharf tax has existed since 1951, and the cascading nature of the wharf tax is caused by the fact that the tax base is the sum of the c.i.f. value of imports plus tariff duties plus the municipality share and other landing costs (storage charges, etc.). During the 60's, the rate of wharf tax was 2.5 percent (of the sum of the costs mentioned above) until 1967, and has been 5 percent since then. However, as a percentage of the c.i.f. value, the wharf tax rate differed among different commodities because of the cascading effect of the tax base, and it is

higher for commodities with higher tariff duties.[91]

A stamp duty on the c. i. f. value of imports was first levied in 1963, and the rate was 5 percent. It was then increased to 10 percent in 1967, to 15 percent in 1968, and to 25 percent in 1969. The latter increases in the rate of the stamp duty were part of the policy to cut down the ex-ante demand for imports (and thus reduce the pressure on the balance of payments) in the second half of the 60's.

The other important tax on imports has been the production tax. This tax is levied on the sum of the c. i. f. value of imports plus all other import duties. As in the case of the two taxes mentioned above, inclusion of the other import duties into the tax base makes the structure of the production tax cascading. The rates have been set differently for different goods. Nevertheless, even if the rates were the same, the production tax rates as a percentage of the c. i. f. value of imports would differ among different commodities since the tariff duty and other tax rates were different among different commodities.[92]

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[91] If there is no production tax on an imported good, then the tax base for the wharf tax is simply the c. i. f. value of that particular commodity; SPO, İthalattan Alınan Vergilerin Sektörel ve Yapısal Analizi, Volume I, Pub. No. 868 (Ankara, March 1970), p. 15.

[92] Turkish import duties are discussed further in Appendix A, and Table I of Appendix A contains a sample of commodity specific tariff duty and production tax rates.

The import duties, aside from their function of keeping down the ex-ante demand for imports, have been an important revenue source for the government. Import tax revenues made up, on the average, about 40 percent of the annual indirect tax revenues of the government in the 60's.[93]

3. Industrialization Pattern, Inflation, and Overvaluation - Bias Against Export Industries.

During the two FYP periods, the industrialization process followed a biased course. The main emphasis of the Plans was on the industries producing import-substitute goods, and most of the capital formation in the industrial sector took place in these industries. Investments in the industrial sector amounted to TL. 12,721 million during the FFYP period, and only 27 percent of this amount -- TL. 3,452 million -- was invested in non-traditional manufacturing export industries (i.e., Food, Textiles, Wood Products, Hides and Leather Products, Ceramics and Glass, and Non-ferrous Metal industries); the annual average portion of the latter amount

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[93] Total indirect tax revenues (i.e., domestic indirect tax revenues plus the indirect tax revenues collected from importers) in turn made up about 68 percent of the total tax revenues of the government in the 1963-1971 period; source: U. S. AID, Economic and Social Indicators - Turkey, op. cit., Table 9-E, p. 35.

is about .23 percent of GNP. The projected total investment in the manufacturing industries for the SFYP period was TL. 25,000 million, and it was projected that 26 percent of this amount -- TL. 6,620 million -- would be invested in the non-traditional export industries;[94] on an annual basis, the latter amount is about .32 percent of GNP. A more balanced industrialization policy would have probably led to a faster growth in those manufacturing industries with export potential than they actually experienced in the 60's. As mentioned earlier, one of the problems of these industries has been high production costs.

In the second half of the 60's, the export performance of the manufacturing industries was poorer than expected by the planners. Among the reasons explained in an earlier section, one of the major reasons was high production costs of the Turkish producers (higher than those of competing foreign producers). Turkish export prices at which Turkish producers would be willing to export without incurring any

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[94] SFYP, Table 199, p. 407; this table lists the actual figures for the FFYP period and the planned amounts for the SFYP period.

unit losses were higher than the world price levels. Inflation and overvaluation of the currency worsened the situation further by reducing the potential competitiveness of manufactured goods. Other negative factors were the lack of standardization and quality control and almost non-existent marketing efforts. The government tried to encourage exports through financial incentives and export promotion measures but, as explained earlier, export promotion efforts were limited and ineffective. Export tax rebates, which were the basic financial incentive in the 60's, were not effective in increasing the export of manufactured goods.

In contrast to the foreign markets, the domestic market has been very attractive to the manufacturers. Growth efforts (and population increases) of the 60's increased the demand for manufactured products. Domestic prices for these products increased continuously, and they stayed well above the world price levels during the 60's. Since the domestic prices were much higher than the export prices (including rebates) at which the manufacturers could sell abroad (generally with no profit), production volumes and quality were determined according to the domestic market needs. If exporting was an alternative, at least with no unit loss, the private sector

investments in the non-traditional manufacturing export sectors would have been probably larger than their actual levels in the 60's, because some Turkish manufacturers might have preferred less or no profit in the short run and some share of the foreign market in the long-run to more unit profits from sales in the domestic market and no share in the foreign market. If the export tax rebate rates were higher in the 60's, so that the manufacturers were able to export with no unit loss, the volume of manufactured exports might have been larger than the actual levels, and also the expansion of production capacity might have been greater than what it actually was. According to a survey sponsored by U. S. AID officials in Turkey (before the 1968 rebate changes), the cotton textile executives claimed that a tax rebate rate in the order of 50 percent would enable them to export without loss.[95] In fact, after the rebate rates for many cotton textile items was increased to 40 or 50 percent in 1968, cotton textile exports increased sharply (these figures were mentioned in an earlier section).

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[95] U. S. AID, Institutional Reforms for the Development of Turkish Exports, op. cit., p. 43.

Besides a special emphasis in the Plans on the industrialization program, the import regime, through quantitative restrictions (i.e., import prohibitions and quotas), further encouraged the development of import-substitute industries in the 60's. Despite their high production costs, these sectors continued to grow and new ones emerged. This was made possible by the fact that the producers were able to sell their products at extremely high prices since there was no foreign competition. Foreign competition was eliminated either by import prohibition or by quotas and to a lesser degree by extremely high import duties. Large margins existed between the domestic wholesale prices and the unit "landed" costs (i.e., c.i.f. prices plus all the import duties) of imported goods, indicating that the traders were obtaining large unit profits.[96] This was possible since only a certain number of traders were able to obtain import licenses out of those who applied for such licenses because of the fixed amounts of quotas (in the case of goods in the Quota List) and the limited supply of foreign exchange (in the case of goods in the Liberalized List). The few who obtained the licenses were able to sell

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[96] In 1968, domestic wholesale prices were 1.1 to 6 times higher than the landed costs, depending on the commodity; for a commodity-by-commodity listing of these prices and comparisons, see Krueger, op. cit., Part Three, Table V-12, p. 53.

the imported goods at extremely high prices after adding large profit margins to their unit costs. Thus, import licenses enabled the holder to obtain a "rent."

Most of the producers of the import-substituting commodities had to rely on imported capital goods to expand their production capacity, and on imported raw materials to continue the production. Since the import levels of some of these inputs were determined by quotas, output levels in some of the import-substituting industries were indirectly affected by the quota allocations, thus leaving little room for competition among the producers. Furthermore, as mentioned earlier, import license applications for investment goods were checked to see if they satisfied the Plan objectives in addition to the other import regulations that they were required to comply with. First, licenses were not issued if excess production capacity existed in an industry or if the planners projected short falls in the domestic demand. Secondly, the allocation of the investment good import licenses was not based on any sort of "efficiency" criteria but on equality rules, and since allocation of import licenses for raw materials and intermediate goods was done on the basis of existing capacities of applicant firms, all firms in an industry were compelled to apply for investment good import licenses. As such, the Turkish import regime has lacked any kind of mechanism for encouraging expansion of

efficient low cost firms. As a result, high cost and low cost firms have existed even in the same industry,[97] indicating that the import regime was not conducive toward creating competition among the producers of the import-substitutes.

4. The August 1970 Devaluation and Its Aftermath.

The August 1970 devaluation and other domestic policy measures which took place with the devaluation brought some changes in the exchange rates and in relative commodity prices. As will be seen, the devaluation introduced a relatively (relative to the pre-devaluation period) more liberalized trade regime. Thus, by examining the effects on the Turkish economy of the changes that took place with the devaluation, we take the first step toward accomplishing the objectives of this study. Focus here is on the possible economic effects of Turkey's entry into the Common Market, and as such, it is a study of the effects of gradual liberalization in foreign trade. Since the August devaluation package introduced some liberalization and somewhat altered the incentives for production and trading activities, examination of the developments that took place after the devaluation is quite appropriate within the context of this study.

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[97] For a detailed examination of cost differences among the Turkish industries and firms, see Krueger, op. cit., Part Four, Chapter VIII, pp. 2-15.

The balance of payments difficulties started in the mid 60's, and the problem became more serious in the late 60's as excess demand for foreign exchange continued. Turkish lira was overvalued during the most part of the 60's. Talks about a devaluation started in the mid 60's, and international organizations (IMF, OECD, and others) advised the Turkish government for a devaluation.

The decision to devalue the Turkish lira was finally made in August 1970, and it was devalued (de jure and de facto) from TL 9 = $1 to TL 15 = $1, a 66.7 percent nominal devaluation.[98] With the devaluation, some additional changes took place in order to liberalize the flow of imports: (1) the stamp duty was reduced from 25 to 10 percent; (2) the guarantee deposit rates were reduced by 50 percent; (3) duty exemptions were granted to some steel products which were being used as intermediate inputs.

Several exchange rates were set for exports. For the traditional exports (such as cotton, tobacco, hazelnuts, raisins, figs, and olive oil) a lower exchange rate -- TL 12 = $1 -- was put into effect, but in July 1971 the exchange rate for these exports was increased to TL 13 = $1. The exchange rate for hazelnuts was increased to TL 14 = $1 in March 1972. The exchange rate TL 15 = $1 applied to the non-traditional exports.

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[98]As will be seen below, the effective devaluation rate was different than the nominal devaluation rate, and the former rate differed from one transaction to another.

Before the August devaluation, the Central Bank's tourist buying rate was TL 12 = $1, which also applied to workers' remittances. The tourist selling rate TL 13.5 = $1 applied to Turks who wanted to buy foreign exchange for foreign travel. After the devaluation the buying rate became TL 14.85 = $1, and the selling rate was set at TL 15 = $1. The latter rate also applied to other invisibles and capital flows with the devaluation.

Because of these additional changes, the rate of effective devaluation was not uniform. Professor Krueger compared pre- and post-devaluation effective exchange rates for different export and import goods and derived the following effective devaluation rates:[99] (i) for traditional exports, it was 27.9 percent, and for non-traditional exports 56.8 percent; (ii) for imports, the effective devaluation was 49.6 percent for capital good imports, 52.3 percent for consumer good imports, 40.3 percent for intermediate good imports, and 55.2 percent for import-substitute goods.

The time of the devaluation more or less coincided with the decision of some alterations in the rebate rates and in the import replenishment program. The rebate rates were divided into two categories, and according to which, firms exporting

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[99] Krueger, op. cit., Part V, Chapter X, Table X-1, p. 6.

more than $1 million were granted higher rates (between 25 and 40 percent), and others were entitled to lower rates (30 percent or lower). The new rebate system aimed at increasing export volumes and encouraging small exporting firms to consolidate. According to the new import replenishment program, exporters were allowed to keep 25 percent of their expected exchange earnings for the purpose of importing materials to be used in their production.

Another move toward encouraging exports was the efforts of the government to decrease the cost of financing exports and to make more funds available for export credits. A "Foreign Exchange Equalization Fund" was established by the Central Bank, and to support this fund, the profits obtained from the difference between the foreign exchange selling price and the rate at which the exporters of traditional export goods received their T.L. earnings were supposedly set aside.[100]

Before analyzing the effects of the devaluation, it is necessary to examine the changes which took place in the domestic policy shortly before or with the devaluation.

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[100] However, it is unlikely that large amounts were made available from this fund because later (in the 1972 Government Budget) the sources of this fund began to be treated as a direct income of the government: Betty S. Yaşer, Economic Aspects of the Devaluation of the Turkish Lira of August 10, 1970, U.S. AID, Discussion Paper No. 5, (Ankara, April 1972), p. 24.

Changes in Domestic Policy. Accompanying the devaluation, several changes in domestic policy were made. Production tax rates on petroleum products were raised. New taxes were levied on purchases of vehicles, on sales of luxury items (furs, T.V.'s, etc.) and on certain services (hotels and restaurants). Taxes were imposed on new construction and on capital gains from real estate transactions. Production tax rates were changed, and assembly industries became subject to this tax. A new Personnel Law was put into effect in December 1970, and this law raised the civil servant salaries substantially.

In August 1970, the prices of sugar and fertilizers, and the support prices of wheat, hazelnuts, raisins, figs, cotton, and olive oil were increased (by 4.3 - 23.8 percent). Later in May, June and July of 1971, prices of some of the products of the State Economic Enterprises were raised. The rates of increases were 12-22 percent for steel, 30-45 percent for electricity, 180 percent for heating coke, 115 percent for industrial coke, 7-22 percent for cement, 7 percent for fuel, and 25-50 percent for paper.[101]

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[101] Yaşer, op. cit., pp. 20 and 31.

Effects of the Devaluation. Available data on foreign trade and domestic economic activities cover only a short part of the post-devaluation period (the 1970-1971, and in some cases, 1970-1972 period). That is why a conclusive analysis of the post-devaluation period is not possible; only an impressionistic review can be made. Furthermore, since a host of policy changes and economic measures were taken before and with the devaluation,[102] to single out the effects of a certain policy change will be a difficult task to undertake and certainly it is outside the scope of this study. Here only the general and visible trends are examined, to the extent that they are relevant in this study.

The short-run effects of the devaluation on foreign trade and on foreign exchange reserves were favorable. Export performance was unexpectedly good. As seen in Table IX, the total export earnings in 1970 were 9 percent above the 1969 level,

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[102] Another important factor which affected the economic life during this period was the political instability. The student unrest and the clashes between the rightist and leftist groups which started in the late 60's continued into 1970 also. The government of Prime Minister Demirel has been accused of the inability to control and of corruption. In March of 1971, the leaders of the Turkish military asked for the resignation of Prime Minister Demirel with an ultimatum. Several caretaker governments were formed after March 1971. They were under pressure from all sides, and since they were in power temporarily, only ad hoc decisions were being made.

in 1971 they were 15 percent above the 1970 level, and in 1972 export earnings were above the 1971 level by 11 percent ($537 million in 1969, $588 million in 1970, $677 million in 1971, and $750 million in 1972). Export earnings are also broken down according to specific commodities in Table IX, and these figures indicated that most of the increase in export earnings, during these two years, was due to the large increases in exports of cotton and industrial products. No doubt the good harvest in 1971 helped the successful export performance, but it is highly improbable that the export success could have been so impressive without the devaluation. By reducing or eliminating the overvaluation of the currency, the devaluation made the Turkish export prices[103] competitive with world prices. The large increases in cotton and manufactured exports indicate that the export volumes of these commodities are sensitive to changes in the effective exchange rates.

Devaluation was also effective in liberalizing imports. Increased export earnings together with large inflows of project credits ($179 million in 1970, and $210 million in 1971),

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[103] Export price checks were in effect during the summer of 1971. These checks delayed the deliveries, and goods were piled up at the ports. In some cases, some foreign customers cancelled their orders because of the delays. Even though the price checks were in effect for a short period, they affected Turkey's export volume adversely.

TABLE IX. TURKEY'S FOREIGN TRADE (millions of U.S. dollars).

	1969	1970	1971	1972[1]
Total Exports	537	588	677	750
Cotton	114	173	193	525
Tobacco	81	78	86	
Hazelnuts	108	87	84	
Other Crops	59	62	80	
Livestock	24	29	38	
Minerals	17	20	21	37
Industrial products	135	139	175	188
Total Imports	801	948	1,171	1,315
Investment goods	362	439	533	1,225
Intermediate goods	403	467	590	
Consumption goods	36	42	48	90

[1] Provisional estimates.

Sources: For exports and total import levels: Ministry of Finance, Monthly Economic Indicators; for the three import categories: Krueger, op. cit., Part Four, Chapter X, Table X-2, p. 11. 1972 figures are from SPO, Yeni Strateji ve Kalkınma Planı: Üçüncü Beş Yıl (1973-1977), pub. no. 1272, Table 45, p. 56, and Table 46, p. 57.

consortium credits ($217 million in 1970, and $89 million in 1971), and workers' remittances ($273 million in 1970, $471 million in 1971)[104] allowed large increases in imports. The total imports amounted to $801 million in 1969 and rose to $1,171 million in 1971 (Table IX), a 46 percent increase in two years. As seen in Table IX, most of this increase was shared by the increases in the imports of investment goods (a $171 million increase) and intermediate goods (a $187 million increase); the absolute increase in consumption good imports was very small ($12 million). In 1972, imports amounted to $1,315 million, 12 percent above the 1971 level. Thus, it is obvious that after the devaluation some trade liberalization took place.

The current account deficit was lower in 1970 and 1971 than the levels experienced in the late 60's. The deficit was $214 million in 1971 (see Table III above). One of the major factors which caused the decline was the large increase in workers' remittances. Before the devaluation, Turkish workers in Europe were reluctant to transfer their savings to Turkey through the official channels since the Turkish Lira was highly

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[104] Ministry of Finance, Monthly Economic Indicators (February - March, 1972), p. 51.

overvalued. They were keeping some of their savings in the European banks, and transferring some of it through the black market. Devaluation eliminated much of the discrepancy between the official and black market exchange rates. This increased not only the flow of workers' remittances, but it also had a once-and-for-all effect by inducing workers to transfer their past accumulated savings. As recorded earlier, the amount of workers' remittances was $141 million in 1969, and it rose to $471 million in 1971; earlier estimates indicate that the amount was even larger in 1972.

Foreign exchange reserves of Turkey reached record high levels in the period following the devaluation. Due to increased export earnings, capital flows, and the rise in workers' remittances, foreign exchange reserves jumped from merely $128 million in 1969 to a fantastically high level of $1,193 million in 1972.[105]

From these observations it can be concluded that the devaluation was successful in improving the balance of payments in the short period after the devaluation.

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[105] Table X.

Effects on the Domestic Economy. Prices rose sharply during this period. However, devaluation itself was not the main cause of this high level of inflation. As mentioned above, the price level of sugar and fertilizers and the support prices of some agricultural commodities were raised in August of 1970. In mid-year of 1971, the prices of some of the basic materials (such as iron, cement, coke, electricity, and fuel) produced by the State Economic enterprises were raised, thus causing some cost-push inflation. However, the main force behind the inflation was the increased demand for consumer products, resulting from the large amounts of purchasing power obtained by the farmers, civil servants, and the families of Turkish workers who were working abroad. The good harvest in 1971 and the relatively high agricultural support prices increased the purchasing power of the Turkish farmers. The TMO (Soil Products Office) had to borrow from the Central Bank in order to finance the purchase of large quantities of cereals (TL 3,000 million in 1971, contrasted with TL 950 million in 1969 and TL 1,125 million in 1970[106]). The new Personnel Law, put into effect in 1970, raised the salaries across-the-board, and this of course

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[106] Central Bank, Bulletin Mensuel, No. 9-11 (Ankara, Sept.-Nov., 1972), p. 23.

increased the purchasing power of the civil servants. Because of the salary increases, the Central Government current expenditures rose sharply.[107] A part of these expenditures was financed by the Central Bank credits extended to the Treasury; these credits amounted to TL 4,359 million in 1970, and TL 6,088 million in 1971, whereas in 1969 the amount was TL 3,057 million.[108] A third group, the families of the Turkish workers who were working abroad acquired large sums of purchasing power also, as increased amounts of workers' remittances were exchanged for the domestic currency. Noting the fact that particularly this latter part of the additional purchasing power received by the consumers did not have a domestic production counterpart, it can be seen why the increased demand for consumer goods was the main force behind the sharp increases in prices.

Money supply figures and wholesale price indices for the years 1969 through 1972 are listed in Table X (in the second

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[107] According to the initial budget appropriation figures of the Ministry of Finance, the current expenditures of the Central Government show an increase of 34 percent in 1971 over the 1970 level, and an increase of 32 percent in 1972 over the 1971 levels; source: Ministry of Finance, Monthly Economic Indicators.

[108] Central Bank, Bulletin Mensuel, No. 9-11 (Ankara, Sept./Nov., 1972), p. 22.

and third columns, respectively). The increased Central Bank credits which were then channeled to the farmers and civil servants, and the monetization of workers' remittances consequently led to large increases in the money supply: it rose from TL 15.11 billion in 1969 to TL 18.3 billion in 1970, to TL 22.66 billion in 1971, and to TL 28.33 billion in 1972, according to the end-of-year figures. Thus, the money supply increased by 55 percent in the two years from 1970 to 1972. An important part of the increase in purchasing power, in the hands of the consumer, was not matched by a sufficient enough increase in the supply of consumer goods. As indicated by the consumer price indices listed in the third column of Table X, consumer prices rose sharply during this period, and they were 8 percent higher in 1970 than the 1969 levels, 16 percent higher in 1971 than in 1970, and 15 percent higher in 1972 than in 1971.

The available data are not sufficient and detailed enough to allow an examination of the effects of the devaluation, through the changes in domestic relative commodity prices and incentives, on the production structure. As mentioned earlier, this study also focuses on the effects of the gradual liberalization in trade upon the production structure, i.e., the directions of possible shifts in the production structure resulting from the changes in relative prices, are to be examined, utilizing the past data.

TABLE X. THE CENTRAL BANK FOREIGN EXCHANGE RESERVES, MONEY SUPPLY, AND CONSUMER PRICE INDICES.

	The Central Bank Foreign Exchange Reserves (end of year figures) (millions of U.S. dollars)	Money supply (end of year figures) (millions of T.L.)	Consumer price indices (1963=100)
1969	128	15,109	144.2
1970	304	18,297	155.6
1971	626	22,660	185.2
1972	1,193	28,330	213.7

Sources: Money supply figures are from Bulletin Mensuel, Central Bank of Turkey; sight savings are not included in the money supply figures. Foreign exchange data and consumer price indices are from: IMF, International Financial Statistics, Vol. XXVI, No. 6 (June, 1973), pp. 354-355; Consumer price indices are Ministry of Commerce indices and refer to Istanbul.

Since the devaluation introduced some degree of liberalization in trade and introduced changes in the relative prices of home goods and traded goods, an examination of changes in the sectoral output levels in the post devaluation period and their comparison with those of this study (which will be simulated later) would have been a useful addition to the study.

The long-run effects of the devaluation remain to be seen, and its success partially depends on the future trend of inflation. If inflation continues at the rate experienced in the early 70's (which was higher than that of Turkey's trading partners), the Turkish prices will be out of line with the international prices very soon, as in the 60's. This would, of course, reduce or eliminate the effectiveness of the export incentives and improvements in the effective exchange rates for exports introduced by the devaluation package. Consequently, exporting might become a costly alternative for the producers. In the event that this happens, the growth of the export-oriented Turkish industries will be slower than what it would be if the producers considered supplying the foreign markets also. The Third Five Year Plan (1973-1977) and what it brings in terms of industrialization policies will also be crucial in determining the long-run effects of the devaluation.

C. EFFECTS OF THE ASSOCIATE MEMBERSHIP DURING THE 60'S

Exports. Since the beginning of 1965, Turkey has been an associate member of the EEC. During the preparatory stage which ended at the end of 1970, Turkey, as an associate member, was granted some limited concessions. These concessions included the establishment of the tariff-quotas for Turkey's traditional exports at preferential tariff rates. As mentioned earlier, the amounts of these quotas were increased several times after 1965, and in 1967 some non-traditional export items, such as sea products, quality wine, grapes, citrus fruits, handmade carpets, and some textile items, were also granted tariff-quotas. The transitional period (the terms of this period were also examined earlier) started in 1971, and it introduced additional tariff reductions on Turkish exports. Also a greater number of manufactured exports became subject to preferential treatment.

Although the value and quantity of Turkish exports to the EEC increased during the 1965-1970 period, quantities of all Turkish traditional export goods, except hazelnuts, actually exported to the Community remained below the quantity limitations set in the Tariff-quotas. Thus, in the 1965-1969 period, the

actual quantities of tobacco, raisins, and dried fig exports to the EEC were below the tariff-quota limitations by, on the average, 17, 18, and 9[109] percent respectively. A hundred percent of the tariff-quota limitations for hazelnuts was utilized in each year of the same period.[110] Tariff-quota utilization rates for tobacco, raisins, and dried figs could have been higher if the Turkish export prices were set at competitive levels vis-a-vis Turkey's competitors in the EEC markets; but, as mentioned earlier, the authorities sometimes set the export prices of these commodities at uncompetitive levels through price controls and interventions. In addition, more effective methods of quality control and standardization, better packaging, and some effective marketing efforts could have increased the volume of traditional exports.

Table XI summarizes the distribution of Turkish exports by country of destination in the years 1964 through 1970. The amount of Turkish exports to the EEC increased, with some fluctuations, during this period: from $137.6 million in 1964 to $232.9 million in 1970. This increase was probably due to

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[109] Derived from Table III in Mükerrem Hiç, op. cit., p. 547.

[110] Ibid.

TABLE XI. DISTRIBUTION OF TURKEY'S EXPORTS BY COUNTRY OF DESTINATION (millions of U.S. dollars).

Country[1]	1964		1965		1966		1967		1968		1969		1970	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
EEC countries	137.6	33.5	156.9	33.9	171.5	35.0	176.6	33.7	164.1	33.1	214.9	40.1	232.9	39.5
EFTA countries (of which)	97.1	23.6	83.4	18.0	92.3	18.8	88.1	16.9	85.1	17.1	81.0	15.0	104.1	17.7
United Kingdom	44.6	10.9	41.3	8.9	46.8	9.5	34.2	6.6	33.9	6.3	30.3	5.6	33.8	5.7
U.S.A.	73.0	17.8	82.3	17.7	80.2	16.4	92.9	17.8	72.5	14.6	59.9	11.1	56.3	9.6
CEMA countries	37.8	9.2	68.3	14.7	74.5	15.2	87.2	16.7	90.0	18.1	90.5	16.9	81.3	13.8
Others	65.3	15.9	72.8	15.7	72.0	14.6	77.9	14.9	84.7	17.1	90.5	16.9	113.9	19.4
Total	410.8	100	463.7	100	490.5	100	522.7	100	496.4	100	536.8	100	588.5	100

[1] EEC Countries are West Germany, Belgium-Luxembourg, France, Netherlands, Italy. EFTA countries are Austria, Denmark, United Kingdom, Sweden, Switzerland, Norway, Portugal; CEMA countries are East Germany, Bulgaria, Czechoslovokia, Hungary, Poland, Romania, USSR.

Source: U.S. AID, Economic and Social Indicators -- Turkey, (Ankara, Aug., 1971), Table 9-B, p. 32. (Original source: State Institute of Statistics, Annual Foreign Trade Statistics).

increases in demand (resulting from the population increase and growth) in the EEC for the kind of commodities that Turkey exports. It is doubtful that the associate membership had any trade diversion effect, because of the tariff reductions on imports from Turkey in increasing Turkey's exports to the Community. The main reason which supports this conclusion is that the other supplying countries, chiefly the Mediterranean countries, which are Turkey's competitors in the EEC markets, were also granted similar privileges.[111]

As shown in Table XI, the percentage share of Turkish exports to the EEC countries in total Turkish exports was 33.5 in 1964 and rose to 39.5 in 1970. Although the share itself increased by 6 percent -- an 18 percent increase in six years -- it fluctuated during the interim years, e.g., it was 33.1 percent in 1968 and rose sharply to 40.1 percent in 1969. The absolute level of Turkish exports to U. S. fell in the second half of the 60's, $73 million in 1964 and $56.3 million in 1970, while the total Turkish exports increased from $410.8 million in 1964 to $588.5 million in 1970. Consequently, the percentage share of Turkish exports to U. S. in total Turkish exports declined over the same period: 17.8 percent in 1964 and 9.6 percent in 1970.

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[111]See EEC, the Bulletin of the European Economic Communities, the volumes covering the 1960's.

The Community also extended financial assistance to Turkey -- $175 million during the preparatory stage[112] and $195 million during the transitional stage -- through the European Investment Bank. The initial loan provided Turkey with additional resources and foreign exchange during the 1960's, and thus helped Turkey in her development efforts to a limited extent. The second loan will be utilized throughout the 70's.

Imports. The terms of associate membership during the preparatory period did not include any item except the loan that might have affected Turkey's imports from the EEC. Only after the beginning of the transitional period in early 1971, which also marks the establishment of the EEC-Turkey customs union, did Turkey begin reducing its levels of tariff rates on imports from the EEC. The initial reduction was 10 percent, and as examined in detail earlier, they will be eliminated completely over a twelve year period. Thus, in the 60's, EEC exports to Turkey were not subject to any preferential treatment. Despite the fact that the same restrictions applied to imports from the EEC, the percentage share of these imports in total Turkish imports slightly increased.

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[112] The actual payments received from this first loan until February 1970 amounted to $101 million: Mükerrem Hiç, op. cit., p. 544.

Table XII presents the distribution of Turkey's imports by country of origin in the years 1964 through 1970. The value of imports from the EEC countries rose from $154.4 million in 1964 to $324.3 million in 1970, whereas the percentage share rose from 28.8 in 1964 to 34.2 in 1970. An examination of the table reveals that his increase in the percentage share of imports from the EEC was balanced by a part of the decrease in the share of imports from the U. S. The main reason for the changes in these two import shares is that imports from the Community increased more rapidly than imports from the U. S.[113] Substantially due to the EEC loans (through the EIB) and direct foreign aid (through the Consortium) which were extended to Turkey, Turkey's imports from the EEC countries increased. However, imports from the U. S. increased very slowly; in fact, in 1967, 1968, and 1969, they were below the 1964 level. This is because of the fall in the U. S. grain exports to Turkey (except in 1970) and a reduction in the AID financed exports; these two components make up the main bulk of the U. S. exports to Turkey.[114]

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[113] The levels of imports from the EEC and the U. S. were almost the same in 1964, but in 1970 imports from the EEC amounted to $324.3 million whereas imports from the U. S. amounted to $194.2 million: see Table XII.

[114] For details, see U. S. AID, Economic and Social Indicators - Turkey, op. cit., Table 12-A, p. 57.

TABLE XII. DISTRIBUTION OF TURKEY'S IMPORTS BY COUNTRY OF ORIGIN (millions of U. S. dollars).

Country	1964		1965		1966		1967		1968		1969		1970	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
EEC countries	154.4	28.8	163.1	28.5	236.4	32.9	237.9	34.7	281.9	36.9	282.8	35.3	324.3	34.2
EFTA countries (of which)	89.7	16.7	94.9	16.6	126.6	17.6	135.5	19.8	156.8	20.5	160.7	20.1	163.8	17.3
United Kingdom	55.7	10.4	55.4	9.7	78.7	11.0	88.0	12.9	38.5	12.9	94.6	11.8	90.8	9.6
U.S.A.	154.6	28.8	160.6	28.1	172.6	24.0	122.7	17.9	120.6	15.8	154.5	19.3	194.2	20.4
CEMA countries	41.6	7.7	57.2	10.0	83.4	11.7	90.2	13.2	97.9	12.8	98.9	12.3	100.2	10.7
Others	96.9	18.0	95.8	16.8	99.3	13.8	98.4	14.4	106.5	13.9	104.3	13.0	165.1	17.4
Total	537.2	100	571.6	100	718.3	100	687.7	100	763.7	100	801.2	100	947.6	100

Source: U.S. AID, Economic and Social Indicators - Turkey, op. cit., Table 9-C, p. 33. (Original source: State Institute of Statistics, Annual Foreign Trade Statistics.)

D. OBJECTIVES AND THE METHODOLOGY OF THE STUDY

Objectives. In reviewing the economic policies of the EEC, it was pointed out that Turkey would be affected by two basic adjustments, if she moved gradually toward full membership in the Common Market. As mentioned earlier, one of the adjustments involves institutional changes such as: (i) a tax reform, (ii) a change in the pricing policy of TMO (Soil Products Office) vis-a-vis the objectives of the Common Agricultural Policy of the EEC, among others mentioned earlier. However, it is difficult to forecast and speculate on the possible effects of these potential institutional changes without knowing their form, scope, and timing. It is for this reason that this study will ignore possible institutional changes and their effects on the Turkish economy.

The second basic adjustment involved in establishing the full membership is the bilateral gradual elimination of tariffs and quantitative restrictions on trade. As tariff reductions take place, which already started in 1971, and thus establish free trade between Turkey and the Community gradually, the relative commodity prices will change in Turkey. As a result, the cost structure and in turn the

production structure (through the changes in value-added per unit of output) will be affected. Furthermore, changes in domestic relative commodity prices may also alter the consumption pattern and change the structure and volume of Turkey's trade with the EEC.

One of the basic objectives of this study is to examine and analyze the possible shifts in the production structure, resulting from relative price changes. The motive behind this objective is to find answers to some important questions concerning Turkey's trade in the future and her industrialization efforts at the present and in the near future, which arise from the possibility of structural changes in the Turkish economy with a gradual liberalization of her trade with the EEC.

The major question of the study is where does Turkey's comparative advantage lie in free trade with the EEC countries? Some of the specific questions, in relation to the major question, are: (1) what is the future of Turkey's import-substitute industries? and (2) should Turkey's agricultural and non-traditional manufacturing export sectors be expanded?

Some of the short-run effects of tariff cuts are to be examined also; they are: (1) changes in sectoral output levels,

consumption levels, import and export levels, and (2) changes in the income distribution. It is also an objective of this study to estimate Turkey's gain or loss from free trade with the EEC.[115]

The Methodology. An examination of the resource-pull effects (i.e., shifts in the production structure) and other long-run and short-run effects, which are listed above, of Turkey's gradual move toward full membership in the EEC is done utilizing a linear programming model. The model was constructed on the basis of a small country assumption and the assumption of proportionality in final consumption quantities.

Being a static model, the model does not generate dynamic paths for endogenous variables of the system. However, it is applicable, through parametric programming, to the estimation of long-run effects of changes in exogenous variables (i.e., exogenous changes resulting from a change in the trade regime) of the system.

Thus, in estimating the resource pull effects of a gradual liberalization of trade with the EEC, the following procedure[116]

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[115] Although it is implicit, it should be stressed that it is not the objective of this study to reach a conclusion as to whether or not Turkey should join the Common Market.

[116] Throughout this study, it is assumed that Turkey definitely committed herself to full membership in the EEC, and that it will be realized.

is followed: first, it is assumed that free trade with the EEC is established by a once-and-for-all removal of all trade barriers by Turkey and the EEC. Secondly, it is assumed that fixed technologies characterize the production activities in Turkey and the fixed production coefficients of 1967 are utilized. Thirdly, Turkey's trade volume with the third countries is kept constant[117] at its 1967 level in the application of the model. Then, the model is applied for estimating the optimum behavior of the Turkish economy, on a fifty-sector basis, under the free trade (with the EEC) conditions.

The solution results are then compared with the actual levels to find out the directions of changes in relative (unit) profitability of each traded-good sector and resulting expansionary or contractionary trends in the output levels. From these observations, the possible resource-pull effects of the gradual liberalization in trade are to be derived. On the basis of their relative profitabilities under the free trade conditions, the traded good sector will be compared for their international competitiveness within the Common Market. This comparison could indicate in which production lines Turkey might have comparative advantage

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[117] Defense of this and the previous two assumptions is left to Chapter III.

in free trade with the EEC, and thus also indicating the sectors which should be encouraged to expand.

Estimates of the short-run effects of the liberalized trade are to be derived by comparing the free trade solution values and the actual values of the relevant variables. Directions of changes in the shadow prices of labor and capital will be utilized in analyzing possible effects of the gradual move toward free trade upon the income distribution.

The objective function of the model is expressed in terms of one endogenous variable which is utilized as a gain or loss variable. The difference between the free trade optimum solution value of this variable and its actual value gives an estimate of Turkey's gain or loss from free trade with the EEC. This estimate will be compared with the estimates of Great Britain's gain from joining the Common Market. Such a comparison, assuming that the estimation techniques are fairly accurate, might lead to some interesting conclusions about the sizes of gains (or losses) that a LDC and an industrialized country could incur by joining a customs union formed by industrialized nations.

E. SUMMARY OF THE CONTENTS OF FOLLOWING CHAPTERS

Chapter II includes a brief review of the literature on effective protections concepts. Then, on the basis of a fifty-sector classification of the Turkish economy, the effective rates of protection (ERP's) are estimated for the Turkish economy, using the 1967-1968 data. ERP's are then utilized in analyzing the resource allocation structure that exists under the present restricted trade conditions. Chapter II also includes a qualitative analysis of the questions raised in Chapter I.

The model is developed in Chapter III. First, the reasons for choosing such a model and then the model and its properties are explained. Particular assumptions which were incorporated into the model are defended. Finally, the application procedures are outlined.

In Chapter IV, the 1967 Turkish Input-Output table and other data utilized in the application of the model and in other calculations are examined. The rest of this chapter is devoted to the discussion of adjustments made on the 1967 actual data. These adjustments include: (i) disaggregation of the 1967 input-output table (from 37 to 50 sectors); (ii) division of the sectoral value-added figures into two factor components; (iii) derivation of the Common Market prices.

The application results and analysis of these results are presented in Chapter V. The basic conclusions of the study and some economic policy implications are also included in Chapter V.

CHAPTER II

EFFECTIVE PROTECTION IN TURKEY

This chapter is devoted to the estimation of effective protection rates for the Turkish economy. The definition of effective rates of protection (ERP), utilized for estimating the present effective rates in Turkey, assumes no substitution among traded intermediate inputs and between primary factors and traded intermediate inputs. As shown by W. M. Corden and indicated by R. W. Jones, with the assumption of no-substitution between intermediate inputs and primary factors, effective rates of protection might be useful ". . . as a guide to the resource reallocations called forth by a particular tariff structure."[1] Thus, the estimates of effective protection rates are used to analyze the resource allocation structure existing under the present Turkish tariff structure. The model estimates the resource-pull effects of the gradual elimination of tariffs on imports from the EEC countries. The latter resource-pull effects are examined in Chapter V.

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[1]The quotation is from Ronald W. Jones, "Effective Protection and Substitution," Journal of International Economics, Vol. 1, (1971), p. 59; W. M. Corden, "The Structure of a Tariff System and the Effective Protection Rate," Journal of Political Economy, Vol. LXXIV, No. 3, (June, 1966), pp. 221-237.

A. THE THEORY OF EFFECTIVE PROTECTION

The nominal tariff theory tries to predict the changes -- assuming there are no traded intermediate inputs -- in output levels, primary factor allocation, and in real and nominal value-added per unit output, the changes which might be caused by a change (or changes) in nominal tariff rate(s). However, the nominal tariff theory cannot be utilized if the objective is to examine the changes in the same variables mentioned above under a tariff structure which also includes traded intermediate inputs. This is the gap which the recently developed effective protection theory is attempting to close. Thus, it is the objective of the "new" theory to devise

> . . . a concept of protection which, in the presence of tariff structures involving the imports of intermediates, constitutes in effect an index which will perform the same tasks as nominal tariffs do in the nominal tariff theory: i.e., predicting accurately the changes in . . . gross output, nominal value of output, primary factor allocation, real value-added and nominal value-added.[2]

The initial attempts to develop a definition (or an index) of effective protection were made under the assumption that no substitution took place between primary factors and traded

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[2] Jagdish N. Bhagwati and T. N. Srinivasan, "The General Equilibrium Theory of Effective Protection and Resource Allocation," Journal of International Economics, Vol. 3, No. 3 (August 1973), p. 260.

intermediate inputs. As will be shown below, Corden,[3] for example, used a unit "value-added" concept and defined an effective protection index as the proportionate change in value-added per unit of output over the free trade value-added per unit of output. Recently, there have been attempts to develop a general equilibrium theory of effective protection by relaxing the no-substitution assumption.[4] The findings of the recent studies generally indicate that formulation of a useful effective protection concept that allows substitution is possible only under very restrictive conditions. Discussion of these studies will be avoided here.

The model (of the study) utilized the fixed coefficients of the 1967 Turkish input-output table. Thus, production activities included in the model are assumed to have fixed production technologies (i.e., no substitution takes place between primary

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[3] Corden, op. cit.

[4] W. M. Corden, "The Substitution Problem in the Theory of Effective Protection," Journal of International Economics, Vol. 1, (1971), pp. 37-57; and Ronald W. Jones, "Effective Protection and Substitution," op. cit.; Corden e.g., tried to formulate an ERP definition that allows only conditional substitution (which in turn requires the use of separable production functions). He claims that these rates can still be used to measure the resource pull effects of a tariff structure. His approach has been criticized because of the strong assumptions made, and a counter example has been given by Srinivasan and Ramaswami, showing that resources can be attracted to industries which are subject to lower effective rates; see: Ramaswami, V. K. and Srinivasan, T. N., "Tariff
(continued next page)

factors and traded intermediate inputs). It is for this reason that the ERP definition used in estimating effective rates of protection for the Turkish economy under the present tariff structure assumes no substitution between primary factors and intermediate inputs.

The Corden Definition. The studies of H. G. Johnson and W. M. Corden have contributed to the development of the "effective protection" concept.[5] As mentioned earlier, initial attempts to define an ERP index which would predict the changes - induced by a tariff structure - in the variables mentioned earlier focused upon developing a definition which is based on the

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Structure and Resource Allocation in the Presence of Factor Substitution," in Trade and Development, (by V. K. Ramaswami), eds. J. N. Bhagwati et al. (London: George Allen & Unwin Ltd., 1971), pp. 54-62. In a recent article M. Bruno, also, examined the substitution problem in a general equilibrium framework: Michael Bruno, "Protection and Tariff Change Under General Equilibrium," Journal of International Economics, Vol. 3, No. 3, August, 1973, pp. 205-226. Also see the Bhagwati-Srinivasan article cited in footnote 2, and A. Ray's article cited in a later footnote (Footnote 11).

[5] Corden, ibid.; H. G. Johnson, "Tariffs and Economic Development," Journal of Development Studies, (October, 1964), pp. 3-30.

assumption of no substitution between primary factors and traded intermediate inputs. Corden's (1966) definition which utilizes a "value-added" concept is the basic definition of an ERP index based upon the no-substitution assumption. Since the latter definition is utilized in estimating ERP's for Turkey, it is examined in detail here.

The following basic assumptions are made in the formulation of Corden's definition: (i) there is no substitution among intermediate inputs, i.e., physical input-output coefficients are fixed; however, substitution among primary factors -- i.e., labor and capital -- is possible; (ii) changes in the trade policy of home country cannot affect international prices; (iii) tradable goods continue to be traded after the imposition of tariffs, taxes and subsidies; (iv) domestic prices differ from international prices by the amount of tariffs (this implicitly assumes that there is perfect competition in domestic markets); (v) primary factors of production are internationally immobile; (vi) tariffs are nondiscriminatory as to the source of imports; (vii) full employment is assumed.

There are n traded commodities in the system, and the units are defined such that the international prices are all fixed at unity.[6] The following notations are used:

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[6]This allows us to interpret the input-output coefficients both as value coefficients and also as quantity coefficients.

a_{ij} = amount of the ith good used for producing one unit of the jth good (i=1, . . ., n; j=1, . . ., n). These coefficients are assumed to remain the same after tariffs are imposed.

ERP_j = effective rate of protection for the jth production activity (which produces the jth commodity).

t_i = tariff rate on the ith traded commodity.

v_j = international value-added (i.e., value-added at international prices) per unit of the jth commodity.

v'_j = domestic value-added per unit of output in the jth industry; this coefficient represents per unit value-added when the tariff structure is in effect.

We then have:

$$v_j = 1 - \sum_{i=1}^{n} a_{ij} \qquad (1)$$

per unit international value-added in the jth industry is equal to the international price minus the cost of intermediate inputs valued at unitary international prices; and

$$v'_j = (1+t_j) - \sum_{i=1}^{n} (1+t_j)\, a_{ij} \qquad (2)$$

per unit value-added at tariff inclusive domestic prices in the jth industry, and it is equal to domestic price minus the cost of intermediate inputs valued at domestic prices; then

$$ERP_j = \frac{v'_j - v_j}{v_j} \quad \text{or} \quad ERP_j = \frac{v'_j}{v_j} - 1 \qquad (3)$$

effective rate of protection that the tariff structure provides to the jth industry is defined as the proportionate change in value-added per unit of output over the free trade value-added per unit of output.[7] By replacing (1) and (2) in the definition (3), we obtain:

$$ERP_j = \frac{t_j - \sum_{i=1}^{n} a_{ij}t_i}{1 - \sum_{i=1}^{n} a_{ij}} \tag{4}$$

or,

$$ERP_j = t_j + \frac{(t_j - \bar{t}_j) \sum_{i=1}^{n} a_{ij}}{1 - \sum_{i=1}^{n} a_{ij}} \tag{5}$$

where

$$\bar{t}_j = \frac{\sum_{i=1}^{n} a_{ij}t_i}{\sum_{i=1}^{n} a_{ij}}$$

is the weighted average tariff on inputs.

It is obvious from the equation (4) that a higher tariff rate upon an importable commodity means higher effective protection for value-added per unit output in the domestic industry producing the same commodity; and higher tariff

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[7] The definition also assumes that the same exchange rate exists under the protected and free trade situations.

rates on inputs lead to a lower effective rate. Some specific results can be derived from equations (4) and (5):

(i) if $t_j = \bar{t}_j$, then $ERP_j = t_j$

(ii) if $t_j \gtrless \bar{t}_j$, then $ERP_j \gtrless t_j$

(iii) if $t_j < a_{ij}t_i$, then $ERP_j < 0$.

Thus, if the weighted average tariff on inputs is equal to the tariff rate on the final product, then the effective rate is equal to the nominal rate, case (i); if the tariff rate on final product is higher than the weighted average tariff on inputs, then the effective rate is higher than the nominal rate (or vice versa), case (ii); if the tariff rate on a final product is less than the difference between the domestic cost of intermediate inputs per unit of output and free trade cost of intermediate inputs, then the effective rate is negative, case (iii).

In applying the Corden definition, the following points bear careful attention in general: (a) in addition to tariff duties and other indirect taxes levied upon foreign trade, there are also internal indirect taxes and subsidies levied upon the domestic production and consumption of traded goods, and these indirect taxes might affect effective rates of protection.[8]

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[8] Corden (in his 1966 article) summarized the effects of these taxes on production costs and suggested ways of treating these taxes in estimating ERP's: Corden, "The Structure of a Tariff System and the Effective Protection Rate," op. cit., pp. 223-24.

(b) Sometimes, nominal tariff rates fail to represent proportionate differences between international and domestic prices of traded goods because of the existence of quantitative restrictions on imports. Thus, because of the factors mentioned in (a) and (b) if nominal tariff rates cannot be relied upon for representing the proportionate differences between domestic and international prices, then tariff equivalents of these additional distortions should be estimated and be used in ERP calculations.[9] Another point which should also be emphasized is related to the interpretation of negative ERP's. An effective protection rate for a production activity can be negative if tariff duty rates of the intermediate inputs used in the production of the traded good produced by this activity are too high. This implies that the production of this traded commodity is actually being taxed. It is also possible to derive a negative ERP when the denominator (i.e., the free trade value-added per unit of output) in the ERP formula is negative. This however does not imply negative protection for that particular industry or production activity. It simply indicates that such production activities would create negligible

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[9]If ERPs are calculated for specific commodities, then the ratio of the difference between the actual domestic and internationa prices of a traded good over the international price of that good can be used as the nominal tariff rate (i.e., t_j's which appear in the equation (4)).

value-added if they were to operate under the free trade conditions and with the same technology. For some activities in LDC's, such as assembly industries which import almost all parts of a final product, this might be the case. A likely explanation for negligible free trade value-added per unit output in these industries is the high transportation costs involved in importing parts of a product rather than the final product itself. Thus, when the absolute size of the denominator is small (positive or negative), ERP will be very large. If this is the case, whether ERP is negative or positive, the sector is actually highly protected.

B. ESTIMATES OF EFFECTIVE RATES OF PROTECTION IN TURKEY

1. The Application Procedures. In applying the ERP definition, as formulated by the equation (4), the 1967 Turkish input-output coefficients were utilized. Some of the sectors included in the table produce non-traded home-goods which are used as input in traded good sectors, and furthermore there are also non-competitive imports used in the production of traded goods.

In the application, the following approaches were used for treating non-traded inputs and non-competitive imports:

(1) non-competitive imports were treated like any other traded input; this is straight forward and there is no reason to comment further on this. (2) In treating the non-traded inputs, Corden's (1966) approach[10] was utilized; his approach is to treat non-traded inputs as primary inputs.[11] Consequently, value-added per unit output in traded good industries is defined as value-added by primary factors plus value-added by non-traded inputs. Corden's defense for his approach is that effective protection for an activity producing a tradeable good should represent the protection for all inputs which are not in infinitely elastic supply, and since non-traded inputs are not in infinitely elastic supply (unlike traded goods which are -- in "small" countries -- through international trade), they should be treated like primary

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[10] Corden, "The Structure of a Tariff System and the Effective Protective Rate," op. cit., pp. 227-28.

[11] Another approach which was suggested by Balassa and Basevi treats non-traded inputs as traded inputs with zero tariffs on them. However, this approach was proved to be wrong. For example, A. Ray shows that, in the general case, Corden's definition of ERP is the most appropriate one to use. He finds out that ERPs based on Balassa's definition give a wrong ranking, and as such, Ray concludes, the latter definition leads to wrong results as far as resource allocation effects of a tariff structure is concerned. See Alok Ray, "Non-traded Inputs and Effective Protection: A General Equilibrium Analysis," Journal of International Economics, Vol. 3, No. 3, (August, 1973), pp. 245-258; Bela Balassa, "Tariff Protection in Industrial Countries: An Evaluation," Journal of Political Economy, Vol. LXXIII, No. 6 (Dec. 1965), pp. 573-574; Giorgio Basevi, "The United States Tariff Structure: Estimates of Effective Rates of Protection of United States Industries and Industrial Labor," Review of Economics and Statistics, Vol. XLVIII, No. 2 (May, 1966), pp. 147-160.

factors.[12] However, as pointed out by Corden, formulation of the concept becomes complicated if traded goods are used in the production of home goods which are in turn inputs to traded goods.[13]

Since the available data are valued at the 1967 Turkish domestic prices, the input-output coefficients are defined at these fixed prices also. Thus, a physical unit of the jth commodity is the amount which could be purchased by one monetary unit (in here, it is TL 1 million) at the 1967 domestic fixed prices. By construction, the physical units of all commodities are defined in this manner in the input-output table. Since the tariff inclusive domestic prices are normalized at unity, the ERP definition as expressed by the equation (4) was adjusted accordingly.[14]

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[12] Corden, op. cit., p. 227

[13] Ibid., p. 228 (in Footnote 5, Corden explains how such cases could be treated in defining value-added per unit output in the protected industries).

[14] The equation used in the application is presented below. There are 41 traded good sectors (each producing one traded good) and 9 home good sectors; the first 41 sectors are traded good sectors. Domestic prices are normalized at unity. Thus, the equation for ERP in the jth production activity becomes:

$$ERP_j = \frac{1 - \sum_{i=1}^{41} a_{ij} - m_j}{\frac{1}{1+t_j} - \sum_{i=1}^{41} \frac{a_{ij}}{1+t_i} - \frac{m_j}{1+t_j^m}} - 1 \qquad (6)$$

(continued next page)

2. The Data. The basic data used in the calculations are derived from the 1967 Turkish input-output table which was disaggregated from 37 sectors to 50 sectors for this study.[15] There are forty-one traded good sectors and nine sectors producing non-traded commodities.

The data supplied by the 1967 input-output table are valued at the 1967 Turkish market prices which include indirect taxes levied upon internal and foreign trade transactions. The domestic transactions are valued at purchasers' prices, i.e., market prices inclusive of the trade and transportation margins. Imports are recorded at their landed cost prices, i.e., c.i.f. prices plus import taxes. In the input-output table, competitive imports used as inputs are included in interindustry flows at their

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where $1/(1+t_j)$ is the international price of the jth traded good, m_j is the domestic value of non-competitive imports used for producing one unit of the jth product, and t_j^m is the weighted average tariff rate (as a percentage of c.i.f. value) on non-competitive imports used by the jth industry per unit of output. The domestic value-added per unit output equals $1-\sum_{i=1}^{41} a_{ij}-m_j$, and the free trade value-added per unit output equals

$$\frac{1}{1+t_j} - \sum_{i=1}^{41} \frac{a_{ij}}{1+t_i} - \frac{m_j}{1+t_j^m}.$$

[15] For detailed explanations onthe data (original and adjusted) utilized here see Chapter IV. The 1967 augmented input-output tables (i.e., flow and coefficient tables) are in Appendix B. A sample of commodity specific nominal tariff rates, other import taxes, and the procedures followed in obtaining sectoral (weighted) tariff rates (i.e., t_j's in the equation (6) in Footnote 14) are presented in Appendix A.

landed cost values. Non-competitive imports used by each sector are recorded in a separate row of the table, and in each cell of this row the c.i.f. value of these imports and total import taxes paid are separately given. Thus, the 1967 input-output coefficient table supplied the values of the coefficients a_{ij}'s, m_j's, and t_j^m's. As mentioned earlier, the domestic prices are normalized at unity.

In order to estimate the sectoral tariff rates (i.e., t_i's in the formula (6)) for traded good sectors a two-step procedure was utilized. The first step involved the calculation of "unadjusted"[16] sectoral tariff rates from commodity specific nominal tariff and export subsidy rates, using import and export proportions as weights.[17] The sectoral tariff rates derived from this approach are biased downward. This is because the weighing method used underestimated these rates by not counting prohibitive tariff rates (since the relevant

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[16] They are called "unadjusted" because of the bias involved in the procedure. This point is explained further in the text.

[17] In order not to disrupt the continuity of this Chapter, details of the procedures followed in calculating sectoral tariff rates are not discussed here. They are included in Appendix A. To give an idea about the exact nature of the weighing method used, calculations done in deriving the weighted sectoral tariff rate for one of the sectors are presented in Appendix A, Table II.

import weights are zero) and giving too much weight to the lower tariff rates. That is why, in the second step of the procedure, these sectoral tariff rates were adjusted by: (i) comparing domestic and international prices directly, whenever it was possible,[18] and (ii) checking the proportionate change in imports/domestic production ratios in four years (from 1963 to 1967) for certain sectors for which direct price comparisons were not possible. For some sectors, adjustments were made on the basis of the results obtained in other sectoral studies.[19] In Appendix A, these adjustments are discussed in detail.

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[18]Such comparisons were made for some sectors which produce only a small number of homogeneous products, such as Sugar, Cement, Iron and Steel, Petroleum Refineries sectors; see Appendix A for details.

[19]The production of fertilizers has been subsidized, and since nominal tariff rates on imported fertilizers did not reflect production subsidies paid, the sectoral tariff rate for the Fertilizers sector was adjusted upward; this upward adjustment was based on the price (international and domestic) and production cost data found in an unpublished official report on the fertilizer industry in Turkey. Rates for some of the export sectors were also adjusted. See Appendix A.

3. The Results. The 1967-1968 data, after some adjustments, were applied to the equation (6) -- see Footnote 14 -- for calculating ERP estimates for 41 tradeable commodities. The results are summarized in Table I. Under column (1), the first set of sectoral adjusted nominal tariff rates and under column (3), the corresponding ERP's are listed. Under columns (4) and (6), the second set of sectoral tariff rates and ERP's are listed respectively.

Primary Sectors -- Nominal tariff rates for sectors producing primary products are negligible,[20] and except for the Livestock sector (for which the nominal tariff rate is 9 percent in the first set, and 5 percent in the second set), they were kept the same in both sets. Effective protection rates for these sectors are not much different than their corresponding nominal rates; but, except for the Forestry sector (for which nominal rate is 21 percent and the effective rate is 24 percent in both sets of calculations), effective rates are lower than nominal rates. In fact, for some of the primary sectors the effective rates are negative. Let t (I) and t (II) indicate nominal

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[20] Most of the products are exportables, and the positive nominal tariff rates upon these activities reflect export subsidies (mainly through the tax rebate) granted to these sectors (see Appendix A for details). Primary sectors are the agricultural sectors (sectors 1 through 9, and sector 40 which is the Animal-Slaughtering sector) and mining sectors (sectors 10, 37 and 38 which are Other Mining, Iron-ore Mining, and Coal Mining respectively).

TABLE I. SECTORAL (ADJUSTED) NOMINAL TARIFF RATES AND EFFECTIVE RATES OF PROTECTION IN TURKEY (1967-1968) (RATES ARE GIVEN AS PROPORTIONS OF c.i.f. PRICES).

Sector number	Sectors	First set of sectoral tariff rates (adjusted nominal rates) t (I) (1)	Denominator[1] (2)	ERP_j (I) (3)	Second set of sectoral tariff rates (adjusted nominal rates) t (II) (4)	Denominator[1] (5)	ERP_j (II) (6)
1	Industrial Crops	.01	.88	-.02	.01	.88	-.02
2	Wheat and other cereals	.05	.79	.03	.05	.79	.02
3	Fruits	.08	.80	.05	.08	.80	.05
4	Citrus Fruits	.05	.79	.02	.05	.80	.02
5	Nuts	.0	.88	-.03	.0	.88	-.03
6	Vegetables	.05	.46	-.08	.05	.45	-.07
7	Forestry	.21	.65	.24	.21	.65	.24
8	Livestock	.09	.50	.11	.05	.54	.04
9	Fishing	.05	.93	.02	.05	.93	.02
10	Other Mining	.21	.76	.19	.21	.77	.18
11	Sugar	.16	.50	.23	1.45	.05	10.38
12	Alcoholic Beverages	.96	.27	1.54	1.44	.17	3.13
13	Milk Industry-Canned Food	.02	.54	-.06	.02	.53	-.04
14	Olive oil, Seed oils, Fats	.37	.35	.40	.25	.41	.18
15	Other Food Sector	.10	.36	.10	.10	.38	.04
16	Cotton Textile	.33	.33	.39	.33	.33	.38

TABLE I. (continued)

Sector number	Sectors	First set of sectoral tariff rates (adjusted nominal rates) t (I) (1)	Denominator[1] (2)	ERP_j (I) (3)	Second set of sectoral tariff rates (adjusted nominal rates) t (II) (4)	Denominator[1] (5)	ERP_j (II) (6)
17	Wool Textile	.43	.16	.86	.43	.15	.98
18	Knitting Industry	.28	.48	.21	.28	.48	.21
19	Other Textile	.65	.26	.62	.40	.35	.21
20	Clothing Industry	.88	.21	1.61	.88	.21	1.61
21	Wood Products	.66	.24	1.14	.66	.25	1.08
22	Paper, Printing Stationery	.75	.29	.94	1.13	.22	1.55
23	Leather, and Leather Products	.25	.41	.27	.25	.41	.26
24	Rubber and Plastics, Products	1.09	.05	8.76	2.28	-.11	-5.61
25	Chemicals and Pharmaceuticals	.73	.27	1.34	1.10	.18	2.50
26	Fertilizers	.68	.46	.84	1.02	.36	1.32
27	Petroleum Refinery and Coal Products	1.67	.26	1.65	2.74	.15	3.36
28	Ceramics, Glass and Non-metallic Products	.71	.35	.92	.30	.54	.23

TABLE I. (continued)

Sector number	Sectors	First set of sectoral tariff rates (adjusted nominal rates) t (I) (1)	Denominator[1] (2)	ERP_j (I) (3)	Second set of sectoral tariff rates (adjusted nominal rates) t (II) (4)	Denominator[1] (5)	ERP_j (II) (6)
29	Cement	.70	.40	.74	1.26	.27	1.54
30	Iron and Steel	.67	.35	.60	1.44	.21	1.63
31	Non-ferrous Metals	.52	.40	.63	.78	.33	.98
32	Metal Products	.82	.22	1.32	1.23	.17	1.90
33	Agricultural and Non-electrical Mach.	.64	.31	.77	1.05	.24	1.32
34	Electrical Mach. and appliances	.72	.31	1.01	1.08	.23	1.63
35	Transportation equip., Maint., Repairs	.82	.23	1.16	1.23	.18	1.84
36	Crude Petroleum	4.23	.17	4.79	4.23	.17	4.67
37	Iron ore Mining	.13	.81	.09	.13	.82	.08
38	Coal Mining	.13	.81	.09	.13	.81	.08
39	Tobacco Processing and Products	.25	.43	.42	.25	.43	.41
40	Animal Slaughtering	.05	.29	-.05	.05	.26	.05
41	Other Transportation	.0	.88	-.16	.0	.91	-.18

Footnotes for Table I.

Sources: Columns (1) and (4) are from Table III in Appendix A.

[1] "Denominator" refers to the denominator of the first term in the ERP formula (i.e., $\frac{1}{1+t_j} - \sum_{i=1}^{41} \frac{a_{ij}}{1+t_i} - \frac{m_j}{1+t_j^m}$; see the equation (6) in Footnote 14). It is the free trade value-added per unit of output. It was necessary to calculate this term also, because technically it is possible to obtain a negative ERP when this term (i.e., the denominator) is negative, even though the relevant production activity is highly protected. Calculation of the denominator helped distinguish sectors with negative ERP's that are caused by the high tariff rates on inputs from those that have negative ERP's because the denominator is negative. This point was discussed earlier in the text.

rates in the first and second sets respectively, and ERP (I) and ERP (II) indicate the effective rates corresponding to the nominal rates t (I) and t (II) respectively. For the Industrial Crops sector, both nominal rates are 1 percent, and both effective rates are minus 2 percent. For the Nuts sector, t (I) and t (II) are both zero, and ERP (I) and ERP (II) are minus 3 percent. t (I) and t (II) are 5 percent for the Vegetables sector, and the corresponding effective rates are minus 8 and minus 7 percent. For the Animal Slaughtering sector both nominal rates are 5 percent, ERP (I) is minus 5 percent, ERP (II) is 5 percent. For the rest of the primary sectors, the effective rates are positive, but they are lower than the nominal rates.

The above results imply that the protection granted to the primary sectors, through the export subsidies (mainly the export tax rebate which is expressed in terms of tariffs) and tariffs, was not as high as the protection that nominal tariff rates seem to indicate. The tariff structure also caused negative protection for some of the primary sectors (these are the sectors that have negative ERP's), as we observed above. This means that export subsidies provided to the commodities produced by these sectors failed to compensate for high tariffs

levied upon the imported inputs. As such, the production in these sectors was indirectly taxed by the tariff structure. It was pointed out in Chapter I that high tariff duties levied upon the imported inputs affected international competitiveness of these sectors adversely[21] by increasing the cost of production.

Manufacturing Sectors - In Turkey, nominal tariff rates levied upon manufacturing sectors[22] are generally much higher

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[21] Among the primary sectors, Industrial Crops (for cotton and tobacco), Nuts (mainly unshelled hazelnuts), and Other Mining (for chrome and copper ores) are the traditional export sectors. The remaining primary sectors are the non-traditional (in some cases potential) export sectors, and they are Wheat and Other Cereals, Fruits (fresh fruits), Citrus Fruits, Vegetables, Forestry, Livestock, Fishing, Iron-ore Mining, Coal Mining, and Animal-Slaughtering sectors.

[22] Sectors 11 through 35 and 39 are manufacturing sectors. Among these, the Milk Industry - Canned Food, Olive oil-Seed oils-Fats, Other Food Sector, Cotton Textile, Knitting Industry, Other Textile, Wood Products, Leather and-Leather Products, Ceramics, Glass and Nonmetallic Products, and Non-ferrous Metals sectors produce exportables. The rest of the manufacturing sectors produce commodities which are import-substitutes. However, this distinction among sectors producing exportables and import-substitutes is not "exclusive", e.g., the Electrical Machinery and Appliances sector is basically an import-substitute sector, but some of its sub-sectors produce products that are being exported (batteries, refrigerators, and other household appliances).

than those levied upon primary sectors. Also, among manufacturing sectors, import-substitute sectors have higher nominal tariff rates than those manufacturing sectors which produce non-traditional exports.[23] Since the protection of import-substitute sectors is one of the functions of the present Turkish tariff structure, nominal tariff rates show an escalating structure as described above; i.e., manufactured final goods are protected more than raw materials and semi-manufactured products.

In comparing the two sets of nominal tariff rates, it is observed that for import-substitute sectors, t_i (II)'s are higher than t_i (I)'s. This is, as pointed out earlier, due to the adjustments made on nominal rates derived from the weighing method; as explained before the weighing method caused a downward bias in nominal rates. Since the upward adjustments are explained in Appendix A, they are not discussed here. However, the upward adjustment made on the nominal tariff rate for the Sugar sector is discussed here in order to provide an example to the reader and show how some of these changes

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[23] The identification of manufacturing sectors (according to whether they produce import-substitutes or exportables) is done in the previous footnote.

were made. t(I) for the Sugar sector (obtained from commodity specific tariff rates by using imports and export as weights) is 16 percent. This rate fails to represent the percentage difference between the international and domestic price of sugar. In 1967, the domestic price of sugar was TL 3.21[24] per kilogram (set by the government). The international price, in the same year, was $6.60[25] per hundred pounds, which (at TL 9=$1 exchange rate) is TL 1.13 per kilogram. A comparison of these two prices give a tariff rate of 145 percent, and this is how t (II) -- which is equal to 1.45 -- was found for sugar.

t_i (II)'s are lower than t_i (I)'s for some of the non-traditional export sectors. These sectors are Olive oil-Seed oils-Fats (for which t (I) is .37 and t (II) is .25), Other Textile (t (I) is .65 and t (II) is .40), and Ceramics, Glass and Non-metallic Products (t (I) is .71 and t (II) is .30). A downward adjustment to nominal tariff rates of these sectors was necessary since, from direct comparisons of domestic and

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[24] SIS, Statistical Yearbook of Turkey: 1968, Pub. No. 580, (Ankara, 1969), Table 382, p. 392.

[25] IMF, International Financial Statistics, Vol. XXVI, No. 6 (June, 1973), pp. 30-31.

international prices and from some sectoral studies, it was found that the weighing method overestimated the sectoral tariff rates for these sectors.[26]

Estimates of effective rates of protection for manufacturing sectors indicate that in Turkey import-substitute sectors are generally subject to higher protection than that implied by the nominal tariff rates. This is due to the escalating nature of the Turkish tariff structure. Results for some of the import-substitute sectors are the following: for the Sugar industry, for which t (I) is .16 and t (II) is 1.45, ERP (I) is .23 and ERP (II) is 10.38.[27] t (I) is .96 and t (II) is 1.44 for the Alcoholic Beverages sector, and the corresponding ERPs are 1.54 and 3.13 respectively. For the Wool Textile sector both nominal rates are the same (.43), ERP (I) is .86 and ERP (II) is .98. Both ERP's are the same for the Clothing Industry (1.16), t (I) and t (II) are also equal (.88). Except

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[26] Again, the reader should refer to Appendix A for explanations.

[27] This (ERP (II)) is very large figure, and the reason is the size of the denominator which is very small (.05). This means that the Sugar industry would create negligible value-added if the economy operated under free trade conditions, assuming that the industry uses the same technology.

for the three import-substitute sectors whose ERP's are discussed next (they require some explanation), ERP's for the remaining import-substitute sectors are higher than their nominal rates.[28] For the Rubber, Plastics, and Products sector t (I) and t (II) are 1.09 and 2.28 respectively, ERP (I) is 8.76, and ERP (II) is minus 5.61. The latter ERP does not imply negative protection despite its negative value; on the contrary it indicates a high level of protection.[29] For the Petroleum Refinery and Coal Products sector, t (I) is 1.67 and t (II) is 2.74, the effective rates are 1.65 and 3.36 respectively. With high nominal rates one would expect even higher effective rates (note that ERP (I) is lower than t (I)); the reason for the low effective rates for the latter sector is that tariff rates on intermediate inputs used by this sector are very high, especially the tariff rate on crude petroleum -- 423 percent -- which is the basic input. Another sector for which effective rates are lower than expected is the Iron and Steel sector (t (I) and t (II)

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[28]In order to avoid excessive length, ERP's for the remaining import-substitute sectors are not presented in the text, see Table I for these rates.

[29]Since the negative figure resulted from a negative denominator (-.11) for ERP (II), this particular negative ERP does not imply negative protection. This point was discussed earlier in this Chapter.

are .67 and 1.44 respectively). Even though tariff rates on inputs such as coal and iron-ore are very low, so that one would expect higher effective rates for the iron and steel industry, both effective rates are relatively low -- ERP (I) is .60 and ERP (II) is 1.63 -- due to the depressing effect of high tariffs on other intermediate inputs (the major ones are petroleum and iron-and-steel).

The effective rates for the manufacturing sectors which produce exportables (non-traditional) are generally lower than nominal rates levied upon these sectors. For the Milk Industry-Canned Food sector ERP (I) is minus .06 and ERP (II) is minus .04; whereas both nominal rates are higher and both are equal to .02. The negative effective rate is partly caused by the high cost of tin plate (for canning) used as input in this sector. As explained in Chapter I, tin plate is produced domestically but at a very high cost, and the industry is protected by high tariffs. Of course, this affects canned food exports adversely. The effective rates for the Olive oil-Seed oils-Fats sector are .40 and .18 respectively, nominal rates are .37 and .25. For the Other Food sector, the nominal rates are both the same, .10, and the effective rates are .10 and .04 respectively. Among the exporting textile sectors, only the Cotton Textile has effective

rates -- ERP (I) is .39 and ERP (II) is .38 -- higher than nominal rates, which are both .33; a partial explanation for the higher effective rates is the fact that cotton, which is the basic intermediate input, is domestically supplied and there is no indirect tax on it. Other textile sectors which produce exportables are subject to effective rates which are lower than nominal rates: for the Knitting-Industry, ERP (I) and ERP (II) are the same, .21, and both nominal rates equal .28; for the Other Textile sector,[30] the effective rates are .62 and .21, and the nominal rates are .65 and .40 respectively. For Wood Products, ERP (I) is 1.14, ERP (II) is 1.08, and both nominal rates are .66; for Leather and-Leather Products, the effective rates are .27 and .26, and the nominal rates are both .25; and for Non-ferrous Metals, ERP (I) is .63, ERP (II) is .98, and the nominal rates are .52 and .78 respectively. The effective rates for the latter group of sectors are higher than the nominal rates; this is again due to low tariff rates on raw materials and other intermediate inputs (mostly obtained from domestic sources) used by these sectors. For the Ceramics, Glass and Non-metallic Products sector, the effective rates are .92 and .23, and the nominal rates are .71 and .30 respectively; due to the adjustment,[31]

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[30] Silk products, nylon products, rugs and carpets, etc.

[31] First nominal rate (i.e., t (I) which is 71 percent) overestimates the actual percentage difference between the domestic and international price, this was observed by comparing (continued next page)

t (II) is much lower than t(I), and as a consequence ERP (II) is lower than ERP (I).

Ranking of ERP's - The absolute value of an effective protection rate for a sector does not tell much about the resource allocation effects of a tariff structure. However, the effective rates for all sectors can be ranked in a scale, and such a ranking can tell in which direction resources are being pulled. Sectors at the top of the scale (i.e., sectors with higher effective rates) attract resources from sectors at the bottom of the scale. Such a ranking is done in Table II, by utilizing the second set of effective protection rates[32] (ERP (II)'s). The sector with the highest ERP is ranked first, and the sector with the second highest ERP is ranked second, and so on.

Sectors which are ranked in the first 17 places are all import-substitute sectors (with the exception of the Wood Products sector which is ranked 16th). Sectors producing traditional and non-traditional exportables are ranked lower. Generally, manufacturing sectors (producing exportables) take the middle

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these two prices directly. For the derivation of t (II) -- 30 percent -- see Appendix A.

[32]It is believed that the second set represents a better set of estimates since the nominal rates used in calculating ERP's in the second set are adjusted for the discrepancies (between domestic and international prices) which were not fully represented in the first set of nominal rates.

TABLE II. THE RANKING[1] OF PRODUCTION ACTIVITIES (PRODUCING TRADEABLE GOODS) ACCORDING TO THEIR EFFECTIVE RATES OF PROTECTION.

Sector number	Sectors	Ranking based on the second set of ERP's
11	Sugar	1
24	Rubber, Plastics, and Products	2
36	Crude Petroleum	3
27	Petroleum Refinery and Coal Products	4
12	Alcoholic Beverages	5
25	Chemicals and Pharmaceuticals	6
32	Metal Products	7
35	Transportation Equip., Maint., Repairs	8
34	Electrical Mach., and Appliances	9
30	Iron and Steel	10
20	Clothing industry	11
22	Paper, Printing and stationeries	12
29	Cement	13
26	Fertilizers	14
33	Agricultural and non-electrical machinery	15
21	Wood Products	16
17	Wool Textile	17
31	Non-ferrous Metals	18
39	Tobacco Processing and Products	19
16	Cotton Textile	20
23	Leather and Leather Products	21
7	Forestry Products	22
28	Ceramics, Glass and Non-metallic Products	23
18	Knitting Industry	24
19	Other Textile	25
10	Other Mining	26
14	Olive oil-Seed oils-Fats	27
37	Iron-ore Mining	28
38	Coal Mining	29
3	Fruits	30
40	Animal Slaughtering	31

TABLE II. (continued)

Sector number	Sectors	Ranking based on the second set of ERP's
15	Other Food Sector	32
8	Livestock	33
2	Wheat and Other Cereals, Hay	34
9	Fishing	35
4	Citrus Fruits	36
1	Industrial Crops	37
5	Nuts	38
13	Milk Industry - Canned Food	39
6	Vegetables	40
41	Other Transportation	41

[1] The sector with the highest ERP is ranked 1st, and the sector with the second highest ERP is ranked 2nd, and so on. The ranking is based upon the effective rates listed in Table I under column 6 (i.e., ERP (II)'s).

places, and primary sectors (all produce exportables) take the lower places in the ranking. The following import-substitute sectors are ranked in the first 5 places: Sugar, Rubber-Plastics and Products, Crude Petroleum, Petroleum Refinery-and Coal Products, Alcoholic Beverages. Sectors which are ranked at the lowest end of the scale (37th, 38th and the rest) are Industrial Crops, Nuts, Milk Industry-Canned Food, Vegetables, and Other Transportation.

A general conclusion which can be derived from this ranking is that in Turkey resources have been attracted to import-substitute sectors from primary sectors and from some manufacturing sectors which produce exportables. This is due to the fact that the protection of value-added, by the tariff structure, in import-substitute sectors has been relatively higher. This result is consistent with the evaluation presented in Chapter I, that a bias against the development and growth of the export sectors has existed during the 60's and early 70's.

The direction of resource movement might be affected by the gradual elimination of tariffs on imports from the EEC countries, if Turkey moved toward full membership in the EEC. The model is applied to estimate possible resource-pull effects of the gradual elimination of tariffs, and the results are discussed in Chapter V.

C. A QUALITATIVE ANALYSIS

In Chapter I, an analysis of how the Turkish trade regime has affected production and foreign trade in the 60's and early 70's was presented. In this chapter resource reallocation effects of the present tariff structure were examined, and results reinforce the general conclusion drawn upon in the first chapter.

In this section, a short qualitative analysis of "what might happen if Turkey moved gradually toward full membership?" is presented. This will also refocus our attention to the basic question of the study, which is taken up quantitatively in the remaining chapters.

Shifts in the Production Structure. If Turkey moved toward full membership, a gradual elimination of tariffs would change the relative commodity prices in the economy. Changes in relative prices might, by affecting the domestic value-added per unit output in each sector, lead to changes in output levels, thus causing resource movements. As it was hypothesized earlier, a gradual elimination of tariffs on imports from the EEC would change the direction of resource reallocations called forth by the present Turkish tariff structure. While theory can

suggest the direction of changes in resource allocation, it does not provide guidance as to the probable quantitative importance of such changes. The model below generates estimates of resource-pulls called forth by the tariff cuts, however and the results concerning possible shifts in the production structure and resulting resource reallocations are discussed in Chapter V.

Effects on Trade. The traditional export goods would continue to have a comparative advantage in trade with the EEC if Turkey moved toward full membership; the model will test this quantitatively. Growth in the EEC countries might increase the demand for Turkey's traditional exports. Nevertheless, whether or not an absolute expansion in traditional exports would take place depends on whether output levels of these commodities would or would not expand under the free trade conditions.[33] This, in turn, would be determined by -- among other factors, such as weather conditions -- the changes in the relative profitability of these sectors as the tariff cuts take place.

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[33] Cotton and coarse grain are highly competitive Turkish exports, and exports of these commodities to the EEC could be increased with increased production.

At the present, the domestic prices of non-traditional export goods are generally higher than their f.o.b. export prices (this point was already discussed in Chapter I). This price discrepancy might completely or partially be eliminated due to a gradual decline in the domestic cost of imported intermediate inputs because of tariff cuts. Large increases in non-traditional exports to the EEC are potentially possible, as free trade is gradually established, with the government's help (through financial incentives, etc.) and an appropriate exchange rate policy.

Turkish imports from the EEC countries constitute about 40-45 percent of Turkey's total imports at present. The EEC-Turkey customs union[34] will probably increase this

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[34] The reader who is not familiar with the theory of customs unions might refer to: R. G. Lipsey, "The Theory of Customs Union: A general survey," Economic Journal, LXX, No. 279 (Sept., 1960), pp. 496-513; H. G. Johnson, "An Economic Theory of Protectionism, Tariff Bargaining, and the Formation of Customs Unions," Journal of Political Economy, Vol. 73 (1965), pp. 256-283, also reprinted in International Economic Integration, P. Robson (ed.), (Penguin Books, 1971), pp. 99-142; Melvyn B. Krauss, "Recent Developments in Customs Union Theory: An Interpretive Survey," Journal of Economic Literature, Vol. X, No. 2 (June, 1972), pp. 413-436.

share by diverting Turkey's imports from third countries to the EEC sources. This is because the gradual elimination of tariffs on imports from the EEC and the adoption of the Common External Tariff would make the EEC products more attractive to the Turkish importers. The absolute size of Turkish imports from the EEC might expand, but the extent of this expansion would depend on the foreign exchange supply[35] and on what happens to output levels in the import-substitute industries. Foreign trade estimates generated by the model will indicate quantitatively whether or not the volume of imports from the EEC would increase if tariff cuts took place. In the next chapter the model is developed.

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[35] The size of the increase in the foreign exchange supply will depend on the growth of export earnings and workers' remittances.

CHAPTER III

A LINEAR PROGRAMMING MODEL

A. INTRODUCTION

In the previous chapters it was shown that the gradual elimination of tariffs would change the relative commodity prices in favor of agricultural and semi-manufactured products if Turkey moved toward full-membership[1] in the Common Market. Furthermore, it was argued that the changes in relative prices would affect the relative profitability of each production activity and consequently the international competitiveness of Turkish products vis-a-vis other suppliers to the Common Market countries; thus, shifts in the production structure and the foreign trade pattern are likely. These potential changes raise some important questions concerning the future of the Turkish economy. Some of these

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[1] The reader should be reminded of the assumption of no institutional changes which might be caused by the full-membership; see Chapter I (the last section) for the details of the assumption.

questions[2] which are focused upon in this study were listed in Chapter I, and in the last section of Chapter II some qualitative answers were presented. A linear programming model is utilized here to provide quantitative answers to these questions.

Although such models are static in nature and hence do not generate the dynamic paths of the endogenous variables of a system and of changes in these variables, they can be applied to simulate long-run effects of exogenous changes in an economy. Optimum behavior of all production activities of an economy, under different economic conditions (some of which are results of a series of gradual changes within a time period), can be examined by comparing the solution values of endogenous variables of the system. The direction of changes (not in a dynamic sense but in a comparative static sense) and the magnitude of relative differences in the solution values of these variables, when different economic conditions are applied, indicate the possible long-run effects of policy changes. In

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[2] Where does Turkey's comparative advantage lie in free trade with the EEC?, and specifically, (1) should Turkey's agricultural and non-traditional manufacturing export sectors be expanded? and (2) what is the future of Turkey's import-substituting sectors?, etc.

particular, changes in the shadow prices of the constraints of the system (as different optimum solutions are obtained) have a time element in their economic interpretation: they indicate the direction of possible structural changes in the economy induced by the changing economic policies. In this sense, the shadow prices of the constraints could be utilized to evaluate the cost of constraints and of exogenous changes in these constraints.

If we were to use a dynamic model in order to answer the questions raised (which are inherently dynamic), we would have to limit ourselves to the examination of an extremely aggregated Turkish economy. This is due to the technical difficulties and data problems involved in the development and application of a dynamic model which incorporates a fairly large number of sectors. The dynamic models which have been developed so far include only a limited number of sectors,[3]

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[3] Some aggregated dynamic linear-programming models have been developed for finite time horizons; it is possible to increase the number of sectors in these models, but then, even if we forget the problems involved in estimating elasticities in behavioral functions, the number of constraints and variables will be so large that application of such a model will not be feasible because of its size. See Lance Taylor and Kendrick, D., "Numerical Solution of Nonlinear Planning Models," Econometrica, Vol. 38, No. 3 (May, 1970), pp. 453-67; Blitzer, C. R., Çetin, H., and Manne, A. S., "A Dynamic Five Sector Model for Turkey, 1967-82," METU Studies in Development, 1 (Fall, 1970), pp. 1-29 (a summary of this paper can be found in the American Economic Review, May, 1970).

and even then the application requires strong assumptions. However, the questions raised in this study should be approached on the basis of a highly disaggregated Turkish economy, otherwise the information that can be derived from the results will be very limited.

One of the basic advantages of a linear programming model is its flexible capacity to incorporate large numbers of production activities and constraints, and this is particularly important here.

A second advantage in utilizing these models lies in the fact that the solutions to such models can be obtained in a short time (and at a low cost) utilizing computers. However, it is necessary that the country under study has a recent and reliable input-output table, which is also fairly disaggregated. Even then, the derivation of the data from the table might necessitate some adjustments, as it did in the present case. In order to obtain the data used in the application of the model developed here, some lengthy and time-consuming adjustments and modifications were made to the latest Turkish input-output table. These adjustments and the other procedures utilized in deriving the data not related to the input-output table are discussed in Chapter IV in detail.

A third advantage is, as in the general equilibrium models, that the linear programming models generate results which are consistent with the structural (i.e., interindustry supply and demand) constraints and the resource (i.e., primary and natural resource) constraints of an economy.

A fourth advantage in applying a linear programming model is that it provides a criterion, in the value of its objective function, for comparing different economic policies. Thus, for example, it is possible to evaluate different trade regimes on the basis of the degree of resource allocation efficiency that they generate.

The basic assumption in a linear-programming model is that each production activity operates with a fixed technology, i.e., the relationships between inputs and the output level of a production process are described by fixed coefficients. This linearity assumption in the production activities necessarily implies (if such a model is applied for long-run projections) that the effects, on the fixed input-output coefficients, of externalities, technological change, and of substitution among inputs (induced by the changes in relative prices) are negligible. Thus, by utilizing a linear programming model for simulating the possible long-run effects of a more

liberalized trade regime in Turkey, we implicitly assume that the basic conclusions of the study will still hold even if some of the input-output coefficients changed due to the factors listed above.[4]

Some tests have been conducted to check the reliability of projections based on input-output tables. One kind of test involved the direct comparisons of input-output coefficients at different points in time. Leontief compared the coefficients of the U. S. input-output tables for the years 1919, 1929, and 1939.[5] The Japanese Ministry of International Trade and Industry carried out a similar test with the Japanese input-output tables for 1951 and 1954.[6] Chenery and Clark

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[4] Changes in a tariff structure, e.g., cause changes in the relative prices, which in turn induce producers to substitute cheaper inputs in the production. Consequently, the input coefficients are affected. Here, it is assumed that such changes will have negligible effects on the final results.

[5] Leontief, W., "Structural Change," in Leontief, W. et al., Studies in the Structure of the American Economy, Oxford University Press, New York, 1953.

[6] This work is cited by Chenery (see footnote 7 below), and it is available in Japanese; Government of Japan, Ministry of International Trade and Industry, Research and Statistics Division, Interindustry Analysis of the Japanese Economy, 1957 (in Japanese).

summarized the major conclusions of the two studies mentioned above (and also of the other similar studies) as follows:[7] (1) changes in most of the coefficients over time are small, and the sizes of changes are positively correlated with the length of time; (2) the degree of accuracy of the predictions based on input-output tables is not sensitive to changes in most input-output coefficients, but there are a limited number of important coefficients which, if they changed between the base year and the predicted year, might cause deviations between the predicted and realized values of the macrovariables under consideration. Thus, one implication of the latter conclusion is that in order to improve the accuracy of the forecasts based on the fixed input-output coefficients, the important coefficients should be found and studied for possible modifications. In addition, to these results, an important feature of the input-output matrices should be mentioned here,

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[7] Chenery, H. B. and Clark, P. G., Interindustry Economics (New York: John Wiley and Sons, Inc., 1959), Fifth printing (1966), Chapter 6, pp. 157-180; in the same chapter the summaries and analyses of the results of the other tests which have been conducted can be found. This book is also a good reference for an extensive coverage of the theoretical and empirical problems involved in the application of the input-output and linear-programming techniques to economic problems.

and it is that ". . . errors in the coefficients do not lead to cumulative errors in the solutions, but on the contrary tend to compensate each other."[8]

A second kind of test utilized to check the reliability of the input-output coefficients involves the comparison of short-run and long-run input-output and multiple regression projections. One notable test of this kind was made by M. Hatanaka[9] using the U. S. input-output table for 1947. Chenery summarizes Hatanaka's results as follows:[10] the input-output projections are, on the average, superior to the multiple regression projections.

In the 60's, additional tests were carried out by others. Christiaan B. Tilanus[11] did a time series analysis on the

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[8] Ibid., p. 164.

[9] Hatanaka, M., Testing the Workability of Input-Output Analysis, Princeton, 1957 (mimeographed). This work was cited in Chenery and Clark, Interindustry Economics, op. cit., pp. 173-176, where his conclusions were analyzed.

[10] Interindustry Economics, op. cit., p. 175.

[11] C. B. Tilanus, Input-Output Experiments: The Netherlands 1948-1961, Rotterdam University Press (1966), Chapter III, pp. 36-51.

input-output coefficients of thirteen input-output tables of the Netherlands (one table for each year of the 1948-1960 period). He had thirteen observations for each coefficient. His conclusions are that the "time trends are relatively insignificant," and "the dispersion of the observations around the average (or around the trend . . .) is substantial" for some coefficients.[12] The latter conclusions support the general findings of the previous studies mentioned above.

Again in the 60's, two methods of adjusting the input-output coefficients were developed. The objective is to modify the coefficients of an input-output table by utilizing the actual data acquired (on changes in the coefficients caused by technological changes and substitutions among inputs) in subsequent years, and thus improve the accuracy of the input-output predictions. R. Stone and J. A. Brown developed the so-called RAS method;[13] later Tilanus and H. Theil

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[12]Tilanus, op. cit., Chapter VIII, p. 134. An important conclusion which was also derived by Tilanus from his experiments, is that it is not necessary that the country under study should have a series of input-output tables, but it is important that the country has a table as up-to-date as possible. Tilanus derived this conclusion by comparing the predictions derived from the latest input-output table with the predictions obtained utilizing a table of coefficients which are the averages of the input-output coefficients of the earlier tables.

[13]R. Stone and J. A. C. Brown, "A Long-Term Growth Model for the British Economy," in R. C. Geary (ed.), Europe's Future in Figures, North-Holland Publishing Company (Amsterdam, 1962).

developed a statistical correction method[14] (hence called SCM) which is similar to the former method.

Thus, on the basis of the results of the tests mentioned earlier and considering the nature of the problem which is studied here, it can be concluded that the assumption of fixed production coefficients is not strong. Also, among the applicable models which can be considered, a linear-programming model seems to be the most suitable one to utilize. In the remainder of this chapter, the model[15] is developed and the application procedures are discussed in detail.

B. THE MODEL, CONSTRAINTS, AND THE DUAL PROBLEM

1. Notation[16]

There are n sectors in the economy. Each has a single production activity with a fixed technology. Each sector

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[14] Tilanus, op. cit., Chapter VI, pp. 94-123. Here Tilanus discusses both methods, and applies them to the Netherlands data. The application results are compared to evaluate the methods, and the major conclusion is that they are similar but the SCM is simpler to apply.

[15] A similar model was developed by Gerald M. Lage; he applied his model to the 1955 Japanese economy to estimate the cost of the trade restrictions in Japan: G. M. Lage, The Welfare Cost of Trade Restrictions: A Linear Programming Analysis, (unpublished Ph.D. thesis; University of Minnesota, 1967).

[16] Bars are used to identify the exogenous variables, and small letters refer to the fixed coefficients.

produces only one commodity, and each commodity is identified by the corresponding number of the sector which produces this commodity. Also, sectors are ordered such that the first n_1 sectors produce internationally traded goods. The remaining sectors produce non-tradable home goods.[17]

The physical units are defined at the fixed domestic prices; here, since the 1967 Turkish input-output table is utilized, the physical units are defined at the 1967 Turkish domestic prices. For example, one unit of the ith good equals the amount of the ith good which could have been bought with one monetary unit (here, it is TL 1 million) at the 1967 domestic prices. Consequently, the domestic prices of all goods are normalized at unity.

a_{ij} = the quantity of the ith good necessary to produce one unit of the jth good ($i, j = 1, \ldots, n$).

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[17] Here, n equals fifty and n_1 equals forty-one (i.e., the number of traded good sectors); thus, there are nine non-traded good sectors which are identified by the numbers 42 through 50.

$\bar{B}$ = the fixed amount of foreign exchange. $\bar{B}$ can be thought as the maximum trade deficit allowed by the authorities. The size of $\bar{B}$ is determined by the amount of foreign aid and workers' remittances. $\bar{B}$ can be expressed, e.g., in U. S. dollars.[18] However, when $\bar{B}$ is expressed, say, in dollars, then the international prices appearing in the balance of payments constraint (and in the objective function) should also be expressed in dollars.

$\bar{C}_i$ = the amount of the ith good ($i = 1, \ldots, n$) actually consumed in 1967. $\bar{C}_i$'s include all final uses, i.e., the private consumption plus the government consumption plus investment and changes in the stocks. $\bar{C}_i$ is zero for purely intermediate goods.[19]

C_i = final consumption quantity of the ith good ($i = 1, \ldots, n$); C_i includes private consumption, government consumption, investment and stock changes.

E_i = amount of the ith good to be exported ($i=1, \ldots, n_1$).

$\bar{K}$ = total stock of capital. It is expressed in value terms as the total value of the services rendered in 1967 by the available capital stock. In other words, $\bar{K}$ is the portion of the total value-added which accrued to the owners of the capital stock in 1967.

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[18] This is because the foreign trade transactions are recorded at the fixed official exchange rates in input-output tables. In the construction of the 1967 Turkish input-output table, the official exchange rate TL 9 = $1 was used to record the foreign trade transactions. In the application, one unit of $\bar{B}$ equals $1/9 million.

[19] In the present case, the final consumption quantity for the output of the Crude Petroleum sector is zero.

k_j = the value of the services of the capital stock necessary for producing one unit of the jth good ($j = 1, \ldots, n$).

$\bar{L}$ = the number of workers who were in the active labor force in 1967 (measured in units of man-years).

l_j = the number of man-years necessary for producing one unit of the jth good ($j = 1, \ldots, n$).

M_i = amount of the ith good to be imported ($i=1, \ldots, n_1$).

m_i = non-competitive imports (valued at international prices) necessary for producing one unit of the ith good ($i = 1, \ldots, n$).

P_i = the shadow price of the ith traded good ($i=1, \ldots, n_1$). These are the actual equilibrium prices which would have existed if the economy operated under purely competitive and free trade conditions described in the model.

P_i^d = the (actual) equilibrium price of the ith home good ($i = 42, \ldots, n$) which would have existed if the economy operated under purely competitive and free trade conditions described in the model. p_i^d is also the shadow price of the ith home good.[20]

$\bar{P}_i^w$ = the exogenous international price of the ith traded good ($i = 1, \ldots, n_1$).

r = the shadow price of a unit of capital services.

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[20] The equilibrium prices of home goods are to be generated by the iterative solutions to the model. The exact procedure is explained later in this chapter; Professor James M. Henderson first suggested and applied this procedure: J. M. Henderson, "A General-Equilibrium Model of International Production and Trade: A Research Proposal," (mimeographed).

u_i = the dual variable corresponding to the upper production capacity constraint of the ith traded good sector ($i = 1, \ldots, n_1$). u_i's are the unit rents or unit profit levels accruing to those traded good sectors which produce at the upper production limits.

v_i = the dual variable corresponding to the lower output limit of the ith traded good sector ($i = 1, \ldots, n_1$). v_i's are the unit loss levels (or the unit subsidy level necessary for producing without any unit loss) that would accrue to the traded good sectors if they produced at the lower output limits.

w = the shadow price of the services of one man-year.

X_i = the quantity of the ith good produced by the ith sector ($i = 1, \ldots, n$).

$\overline{X}_i^u$ = the fixed upper production capacity limit for the ith traded good sector ($i = 1, \ldots, n_1$).

$\overline{X}_i^L$ = the lower output limit for the ith traded good sector ($i = 1, \ldots, n_1$).

λ = the consumption scalar. λ gives the ratio of the final consumption quantity of the ith good ($i = 1, \ldots, n$) to the 1967 actual amount of the final consumption of the ith good. Thus, we have the following equality: $C_i = \overline{C}_i \lambda$. The value of λ is the same for each good because of the assumption of proportionality in consumption (which is discussed below).

δ = the shadow price of one unit of foreign exchange (i.e., one U. S. dollar).

2. The Basic Model and the Constraints

The problem can be stated as: maximize the international value of domestic final consumption quantities subject to a system of linear constraints. If C is the international value of the total consumption, then the problem is to find the non-negative values of C_i's which maximize C, i.e.,

$$\text{Max } C = \bar{P}_1^w C_1 + --- + \bar{P}_{41}^w C_{41} + P_{42}^d C_{42} + --- + P_{50}^d C_{50}$$ [21]

The objective function expressed in this form assumes that the "equilibrium"[22] prices of home goods can be treated as if they are some sort of international prices for these goods and compatible with the exogenous international prices of traded goods. Even though it is difficult to define international prices

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[21] Note again that the international prices of traded goods ($\bar{P}_i^w$'s; i = 1, . . ., 41) are exogenous, and the competitive-free trade equilibrium prices of home goods (P_i^d's, i = 42, . . ., 50) are endogenous. As stated in footnote 20, the equilibrium levels of P_i^d's will be determined by the iterative solutions to the model, and the procedure is explained in the last section of this chapter.

[22] P_i^d's are the actual equilibrium prices which would exist under purely competitive and free trade conditions described in the model.

for home goods, it is economically permissible to treat P_i^d's as if they were international prices for home goods; this is because the unit values of home goods and traded goods are interrelated through their fixed input-output interdependence. Also, home goods are traded indirectly since they are included in the input structure of traded commodities.

The objective function of the model is not expressed in the form presented above, however; instead it is expressed in terms of one endogenous variable which is the consumption scalar (i.e., λ). Before presenting the objective function in its modified form, it is necessary to discuss the assumption of proportionality in final consumption first.

It is assumed that final consumption is in fixed proportions, and these fixed proportions will remain at the levels realized in 1967. This, of course, implies a zero price elasticity and a unitary income elasticity of final consumption demand (i.e., private consumption demand plus government consumption demand plus investment and changes in stocks) for each good. Thus, even if the relative prices change, the 1967 fixed consumption proportions remain the

same.[23] There are two major interrelated reasons for incorporating the proportionality assumption into the model. First, it allows us to express the objective function in terms of one endogenous variable, i.e., the consumption scalar, λ. This in turn makes the comparison, on the basis of the value of λ, of different optimum solutions corresponding to different trade regimes possible. That is, the optimum values of λ can be utilized as an indicator of the resource allocation efficiency generated by alternative trade regimes.[24] If all goods were traded, the proportionality assumption would not be needed since the objective function could be expressed as the maximization of the summation of the international value of the net domestic production levels (i.e., net of intermediate use). Then, the total international values of the net domestic production derived

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[23] For example, if in 1967 the ratio of the final consumption quantities of the ith and jth good was

$$c_{ij} \text{ (i.e., } \frac{\overline{C}_i}{\overline{C}_j} = c_{ij} \text{),}$$

then, it is assumed c_{ij} will remain the same. This assumption is incorporated into the model through the equality $C_i = \lambda \overline{C}_i$ $(i = 1, \ldots, n)$, since

$$\frac{\overline{C}_i}{\overline{C}_j} = c_{ij} = \frac{C_i}{C_j} = \frac{\lambda \overline{C}_i}{\lambda \overline{C}_j} = c_{ij}$$

[24] For example, in the application, the free trade optimum value of λ is compared with its 1967 value (which, by the equality $\overline{C}_i = \overline{C}_i \lambda$, equals one). The difference between the two values of will be utilized as an estimator of Turkey's gain (or loss) from free trade with the EEC.

under alternative trade regimes could be compared to evaluate these regimes. In short, there would be no need for using one endogenous variable such as (as a gain and/or loss variable) in the objective function. This is because under free trade conditions, with exogenous international prices, all we have to know is the equilibrium production levels when all goods are traded; the system will be deterministic even if we do not specify the final-consumption pattern. Thus, no matter where the final consumption equilibrium takes place, the system will be in equilibrium once the production is determined.[25] The discrepancies between the net domestic production and final consumption demand can be eliminated through foreign trade since it is assumed that any amount that the system necessitates, for the overall equilibrium, to be imported (or exported) can be imported (or exported) at fixed international prices.[26] However, there are nine home good sectors in the system. Since these goods cannot be acquired from (or sold to) the outside, the

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[25] Production equilibrium is determined by the exogenous relative international prices and the constraints of the system (which, in geometric terms, form a production possibility frontier).

[26] By treating the relative international prices exogenously, we assume that the home country is small, and that it can export or import any amount at these fixed international prices (i.e., the foreign offer curve is assumed to be infinitely elastic).

domestic supply must meet the domestic demand for these goods. This is necessary for the system to be in equilibrium. The intermediate demand for home goods is determined by the input-output structure; thus, it becomes necessary to specify the pattern of final consumption demand in order to have a deterministic model. So, the assumption of proportionality in final consumption specifies the final consumption pattern and thus enables the system to determine the production and consumption equilibria simultaneously.

A second reason for incorporating the proportionality assumption into the model is related to the non-uniqueness property of an optimum solution basis of the system. As will be shown later, the optimum solution basis is not unique. This does not create any problem, however, since the proportionality assumption enables the system to generate unique optimum solution values for the output levels (X_i's), final consumption (i.e., C_i's) and net export (i.e., $E_i - M_i$) levels.

With the inclusion of the proportionality assumption, the model does not lend itself to the study of changes in the consumption pattern, changes which might be caused by the changes in relative prices. It would have been appropriate to examine the possible changes in the final consumption

pattern to the extent that they in turn would affect the relative international prices, but it is very unlikely that they might affect the latter set of prices.[27] Due to its relatively small trade and production volumes in the total Common Market trade and production volumes, changes in the Turkish final consumption levels for traded goods will be too small to have any noticeable effect on the relative international prices. That is why the model incorporates the small country assumption and thus treats the international prices exogenously. Also, by including the proportionality assumption into the model, nothing is lost since this study focusses basically upon the effects on the production structure of changes in the relative domestic prices (changes which result from a change in the trade regime). It is a convenient assumption, and the basic conclusions are not affected by it.

The objective function of the model, after the adjustments,[28] becomes

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[27] However changes in the domestic consumption pattern might affect the relative domestic prices of home goods. This point is discussed further when the solution results are analyzed in Chapter V.

[28] C_i's are replaced by $\overline{C}_i$ λ's.

$$\text{Max } C = \overline{P}_i^w \overline{C}_i \lambda + \ldots + \overline{P}_i^w \overline{C}_{41} \lambda + P_{42}^d \overline{C}_{42} \lambda + \ldots + P_{50}^d \overline{C}_{50} \lambda ,$$

or

$$\text{Max } C = \{ \sum_{i=1}^{41} \overline{P}_i^w \overline{C}_i + \sum_{i=42}^{50} P_i^d \overline{C}_i \} \lambda$$

The model is presented in its complete form below.

Determine the non-negative values of the variables X_i's, M_i's, E_i's and λ such that they

$$\text{Maximize } \{ \sum_{i=1}^{41} \overline{P}_i^w \overline{C}_i + \sum_{i=42}^{50} P_i^d \overline{C}_i \} \lambda \tag{3-1}$$

subject to

$$-X_i + \sum_{j=1}^{50} a_{ij} X_j + E_i - M_i + \overline{C}_i \lambda \leqq 0, \text{ for } i = 1, \ldots, 50 \tag{3-2}$$

(where $E_i \equiv 0$ and $M_i \equiv 0$ if $i \geqq 42$),

$$\sum_{j=1}^{50} l_j X_j \leqq \overline{L} \tag{3-3}$$

$$\sum_{j=1}^{50} k_j X_j \leqq \overline{K} \tag{3-4}$$

$$\sum_{j=1}^{50} m_j X_j - \sum_{i=1}^{41} \overline{P}_i^w E_i + \sum_{i=1}^{41} \overline{P}_i^w M_i \leqq \overline{B} \tag{3-5}$$

$$X_i \leqq \overline{X}_i^u, \text{ for } i = 1, \ldots, 41 \tag{3-6}$$

$$X_i \leqq -\overline{X}_i^L, \text{ for } i = 1, \ldots, 41 \tag{3-7}$$

Inequalities (3-2) represent the input-output material balances, i.e., the supply of each good (domestic gross production plus imports) must be at least as large as the demand (intermediate demand plus final consumption quantity plus exports) for that good. Labor and capital constraints are represented by the inequalities (3-3) and (3-4) respectively: the inequality (3-3) states that the total demand for labor cannot exceed the available fixed supply of labor, and similarly (3-4) states that the total demand for the services of capital stock cannot exceed the total amount which is obtainable from the country's capital stock. The balance of payments constraint is represented by the inequality (3-5): the net demand (i.e., net of the foreign exchange earnings from exports) for foreign exchange cannot exceed the fixed supply of foreign exchange. In this inequality, exports and imports are valued at fixed international prices, and the same price is used to value exports and imports of a traded good regardless of whether the traded good is exported or imported.[29]

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[29] It is assumed that there is only one international price for each internationally traded good, irrespective of whether the good is exported or imported. This means that we neglect the spread caused by differences in the transportation costs between the c.i.f. and f.o.b. prices of the same traded good. However, this is an indispensable assumption since it is an impossible task to gather data on the transportation costs of shipments destined to different places, and even if data were available then we would have to face the problem of multiple prices for the same good because of (continued next page)

Inequalities (3-6) and (3-7) state that the output levels of the traded good sectors cannot exceed their relevant fixed upper production capacity limits, and they cannot be less than the relevant fixed lower output limits, respectively. These two sets of constraints serve two interrelated purposes in examining the direction of shifts in the production structure, shifts which are likely to take place if Turkey moved gradually toward free trade with the EEC. First, by allowing the optimum output levels to take values within certain upper and lower bounds, these constraints introduce, indirectly, the element of time into the model and its solutions. This is implicit in the fact that we can examine the deviations of the free trade optimum output levels of the domestic traded good sectors from the 1967 output levels.[30] For example, if the free trade optimum output level of a domestic traded good sector is at the upper output limit,

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differences in the transportation costs. This would then necessitate a separate treatment of exports and imports of the same good depending on the source of supply or the destination. The latter approach would enlarge the system enormously. Upon these considerations, it was necessary to assume the equality of c.i.f. and f.o.b. prices of traded goods.

[30] That is, the direction of resource-pulls which might be caused by the tariff cuts is estimated by comparing the optimum capacity utilization in each traded good sector under free trade conditions with the actual capacity utilization in 1967.

which is set at a larger level than the 1967 output level of this sector, then it can be concluded that the output level of this sector would expand if Turkey moved toward full-membership in the Common Market. The free trade optimum solutions would generate output expansions, above the 1967 levels, in those traded good sectors which show positive unit profit levels at the exogenous international price levels. Similarly, if the free trade optimum output level of a traded good sector is at the lower output limit, which is fixed at a lower level than the 1967 level, then this is an indication of the possibility that the production level in this sector might contract if Turkey moved toward full-membership in the EEC; such a contraction would take place if the sector is relatively less profitable under the free trade conditions. Thus, comparisons of the free trade optimum output levels of the traded good sectors with their 1967 levels will indicate the direction of possible shifts in the production structure. If, however the lower output limits were not incorporated into the model, the model could have generated free trade optimum solutions with zero optimum output levels for some traded good sectors.[31] This would make the comparison of the relative

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[31] Besides the lower output limits, a second way of avoiding zero production levels for the traded good sectors is to use import quotas, e.g., the inequalities (3-7) could be replaced by import quota constraints which state that the import level (continued next page)

profitability of traded good sectors under the free trade conditions impossible. However, the relative profitability comparison, on the basis of the free trade unit profit or loss levels, among the traded good sectors is necessary to find the production lines in which Turkey might have a comparative advantage in free trade with the EEC. Also, the upper output limits eliminate the problem of getting extremely high output levels for some traded good sectors: in the absence of the upper production capacity limits, the free trade optimum output levels of few traded good sectors might be very large, thus forcing the rest of the sectors to produce at the lower output limits or not to produce at all (if there are no lower output limits) since the endowments of primary factors are fixed. This again would eliminate the possibility of relative profitability comparisons under the free trade conditions.

A second purpose, which is interrelated to the first one, of the inclusion of the upper and lower output limits into the model

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of any traded good cannot exceed a certain percentage of the domestic production level (i.e., $-z_i X_i + M_i \leqq 0$, for i=1, . . ., 41, where z_i is the fixed percentage). The model was tested using import quota constraints rather than the lower output limits, but because of the technical shortcomings of the model, results were not satisfactory. That is why the import-quota approach was dropped.

is the following: the dual variables corresponding to these constraints have useful economic interpretations since they indicate the implicit (unit) costs of these constraints within the system. The optimum solution levels of these dual variables show the unit profit (loss) levels that the corresponding traded good sectors would incur by operating at the upper (lower) output limits. Thus, on the basis of the optimum solution values of the dual variables of the capacity constraints, the traded good sectors can be ranked by their relative profitability (and hence by their international compatitiveness) under the free trade conditions.[32] This will then help find the commodities in which Turkey might have a comparative advantage in free trade with the EEC. Without these constraints such a ranking would not be possible.

3. The Dual Problem and the Properties of the Dual System

Because of the nature of the problem under study, an examination of the dual system and the dual variables is particularly important. It is well-known that every constrained optimization problem has a corresponding dual problem, and the optimum

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[32] It should be mentioned here that, in the application, a sensitivity analysis (i.e., a parametric programming) is carried out for different sets of $\overline{X}_i^u$'s and $\overline{X}_i^L$'s, so that the results of the relative profitability ranking can be checked for their consistency as the boundaries of output limits are changed.

solution to one problem reveals information about the other. In this study, the primal problem is a value maximization problem (or an "allocation" problem) which is formulated for determining optimum quantities; the corresponding dual problem is a value minimization problem (or a "pricing" problem) which aims at determining the opportunity costs (or unit values) of scarce resources.

In the primal problem we maximize the international value of the final-consumption quantities, subject to the material balance constraints, primary factor endowment constraints, balance of payments constraint, and the output capacity constraints. In the dual problem we minimize the value of the resources used for producing the optimum bill of goods, subject to a system of appropriate linear constraints.

The dual problem is stated as follows: determine the non-negative values of P_i's, P_i^d's, w, r, δ, u_i's, and v_i's in order to

$$\text{Minimize } \overline{L}w + \overline{K}r + \overline{B}\delta + \sum_{i=1}^{41} \overline{X}_i^u u_i - \sum_{i=1}^{41} \overline{X}_i^L v_i \qquad (3\text{-}8)$$

subject to

$$-P_j + \sum_{i=1}^{41} a_{ij}P_i + \sum_{i=42}^{50} a_{ij}P_i^d + l_j w + k_j r + m_j \delta + u_j - v_j \geqq 0, \text{ for } i=1, \ldots, 41 \tag{3-9}$$

$$-P_j^d + \sum_{i=1}^{41} a_{ij}P_i + \sum_{i=42}^{50} a_{ij}P_i^d + l_j w + k_j r + m_j \delta \geqq 0, \text{ for } j = 42, \ldots, 50 \tag{3-10}$$

$$P_i - \overline{P}_i^w \delta \geqq 0, \text{ for } i=1, \ldots, 41 \tag{3-11}$$

$$-P_i + \overline{P}_i^w \delta \geqq 0, \text{ for } i=1, \ldots, 41 \tag{3-12}$$

$$\sum_{i=1}^{41} \overline{C}_i P_i + \sum_{i=42}^{50} \overline{C}_i P_i^d \geqq \sum_{i=1}^{41} \overline{C}_i \overline{P}_i^w + \sum_{i=42}^{50} \overline{C}_i P_i^d \tag{3-13}$$

The objective function (3-8) is the summation of the opportunity values of the fixed primary factor endowments and foreign exchange supply plus the total amount of rents (or profits) resulting from the utilization of the upper capacity limits minus the total amount of losses (or subsidies) resulting from operating at the lower output limits. Inequalities (3-9) and (3-10) can be interpreted easily if P_j's, P_j^d's, u_j's, and v_j's are moved to the right hand side of these inequalities: put in this form, these inequalities state that the unit production cost in the jth sector is at least as large as the actual equilibrium price of the jth commodity minus the unit profit

level plus the unit loss level. Inequalities (3-11) and (3-12) together imply the equality of actual equilibrium prices (the prices which would have existed under purely competitive and free trade conditions) of traded goods with the corresponding exogenous international prices multiplied by the shadow price of a unit of foreign exchange (i.e., U.S. dollar). As will be shown below, δ equals one, thus the equality of P_i and $\overline{P}_i^w$ holds for all traded goods. The last inequality (3-13) states that the summation of the 1967 final consumption quantities valued at the actual competitive equilibrium prices is at least as large as the summation of the 1967 consumption levels valued at the exogenous international prices.

For each endogenous variable in the primal system there is a corresponding constraint in the dual system, and for each constraint in the primal problem there is a corresponding dual variable. The dual variables have a shadow price interpretation[33] in terms of marginal changes of the value of the primal objective function, when the latter objective function is differentiated in the neighborhood of an

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[33] The terms "implicit" prices or "efficiency" prices are also used to identify the optimum values of these dual variables.

optimum solution. Thus, a shadow price equals the marginal increase (or decrease) in the value of the primal objective function, when the fixed amount of the constant on the right hand side of the corresponding primal constraint increases (or decreases) by a small amount;[34] however, this definition may not hold if the optimum solution is a "corner" solution.

The fundamental duality theorem and the other duality theorems establish the links between the primal and dual systems of a linear programming problem. Since our analysis of the effects of a free trade regime on the sectors which produce tradables heavily depends on prices and unit costs, a review of these theorems will be helpful in understanding the exact nature of the price relationships in the system.

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[34] For example, the shadow price of labor (i.e., w) equals the change in the value of the primal objective function in the neighborhood of an optimum solution when $\overline{L}$ changes by a small amount (all other constants remaining at their original levels), i.e.,

$$w = \frac{\partial \left[\left(\sum_{i=1}^{41} \overline{P}_i^{w} \overline{C}_i + \sum_{i=1}^{50} P_i^{d} \overline{C}_i \right) \lambda \right]}{\partial \overline{L}} \Bigg|_{\text{valued at an optimum solution point.}}$$

The fundamental duality theorem can be stated as follows:

> If either the primal or the dual has a finite optimum solution, then the other problem has a finite optimum solution,[35] and the optimum values of the objective functions of the two problems are equal.

As mentioned earlier, the optimum solution to the dual problem also determines the values of dual variables (i.e., the shadow prices). The other important duality theorem is the following:

> Whenever inequality occurs in the ith relation of either problem for an optimizing solution, then the ith variable of an optimizing solution of the dual system vanishes. Conversely, if the ith variable of the dual system is positive, then the ith relation of the primal system is an equality.[36]

Next, with the help of the duality theorems (in particular the second one), the optimality relationships of the primal and dual variables and the constraints are examined.

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[35] The statement of the theorem and the proof can be found in Saul I. Gass, Linear Programming: Method and Applications (2nd edition; New York: McGraw-Hill Book Company, Inc., 1964), p. 84.

[36] Gass, op. cit., p. 94.

4. Optimality Relationships

The dual variable corresponding to the balance of payments constraint (3-5) is δ. The free trade optimum value of δ is the shadow price of a unit of foreign exchange, i.e., it is the marginal increase (or decrease) in the optimum value of the primal objective function in the neighborhood of an optimum solution, when the fixed amount of foreign exchange increases (or decreases) by a small amount, say by $1. Since the model assumes free trade at the fixed international prices and perfectly competitive domestic markets, the optimum solution value of δ naturally equals one. This is because if the amount of $\overline{B}$ (fixed foreign exchange supply) increases,[37] say by $1, then the final consumption quantities of traded and home goods could be increased in fixed proportions such that when these changes are valued at fixed international prices ($\overline{P}_i^w$'s) and equilibrium prices of home goods (P_i^d's) respectively, we get a summation (i.e., the marginal increase in the optimum value of the objective function) which equals

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[37] The same argument (in a symmetrical way) also holds for a marginal decrease in $\overline{B}$.

one.[38] The proportionate increases in the final consumption quantities of traded goods could be met by importing at fixed international prices, and the proportionate increases in the final consumption quantities of home goods would materialize since the domestic production levels of home goods and traded goods could be changed in an equilibrating manner. As will be seen in Chapter V, the optimum solution value of δ equals one.

Utilizing the above result (i.e., $\delta = 1$) and the equalities $P_i = \overline{P}_i^w \delta$ ($i = 1, \ldots, 41$) derived earlier, it is found that the actual free trade equilibrium prices and the corresponding fixed international prices of traded goods are equal. This result can also be derived by applying the second duality theorem, i.e., if the optimum solution value of E_i (or M_i) is positive or zero, then the equality $P_i = \overline{P}_i^w \delta$ holds, and since $\delta = 1$, we derive the equality $P_i = \overline{P}_i^w$ for all $i = 1, \ldots, 41$.

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[38] That is, the summation $\sum_{i=1}^{41} \overline{P}_i^w \Delta C_i + \sum_{i=42}^{50} P_i^d \Delta C_i$ equals \$1 when $\overline{B}$ increases by \$1. Of course, the increments satisfy the conditions $\frac{\Delta C_i}{\Delta C_j} = c_{ij}$ where $i \neq j$ and $i, j = 1, \ldots, 50$, and c_{ij}'s equal their 1967 levels.

Two more optimality relationships are derived by applying the second duality theorem. The first one is related to the relationships between the unit production costs and the free trade equilibrium prices of commodities. The free trade optimum output level of each and every production activity has to be positive due to the existence of lower output limits (in the case of traded goods) and the assumption of proportionality in final consumption (in the case of home goods). Hence, since the optimum value of X_j is positive, the following equalities hold for the dual constraints (3-9) and (3-10):

for traded goods

$$\sum_{i=1}^{41} a_{ij}P_i + \sum_{i=42}^{50} a_{ij}P_i^d + l_j w + k_j r + m_j \delta = P_j - u_j + v_j, \text{ for } j=1, \ldots, 41 \quad (3\text{-}14)$$

and for home goods

$$\sum_{i=1}^{41} a_{ij}P_i + \sum_{i=42}^{50} a_{ij}P_i^d + l_j w + k_j r + m_j \delta = P_j, \text{ for } j=42, \ldots, 50 \quad (3\text{-}15)$$

In the case of traded goods, let $\hat{X}_j$ be the optimum value of X_j: then (i) if $\hat{X}_j = X_j^u$, then $u_j \geqq 0$ and $v_j = 0$; (ii) if $\hat{X}_j = \overline{X}_j^L$, then $u_j = 0$ and $v_j \geqq 0$; (iii) if $\overline{X}_j^u > \hat{X}_j > \overline{X}_j^L$, then $u_j = 0$ and $v_j = 0$.

The left hand side of the equality (3-14) is the unit production cost for the jth traded good sector, and the right

hand side equals the actual equilibrium price (which is equal to the international price $\bar{P}_j^w$) minus the unit profit (or rent) of operating at the upper capacity limit plus the unit loss (or unit subsidy) of operating at the lower output limit. Thus, if a traded good sector is producing at the upper output limit in an optimum solution, then it can be concluded that this sector would be competitive and possibly incur unit profit (i.e., if $u_j > 0$) under the free trade conditions, with the fixed 1967 technology. On the other hand, if a traded good sector is producing at the lower output limit in an optimum solution, the implication is that the international competitiveness of this sector would be relatively low under the free trade conditions. Also, there is a possibility that the latter sector would incur unit losses (i.e., if $v_j > 0$) if it operated at the exogenous international prices with the 1967 fixed technology, or it would require subsidy in order to produce without any unit loss.

The last optimality relationship is related to the dual constraint (3-13). Since the free trade optimum solution value of λ is positive,[39] the dual constraint (3-13) is satisfied

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[39] In fact, λ has to be greater than one. This point is discussed in the last section.

as an equality by the second duality theorem. As an equality, this constraint states that the summation of the 1967 final consumption quantities valued at international prices equals the summation of the same final consumption quantities valued at the domestic equilibrium prices which would exist under purely competitive and free trade conditions.

C. PROPERTIES OF THE MODEL

1. Existence

In general, a linear programming problem of the kind that is studied here will have a bounded, closed and convex feasible solution set which is not a null set, and there will be at least one basic feasible solution for such systems. A discussion on the existence of a basic feasible solution to the model is avoided here.[40]

2. Exports and Imports

Since it is assumed that each sector produces one homogenous product, the export (E_i) and import (M_i) levels of a traded good sector do not take positive values simultaneously in an optimum basis. For example, if the

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[40] The model was tested, and at least one basic feasible solution exists.

optimum value of E_i is positive for an optimum solution, then M_i is zero (or vice versa). Of course, it is also possible that the optimum solution levels of both variables (i.e., E_i and M_i) are zero.

Thus, an optimum solution to the model will have a few basic activities (E_i's and/or M_i's) which are at zero levels. Hence, the model has a "degenerate" optimum solution (s).[41] However, the degeneracy of an optimum solution is not expected to create any problem, since any optimum solution to the model generates unique values for the output levels (X_i's), net exports (i.e., $E_i - M_i$), and the consumption scalar λ .

3. Uniqueness

In every linear-programming problem, if there is an optimum solution, the value of objective function is always unique, but the activities appearing in an optimum solution basis need not be unique. For example, if a different set of activities (such that at least one activity was non-basic in the previous optimum solution) forms a

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[41]A basic feasible solution is called degenerate if at least one basic variable is zero; see Gass, op. cit., Chapter 7, pp. 115-122, on the degeneracy problem.

basis which also constitutes a basic feasible solution and generates the same optimum value for the objective function, then the optimum solution to the problem is not unique.

Here, the model has non-unique optimum solutions. As explained above, some of the export and import activities appear at zero levels in an optimum basis. This means that a non-basic slack activity can be introduced into the optimal basis by deleting one of the export or import activities which is at zero level, without changing the optimum value of the objective function. This is possible, since the only variable with a positive coefficient in the objective function is λ, and λ always has a positive and unique optimum solution value. The non-uniqueness of an optimum solution to the model does not create any problem. As stated earlier, the optimum solution values of output levels, net exports, and the consumption scalar are unique.

D. APPLICATION

For the application of the model, the values of exogenous variables and coefficients were derived from the 1967 data. The 1967 Turkish input-output table is the main

source of the data, and the availability of this input-output table was the major reason for utilizing the 1967 data. Further discussion of the data will be postponed until Chapter IV.

The model is applied to derive a free trade-perfectly competitive optimum solution. For this, the international prices of 1967 are used as the exogenous international prices in the model. As for the prices of home goods (i.e., P_i^d's) the following procedure is followed: first, the 1967 unitary domestic prices of home goods[42] are plugged into the primal objective function for the initial optimal solution, then the dual variables corresponding to home goods (i.e., the shadow prices of home goods) derived from the initial optimum solution are compared with the corresponding home good prices which were plugged into the objective function. If they are equal, it means that the initial set of home good prices are the equilibrium prices for home goods (i.e., equilibrium prices which would exist under the purely competitive and free trade conditions described by the

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[42]However, we can start with any set of positive prices for home goods in the primal objective function for the initial optimum solution because the procedure followed for finding an equilibrium set of home goods prices does lead to a unique set of prices for these goods.

model). However, if the home good prices in the initial set are different than the shadow prices of home goods obtained from the initial optimum solution, then we plug in the shadow prices of home goods into the objective function and solve the system again. This iteration process continues until we derive an optimum solution which generates a set of shadow prices for home goods which are equal to the corresponding home good prices which appeared in the objective function. The latter set of prices is the equilibrium set of prices for home goods.

There are two major questions which arise in relation to the above procedure: (i) does an equilibrium set of prices exist for the home goods?, and (ii) if there is such an equilibrium set of prices, how many iterative solutions might be needed to obtain the corresponding optimal solution?. Professor J. M. Henderson's test on the conjecture that such an equilibrium set of prices exists "if the primal program has a nontrivial solution for any nontrivial price vector"[43] proved very promising in the general case (m goods, n countries, k primary factors). His tests also indicated that prices converge rapidly toward an equilibrium price vector. In any case, the model was tested, and

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[43]Henderson, op. cit., pp. 13-14.

the results showed that the prices of home goods converge to an equilibrium price set.

The free trade optimum solution results derived by utilizing the procedure described above, are then to be compared with the 1967 levels of the corresponding variables. Such comparisons will indicate the possible long-run effects of the gradual changes in the Turkish trade regime if Turkey moved gradually toward full-membership in the Common Market.

The free trade optimum production levels of the traded good sectors are compared with their 1967 levels. The sectors which show an expansionary trend (i.e., if they are producing at the upper limits) and those which show a contractionary trend (i.e., if they are producing at the lower limits) under free trade conditions are grouped separately to find out the direction of likely shifts in the production structure which might happen as tariff cuts took place.

International sectors are ranked by their international competitiveness; the ranking is based on the free trade optimum solution levels of the unit profits (u_j's) and losses (v_j's) corresponding to the traded good sectors. The results of the ranking is utilized for finding the types of products

in which Turkey might have a comparative advantage in free trade with the EEC.

The free trade shadow prices of labor and of the services of capital stock are compared with the 1967 returns to these primary factors in order to find out the possible income redistribution effects of the gradual tariff cuts.

Finally, the free trade optimum solution value of the consumption scalar (λ) is compared with its 1967 value which is equal to one.[44] The difference between the free

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[44] The 1967 value of λ equals one (from the equality $\overline{C}_i = \overline{C}_i \lambda$). As stated earlier, the free trade value of λ has to be equal to, or larger than, one. This is because the 1967 input-output levels of the endogenous variables of the system also constitute a feasible solution to the primal problem. However, the model, by incorporating the constraints in their inequality forms (which, except capacity limits, are satisfied as strict equalities in the input-output table) and allowing the output levels take values within certain limits, increased the range of possible values for the endogenous variables of the system. Since the 1967 levels constitute a feasible solution to the model and λ equals one, the optimization process would not generate an optimum solution for which λ is less than one. Thus, the free trade optimum solution value of λ can not be smaller than one.

trade and the 1967 value of λ is utilized as an estimator of Turkey's gain (or loss) from free trade with the EEC. The estimate of Turkey's gain (or loss) is then compared with the estimates of Great Britain's gain from joining the Common Market.

CHAPTER IV

THE DATA: 1967

A. THE AUGMENTED 1967 TURKISH INPUT-OUTPUT TABLE

Any effort to estimate the effects of a shift in Turkey's trade regime must use data that are sufficiently disaggregated with respect to Turkish export and import-competing industries. A major effort in this study was concentrated on disaggregating the 1967 37-sector Turkish input-output table into a 50-sector table so as to present all the export and import-competing industries with different degrees of international competitiveness as individual sectors. Thus, some of the industries and agricultural sectors which appeared as sub-sectors in the original 1967 37-sector input-output table were separated from the main sector and presented as individual sectors in the "augmented" 1967 50-sector input-output table, if the international competitiveness of these industries was substantially different than that of the main sector in the original table. The disaggregation procedures were lengthy and time

consuming. In this chapter, only the basic principles utilized in the disaggregation are presented, and the details are not discussed.

The "augmented" 1967 Turkish input-output table which is the major source of the data for the application of the model is presented in Appendix B. Table I (of Appendix B) is the input-output flow table, and Table II is the input-output coefficient Table. As stated above, the augmented table was derived from the 1967 Turkish input-output table[1] by disaggregating the latter from thirty-seven to fifty sectors and changing the valuation of flows from producers' to purchasers' prices. In this chapter, the procedures followed in adjusting the "original" 1967 Turkish input-output table to obtain the augmented table, and the methods utilized in deriving the rest of the data, are discussed.

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[1]The Turkish State Planning Organization prepared the 1967 input-output table and it is available only in blueprint. At the time of writing, the background information (i.e., the original data, the data on the subsectors of each of the thirty-seven sectors, technical details, etc.) of the table was not available, although much can be inferred from the 1963 input-output table and from conversation with the participants in the project.

The 1967 Turkish input-output table has thirty-seven sectors: six primary, twenty-one manufacturing, and ten service sectors. Inter-industry commodity and service flows are recorded at market prices (i.e., ex-factory prices plus all the indirect taxes) exclusive of the trade and transportation margins, i.e., the prices used for the valuation of these flows are "producers'" prices. Inter-industry flows include the competitive imports at landed cost values (i.e., c.i.f. prices plus all import duties), but the non-competitive imports used as inputs are treated separately. Value-added generated by each sector is not divided into its primary factor components, i.e., the shares of labor and capital services; only the total value-added figures are available.

As stated above, several adjustments and modifications were made to the 1967 table to obtain the augmented table. The first major adjustment was the disaggregation of the table. Disaggregation was necessary for obtaining the data used in the application of the model at a "satisfactory"[2] level

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[2] As noted earlier, the very nature of the questions raised in this study necessitates an approach that is based on a highly disaggregated Turkish economy, and there are several sectors of the 1967 original input-output table that are too aggregated for this purpose.

of disaggregation. Thus, some of the sectors of the 1967 table were disaggregated[3] into several new sectors. The selection of sectors to be disaggregated was based on the criteria that: (i) no sector in the augmented table should have sub-sectors, some of which produce import-substitutes and some of which produce exportable goods, i.e., each sector in the augmented table should include sub-sectors which produce only importables or exportables; (ii) each export-oriented sector in the augmented table should only include sub-sectors which produce either traditional or non-traditional export goods, but not both. The major reason underlying these two criteria is that each sector of the augmented table should include commodities with similar competitive structures. Since the international competitiveness of traded good sectors is to be examined under the free trade conditions described in the model, we do not want to include sectors in the system which include goods with important differences in

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[3] However, two of the original sectors were aggregated into one sector. This aggregation was necessary to bring the number of sectors in the augmented table to 50; the computer program was originally written for 50 sectors. The two sectors so aggregated -- the Building Construction and Non-Building Construction sectors -- produce non-tradable goods which are not used as intermediate inputs and their input structures are similar. This aggregation is therefore not expected to have any effect on the results.

their competitiveness; otherwise, the international competitiveness of a sector could be easily underestimated or overestimated. For example, if a traded good sector includes importable and exportable goods, then the overall relative competitiveness of this sector will be the average of the international competitiveness of these goods; thus, the competitiveness of each good in this sector will be either overestimated or underestimated.

In Table I, the original sectors which were chosen to be disaggregated and the new sectors are listed in the first and second columns respectively. Three primary sectors -- two agricultural and one mining -- and two manufacturing sectors of the original table were disaggregated. The Agricultural sector of the original table was disaggregated into six sectors. The latter sector was disaggregated since it contained sub-sectors which produce traditional and non-traditional export goods with different levels of relative competitiveness. It was disaggregated into the following six sectors: the Industrial Crops, Wheat-and-Other Cereals, Pulses, Hay, Fruits, Citrus Fruits, Nuts, and Vegetables. The Industrial Crops sector includes cotton and tobacco which are both traditional export goods,

TABLE I. The Original Sectors Which Were Disaggregated and The New Sectors.

Original Sectors	New Sectors
1. Agriculture	1.1 Industrial Crops 1.2 Wheat, Other Cereals, Pulses, Hay, etc. 1.3 Fruits 1.4 Citrus Fruits 1.5 Nuts 1.6 Vegetables
2. Animal Husbandry and Fishery	2.1 Livestock 2.2 Animal Slaughtering 2.3 Fishing
3. Other Mining	3.1 Other Mining 3.2 Crude Petroleum
4. Food Processing Industries	4.1 Milk Industry - Canned Food 4.2 Olive Oil, Seed Oils and Fats 4.3 Other Food
5. Textile and Apparels Industry	5.1 Cotton Textile 5.2 Wool Textile 5.3 Knitting Industry 5.4 Other Textile 5.5 Clothing Industry
6. Building Construction 7. Non-building Construction	1. Construction

and the Nuts sector includes hazelnuts which is also a traditional export good. The rest of the agricultural sectors listed above produce non-traditional export goods. The latter kind of agricultural goods were not grouped together, but rather they were included in different sectors so that they can be kept in separate and more or less homogenous sectoral groups. That is why the original Agricultural sector was disaggregated into six sectors rather than into a smaller number of sectors. The latter rule was also applied to the other disaggregated sectors in determining the degree of disaggregation (i.e., the number of new sectors to be derived from a disaggregated sector). The Animal-Husbandry and Fishery sector was disaggregated into the Livestock, Animal Slaughtering, and Fishing sectors. The Livestock sector is relatively more competitive than the latter two sectors. The Other Mining sector was disaggregated into the Other Mining and Crude Petroleum sectors. The latter Other Mining sector includes mainly the exportable minerals such as the traditional export items chrome and copper. The Crude Petroleum sector, on the other hand, is an import-substituting industry, and the production of crude petroleum is protected by high tariffs (423 percent on crude petroleum imports). Thus, in order not to underestimate the international

competitiveness of domestically produced minerals other than crude petroleum, it was necessary to disaggregate the original Other Mining sector. The Food Processing Industries sector was disaggregated into three sectors: they are Milk Industry - Canned Food, Olive Oil - Seed Oils - Fats, and Other Food. These latter three sectors are all export-oriented sectors, but, nevertheless, their relative competitiveness differ. The Textile and Apparels sector was also disaggregated, and five new sectors were derived from this disaggregation; they are Cotton Textile, Wool Textile, Knitting Industry, Other Textile, and Clothing Industry. The Cotton Textile, Knitting Industry and Other Textile sectors produce exportable commodities, whereas the Wool Textile and Clothing Industry produce import-substituting products. As mentioned in Footnote 3, the Building Construction and Non-building Construction sectors were aggregated (see Footnote 3 for the reason), and the new sector is the Construction sector of the augmented table. Through these disaggregations, thirteen new sectors were obtained; hence, the augmented table has fifty sectors.[4]

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[4]Disaggregation of the 1967 input-output table into more than 50 sectors would have been preferable, but the available data on sub-sectors were limited and this made any further disaggregation impossible.

The disaggregation process required additional information about the input structure and the distribution of the outputs of the new sectors. Since detailed information for 1967 (either from the 1967 input-output table or from other published sources) was not available, disaggregation was based on past data. For this purpose, the 1963 Turkish input-output table was utilized to a great extent, and in certain instances reference was also made to the 1960 Greek input-output table.[5] The 1963 input-output table was also constructed on the basis of (the same) thirty-seven sectors which are comparable with the corresponding sectors of the 1967 table. However, one advantage of the 1963 table is that it was published with a text containing detailed information on the subsectors. The 1960 Greek table was constructed on the basis of fifty sectors which are comparable with those of the augmented 1967 input-output table.

The first step in disaggregation was to determine the output levels of the new sectors. For this, the output

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[5]State Planning Organization, Structural Interdependence of the Turkish Economy: 1963, (Republic of Turkey, Prime Ministry: May 1967); A. Koutsoyiannis, and A. Ganas, Input-Output Table of the Greek Economy: (Year 1960), Center of Planning and Economic Research, (Athens, 1967).

proportions of the subsectors (which correspond to the new sectors) in the relevant sector's output in the 1963 table were used. It was assumed that these output proportions remained the same during the 1963-1967 period. Then, the output level of each disaggregated sector in the 1967 table was multiplied by the 1963 output proportions of its subsectors in order to determine (approximately) the output levels of the new sectors. The second step was to disaggregate the inter-industry flows originating from (and the flows destined to) the sectors that were disaggregated. This was done on several bases: (1) inputs to some of the disaggregated sectors in the 1967 table were disaggregated into the cells of the new sectors column-wise -- by using the relevant input-output proportions derived from the Greek table; this procedure assumes that the input structures of some of the new sectors are similar to those of the corresponding sectors in the 1960 Greek table;[6] (2) inputs to the rest of the disaggregated sectors were distributed into the new cells (corresponding to the new sectors)

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[6] However, some changes were made in the proportions derived from the Greek table before they were applied, and these changes were based on the differences between the output proportions of the new sectors (in the disaggregated sector's output) in the augmented 1967 table and the output proportions of the same sectors in the Greek table. Thus, the proportions derived from the Greek table were somehow adjusted for these differences.

-- again column-wise -- on the basis of the output proportions of the new sectors in the original sector's output and on the basis of some specific assumptions made as the necessity arose.

The second step also included a further adjustment to the disaggregated input flows: it involved the determination of intra-industry flows that existed between the subsectors of the disaggregated sectors of the original 1967 table; some of these subsectors are vertically integrated (e.g., Livestock, and Animal Slaughtering), and since these subsectors are "main" sectors in the new table, intra-sectoral input flows in the original table became inter-sectoral flows in the augmented table, and that is why these flows were added to the relevant cells in the new table. Furthermore, necessary adjustments were also made to the output levels of the new sectors to reflect the intra-sectoral flows which became inter-sectoral flows after the disaggregation. The third step was to disaggregate the value-added figures of the disaggregated original sectors; this was based on the output proportions and intermediate input proportions of the new sectors in the original sector's total output and total intermediate input, respectively. The same approach was utilized to disaggregate the non-competitive imported inputs (which are distributed in a separate row).

The fourth step was to disaggregate the components of the final demand for the outputs of the new sectors; the necessary information (i.e., the export and import levels of these commodities) for this process was gathered from published sources.[7] Since the output levels of the new sectors and the total intermediate demand for these outputs were already determined from the previous steps of disaggregation, and the data on export and import levels were separately compiled, the final consumption levels were calculated as residuals.

The second major adjustment made to the 1967 table (after the disaggregation, however) was to change the valuation of the flows. The inter-industry and final demand flows are recorded at producers' prices in the original table. Thus, f.o.b. export prices did not include the inland trade and transportation margins, whereas c.i.f. import prices included these margins. In order to eliminate the gap between the c.i.f. prices of imports and f.o.b. prices of

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[7] State Institute of Statistics, Statistical Yearbook of Turkey: 1968, (Ankara: 1969), pub. no. 580; U.S. AID, Economic and Social Indicators - Turkey, (Ankara: August 1971); U.S. AID, "Annual Exports: 1961-1970" (Mimeographed), in which exports are listed according to the six digit BTN commodity classification.

exports, at least partially, it was necessary to value the flows at purchasers' prices.[8] To change the valuation of the flows to purchasers' prices, the following approach was used: in the original table, trade and transportation margins on the inputs purchased by the jth sector enter into the cost of services purchased from the transportation and trade sectors, i.e., these margins appear in the value of inputs from these service sectors into the jth sector. In the augmented table, these margins do not appear in the value of inputs from the trade and transportation sectors because the cost of the trade and transportation margins of material inputs into the jth sector was deducted from the total value of services of the trade and transportation sectors that was sold to the jth sector; then this deducted portion (i.e., margins) was distributed among the non-empty cells of the jth column of the augmented table in appropriate proportions.[9] The remaining part of the input costs

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[8]The difference between producers' prices and purchasers' prices is the transportation and trade margins; purchasers' prices include these margins, and producers' prices exclude them. See, Problems of Input-Output Tables and Analysis, United Nations, (New York: 1966), Series F, No. 14, pp. 36-39.

[9]These proportions were based on the 1963 proportions which were obtained from the 1963 Table of Trade and Transportations Margins: State Planning Organization, Structural Interdependence of the Turkish Economy: 1963, op. cit., (Appendix, Table I.5.1.1).

(from the trade and transportation sectors into the jth sector) represent the costs of services directly delivered to the jth sector.

1. Exogenous Variables $\overline{X}_i^U$'s, $\overline{X}_i^L$'s, $\overline{C}_i$'s, and $\overline{B}$

The augmented 1967 input-output table supplies the data for the 1967 production ($\overline{X}_i$'s) and final consumption ($\overline{C}_i$'s) levels. In Table II, $\overline{X}_i$'s and $\overline{C}_i$'s are listed in columns one and two respectively. $\overline{C}_i$'s are exogenous variables in the model, and that is why they are also listed in Table II. The upper and lower output limits of the model ($\overline{X}_i^u$'s and $\overline{X}_i^L$'s) are calculated by taking certain percentages of $\overline{X}_i$'s (a discussion related to the latter fixed percentages is presented below). The output capacity limits so calculated are listed in the last four columns of Table II.

$\overline{X}_i^u$'s and $\overline{X}_i^L$'s

In the application, two different sets of upper and lower output limits are used. As explained in Chapter III, the major reason for applying two different sets of capacity limits is the consistency check that such a sensitivity analysis provides. That is, the solution results regarding the

TABLE II. The Actual Output and Consumption Levels, and the Upper and Lower Output Limits, (1967). (in physical units defined at fixed 1967 domestic prices)

	Actual output levels: $\bar{X}_i$: (1)	Actual consumption levels: $\bar{C}_i$[1] (2)	Upper Output Capacity Limits:[2] $\bar{X}_i^u$(I) and $\bar{X}_i^u$(II)		Lower Output Limits:[2] $\bar{X}_i^L$(I) and $\bar{X}_i^L$(II)	
			$\bar{X}_i^u$(I) = $\bar{X}_i$(1+.10) (3)	$\bar{X}_i^u$(II) = $\bar{X}_i$(1+.20) (4)	$\bar{X}_i^L$(I) = $\bar{X}_i$(1-.10) (5)	$\bar{X}_i^L$(II) = $\bar{X}_i$(1-.20) (6)
1. Industrial Crops	6,479	834	6,803	7,127	6,155	5,831
2. Wheat, other cereals, hay, etc.	19,318	8,897	20,284	21,250	18,352	17,386
3. Fruits	2,114	1,651	2,220	2,325	2,008	1,903
4. Citrus Fruits	300	226	315	330	285	270
5. Nuts	600	140	630	660	570	540
6. Vegetables	1,196	902	1,256	1,316	1,136	1,076
7. Forestry Products	1,671	510	1,755	1,838	1,587	1,504
8. Livestock	14,418	7,775	15,139	15,860	13,697	12,976
9. Fishing	414	201	435	455	393	372
10. Other Mining	1,172	93	1,289	1,406	1,055	938
11. Sugar	2,472	1,666	2,719	2,966	2,225	1,978
12. Alcoholic Beverages	706	641	777	847	635	565
13. Milk industry-canned food	787	625	866	944	708	630
14. Olive oil, seed oils, fats	1,066	490	1,173	1,279	959	853
15. Other food sector	13,791	11,026	15,170	16,549	12,412	11,033
16. Cotton Textile	8,059	3,078	8,865	9,671	7,253	6,447

TABLE II. (continued)

	$\bar{X}_i$	$\bar{C}_i$	$\bar{X}^u_{i(I)}$	$\bar{X}^u_{i(II)}$	$\bar{X}^L_{i(I)}$	$\bar{X}^L_{i(II)}$
17. Wool Textile	1,985	622	2,184	2,382	1,787	1,588
18. Knitting Industry	698	553	768	838	628	558
19. Other Textile	3,483	1,158	3,831	4,180	3,135	2,786
20. Clothing Industry	1,918	1,599	2,110	2,302	1,726	1,534
21. Wood Products	2,567	1,055	2,824	3,080	2,310	2,054
22. Paper, printing, stationeries	1,139	608	1,253	1,367	1,025	911
23. Leather and Leather Prod.	1,100	660	1,210	1,320	990	880
24. Rubber, Plastics, and Prod.	1,576	625	1,734	1,891	1,418	1,261
25. Chemicals and Pharmaceuticals	3,728	2,648	4,101	4,474	3,355	2,982
26. Fertilizers	266	32	293	319	239	213
27. Petroleum Refineries, Coal Prod.	4,919	1,158	5,411	5,903	4,427	3,935
28. Ceramics, Glass, and other non-metal Prod.	1,346	565	1,481	1,615	1,211	1,077
29. Cement	866	3	953	1,039	779	693
30. Iron and Steel	3,698	354	4,068	4,438	3,328	2,958
31. Non-ferrous Metal	911	33	1,002	1,093	820	729
32. Metal Products	2,492	1,855	2,741	2,990	2,243	1,994
33. Agri. and non-elect. Mach.	2,223	2,496	2,445	2,668	2,001	1,778
34. Elect. Mach. and Appl.	1,339	1,104	1,473	1,607	1,205	1,071
35. Transp. equip. Mainten. Repairs	2,798	1,994	3,078	3,358	2,518	2,238

TABLE II. (continued)

	$\overline{X}_i$	$\overline{C}_i$	$\overline{X}^u_i(I)$	$\overline{X}^u_i(II)$	$\overline{X}^L_i(I)$	$\overline{X}^L_i(II)$
36. Crude Petroleum	460	---	506	552	414	368
37. Iron-Ore Mining	157	2	173	188	141	126
38. Coal Mining	1,491	485	1,640	1,789	1,342	1,193
39. Tobacco Processing and Products	2,427	2,227	2,670	2,912	2,184	1,942
40. Animal Slaughtering	4,488	2,180	4,937	5,386	4,264	4,039
41. Other Transportation	7,062	6,185	7,768	8,474	6,356	5,650
42. Professions, Personal Services	8,038	6,676				
43. Railway Transportation	556	373				
44. Trade	1,585	35				
45. Banking, Insurance, Coop	3,426	1,129				
46. Public Services	9,065	8,837				
47. Electricity Gene., Transmission	1,339	382				
48. Communications	789	409				
49. Construction	11,413	11,413				
50. Ownership of Dwellings	4,808	3,496				

[1] Includes private consumption plus government spending plus investment and changes in stocks.

[2] For agricultural sectors (i.e., sectors 1 through 9 and 40) following equalities were used: $\overline{X}^u_i(I) = \overline{X}_i(1+.05)$, and $\overline{X}^u_i(II) = \overline{X}_i(1+.10)$; $\overline{X}^L_i(I) = \overline{X}_i(1-.05)$ and $\overline{X}^L_i(II) = \overline{X}_i(1-.10)$.

Sources: The figures in columns (1) and (2) are from the Input-Output Table (see Table I in Appendix B). Figures in columns (3), (4), (5), and (6) were determined from column (1) as described by the equalities.

resource-pull effects of the tariff eliminations and the ranking of the traded good sectors by their international competitiveness can be tested for their consistency utilizing such a parametric programming.[10] Henceforth, the first set of output capacity limits will be referred to as "10 percent capacity limits" and they will be identified by $\overline{X}_i^u(I)$'s and $\overline{X}_i^L(I)$'s; the second set of output capacity limits will be referred to as "20 percent capacity limits" and they will be identified by $\overline{X}_i^u(II)$'s and $\overline{X}_i^L(II)$'s.

In the first set, output levels of manufacturing sectors were allowed to vary (above or below the 1967 actual domestic production levels) within the limits of plus or minus 10 percent of the 1967 levels. Thus, $\overline{X}_i^u(I)$'s equal 110 percent and $\overline{X}_i^L(I)$'s equal 90 percent of the relevant 1967 domestic production levels. In the second set, the range of variation was doubled; hence, for the manufacturing sectors, $\overline{X}_i^u(II)$'s equal 120 percent, and $\overline{X}_i^L(II)$'s equal 80 percent of the relevant 1967 production levels.

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[10] It should also be pointed out that by applying two different sets of output capacity limits, we partially eliminate the problem of making a possible mistake (thus causing the model to generate unsatisfactory results) by picking a very large percentage (i.e., 20 percent) or a very small percentage (i.e., 10 percent) used in setting the output limits.

In setting the upper[11] output limits for the manufacturing sectors above the 1967 levels by 10 and 20 percent, certain points were considered. Since it is one of the objectives of this study to examine the resource-pull effects of the changes in relative domestic prices by observing the variations in the production levels, it was necessary to allow output levels to take values within a "reasonably large" range of values; if these percentages were larger (e.g., 30 or 40 percent) only one or two extremely profitable sectors would produce at the upper limits and would probably use important portions of the fixed supply of primary factors, thus forcing the rest of the sectors to produce at the lower output limits. This, however, would not enable us to observe potentially possible production shifts which might take place if Turkey moved gradually toward full membership in the EEC. Furthermore, since most of the sectors would appear to be incurring losses (because they are forced to produce at lower limits), even though some of them might be relatively profitable, the ranking of the traded good

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[11] The lower output limits were set using the same percentages which were applied to set the upper limits; it is assumed that setting the lower limits in a symmetrical way is the most appropriate approach to use.

sectors by their international competitiveness would not supply reliable information. Thus, by applying relatively smaller percentages in setting the upper limits, we eliminate the above problem. On the other hand, if we were to use lower percentages (e.g., 2 1/2 or 5 percent), a symmetrical problem would have been created, because for most of the sectors it would be possible to produce at the upper limits while only a very few sectors would have been forced to produce at the lower limits due to the fixed supply of primary factors. Again, this would have eliminated the possibility of examining the changes in the output levels of sectors which might have different potential unit profit levels under the free trade conditions. Also, we would have been forcing too much inflexibility upon the model (as far as the feasible solution set is concerned) by allowing the output levels to take values only within a very narrow range.

Output levels of the agricultural sectors were allowed to vary within the limits of plus or minus 5 percent of the 1967 domestic production levels in the first set, so the $\overline{X}_i^u(I)$'s equal 105 percent and $\overline{X}_i^L(I)$'s equal 95 percent of the relevant 1967 output levels. In the second set, the range of variation was doubled as in the case of manufacturing

sectors. Hence, the $\overline{X}_i^u(II)$'s equal 110 percent and $\overline{X}_i^L(II)$'s equal 90 percent of the 1967 output levels.

There are two interrelated reasons for using smaller percentages in setting the output limits for the agricultural sectors: (1) first, it was necessary to reflect the fact that the flow of primary factors (labor and capital) between the agricultural and manufacturing sectors involves higher transfer costs than the costs which exist when these factors move among the manufacturing sectors, so the lower percentages indicate that it is relatively more difficult for the agricultural sectors to expand by attracting resources from the manufacturing sectors; (2) second, Turkey's agricultural sectors are relatively large in terms of their output levels and their shares in GNP, and thus, a 5 percent expansion in these sectors would probably require as much resource transfer as a 10 percent expansion in the manufacturing sectors would require.

Fixed Foreign Exchange Supply: $\overline{B}$

The value of the fixed trade deficit ($\overline{B}$) was derived from the augmented input-output flow table. The total export earnings (recorded at f.o.b. prices) was deducted from the

summation of import spendings on the competitive and non-competitive imports (valued at c.i.f. prices); the resulting figure is TL. 3,693 million (or $3,693/9 million, since the foreign trade transactions were recorded at the official exchange rate TL. 9 = $1).

Input-Output Coefficients: a_{ij}'s

The data necessary for constructing an input-output coefficient table (i.e., the table of a_{ij}'s) are available in an input-output flow table. If X_{ij} is the amount of the ith good used by the jth sector for producing X_j amount of the jth good, then a_{ij} (the amount of the ith good necessary for producing one unit of the jth good) is equal to the ratio X_{ij}/X_j. Since X_{ij}'s and X_j's are available in an input-output flow table, the coefficient table can be constructed easily. The augmented 1967 input-output coefficient table was constructed on this basis, using the data provided by the augmented flow table. The coefficient table so constructed is presented in Appendix B (Table II).

2. Labor, Capital, and Non-Competitive Import Coefficients (l_j's, k_j's, and m_j's), $\bar{L}$, $\bar{K}$

The labor coefficients, l_j's, are listed in the first column of Table III. The total value-added figures for each sector in the augmented 1967 input-output table were utilized in estimating these labor (and also capital) coefficients. The first step of the estimation procedure was to determine labor's share in the value-added in each sector for 1967. In determining labor's share, past data were utilized.[12] Detailed data

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[12] The other alternatives for determining labor's share in each sector's total value-added were: (1) to try to disaggregate the available data (which were too aggregated for our purposes) on actual wage and salary payments in 1967; and (2) to multiply the 1967 employment figure of each sector by an appropriate (1967) wage rate. The first approach would have necessitated the calculation of some proportions (based on some assumptions) which could be used in disaggregating the 1967 actual payments to labor. The second approach would have necessitated: first, the calculation of a weighted average (daily) wage rate (from the wage rates of different skill groups and the proportions of workers employed from different skill groups in the total number of workers employed by each sector); second, the estimation of the number of work days (and of shifts) during a year in each sector. Considering the number of steps and assumptions involved in the above procedures (if they were to be used), it was presumed that the margin of error which might be caused by the method used in the study is smaller than the potential errors which the other two approaches might have caused.

TABLE III. Labor, Capital and Non-Competitive Import Coefficients (1967).

	Labor coefficients: value of the labor services per unit of output (mill. TL per unit of output) $l_{j's}$	Capital coefficients: value of non-labor primary factor services per unit of output (mill. TL per unit of output) $k_{j's}$	Non-competitive import coefficients: value of the non-competitive imports per unit of output (mill. TL per unit of output) $m_{j's}$
1. Industrial Crops	.69748	.14277	.01358
2. Wheat, other cereals, hay etc.	.56880	.22119	.00554
3. Fruits	.26868	.49858	.00284
4. Citrus Fruits	.25667	.47667	.00667
5. Nuts	.28000	.52000	.00333
6. Vegetables	.26087	.10702	.00753
7. Forestry Products	.23279	.54279	.00060
8. Livestock	.08878	.46601	.00014
9. Fishing	.47343	.47343	.00000
10. Other Mining	.54181	.33276	.00171
11. Sugar	.11448	.45712	.00081
12. Alcoholic Beverages	.04391	.59207	.01275
13. Milk industry-canned food	.11944	.37992	.00508
14. Olive oil, seed oils, fats	.16604	.36961	.00094
15. Other food sector	.05243	.32180	.00399
16. Cotton Textile	.11875	.32126	.00906
17. Wool Textile	.19547	.07607	.03980

TABLE III. (continued)

	$l_{j's}$	$k_{j's}$	$m_{j's}$
18. Knitting Industry	.12178	.43410	.00860
19. Other Textile	.06288	.42148	.00804
20. Clothing Industry	.06726	.41137	.00834
21. Wood Products	.13479	.36385	.00467
22. Paper, printing, stationeries	.17998	.33538	.02985
23. Leather, and Leather Prod.	.12091	.36182	.02182
24. Rubber, Plastics, and Products	.05457	.39784	.34645
25. Chemicals and Pharmaceuticals	.10837	.49303	.15156
26. Fertilizers	.17667	.55263	.05263
27. Petroleum Refineries, Coal Prod.	.01281	.63102	.00508
28. Ceramics, Glass, and other non-metal Prod.	.12853	.48365	.03120
29. Cement	.13048	.41108	.00115
30. Iron and Steel	.05246	.42428	.00541
31. Non-ferrous Metal	.10648	.48408	.08672
32. Metal Products	.12319	.33307	.06942
33. Agri. and non-elect. Mach.	.03689	.49123	.07512
34. Elect. Mach. and Appl.	.06945	.51232	.10605
35. Transp. equip., Mainten. Repairs	.16583	.30808	.06040
36. Crude Petroleum	.07609	.87174	.00000
37. Iron-Ore Mining	.54777	.27388	.00637
38. Coal Mining	.58618	.23944	.00067
39. Tobacco Processing, Prod.	.08199	.50391	.00247

TABLE III. (continued)

	$l_{j's}$	$k_{j's}$	$m_{j's}$
40. Animal Slaughtering	.16422	.10495	.00045
41. Other Transportation	.02804	.28321	.00566
42. Professions, Personal Services	.03533	.55362	.00659
43. Railway Transportation	.32374	.00000	.02158
44. Trade	.01388	.15647	.00063
45. Banking, Insurance, Coop.	.60187	.19002	.00029
46. Public Services	.21677	.72587	.00143
47. Electricity Generation, Trans.	.21210	.37640	.00069
48. Communications	.50570	.31052	.00000
49. Construction	.27907	.20205	.00578
50. Ownership of Dwellings	.00000	.93968	.00000

Sources: The methodology used in estimating the values of labor and capital coefficients was explained in the text. The values of the non-competitive import coefficients were obtained from the input-output coefficient table (see Table II in Appendix B).

on the actual salary and wage payments in 1963 by the manufacturing and service sectors were available,[13] and the sectors (according to which the data were broken down) were comparable to those of the augmented 1967 input-output table. For agricultural sectors, the 1963 actual payments were estimated by multiplying the 1963 employment figures with the 1963 wage rates in these sectors (for statistical sources see footnote 13). Then, the total salary and wage payment figures for 1963 and the 1963 total value-added figures[14] were used in calculating labor's share in value-added

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[13] State Institute of Statistics, Census of Manufacturing Industries and Business Establishments: Manufacturing, 1964, (Ankara: 1968), Pub. No. 547, Section III, Table 1, pp. 1058-1071.

State Institute of Statistics, Census of Manufacturing Industries and Business Establishments: Commerce, Transportation, and Communications Services, 1964, Series: 2, (Ankara, 1969), Pub. No. 567, Section I.IV, Table 18, pp. 52-55; Section II.IV, Table 17, pp. 95-99; Section III.IV, Table 15, pp. 143-144.

State Institute of Statistics, Census of Population: Social and Economic Characteristics of Population: 1965, (Ankara: 1969), Pub. No. 568, Table 40, pp. 472-485.

State Institute of Statistics, Statistical Yearbook of Turkey: 1968, op. cit., Table 141, pp. 158-159.

[14] The data on total value-added generated by each sector in 1963 were obtained from the 1963 Turkish input-output table.

in each sector for 1963, as a proportion of the total value-added generated by each sector. Assuming that the proportionate share (in total value-added) of earnings by labor in each sector did not change during the 1963-1967 period,[15] the 1963 values of proportionate labor shares were multiplied by the value-added figures of corresponding sectors in the augmented 1967 input-output table[16] in order to determine

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[15] This implicitly assumes that no substitution between labor and other primary factors (and no change in the relative factor prices) occurred during this period. Since the period is reasonably short, this should be considered a safe assumption.

[16] Row 58 in the augmented input-output flow table (Table I, Appendix B). These figures are net of indirect taxes. Further adjustments were also made to these figures (before the shares of labor and capital were determined) in order to eliminate the windfall gains (resulting from price changes), large profits (resulting from monopolistic practices), and other payments that are in the nature of "transfers" which should not be included in the value-added. However, this adjustment was not made to all value-added figures; only those sectors in which such transfers might have been realized were subjected to these adjustments. These sectors are some of the import-substitute sectors: Wool Textile, Paper, Printing and Stationeries, Rubber Plastics, and Products, Chemicals, Fertilizers, Cement, Iron and Steel, Non-ferrous Metal, and Metal Products. The wholesale and retail trade margins constitute an important portion of the (purchasers') prices of these products, and it is believed that the Trade sector made large profits due to the reasons mentioned above, and also from the sales of imported items at prices which were a few times higher than their relevant landed-cost prices. However, these large profit margins realized by the Trade sector are included neither in the value of output nor in the value-added figure of the Trade sector in the input-output table. Due to the valuation adjustment made to the 1967 table, all the flows are valued at purchasers' prices; thus the windfall gains realized by (continued next page)

labor's share in each sector's total value-added, the residual part of value-added making up the share of non-labor primary factors.

The second step involved in estimating the labor coefficients was to divide the share of labor in value-added in each sector by the corresponding sector's output level; the ratios so derived are the labor coefficients, l_j's, utilized in the application of the model, and they are expressed in units of TL. million worth of labor services per unit of output.

Note that the labor coefficients are not expressed in units of man-years per unit of output, but in units of TL. million worth of labor services per unit of output. We

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the Trade sector are reflected in the values of output levels of the other sectors and also in their value-added figures which were derived as residuals after the costs of intermediate inputs were deducted. Hence, in order to eliminate these windfall gains, the value-added figures of the sectors listed above were reduced by 15 percent. This is probably a conservative figure, but, nevertheless, it is probably safer for minimizing the margin of error. Since a separate estimation of the amount of "transfers" in each sector would require enormous amount of time and effort, the above approach was preferred.

could have expressed the labor coefficients in terms of man-years per unit output by, first estimating the number of workers employed in each sector in 1967 and then dividing the employment figures by each sector's 1967 output level. For this, there were two alternative approaches: the first approach was to gather the sectoral employment figures from labor statistics, and then divide these figures by the output levels of respective sectors; the second approach was to divide the labor's share in value-added for 1967 in each sector by a weighted average wage rate and thus find the estimates of employment levels for each sector, and then divide these sectoral employment figures by the corresponding output levels. The first approach was already tried, and it generated some inconsistent results. This was due to the fact that the unit production costs (i.e., the column sums -- valued at 1967 domestic prices -- of the input-output coefficients) were not equal to unity, which is the 1967 domestic price level of each good. This situation could have been corrected by some adjustments, though time consuming; but, since it was unnecessary to use this approach, the first approach was dropped. The second approach was not utilized either

since it necessitated the estimation of a weighted average wage rate (or rates) for 1967. Also, the approach used here in estimating the labor coefficients and the second approach explained above are essentially the same, but the former was much easier to apply.

Fixed Labor Endowment: $\bar{L}$

The summation of the labor part of earnings in total value-added by each sector in 1967 was taken as the value of $\bar{L}$. This amount equals TL. 35,535 million. It should be noted here also that the labor endowment is not expressed in man-years, but rather in terms of TL. million worth of labor services. Thus, the above fixed amount of the 1967 value of labor services can be considered as a pool of funds available to the producers -- on a competitive basis to be used in employing labor services.

Capital Coefficients: k_j's

The capital coefficients, k_j's, for the fifty sectors are presented in the second column of Table III. After finding out the share of labor in total value-added generated by each sector in 1967 (by using the approach explained

above), the residual part of the value-added in each sector was utilized to estimate the capital coefficients, k_j's. The values of k_j's were determined by dividing the non-labor part of value-added in each sector by the corresponding sector's output level. Thus, k_j's are expressed in units of TL. million worth of non-labor primary factor services per unit of output.

It is clear that k_j's are not pure capital coefficients. This is because the non-labor part of value-added generated by each sector is made up by (1) return to land (rent), plus (2) return to the equity capital and borrowed capital (interest), plus (3) return to entreprenourship, and plus (4) payments to the self-employed people. Ideally, we would like to have the pure capital component of value-added and calculate k_j's from these shares. However, because of the data problems, it was impossible to determine the share of capital in value-added. Thus, the non-labor part of value-added was taken to estimate k_j's. This, however, should not create any problem since k_j's can be treated as non-labor primary factor coefficients, rather than capital coefficients.

The Fixed Endowment of Non-Labor Primary Factor Services: $\overline{K}$

The summation of the non-labor part of earnings in total value-added by each sector in 1967 was taken as the value of $\overline{K}$, and it is equal to TL. 64,940 million. As in the case of the fixed endowment of labor services (which is expressed in value terms), the latter amount can also be considered as a fixed amount funds available to the producers, on a competitive basis, to be used in employing non-labor primary factor services.

The Non-Competitive Import Coefficients: m_j's

The non-competitive import coefficients are presented in the third column of Table III. m_j's were calculated by dividing the c.i.f. value of all non-competitive imports used as inputs[17] in each sector of the augmented input-output table by the corresponding sectors 1967 output level. Thus, m_j is the international value of the non-competitive imports used for producing one unit of the jth good.

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[17] These values appear in Row 52-b of Table I in Appendix B.

B. THE EXOGENOUS INTERNATIONAL PRICES: $\overline{P}_i^w$'s

Two different sets of exogenous international prices were used in the application of the model. These prices are presented in the second and fourth columns in Table IV. As discussed in Chapter III, a "small" country assumption is incorporated into the model. Hence, the 1967 international prices of the 41 traded goods are included as exogenous variables in the model. So, if free trade between Turkey and the Common Market countries took place, these are the relative prices at which commodities would be traded.

Exogenous international prices were calculated from the unitary (tariff inclusive) domestic prices and the sectoral tariff rates. If t_j is the nominal tariff rate on the jth commodity, then we have the following equality:

$$\overline{P}_j^d = (1 + t_j)\overline{P}_j^w$$

where $\overline{P}_j^d$ is the domestic price - equal to one - and $\overline{P}_j^w$ is the fixed international price of the jth traded good. From this inequality, it is clear that the exogenous international prices can be determined if we know the sectoral tariff rates since $\overline{P}_i^w = 1/(1+t_j)$.

In Table IV, the two sets of sectoral tariff rates used in the calculation of the two sets of international prices[18] are presented in the first and third columns. The unitary domestic prices are listed in the fifth column, and in the sixth column, sectors are identified according to whether or not they are traded-good or home-good sectors.

The methodology used in estimating the sectoral tariff rates in 1967 was explained in Chapter II (p. 12), and a detailed explanation is given in Appendix A. Thus, it will suffice to say that a set of weighted sectoral tariff rates were estimated from the commodity specific tariff rates using the 1968 import and export proportions as weights. Then, some adjustments[19] were made to these sectoral tariff

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[18] Henceforth, the two sets of international prices will be identified by $\overline{P}_i^w(I)$ and $\overline{P}_i^w(II)$, where $\overline{P}_i^w(I)$ will refer to the first set and $\overline{P}_i^w(II)$ will refer to the second set of exogenous international prices.

[19] As discussed in Chapter II (and in Appendix A), these adjustments were made by utilizing the results of some sectoral studies and also by direct comparisons of the actual domestic and international prices in 1967.

TABLE IV. Sectoral (nominal) Tariff Rates, International Prices, and Tariff Inclusive Domestic Prices, (Turkey: 1967-1968).

	First set of adjusted tariff rates (% of c.i.f. prices) (1)	First set of international prices: $\bar{P}^w_i(I)$'s (2)	Second set of adjusted tariff rates (% of c.i.f. prices) (3)	Second set of international prices $\bar{P}^w_i(II)$'s (4)	Tariff inclusive domestic prices (5)	Identification of the sectors (6)
1. Industrial Crops	.1	.99	1	.99	1.00	Tradable
2. Wheat, other cereals, hay, etc.	5	.95	5	.95	1.00	"
3. Fruits	8	.93	8	.93	1.00	"
4. Citrus Fruits	5	.95	5	.95	1.00	"
5. Nuts	0	1.00	0	1.00	1.00	"
6. Vegetables	5	.95	5	.95	1.00	"
7. Forestry Products	21	.83	15	.87	1.00	"
8. Livestock	5	.95	5	.95	1.00	"
9. Fishing	5	.95	5	.95	1.00	"
10. Other Mining	21	.83	21	.83	1.00	"
11. Sugar	145	.41	145	.41	1.00	"
12. Alcoholic Beverages	144	.41	144	.41	1.00	"
13. Milk industry-canned food	2	.98	2	.98	1.00	"
14. Olive oil, seed oils, fats	25	.80	15	.87	1.00	"
15. Other food sector	10	.91	8	.93	1.00	"
16. Cotton Textile	33	.75	15	.87	1.00	"
17. Wool Textile	43	.70	43	.70	1.00	"

TABLE IV. (continued)

	(1)	(2)	(3)	(4)	(5)	(6)
18. Knitting Industry	28	.78	20	.83	1.00	Tradable
19. Other Textile	40	.71	25	.80	1.00	"
20. Clothing Industry	88	.53	50	.67	1.00	"
21. Wood Products	66	.60	35	.74	1.00	"
22. Paper, Printing, stationeries	113	.47	113	.47	1.00	"
23. Leather, and Leather	25	.80	15	.87	1.00	"
24. Rubber, Plastics, and Products	228	.30	228	.30	1.00	"
25. Chemicals and Pharmaceuticals	110	.48	110	.48	1.00	"
26. Fertilizers	102	.50	102	.50	1.00	"
27. Petroleum Refineries, Coal Prod.	274	.27	274	.27	1.00	"
28. Ceramics, Glass, and other non-metal prod.	30	.77	20	.83	1.00	"
29. Cement	126	.44	126	.44	1.00	"
30. Iron and Steel	144	.41	144	.41	1.00	"
31. Non-ferrous Metal	78	.56	78	.56	1.00	"
32. Metal Products	123	.45	123	.45	1.00	"
33. Agri. and non-elect. Mach.	105	.49	105	.49	1.00	"
34. Elect. Mach. and Appliances	108	.48	108	.48	1.00	"
35. Transp. equip., Mainten. Repairs	123	.45	123	.45	1.00	"
36. Crude Petroleum	423	.19	423	.19	1.00	"
37. Iron-Ore Mining	13	.88	13	.88	1.00	"

TABLE IV. (continued)

	(1)	(2)	(3)	(4)	(5)	(6)
38. Coal Mining	13	.88	13	.88	1.00	Tradable
39. Tobacco Processing Prod.	25	.80	25	.80	1.00	"
40. Animal Slaughtering	5	.95	5	.95	1.00	"
41. Other Transportation	0	1.00	0	1.00	1.00	"
42. Professions, Personal Services					1.00	Home good
43. Railway Transportation					1.00	"
44. Trade					1.00	"
45. Banking, Insurance, Coop.					1.00	"
46. Public Services					1.00	"
47. Electricity, gene., Trans.					1.00	"
48. Communications					1.00	"
49. Construction					1.00	"
50. Ownership of Dwellings					1.00	"

Source: Columns (1) and (3) are from Table III in Appendix A. International prices were derived from the relevant tariff rates as explained in the text. The free trade equilibrium prices of home goods are to be generated by the solutions to the model.

rates in order to eliminate the biases involved in estimating the weighted sectoral tariff rates. However, rather than obtaining one set of "adjusted" sectoral tariff rates, three different sets of adjusted sectoral tariff rates were derived (see Table III in Appendix A). The reason for estimating more than one set of sectoral tariff rates is to edge against any possible error that might be caused by the adjustments made in the estimation of any one set of the adjusted tariff rates. Two of the three sets of adjusted tariff rates, which are considered close approximations to the true rates, were utilized to calculate the two sets of exogenous international prices. In applying the model to the free trade case, both sets of international prices are utilized, and the results of the solutions to each set of international prices are analyzed separately. The use of two different sets of international prices allows a sensitivity analysis; thus if a mistake was made in deriving some international prices, we can observe how sensitive the results are to certain price changes. If there are important differences between the two solutions, a reconciliatory explanation is to be given; if, however, the results of the free trade solutions for the two sets of international prices do not differ much, we can conclude

that the margin of error will be small in using either set of results in the comparison with the 1967 actual levels.

CHAPTER V

APPLICATION OF THE MODEL: RESULTS AND CONCLUSIONS

A. ALTERNATIVE FREE TRADE SOLUTIONS*

In Chapter IV, the methodology used in deriving the two sets[1] of international prices from the tariff inclusive unitary domestic prices and the adjusted sectoral tariff rates was explained; the two sets of international prices were $\overline{P}_i^w(I)$, which refers to the first set, and $\overline{P}_i^w(II)$, which refers to the second set. In the application of the model to the free trade case, both sets were used[2] and two different free trade solutions were obtained for each set of international prices: for the first solution 10 percent capacity limits (i.e., $\overline{X}_i^u(I)$'s and $\overline{X}_i^L(I)$'s), and for the second solution

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*The solutions were obtained at the Computer Center of the University of Minnesota. The author is grateful to Professor James M. Henderson for writing a computer program for the application of the model.

[1] See Table IV in Chapter IV.

[2] The reason for using two sets (rather than one set) of international prices was explained in the last section of Chapter IV.

20 percent capacity limits (i.e., $\overline{X}_i^u$(II)'s and $\overline{X}_i^L$(II)'s) were utilized.[3] In all, four free trade solutions were obtained. In Table I, the specific set of international prices and output capacity limits utilized in each solution are listed: the first column contains the numbers which identify the solutions, and in the second and third columns, the sets of international prices and capacity limits used in each of the free trade solutions are listed respectively.

Classification of the Sectors

To repeat the classification of the traded good sectors according to whether they produce exportables or importables will be helpful in following the rest of this chapter (it was already done in Chapter II). Sectors 1 through 41, out of a total of 50 sectors, produce tradable commodities. Sector 1 through 10 are primary sectors, of which the Industrial Crops (sector 1), Nuts (sector 5), and Other Mining (sector 10) sectors produce traditional export commodities, including tobacco and cotton (sector 1),

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[3]See the section on output capacity constraints in Chapter IV.

TABLE I. Alternative Free Trade Solutions.

Free Trade Solutions	International Prices[1]	Output Capacity Limits[2]
I. 1	$\overline{P}_i^w$(I)'s	$\overline{X}_i^u$(I)'s and $\overline{X}_i^L$(I)'s
I. 2	As in I. 1	$\overline{X}_i^u$(II)'s and $\overline{X}_i^L$(II)'s
II. 1	$\overline{P}_i^w$(II)'s	$\overline{X}_i^u$(I)'s and $\overline{X}_i^L$(I)'s
II. 2	As in II. 1	$\overline{X}_i^u$(II)'s and $\overline{X}_i^L$(II)'s

[1] $\overline{P}_i^w$(I)'s refer to the first set of international prices, and $\overline{P}_i^w$(II)'s refer to the second set of international prices (see Table IV of Chapter IV).

[2] $\overline{X}_i^u$(I)'s and $\overline{X}_i^L$(I)'s are the 10 percent capacity limits (for i = 1, . . ., 41): $\overline{X}_i^u$(I)'s were determined by taking 110 percent (105 percent for agricultural sectors) of the 1967 actual output levels, and $\overline{X}_i^L$(I)'s were determined by taking 90 percent (95 percent for agricultural sectors) of the actual output levels. $\overline{X}_i^u$(II)'s and $\overline{X}_i^L$(II)'s are the 20 percent capacity limits, and they were derived similarly, taking 120 and 80 percent of the actual output levels respectively, (for agricultural sectors percentages are 110 and 90, respectively). See Table II in Chapter IV for the values of capacity limits.

hazelnuts (sector 5), and chrome and copper (sector 10). The rest of the primary sectors produce commodities which are exported in limited quantities. The rest of the sectors which produce tradables are manufacturing sectors: among these, the food processing sectors (sectors 13, 14, and 15), some of the textile sectors (sectors 16, 18 and 19), Wood Products, Leather and Leather Products, Ceramics, Glass and Non-Metallic Products, Iron-Ore Mining, Coal Mining, and Animal Slaughtering sectors produce commodities which are exportables. The remaining manufacturing sectors produce tradables which are import-substitutes.

B. OPTIMUM SOLUTIONS AND ANALYSIS OF THE RESULTS

In this section, the free trade optimum solution results are presented and analyzed. Then, the free trade optimum solution values of the endogenous variables of the system (both the primal and dual variables) are compared with their 1967 actual values so as to find quantitative answers to the questions raised in Chapter I. It should be pointed out that the 1967 levels of the macro-variables and prices, with which we are concerned, are derived from the

augmented 1967 Turkish input-output table; they are not from the national income accounting statistics. Thus, on the one hand, we have an input-output table which represents the Turkish economy of 1967; i.e., the levels of macro-variables were determined under the restricted trade conditions of 1967. Also, the table was constructed with the implicit assumption that the economy operated under perfectly competitive market conditions. Consequently, the unit profit levels are zero, and the prices which establish the competitive profit conditions[4] are the tariff inclusive unitary domestic prices. On the other hand, we have a linear-programming model, and for its application the fixed production coefficients of the input-output table were utilized;

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[4] The competitive profit conditions of the augmented input-output table are represented by the equalities

$$\bar{P}_j^d - \sum_{i=1}^{50} a_{ij}\bar{P}_i^d - l_j\bar{w} - k_j\bar{r} - m_j\,(1+t_j^m) = 0, \quad j = 1, \ldots, 50$$

where $\bar{P}_j^d$'s are the tariff inclusive unitary domestic prices (i.e., $\bar{P}_j^d = 1$, for all $j = 1, \ldots, 50$), $\bar{w}$ is the 1967 wage rate and $\bar{r}$ is the 1967 rental rate on the non-labor primary factor services, and t_j^m is the tariff rate on the c.i.f. international value of the non-competitive imported inputs (i.e., m_j's) used for producing one unit of the jth commodity. a_{ij}'s, l_j's, k_j's and m_j's are the same coefficients that also appear in the model (see Chapter III for their definitions).

also, the constants on the right hand side of the inequality constraints were derived from the input-output table. Furthermore, the input-output values of the macro-variables satisfy the constraints of the model, except the output capacity constraints, as equalities, and as such they constitute a feasible solution to the model, with the consumption scalar having a value of one.

Hence, the free trade optimum solution values and the 1967 input-output values of the macro-variables are comparable. The former set of values were obtained assuming that the economy operated under the conditions of perfect competition and free trade. The input-output levels of the macro-variables are the values realized under the restricted trade conditions of 1967. The comparison of the two sets of values will then indicate the differences which are attributable to the change in the trade regime, i.e., to the changes in the relative commodity prices resulting from the elimination of tariffs.

First, the free trade optimum solution values of the dual variables corresponding to the primary factor constraints, i.e., the wage rate, w, and rental on the non-labor primary factors, r, are compared with their

1967 levels. Since both systems (the model and the input-output table) represent an economy which is assumed to operate under perfect competition, the two sets of wage and rental rates are the equilibrium rates corresponding to the two trade regimes (i.e., free trade and restricted trade), and they represent the opportunity prices of the corresponding primary factors. By comparing the free trade and 1967 values of the wage-rental ratio, we can determine the proportionate change in the relative factor price ratio (i.e., $d(w/r) / w/r$) which might take place because of the change in the trade regime. The sign of the proportionate change in the relative factor prices will indicate the direction of likely change, caused by the gradual tariff eliminations, in the relative factor price. Also, the free trade and 1967 restricted trade values of the nominal and real wage and rental rates are compared. The directions of the proportionate changes in the nominal and real factor prices are utilized to estimate the magnitude of the Stolper-Samuelson effect,[5] and hence, to determine the

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[5] Wolfgang F. Stolper and P. A. Samuelson, "Protection and Real Wages," Review of Economic Studies, 9 (Nov. 1941), pp. 58-73.

possible income distribution effects of Turkey's gradual move toward free trade with the EEC.

Secondly, the competitive commodity equilibrium prices of the free trade optimum solutions are examined and compared with the 1967 restricted trade unitary domestic prices. Here, the main emphasis is on the comparison of the free trade competitive equilibrium relative prices of home goods with their relative prices under the restricted trade conditions of 1967. That comparison indicates the direction of likely changes in the relative prices of home goods upon the gradual elimination of tariffs.

Thirdly, the traded good sectors are ranked by their international competitiveness under the free trade conditions. The ranking is based upon the free trade optimum solution values of the dual variables u_i's and v_i's, i.e., the unit profit and loss levels of the traded good sectors, which result from the utilization of upper and lower capacity limits respectively. The relative positions, in the ranking, of the traded good sectors are to be utilized in determining the production lines in which Turkey might have a comparative advantage in free trade with the EEC.

The resource-pull effects of the tariff cuts are examined by comparing the free trade optimum solution values of the output levels and their corresponding 1967 levels. Then, the free trade optimum solution value of the consumption scalar, λ, is compared with its unitary 1967 value; the difference between the former and the latter value of is utilized as an estimate of Turkey's gain (or loss) from free trade with the EEC. The estimate is then compared with the estimates of Great Britain's gain from joining the Common Market. Finally, the free trade optimum solution values of output, consumption, export, and import levels are examined. In the last section, the basic conclusions of the study are summarized.

1. The Free Trade Optimum Solution Values of the Dual Variables

a. The shadow prices of foreign exchange, labor, and non-labor primary factors[6]

The free trade optimum solution values of the balance of payments constraint and of the primary factor constraints

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[6] The "non-labor primary factors" correspond to the services of capital stock, $\bar{K}$, in the model. The former term is used here, because the primary factor coefficients and the (continued on next page)

are the equilibrium prices which would be realized if the economy operated under the perfectly competitive and free trade conditions described in the model. Since these prices reflect the competitive market equilibrium prices of these factors, they are also the unit opportunity costs of these resources.

The shadow prices of foreign exchange, non-labor primary factors, and labor are presented in Table II-A. As seen in the first row of the table, the shadow price of foreign exchange (i.e., a unit of U. S. dollars) is equal to one in all free trade solutions; as explained in Chapter III (p.177), the unitary shadow price for foreign exchange is built into the model.

Nominal and Real Rental Rates

In the second row of Table II-A, the free trade solution values of the shadow price of TL 1 million worth of non-labor primary factor services (at 1967 fixed prices) are listed. In all free trade solutions, its value is less

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corresponding fixed endowment used in place of capital services, in the application, represent all the non-labor primary factor services. However, the services of non-labor primary factors can also be thought as a proxy variable for the services of capital stock (see Chapter IV, p.220 for an explanation). Nevertheless, in the discussion of the results, the term "non-labor primary factor services" is used.

TABLE II-A. The Shadow Prices of Foreign Exchange, Labor and Non-Labor Primary Factors Services (units are in millions of Turkish Lira).

	The Free Trade Optimum Solution Values				The 1967 actual values
	I.1	I.2	II.1	II.2	
Foreign Exchange: δ	1.00	1.00	1.00	1.00	
Non-labor primary factor services: r, rental	.953	.679	.949	.825	1.00
Labor services: w, wage rate	.984	1.092	.986	1.034	1.00
The wage-rental ratio: w/r	1.033	1.608	1.039	1.254	1.00
The proportionate change in the relative factor price: d(w/r)/w/r[1]	.033	.608	.039	.254	

[1] d(w/r) is the difference between the free trade and 1967 restricted trade values of the relative factor price, and the denominator (i.e., w/r) is the 1967 value of the relative factor price, and it equals one.

than one; TL .953 million in the solution I. 1, TL. 679 million in the solution I. 2, TL .949 million in the solution II. 1, and TL .825 million in the solution II. 2. In the solutions I. 1 and II. 1, for which the 10 percent capacity limits were utilized, the shadow price of the non-labor primary factor services (or the free trade nominal rental rates) is larger than its value in the solutions I. 2 and II. 2, both of which utilized the 20 percent capacity limits. The reason for the latter difference in the value of the nominal rental rate between the two sets of solutions is that the demand for the non-labor factor services is larger when the 10 percent capacity limits are applied. This is because, as will be seen below, all import-substituting manufacturing sectors produce at the lower output limits in all four free trade solutions, and as a consequence, the solution output levels (which are all at lower limits) of these sectors are higher when the 10 percent capacity limits are applied; and, since the import-substituting sectors are relatively more intensive in non-labor factor services,[7] the demand for this factor

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[7] The factor-intensity coefficients of the traded good sectors are presented in Table III in Appendix B. The latter coefficient for each traded good sector equals the ratio of the corresponding sector's non-labor factor coefficient (i.e., k_j) over the labor coefficient (i.e., l_j). Thus, if k_j/l_j is larger than k_i/l_i, then the jth sector is considered relatively more intensive in the non-labor factor services than the ith sector.

is larger in the solutions I. 1 and II. 1, and hence the nominal rental rate is larger. The 1967 actual level of rental rate on TL 1 million worth of non-labor factor services, however, is again TL 1 million (see the fifth column of Table II-A); this is true by the definition of total fixed supply of non-labor factor services used in the model.[8] Hence, the solution results indicate that the level of the nominal rental rate would decline with the elimination of tariffs.

More important is of course the change in the real rental rate. In the second row of Table II-B, the real rental rates corresponding to each free trade solution and the 1967 unitary real rental rate on the non-labor primary factor services are presented; their values were determined by utilizing a weighing method (which is explained in a footnote under Table II-B). The weighted average free trade real rental rate is 1.164, .83, 1.141, and .992 in the free trade solutions I. 1, I. 2, II. 1, and II. 2 respectively. Since, the nominal rental rates are higher in the solutions I. 1 and

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[8] Chapter III, p. 157, and Chapter IV, p.221 .

TABLE II-B. The Free Trade and 1967 Restricted Trade Values of the Real Wages and Rental Rates.[1]

	The free trade values				The 1967 restricted trade values
	I.1	I.2	II.1	II.2	
Real wage rate	1.203	1.333	1.185	1.243	1.00
Real rental rate	1.164	.830	1.141	.992	1.00
The wage-rental ratio	1.033	1.606	1.039	1.253	1.00

[1] The real wage and rental rates are determined by applying the following weighting procedures:

$$\text{real wage rate} = \sum_{i=1}^{50} \left\{ w/\overline{P}_i^w \; \frac{\overline{P}_i^w \, \overline{C}_i}{\sum_{i=1}^{50} \overline{P}_i^w \, \overline{C}_i} \right\}$$

where w is the nominal wage rate, $\overline{P}_i^w$'s are the free trade equilibrium commodity prices, and $\overline{C}_i$'s are the 1967 final-consumption quantities. Thus, the second term in the parenthesis constitutes the weights and they are the proportions of the free trade values of the final-consumption quantities in total final-consumption spending (expressed at the free trade prices). Similarly,

$$\text{real rental rate} = \sum_{i=1}^{50} \left\{ r/\overline{P}_i^w \cdot \frac{\overline{P}_i^w \, \overline{C}_i}{\sum_{i=1}^{50} \overline{P}_i^w \, \overline{C}_i} \right\}.$$

For determining the 1967 restricted trade values of the real wage and rental rates, the unitary restricted trade equilibrium prices were used.

II. 1 (because of the reasons explained above) than their values in the other two solutions, the real rental rate is also higher in the solutions I. 1 and II. 1 tha they are in the solutions I. 2 and II. 2. Also, the free trade values of the real rental rates derived from the solutions I. 1 and II. 1 -- 1. 164 and 1. 141 -- are higher than its 1967 unitary value. This is because, in these two solutions, the nominal rental rate is lower than its 1967 unitary level by about 5 percent, whereas the free trade commodity equilibrium prices (i. e., nominal prices) are generally 30-40 percent lower than their 1967 unitary levels. Hence, the free trade real rental rate is larger than one in the solutions I. 1 and II. 1. Whereas the free trade values of the real rental rate derived from the solutions I. 2 and II. 2 (which utilized the 20 percent capacity limits) are lower than its 1967 unitary restricted trade value. Here, the reason is that in these latter solutions, the free trade nominal rental rates were much smaller than the 1967 unitary rental rate, and since the decrease in the nominal rental rate in these two solutions was proportionately larger than the decrease in the nominal price levels (in absolute terms), the real rental rate is less than unitary.

Nominal and Real Wage Rates

The free trade solution values of the nominal wage rate are TL .984 million in the solution I. 1, TL 1.092 million in the solution I. 2, TL .986 million in the solution II. 1, and TL 1.034 million in the solution II. 2 (see Table II-A, third row), compared to a wage rate of TL 1 million under the restricted trade conditions of 1967. Thus, the nominal wage rate is less than the 1967 unitary wage rate in the solutions I. 1 and II. 1 (which utilized the 10 percent capacity limits), and it is larger than the 1967 unitary wage rate in the solutions I. 2 and II. 2 (which utilized the 20 percent capacity limits). The reason for a larger than unitary wage rate in the latter two solutions is that the demand for labor services is relatively larger in these two solutions since, as will be seen below, there are more export-oriented sectors (which are generally labor-intensive[9]) producing at the upper output limits in the solutions I. 2 and II. 2 than there are in the solutions I. 1 and II. 1.[10] Therefore,

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[9]See Table III in Appendix B, for the factor intensities of these sectors.

[10]The Forestry Products, Knitting Industry, Leather and Leather Products, Animal Slaughtering sectors are producing at the lower output limits in the solutions I. 1 and II. 1, the solutions with the 10 percent capacity limits, and they are producing at the upper output limits in the solutions I. 2 and II. 2, which utilized the 20 percent capacity limits.

the demand for labor services is relatively larger in the solutions I.2 and II.2, which utilized the larger -- 20 percent -- capacity limits, and thus the nominal wage rate is also larger than its values in the other two solutions and in 1967.

The free trade and 1967 restricted trade real wage rates are presented in the first row of Table II-B. They were determined by utilizing the same weighting method used for determining the real rental rates (see the footnote under Table II-B). As seen, the free trade real wage rates are all larger than the unitary 1967 real wage rate. This is an expected result, however, since the free trade nominal wage rates are almost equal to or larger than TL 1 million, and the free trade absolute (nominal) commodity price levels are generally lower than the 1967 unitary price levels.

Relative Factor Prices: The Wage-Rental Ratio

The values of the free trade and 1967 restricted trade wage-rental ratio are listed in the fourth row of Table II-A. They were determined by dividing the nominal wage rates with the corresponding nominal rental rates. In contrast with the 1967 unitary wage-rental ratio, the free trade values of the wage-rental ratio are all larger than one:

1.033, 1.608, 1.039, and 1.254 in the solutions I.1, I.2, II.1, and II.2 respectively.[11] The free trade wage-rental ratio is particularly large in the solutions I.2 and II.2 since, as explained above, expansion of the demand for labor (and consequently the absolute increase in the nominal wage rate) is relatively larger in these two solutions than in the solutions I.1 and II.1. In the third row of Table II-A, the proportionate changes in the wage-rental ratio are given for each free trade solution, they are: .033, .608, .039, and .254 respectively. They are all positive, which strongly indicates that the relative factor price would change in favor workers, if Turkey moved gradually toward full membership in the EEC.

Possible Income Redistribution Effects of Tariff Eliminations in Turkey

On the basis of the solution results examined above, concerning the direction of changes (as a result of the change in the Turkish trade policy vis-a-vis the EEC countries) in

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[11] Note that the free trade wage-rental ratios presented in the third row of Table II-B (which were determined by dividing the real wage rate with the real rental rate) are equal to those presented in Table II-A, except for the negligible differences resulting from rounding off the figures.

the nominal and real wage and rental rates, and in the wage-rental ratio, the following conclusion can be derived (assuming the fixed production coefficients of 1967); if Turkey moved gradually toward full membership in the Common Market, relative factor prices would change in favor of labor in Turkey, and also, if the expansion in the exporting sectors and the contraction in the import-substituting sectors were in the order of 20 percent (or more) of the 1967 production levels, then the nominal and real wage and rental rates would change in the opposite directions compared to their 1967 restricted trade levels. Both the nominal and real wage rates would increase, and in contrast, the nominal and real rental rates on the non-labor primary factor services would decline.

Hence, the results indicate that the income distribution in Turkey would change in favor of wage earners, if Turkey moved gradually toward full membership in the EEC. This result is in accordance with the basic conclusion of the Stolper-Samuelson theorem, which states that an increase in the relative price of a commodity increases the real return to the factor used intensively in its production under certain

conditions.[12] Here, the free trade equilibrium prices of exportables (relative to the prices of importables) are higher than their 1967 levels under protection. As will be seen below, as a result of a rise in their relative prices, the sectors which produce exportables expanded and import-substitute sectors contracted under free trade. The expansion in the former group of sectors increased the demand for labor services, since these sectors are labor-intensive. On the other hand, the contraction of import-substitute sectors released relatively more non-labor factor services than the amount demanded by the expanding export sectors. Consequently, the increased demand raised the equilibrium level of return to labor. Also, since the absolute nominal commodity

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[12]The theorem was originally developed, utilizing a two-commodity two-factor model, in Wolfgang F. Stolper and P. A. Samuelson, "Protection and Real Wages," op. cit.. There have been several attempts to generalize the theorem; references can be made to the following studies: Ronald W. Jones, "The Structure of Simple General Equilibrium Models," Journal of Political Economy, 73 (December, 1965), pp. 557-572; John S. Chipman, "Factor Price Equalization and the Stolper-Samuelson Theorem," International Economic Review, 10 (October, 1969), pp. 399-406; Murray C. Kemp and Leon L. F. Wegge, "On the Relation Between Commodity Prices and Factor Rewards," International Economic Review, 10 (October, 1969), pp. 406-413; Murray C. Kemp and Leon L. F. Wegge, "Generalizations of the Stolper-Samuelson and Samuelson-Rybczynski Theorems in Terms of Conditional Input-Output Coefficients," International Economic Review, 10 (October, 1969), pp. 414-425.

price levels are lower under free trade than their 1967 unitary levels, the real wage rate is larger under free trade.

It should be pointed out that if altered factor prices become a reality, producers normally try to substitute cheaper factor(s) for the now expensive factor, after a change in the relative factor prices. Of course, this leads to changes in the factor proportions. In this study, however, fixed factor proportions were assumed, and hence the model does not examine the effects of changes in the relative factor reward upon the factor proportions. Nevertheless, in the Conclusion Section, the likely effects of changes in the relative factor prices upon the present factor proportions are discussed.

b. The Free Trade Equilibrium Commodity Prices

The Free Trade Equilibrium Prices of Traded Goods.

The optimum solution values of the dual variables corresponding to the commodity material balance constraints (i.e., P_i's) are presented in Table III. The values of these dual variables, for the same commodity, are equal in the free trade solutions I.1 and I.2, and in the solutions II.1 and

TABLE III. The Free Trade Equilibrium Prices of Traded Goods (units are in million T. L.).

	Free Trade Solutions	
	I. 1 and I. 2	II. 1 and II. 2
	(1)	(2)
1. Industrial Crops	.99	.99
2. Wheat, other cereals, hay, etc.	.95	.95
3. Fruits	.93	.93
4. Citrus Fruits	.95	.95
5. Nuts	1.00	1.00
6. Vegetables	.95	.95
7. Forestry Products	.83	.87
8. Livestock	.95	.95
9. Fishing	.95	.95
10. Other Mining	.83	.83
11. Sugar	.41	.41
12. Alcoholic Beverages	.41	.41
13. Milk industry -Canned Good	.98	.98
14. Olive oil, seed oils, Fats	.80	.87
15. Other Food Sector	.91	.93
16. Cotton Textile	.75	.87
17. Wool Textile	.75	.87
18. Knitting Industry	.78	.83
19. Other Textile	.71	.80
20. Clothing Industry	.53	.67
21. Wood Products	.60	.74
22. Paper, printing, stationeries	.47	.47
23. Leather, and Leather Products	.80	.87
24. Rubber, Plastics, and Products	.30	.30
25. Chemicals and Pharmaceuticals	.48	.48
26. Fertilizers	.50	.50
27. Petroleum Refineries, Coal Products	.27	.27
28. Ceramics, Glass, and other non-metal. Pro.	.77	.83

TABLE III. (continued)

		(1)	(2)
29.	Cement	.44	.44
30.	Iron and Steel	.41	.41
31.	Non-ferrous Metal	.56	.56
32.	Metal Products	.45	.45
33.	Agri. and non-elect. Mach.	.49	.49
34.	Elect. Mach. & Appliances	.48	.48
35.	Transp. equip., Mainter Repairs	.45	.45
36.	Crude Petroleum	.19	.19
37.	Iron-ore Mining	.88	.88
38.	Coal Mining	.88	.88
39.	Tobacco Processing, Prod.	.80	.80
40.	Animal Slaughtering	.95	.95
41.	Other Transportation	1.00	1.00

II. 2. This is because the first set of exogenous international prices, $\overline{P}_i^w(I)$'s, is used in the solutions I. 1 and I. 2, and the second set, $\overline{P}_i^w(II)$'s, is used in the solutions II. 1 and II. 2. It was shown in Chapter III (p. 178) that the optimum solution value of the dual variable P_i equals the exogenous international price $\overline{P}_i^w$, and since $\overline{P}_i^w$ is the same in the solution I. 1 and I. 2 (and similarly in the solutions II. 1 and II. 2), the optimum solution value of P_i is the same in the two free trade solutions. It was also mentioned that the optimum levels of the dual variables P_i's are the free trade equilibrium prices of the corresponding traded goods. In other words, these would be the equilibrium prices that would prevail if the Turkish economy operated under the purely competitive and free trade conditions described in the model. Thus, the prices listed in the first and second columns are equal to the corresponding exogenous international prices which were presented in Table IV of Chapter IV; we have $P_i = \overline{P}_i^w(I)$, for $i = 1, \ldots, 41$ in the free trade solutions I. 1 and I. 2, and $P_i = \overline{P}_i^w(II)$, for $i = 1, \ldots, 41$, in the free trade solutions II. 1 and II. 2.

The tariff inclusive 1967 domestic prices of traded goods, as will be remembered, are all unity. An examination of the free trade equilibrium relative prices of import-substitutes (relative to the prices of exportables

under the same trade regime) indicates that these prices are lower than their corresponding levels under the restricted trade conditions of 1967. As will be seen below, changes in the relative prices cause changes in the production levels; the effects of the relative commodity price changes upon the absolute and real rates of factor rewards were already discussed above.

The Free Trade Equilibrium Prices of Home Goods

In the model, the prices of home goods are endogenous (see Chapter III), and the solutions to the model generate an equilibrium set of prices for the home goods, the prices which would exist under the purely competitive and free trade conditions described in the model. The procedure whereby the solutions generate an equilibrium set of prices for home goods was explained in the last section of Chapter III: for an initial optimum solution, an arbitrary set of non-trivial home good prices are plugged into the primal objective function, and a solution is obtained. If the optimum values of the dual variables which correspond to the home goods are equal to those prices which were inserted into the objective function, then the latter prices are the equilibrium prices. If the corresponding prices in the two sets (i.e.,

the initial price set and the dual prices) are not equal, we solve the system again by plugging the solution values of the dual variables corresponding to the home goods into the primal objective function. This procedure continues until the equality of home good prices in the objective function and the corresponding dual variables is obtained.

The absolute levels of the free trade equilibrium prices of home goods derived from the procedure explained above, for each free trade solution, are presented in Table IV-A. They are the optimum solution values of the dual variables corresponding to home goods. Noting that the 1967 restricted trade equilibrium prices of home goods are all unity, examination of the table indicates that the free trade equilibrium prices of home goods are all less than unity in all four free trade solutions. This is because: (1) the free trade equilibrium prices of almost all traded goods are less than unity, and since some of the traded goods are used as intermediate inputs in the production of home goods, consequently the free trade competitive equilibrium prices of home goods are reduced due to the decline in their unit production costs; also, (2) the free trade nominal rental rate is lower than the 1967 unitary rental rate (see the last

TABLE IV-A. The Free Trade Equilibrium Prices of Home-Goods (generated by the optimum solutions to the model). (units are in million T. L.)

	Free Trade Solution Results			
	I. 1	I. 2	II. 1	II. 2
42. Professions-Personal Services	.90	.72	.91	.82
43. Railway Transportation	.83	.86	.85	.86
44. Trade	.88	.75	.88	.83
45. Banking-Insurance-Coop.	.93	.93	.93	.93
46. Public Services	.95	.77	.95	.87
47. Electricity Generation, Trans.	.85	.76	.85	.81
48. Communications	.93	.90	.93	.92
49. Construction	.77	.73	.78	.76
50. Ownership of Dwellings	.94	.68	.94	.82
Nominal free trade wage rate	.98	1.09	.99	1.03
Nominal rental on non-labor primary factor services	.95	.68	.95	.83

[1] The solution results were rounded off to two decimal points.

row in Table IV-A), and in two of the free trade solutions, the nominal wage rate is very close to, but less than, unity (see the tenth row of Table IV-A). In the other two free trade solutions, the wage rate is above the 1967 unitary wage rate by 9 and 3 percent, but the latter increases in the wage rate are more than matched by the fall in the nominal rental rates in the corresponding free trade solutions, thus leading to a reduction in the unit production costs of home goods under free trade.

The differences among the four free trade solution values of the free trade equilibrium price of a home good can partially be explained in terms of the primary factor intensities of home good sectors. For example, the Professions-Personal Services, Trade, Public Services, Electricity Generation, Ownership of Dwellings sectors are relatively more intensive in non-labor primary factor services, and as a consequence their free trade equilibrium prices in the solutions I.2 and II.2 are lower than the corresponding prices in the solutions I.1 and II.1 since in the former two solutions the nominal rental rate on non-labor factor services is smaller than its values in the solutions I.1 and II.1. Whereas, the Railway Transportation sector is a labor-intensive

sector in the application, and since the free trade equilibrium wage rate is higher in the solutions I. 2 and II. 2 than its value in the solutions I. 1 and II. 1, the free trade equilibrium price of this home good is higher in the solutions I. 2 and II. 2 than its level in the solutions I. 1 and II. 1.

The above results concerning the less than unitary free trade equilibrium prices of home goods, contrasted with their 1967 unitary levels, suggest that a change in the tariff structure of a country would not only change the absolute levels of the supply prices of home goods, through the changes in their unit production costs, but also the relative prices of home goods (relative to the prices of traded goods) because of the differences in the factor-intensities and differences (among the home good sectors) in the degree to utilization of traded goods as inputs; of course, it should be pointed out that the above discussion assumes that the final consumption pattern does not change after a change in the tariff structure, which is what we assumed in the model. The free trade relative prices of home goods are presented in Table IV-B. For each free trade solution, home good prices are expressed relative to the prices of exportables in the first

TABLE IV-B. The Free Trade Relative Prices of Home Goods (relative to the prices of exportables and importables).[1] (units are in million T.L.)

	Free Trade Solutions							
	I.1		I.2		II.1		II.2	
Sectors	Home good/ exportable relative prices	Home good/im-portable relative prices	Home good/ex-portable relative prices	Home good/im-portable relative prices	Home good/ex-portable relative prices	Home good/im-portable relative prices	Home good/ex-portable relative prices	Home good/im-portable relative prices
42	.99	1.23	.77	.99	1.00	1.25	.88	1.12
43	.91	1.14	.92	1.18	.93	1.16	.92	1.18
44	.97	1.21	.81	1.03	.97	1.21	.89	1.14
45	1.02	1.27	1.00	1.27	1.02	1.27	1.00	1.27
46	1.04	1.30	.83	1.05	1.04	1.30	.93	1.19
47	.93	1.16	.82	1.04	.93	1.16	.87	1.11
48	1.02	1.27	.97	1.23	1.02	1.27	.99	1.26
49	.84	1.05	.78	1.00	.86	1.07	.82	1.04
50	1.03	1.29	.73	.93	1.03	1.29	.88	1.12

[1] In order to determine the relative home good prices (relative to the prices of exportables and importables), the free trade nominal equilibrium prices of home goods (presented in Table IV-A) were divided by a weighted average price of exportables, to derive the home good/exportable relative prices, and were divided by a weighted average price of importables, to determine the home good/importable relative prices. The weighted average price of exportables was determined by utilizing the formula:

TABLE IV-B. (continued)

$$\overline{P}^E = \sum_i \left\{ \overline{P}_i^w \cdot \frac{\overline{P}_i^w C_i}{\sum_i \overline{P}_i^w C_i} \right\}$$

where i includes only the export sectors, $\overline{P}_i^w$'s are the exogenous international prices of exportables, C_i's are the free trade final consumption quantities of exportables, and $\overline{P}^E$ is the weighted average price level of exportables. A weighted average price level for importables was calculated similarly, except that, in the formula, i included only the import-substituting sectors.

column, and relative to the prices of importables in the second column; the methodology utilized in determining the home good/exportable and home good/importable relative prices is explained in a footnote under Table IV-B. Noting that the 1967 relative home good prices (relative to the prices of both exportables and importables) are all unity, the following results can be observed from the table: (1) the free trade home good prices are higher when they are expressed relative to the prices of importables than they are when expressed relative to the prices of exportables, and (2) generally, the free trade relative home good prices are larger than unity when home good prices are expressed relative to importable good prices, and they are less than unity for some home goods and unity or larger than unity for others, when these prices are expressed relative to the prices of exportables.

On the basis of the above results, it can be concluded that, upon Turkey's entry into the Common Market, the absolute levels of home good prices are likely to decline, under the fixed technology of 1967; however, the relative prices of home goods might change in either direction. Results indicate that home good prices would decline

relative to the prices of exportables and they would rise relative to the prices of importables.[13]

c. The Shadow Prices of the Capacity Constraints and the International Competitiveness of Traded Good Sectors

As shown in Chapter III, the shadow prices of (or the optimum solution values of the dual variables corresponding to) the capacity constraints -- u_i's and v_i's -- indicate the potential unit profit or loss level in each traded good sector under free trade conditions with the technical coefficients existing in 1967. Thus, if u_i is positive, it means that the ith traded good sector is producing at the upper output limit, and the value of u_i equals the difference between the free trade equilibrium price of the ith traded good, P_i (which is equal to the exogenous international price $\overline{P}_i^w$), and its unit production cost under free trade; hence, u_i equals the unit profit (or rent) level in the ith sector resulting from the

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[13] This result also supports Johnson's conclusion which, in summary, states that the relative prices of home goods might change in either direction as a result of changes in tariff rates: Harry G. Johnson, "A Model of Protection and the Exchange Rate," Review of Economic Studies, XXXIII (2), No. 94 (April, 1966), pp. 159-163 (see p. 163 for the statement).

utilization of the upper capacity limit. Positive u_i also indicates that the ith traded good sector has strong international competitiveness. On the other hand, if v_i is positive, then it implies that the ith sector is producing at the lower output limit, and v_i is the difference between the unit production cost of the ith good and its free trade equilibrium price, P_i (or $\overline{P}_i^w$). Hence, v_i equals the unit loss (or subsidy) level in the ith traded good sector, and it also indicates that the ith sector has relatively lower international competitiveness under free trade with the fixed technology of 1967.

The free trade optimum solution values of u_i's and v_i's and their relation to the unit production costs and equilibrium prices can also be explained by utilizing partial equilibrium diagrams; this approach will also improve the understanding of the free trade optimum solution results and simplify the competitive profit relationships described above. Fig. V-1 (a) describes the free trade equilibrium in the ith domestic traded good market, when the domestic production takes place at the upper output limit (i.e., $\overline{X}_i^u$) and the net output (net of the intermediate use) is larger

than the final consumption demand (i.e., $C_i = \overline{C}_i \lambda$). OY gives the net output level, and OC gives the final consumption level; note that at point Y, the net output level corresponds to the gross output level $\overline{X}_i^u$. The vertical CD line implies that the price elasticity of final consumption demand for the ith traded good is zero, reflecting the assumption of proportionality in final consumption. The horizontal distance between the vertical (price) axis and the vertical line CD, which determines the final consumption level at point C, is equal to the 1967 final consumption level of the ith good, $\overline{C}_i$, multiplied by the optimum solution value of the consumption scal· λ. KK' is the perfectly elastic foreign supply curve, and its vertical distance to the horizontal (quantity) axis is equal to the exogenous international price level, $\overline{P}_i^w$. The later price, as shown earlier, also equals the domestic free trade equilibrium price of the ith traded good. The LL' line is the unit production cost line; its vertical distance to the horizontal axis represents the unit production cost level in the ith traded good sector under free trade. As shown in the diagram, the unit cost levels equal P_i minus u_i, where u_i is the unit profit (or rent) level resulting from the utilization of the upper

Fig. V-1. The Free Trade Optimum Solution Results: Equilibrium in the ith Domestic Traded Good Market

(a) Optimum output level is at the upper limit

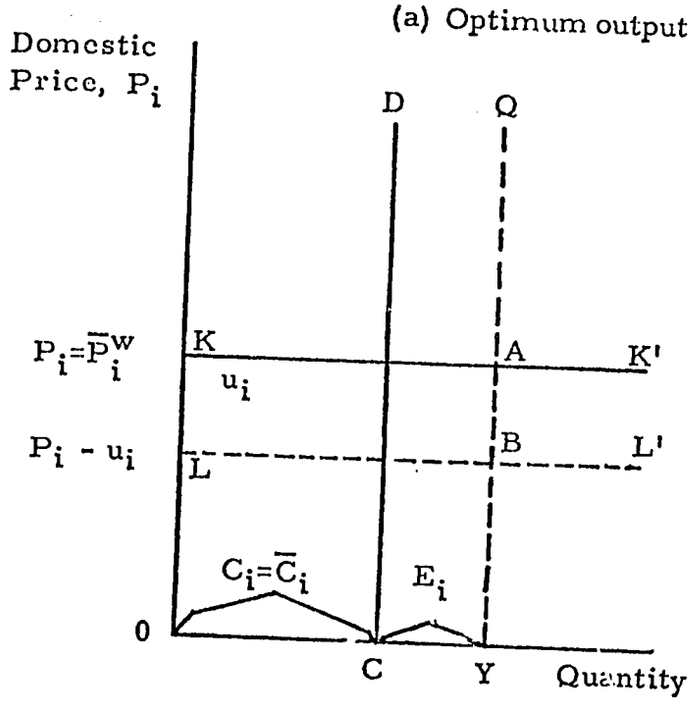

Fig. V-1 (a)

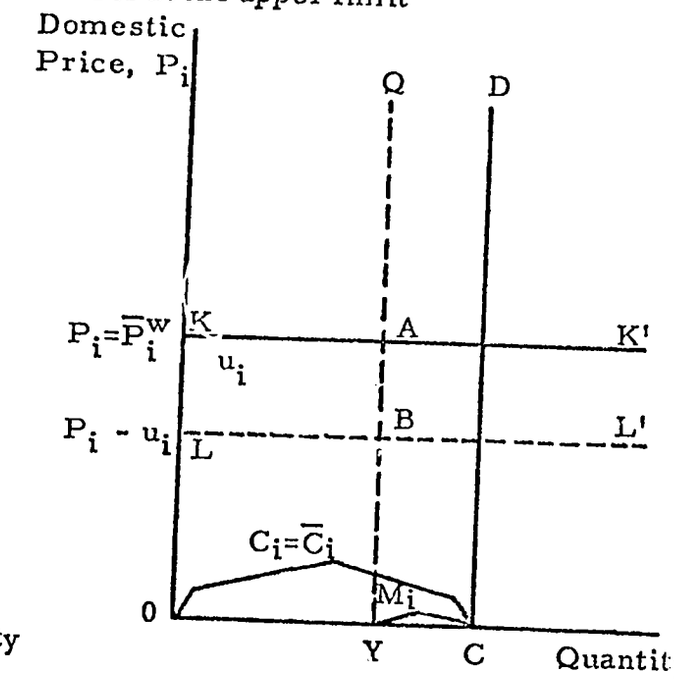

Fig. V-1 (b)

(b) Optimum output level is at the lower limit

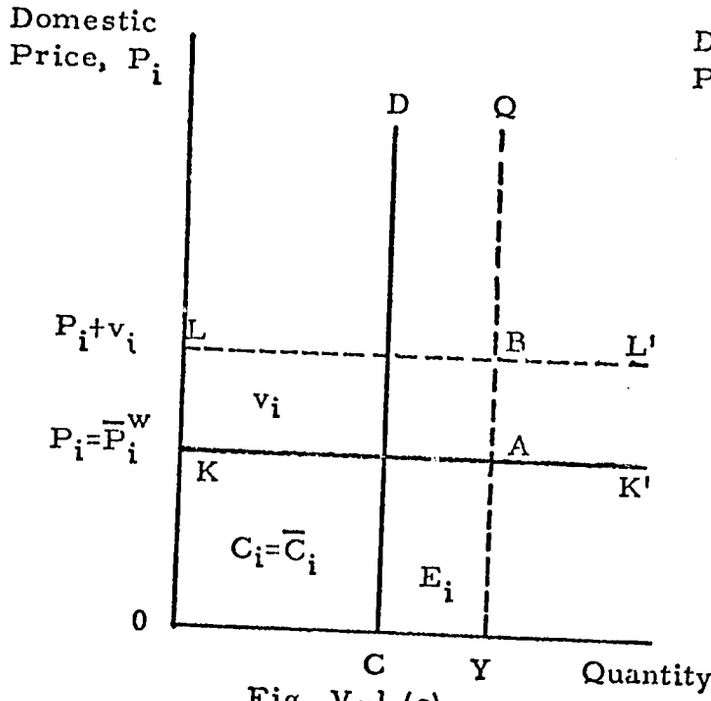

Fig. V-1 (c)

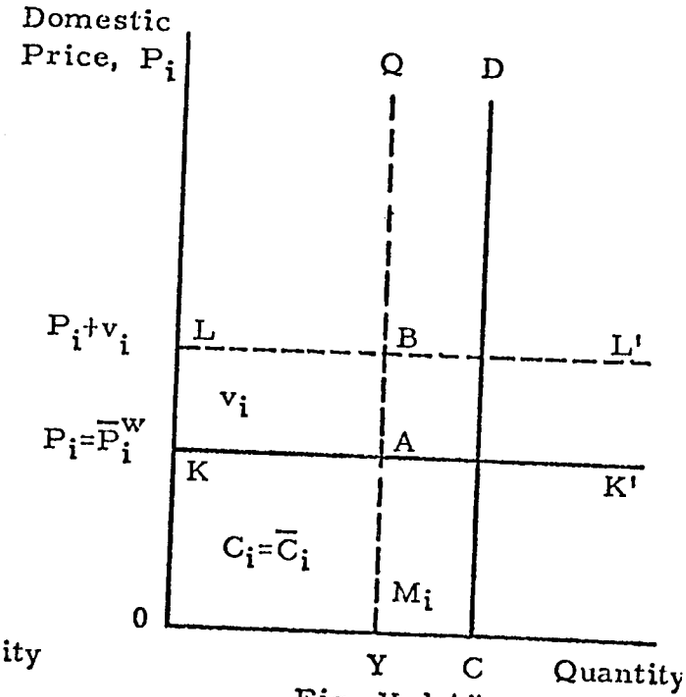

Fig. V-1 (d)

capacity limit $\overline{X}_i^u$. CY gives the amount of the ith good to be exported at $\overline{P}_i^w$. In Fig. V-1 (b), a similar situation is presented, except that the net output level of the ith traded good at point Y, which corresponds to the gross output level $\overline{X}_i^u$, is less than the final consumption demand at point C (i.e., the quantity C_i which equals $\overline{C}_i \lambda$). Thus, YC gives the amount of the ith good to be imported at $\overline{P}_i^w$

In Fig. V-1 (c) and Fig. V-1 (d), the free trade optimum equilibrium of a traded good sector which produces at the lower output limit is described. In both figures, the unit production cost line, LL', is above the free trade equilibrium price line, KK', indicating that v_i is positive and the unit production cost in the ith traded good sector is above the free trade equilibrium price, P_i (or $\overline{P}_i^w$). v_i is the unit loss (or subsidy) level in this sector, resulting from producing at the lower output limit; it indicates that this sector is less competitive under free trade, and positive production without any unit loss would require production subsidy under the technical coefficients of 1967. Fig. V-1 (c) describes a case where the domestic net production level at Y, corresponding to the gross output level $\overline{X}_i^L$, is larger than the final consumption demand at C (i.e., $\overline{C}_i \lambda$). Thus, CY amount of the ith good

is to be exported. In Fig. V-1 (d), an opposite case is presented, i.e., the net output level is less than the domestic final consumption demand, and thus YC amount of this good is to be imported at $\overline{P}_i^w$.

Table V contains the shadow prices of the capacity constraints -- u_i's and v_i's -- for each free trade solution. Letters U, L, and B indicate the capacity limits utilized. If letter U follows a shadow price, the corresponding sector is producing at the upper output limit and the shadow price is the value of the unit profit (or rent) level u_i (i.e., the excess of the free trade equilibrium price over the free trade unit production cost). Letter L identifies the sectors which are producing at the lower output limits, thus the shadow price which precedes L is the unit loss (or subsidy) level, v_i (or the excess of unit production cost over the relevant free trade equilibrium price). When the output level of a traded good sector is at neither output limit, then the shadow price of both capacity constraints is zero; letter B indicates such cases. An examination of the four free trade solution results indicates that the results do not differ much as far as the capacity utilization is concerned; only the absolute values of the shadow prices of the capacity

TABLE V. The Shadow Prices of Capacity Constraints and the Capacity Utilization in Traded Good Sectors. (values are in units of million T.L.)

	Free Trade Solutions							
	I.1		I.2		II.1		II.2	
1. Industrial Crops	.034	u	.0	B	.034	u	.018	u
2. Wheat, other cereals, hay, etc.	.0	B	.0	B	.0	B	.0	B
3. Fruits	.0	B	.116	u	.0	B	.052	u
4. Citrus fruits	.019	u	.131	u	.019	u	.069	u
5. Nuts	.063	u	.181	u	.063	u	.116	u
6. Vegetables	.046	u	.053	u	.042	u	.045	u
7. Forestry Products	.120	L	.008	u	.078	L	.020	L
8. Livestock	.002	u	.121	u	.002	u	.056	u
9. Fishing	.006	u	.086	u	.006	u	.042	u
10. Other Mining	.106	L	.071	L	.107	L	.091	L
11. Sugar	.536	L	.421	L	.536	L	.484	L
12. Alcoholic Beverages	.485	L	.326	L	.490	L	.418	L
13. Milk industry-Canned Food	.040	u	.132	u	.038	u	.080	u
14. Olive oil, seed oils, Fats	.131	L	.045	L	.069	L	.030	L
15. Other food sector	.005	u	.088	u	.021	u	.059	u
16. Cotton Textile	.110	L	.033	L	.034	L	.0	B
17. Wool Textile	.136	L	.135	L	.143	L	.143	L
18. Knitting Industry	.076	L	.031	u	.030	L	.018	u
19. Other Textile	.136	L	.026	L	.073	L	.023	L
20. Clothing Industry	.313	L	.200	L	.213	L	.162	L
21. Wood Products	.253	L	.166	L	.139	L	.100	L
22. Paper, printing, stationeries	.316	L	.241	L	.320	L	.287	L
23. Leather, and Leather Prod.	.084	L	.004	u	.026	L	.014	u
24. Rubber, Plastics, and Products	.609	L	.499	L	.613	L	.564	L
25. Chemicals, and Pharmaceuticals	.423	L	.297	L	.426	L	.369	L
26. Fertilizers	.432	L	.293	L	.430	L	.367	L
27. Petroleum Refineries, Coal Prod.	.470	L	.298	L	.468	L	.390	L
28. Ceramics, glass, and other non-metal Prod.	.094	L	.028	u	.036	L	.018	u

TABLE V. (continued)

	I. 1		I. 2		II. 1		II. 2	
29. Cement	.382	L	.276	L	.381	L	.334	L
30. Iron and steel	.313	L	.200	L	.312	L	.261	L
31. Non-ferrous metal	.291	L	.166	L	.290	L	.233	L
32. Metal Products	.306	L	.225	L	.306	L	.269	L
33. Agri. and non-elect. Mach.	.286	L	.153	L	.286	L	.226	L
34. Elect. Mach and Appliances	.355	L	.220	L	.354	L	.293	L
35. Transp. equip,, Mainten., Repairs	.304	L	.236	L	.306	L	.276	L
36. Crude Petroleum	.745	L	.513	L	.741	L	.637	L
37. Iron-ore Mining	.046	L	.027	L	.046	L	.037	L
38. Coal Mining	.044	L	.038	L	.046	L	.043	L
39. Tobacco Processing, Products	.151	L	.019	L	.150	L	.090	L
40. Animal Slaughtering	.005	L	.007	u	.004	L	.001	u
41. Other Transportation	.388	u	.480	u	.389	u	.430	u

[1] Letters u, L, and B indicate the capacity utilization in each sector. Letter u identifies the sectors which are producing at the upper capacity limits; thus, the shadow price of a capacity constraint, which precedes letter u equals the unit profit level in the corresponding sector. If letter L follows a shadow price, it means that the corresponding sector is producing at the lower output limit, and the shadow price of the lower output limit equals the unit loss level in this sector. If a sector is producing at an output level in between the upper and lower capacity limits, then the shadow prices of the capacity limits are zero; letter B is used in such cases.

constraints differ by small amounts from one solution to another. Since the small differences in the solution values of u_i's and v_i's in the four free trade solutions do not change the basic conclusions of this section, we will concentrate on only one of the free trade solution results, and it is the free trade solutions II.2.[14]

All agricultural sectors, except the Wheat-Other Cereals - Hay and Forestry Products sectors, produce at the upper output limits according to the free trade optimum solution results. For the Industrial Crops sector, the shadow price of the upper capacity limit is TL .018 million. The Wheat-Other Cereals-Hay sector produces at an output level in between the upper and lower output limits, thus the shadow price of both capacity constraints is zero. For the Fruits, Citrus Fruits, Nuts, Vegetables, Livestock, and Fishing sectors, the shadow prices of the upper capacity limits are respectively TL .052 million, TL .069 million, TL .116 million, TL .045 million, TL .056 million, and TL .042 million. The Forestry Products sector produces at the lower output limit, and the value of the shadow price of the lower output limit is TL .071 million.

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[14]It does not make any difference which solution we pick for examining and analyzing the results; the conclusions are the same.

The Other Mining, Iron-Ore Mining, Coal Mining and Crude Petroleum sectors produce at the lower output limits, and the shadow prices of the lower output limits for these sectors are TL .091 million, TL .037 million, TL 043 million, and TL .637 million respectively. As seen, for the first three mining sectors, which are export-oriented sectors, the shadow prices of lower capacity limits (or the unit loss levels) are relatively low, particularly, in comparison to the unit loss level of the Crude Petroleum sector. Also, as will be seen below, the first three mining sectors listed above are relatively more competitive than all import-substituting sectors. The Crude Petroleum sector, however, is a very high cost sector at free trade prices, under the fixed technology of 1967; the size of the shadow price of the lower output limit (i.e., the unit loss level), TL .637 million, indicates this. This is an expected result, and it is also supported by the fact that this sector is the most highly protected import-substitute sector in Turkey; the nominal tariff rate on crude petroleum imports was 423 percent[15] in 1967. It will also be shown below that the Crude Petroleum sector is the least competitive sector in Turkey.

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[15]See Appendix A, Table III.

Among the manufacturing sectors, the sectors which produce at the upper output limits and/or at output levels in between the upper and lower capacity limits are all non-traditional export sectors, and they are: the Milk-Industry-Canned Food, Cotton Textile, Knitting Industry, Leather and Leather Products, and Ceramics-Glass and Other Non-metallic Products sectors. The shadow price of the upper capacity limits for the latter sectors are TL. .08 million, TL. .059 million, zero, TL. .018 million, TL. .014 million, and TL. .018 million respectively. The rest of the manufacturing sectors produce at the lower output limits. However, the absolute values of the shadow price of the lower output limits for these manufacturing sectors differ from each other, indicating that they have different degrees of international competitiveness under the fixed technologies of 1967. Among the sectors in the latter group of manufacturing sectors, the ones with very high production costs (i.e., the sectors with relatively large unit loss levels) are all import-substitute sectors. Some of these high cost import-substitute sectors are: Electrical Machinery and Appliances, Cement, Fertilizers, Chemicals and Pharmaceuticals, Petroleum Refineries and Coal Products, Alcoholic Beverages, Sugar, and Rubber-Plastics and Products.

The unit loss levels or the shadow prices of lower capacity constraints for these latter sectors are respectively TL. .293 million, TL. .334 million, TL. .367 million, TL. .363 million, TL. .39 million, TL. .418 million, TL. .484 million, and TL. .564 million.

There are only three non-traditional manufacturing export sectors which produce at the lower output limits, and they are: Other Textile, Olive Oil-Seed Oils-Fats, and Wood Products sectors. However, the unit loss levels of these latter three sectors are smaller than those of other manufacturing sectors which produce at the lower output limits; the shadow price of the lower output limits for these three non-traditional exports are TL. .023 million, TL. .03 million, and TL. .1 million respectively. The shadow prices of the lower output limits for the remaining manufacturing sectors are not discussed here, but their solution values can be found in Table V.

The basic conclusions of this section are (1) that the agricultural sectors,[16] except the Forestry Products sector,

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[16] Sectors 1 through 10, except 7, and sector 40.

appear profitable under the free trade regime with the fixed coefficients of 1967, and (2) among the manufacturing sectors, the non-traditional manufacturing export sectors,[17] except the three listed above, appear profitable, and (3) the import-substituting manufacturing sectors, without any exception, show unit losses under the technical coefficients of 1967. Thus, it seems that the trade liberalization would generally improve the profit conditions of the agricultural and most of the non-traditional manufacturing export sectors, if Turkey moved gradually toward full membership in the Common Market. By contrast, profitability in all of the import-substituting sectors would decrease under the technical coefficients existing in 1967. This implies that, in order to compete with the cheaper imports from the EEC, these industries would have to increase their efficiency and thus decrease their production costs. Of course, the marginal firms which were unable to increase their efficiency would be forced out of business.

Since the free trade shadow prices of the capacity constraints indicate the potential profitability of the traded good sectors under the free trade conditions, they can be utilized as a criterion for comparing the international

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[17] Sectors 13, 15, 18, 23, and 28.

competitiveness of the traded good sectors. The sectors which have positive profit levels (or smaller unit losses)[18] under the free trade conditions should be considered potentially more competitive than those which show unit losses in free trade with the EEC, since they appear profitable at free trade prices even with the fixed coefficients of 1967. Profitability in these sectors might be increased further upon increases in efficiency during the period in which tariffs would be eliminated gradually, if Turkey moved toward full membership in the EEC. Of course, some of the sectors which show unit losses according to the free trade solution results might also become profitable before the full membership date because of the forced increase in efficiency (which would be caused by foreign competition); but, it is more likely that the sectors which appear relatively more profitable according to the free trade solution results would also be more profitable at the time of entry into the EEC. Nevertheless, the important point is that we are ranking the traded good sectors by their "potential"

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[18] The sectors which have small unit losses under the free trade conditions, with the fixed coefficients of 1967, are potentially more competitive than those with larger unit losses, because with a slight increase in their efficiency these sectors could improve their profitability, as gradual liberalization of trade takes place.

international competitiveness in free trade with the EEC, and as such the ranking can be based on the free trade shadow price of the capacity constraints.

Such a ranking is done for the traded good sectors in Table VI. In this table, there is only one ranking and it is based on the shadow prices of the capacity constraints obtained from the free trade solution II.2. Although separate rankings were obtained for each set of the free trade shadow prices of the capacity constraints, the rankings were not changing from one free trade solution to another; therefore, only one of the rankings is presented in Table VI. In the ranking, lower numbers identify the sectors which are relatively more competitive:[19] the sector which has the highest competitive standing (i.e., the sector with the largest unit profit level) is ranked first and the sector which has the second highest competitive standing is ranked second, and so on.

The following observations are made from the ranking: (i) in general, the most competitive sectors are the agricultural, except the Forestry Products sector, and non-traditional

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[19] These are the sectors which show larger unit profit levels and/or smaller unit loss levels.

TABLE VI. Ranking of the Traded Good and Service Sectors by Their International Competitiveness.[1]

Sector number	Sector	The shadow price of the capacity constraint (in mill. T. L.)		Ranking
41	Other Transportation	.430	u	1
5	Nuts	.116	u	2
13	Milk industry-Canned Food	.080	u	3
4	Citrus Fruits	.070	u	4
15	Other Food Sector	.059	u	5
8	Livestock	.056	u	6
3	Fruits	.052	u	7
6	Vegetables	.046	u	8
9	Fishing	.042	u	9
28	Ceramics-Glass and and non-metallic products	.018	u	10
18	Knitting Industry	.018	u	11
1	Industrial Crops	.018	u	12
23	Leather and Leather Products	.014	u	13
40	Animal Slaughtering	.001	u	14
16	Cotton Textile	.0	B	15
2	Wheat-Other Cereals-Hay, etc.	.0	B	16
7	Forestry Products	.020	L	17
19	Other Textile	.023	L	18
14	Olive oil-seed oils-Fats	.030	L	19
37	Iron-Ore Mining	.037	L	20
38	Coal Mining	.043	L	21
39	Tobacco Processing and Products	.090	L	22
10	Other Mining	.091	L	23
21	Wood Products	.100	L	24
17	Wool Textile	.143	L	25
20	Clothing Industry	.162	L	26
33	Agricultural and non-elec. Machinery	.226	L	27

TABLE VI. (continued)

31	Non-ferrous metals	.233	L	28
30	Iron and Steel	.261	L	29
32	Metal Products	.269	L	30
35	Trans. equip., Mainten. Repairs	.276	L	31
22	Paper, Printing, Stationeries	.287	L	32
34	Elec. Mach. and Appliances	.293	L	33
29	Cement	.334	L	34
26	Fertilizers	.367	L	35
25	Chemicals and Pharmaceuticals	.369	L	36
27	Petroleum Refineries Coal products	.390	L	37
12	Alcoholic Beverages	.418	L	38
11	Sugar	.484	L	39
24	Rubber, Plastics and Products	.564	L	40
36	Crude Petroleum	.637	L	41

[1] This ranking is based on the values of the shadow prices of the capacity constraints obtained in the free trade solution II.2 (see Table V). As explained in the text, sectors which produce at the lower output limits (according to the solution results) have larger shadow prices for the lower capacity constraints, and they are high cost and less competitive sectors. In the ranking, lower numbers identify relatively more competitive sectors, thus, the sector with the highest competitive standing (i.e., the sector for which the shadow price of the upper capacity limit is the largest) is ranked 1st.

manufacturing export sectors; and (ii) the least competitive sectors are the import-substitute sectors. In fact, if we divide the traded good sectors in the ranking into three groups and include the sectors ranked in the first 16 places in the "very competitive" group, in which the sectors with positive unit profit levels and/or with no unit losses are included, and then include the sectors ranked 17th through 24th in the "potentially competitive" group, in which the sectors with very small unit losses are grouped together, and finally include the sectors which are ranked 25th through 41st in the "non-competitive" or the "least competitive" group that includes the sectors with high unit loss levels, we find that the above two observations are very definite and mutually exclusive. The "very competitive" group includes all the traditional and non-traditional agricultural export sectors[20] and also most of the non-traditional manufacturing export sectors. In the "potentially competitive" group, the mining sectors, Forestry Products, Other Textile, Olive Oil-Seed Oils-Fats, Wood Products, and Tobacco Processing and Products (which is the only import-substitute sector in the potentially competitive group) are included. All

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[20]Except the Forestry Products sector.

the import-substitute sectors, except the Tobacco Processing and Products sector, fall into the third category, i.e., the "non-competitive" or the least competitive group. Among the least competitive sectors, the following five sectors take the last five places in the ranking: Petroleum Refineries and Coal Products, Alcoholic Beverages, Sugar, Rubber-Plastics and Products, and Crude Petroleum.

In conclusion, it can be stated that the traditional and non-traditional export sectors would be the lines of production in which Turkey would have a comparative advantage (as opposed to the import-substituting sectors) in free trade with the EEC, if Turkey moved toward full membership in the EEC.

These findings, concerning the profitability and competitiveness of the traded good sectors under the free conditions, have important economic policy implications in relation to Turkey's industrialization efforts. To be more specific, they shed some light on the questions of "Which sectors should be encouraged for development and growth?", and "What is the future of import-substituting sectors if Turkey moved toward full membership in the EEC?". These points are discussed in Conclusions Section of this chapter.

2. Resource Allocation Effects of the Liberalization of Trade with the EEC: Shifts in the Production Structure.

If Turkey moved toward full membership in the EEC, due to changes in the relative commodity prices resulting from the gradual eliminations of tariffs, there would be resource reallocations. Resources would move from sectors which would be contracting toward the expanding sectors at the new set of relative commodity prices. Thus, by comparing the free trade optimum capacity utilizations in the traded good sectors, we can estimate the direction in which the resources might move if the trade liberalization (with the EEC) took place in Turkey.

In the previous section, while comparing the shadow prices of the capacity constraints the free trade optimum solution results of the capacity utilization in each traded good sector were also examined; in Table V, as explained earlier, letters U and L indicate the upper and lower capacity utilization respectively in the traded good sectors. It was observed that under free trade some sectors showed expansionary trends and some showed contractionary trends, indicating that the production structure in Turkey would shift due to changes in the relative commodity prices as tariff cuts take place.

According to the solution results (see Table V), the agricultural sectors, except the Forestry Products, and most

of the non-traditional manufacturing export sectors[21] produce at the upper output limits.[22] Whereas, the mining sectors, a few non-traditional manufacturing export sectors,[23] and all the import-substituting sectors produce at the lower output limits. Thus, it appears that, in general, the export sectors (agricultural and most of the non-traditional manufacturing export sectors) would expand and the import-substituting sectors would contract, if Turkey moved toward free trade with the EEC. This implies that resources would move generally from the import-substituting sectors toward the export sectors.

The above results can be explained utilizing a two sector general equilibrium diagram. Assume that there are two sectors in Turkey; one of them produces an importable good and the other one produces an exportable good. Also, assume that there are fixed endowments of land, labor and capital. Each

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[21] Sectors 13, 15, 18, 23, 28. The Cotton Textile sector produces at an output level in between the upper and lower capacity limits.

[22] The Wheat-Other Cereals-Hay sector produces at an output level in between the upper and lower capacity limits.

[23] Sectors 14, 19, 21.

sector operates with a fixed technology, i.e., for a unit production of either good, fixed amounts of land, labor, capital, and also fixed amounts of both good are needed. Furthermore, it is also assumed that the two commodities are consumed in fixed proportions, and that the tariff revenues are either redistributed to the consumers or that the government spends these revenues to purchase both commodities, in the same fixed proportion that consumers purchase them.

Figure V.2 is drawn on the basis of the above assumptions, and it supplies a geometric explanation for the direction of the likely shift in the Turkish production structure, which we already discussed earlier in this section on the basis of the free trade solution results. In Figure V.2, the 1967 production and consumption, under protection, and the corresponding free trade equilibrium points are shown. TP_rP_fT' is the transformation curve corresponding to the net output levels (i.e., output levels net of the intermediate use). The shape of the transformation curve is determined by the factor intensities in the two sectors and by the fixed factor endowments.[24] FF' is the exogenous international price line;

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[24]For the techniques of the derivation of transformation curves (corresponding to net output levels) when intermediate inputs exist, see: Robert Dorfman, et al., Linear Programming and Economic Analysis, (McGraw-Hill Book Company, 1958), (continued next page)

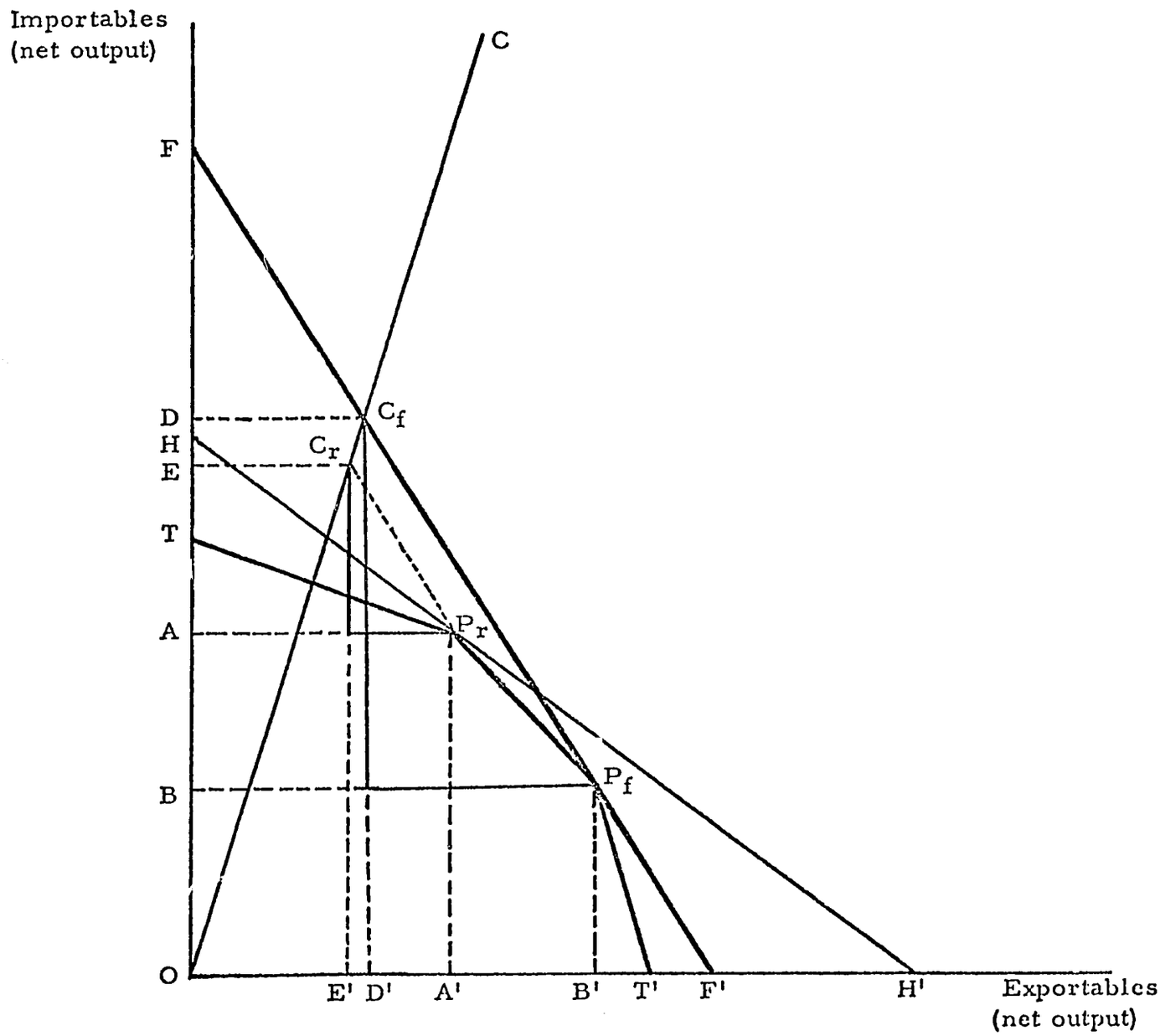

Fig. V.2. General Equilibrium Under Free Trade and Restricted Trade Conditions.

it is assumed that the home country is small, and thus cannot affect the international terms of trade. The slope of FF' line represents the negative of the rate of transformation between the two goods through trade. HH' represents the tariff inclusive domestic terms of trade between the two goods; the marginal rate of transformation in domestic production is equated to minus the slope of HH' line under protection. OC is the income-consumption line, and it incorporates the assumption of proportionality in final consumption into the diagram; the slope of the OC line gives the fixed proportion in which the two commodities are consumed. Hence, if we were to present the 1967 production and consumption equilibrium points under protection, and the corresponding free trade equilibrium points on this diagram, we would have the following corresponding points: the points P_r and C_r are the 1967 production and consumption equilibrium points respectively, under protection, and P_f and C_f are the free trade production and consumption equilibrium points. Thus, under protection, the net output levels of importable and exportable goods are respectively OA and OA', and the final consumption quantities are OE and OE';

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pp. 219-221; also Jaroslav Vanek, "Variable Factor Proportions and Interindustry Flows in the Theory of International Trade," Quarterly Journal of Economics, LXXVII, No. 1 (February, 1963), pp. 129-142.

AE is the amount of the import-substitute good purchased from abroad in exchange for E'A' amount of the exportable good. After the change in the trade regime, i.e., after the elimination of tariff on the importable good, the marginal rate of transformation in domestic production is equalized to the exogenous international price ratio. As a result, the production equilibrium moves to point P_f, where the net output level of the exportable good, OB', is more, and the net output level of the import-substituting good, OB, is less than their corresponding levels under protection. Thus, the movement of the production point from point P_r to P_f shows that the import-substituting sector contracted and export sector expanded, and hence relatively more amounts of factors are employed in the latter sector than before. C_f is the free trade consumption equilibrium point, and the corresponding final consumption quantities are OD amount of the importable good and OD' amount of the export good; both quantities are larger than the respective quantities consumed under protection.[25]

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[25] The 1967 value of the consumption scalar is represented by the ratio OE/OE or OE'/OE', and it is equal to one. The free trade value of the consumption scalar equals OD/OE or OD'/OE', and it is larger than one. Hence, the proportionate increase in the value of λ equals ED (in terms of importables) or E'D' (in terms of exportables).

3. The Free Trade Optimum Solution Values of the Consumption Scalar: Gains or Losses from Free Trade with the EEC.

The consumption scalar, λ , is the only endogenous variable in the objective function of the maximization problem. It is the value of the free trade final-consumption quantity (in physical units defined at the 1967 fixed domestic prices) of the ith good as a proportion of the 1967 consumption level.[26] As explained in Chapter III (p.161), due to the assumption of proportionality in final-consumption quantities, the value of the consumption scalar is the same for each commodity.

Since the consumption scalar is defined in physical terms, the free trade optimum solution values of λ and its 1967 unitary value under protection can be compared directly. The difference between the free trade and 1967 value of represents the proportionate increase (or decrease) in the final consumption quantity of each good over the 1967 actual levels, the increase (or decrease) which would have been realized if the economy operated under free trade conditions. Hence, the difference between the two values of the consumption

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[26] That is, $\lambda = C_i/\overline{C}_i$: see Chapter III, p.159 for the definition of λ .

scalar can be considered as an estimate of Turkey's gains (or losses) from free trade with the EEC, as a proportion of the actual final consumption quantities of 1967.

The free trade optimum solution values and the 1967 unitary value of the consumption scalar, λ, are presented in Table VII, in the first and second rows respectively. The free trade solution values of λ are 1.0781, 1.0986, 1.0781, and 1.0979 for the four free trade solutions, in that order. They are all larger than the unitary 1967 value of λ. Also, note that the free trade values of λ are larger under the 20 percent capacity limit constraints than they are when the 10 percent capacity limits are applied (the figure 1.0781 corresponds to the solutions I. 1 and II. 1, both of which utilized the 10 percent capacity limits, and the first set of international prices was used for the solutions I. 1 and the second set was used for the solution II. 1). This is because, compared to the 10 percent capacity limits, under the 20 percent capacity limits, the system is allowed to operate with a system of more relaxed constraints, and thus the possibility of more improvements in the resource allocation efficiency is increased. Furthermore, the results also indicate that the optimum solution value of λ was not very sensitive to

TABLE VII. The Free Trade Optimum Solution Values of the Consumption Scalar and Turkey's Gain from Free Trade with the EEC.

	I.1 (first set of international prices and 10 percent capacity limits)	I.2 (first set of international prices and 20 percent capacity limits)	II.1 (second set of international prices and 10 percent capacity limits)	II.2 (second set of international prices and 20 percent capacity limits)
The free trade solution values of λ	1.0781	1,0986	1.0781	1.0979
The 1967 value of λ	1.00	1.00	1.00	1.00
Gains from free trade with the EEC as a percentage of the 1967 consumption levels	7.81	9.86	7.81	9.79

the price differences between the two sets of international prices;[27] as seen above, the solution value of λ is the same for the solutions I. 1 and II. 1 which utilized the same capacity limits (10 percent) but different price sets.

Thus, the results indicate that free trade with the EEC would lead to a gain rather than to a loss. The estimates of Turkey's gain from free trade with the EEC, as a percentage of the 1967 final consumption levels, are listed in the third row of Table VII. They are 7.81, 9.86, 7.81, and 9.79 percent for the free trade solutions I. 1, I. 2, II. 1, and II. 2 respectively. These estimates imply a gain of about 8 to 10 percent (of the 1967 final consumption quantities). It should be pointed out that this gain is due to a more efficient allocation of resources under free trade conditions in which the marginal rates of transformation

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[27]See Table IV in Chapter IV, or Table III in this chapter. It will be noticed that the only differences between the two price sets are in the prices of some non-traditional export sectors. Prices of these sectors are relatively higher in the second price set. Despite this price difference, however, most of these non-traditional export sectors (sectors 7, 14, 16, 18, 19, 21, 23, 28) continued to produce at the lower output limits when the 10 percent capacity limits were applied. Some of them produced at the upper output limits only when the 20 percent capacity limits were utilized, not when prices were relatively higher.

in production are equalized to the marginal rates of transformation through trade. Because of the assumption of proportionality in final consumption, the possible gains or losses which might be caused by the likely changes in the final consumption pattern after the elimination of tariffs are not considered here.[28]

The estimates of gains from free trade or from the formation of a customs union found in the other studies are generally less than one percent of NI of the respective countries. For example, H. G. Johnson estimated that the United Kingdom's gain from free trade with the EEC would be about 1 percent of GNP for 1970.[29] Johnson states that his estimation procedures are imperfect, but, nevertheless, he concludes that the other

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[28] For an analytic review of the approaches whereby substitution in consumption has been treated in the theory of customs union literature, see Melvyn B. Krauss, "Recent Developments in Customs Union Theory: An Interpretive Survey," JEL, Vol. X, No. 2 (June, 1972), pp. 413-436.

[29] H. G. Johnson, "The Gains from Freer Trade with Europe: An Estimate," Manchester School, Vol. 26 (1958), pp. 247-255; also printed in International Economic Integration, P. Robson (ed.), (Penguin Books; 1971), pp. 340-347.

estimates will not be much different than the figure he obtained. Melvyn B. Krauss[30] cites a study (unpublished) by M. H. Miller and J. Spencer[31] in which they tried to estimate the welfare effect, upon Great Britain, of Britain's entry into the Common Market, and their estimate of the gains from trade creation is one tenth of one percent of British GNP.

Compared to the estimates of the two studies mentioned above, the estimate of Turkey's gain -- 8 to 10 percent -- from free trade with the EEC is relatively large. However, the countries which were examined in the other studies -- in particular Great Britain -- have highly industrialized economies. As in the other Western European countries, the manufacturing industries in Great Britain are well established industries; i.e., they are no longer at their infant stage. In general, both groups of countries export finished and mostly manufactured products, and they import raw materials and tropical goods. Also, the production-cost structures, in the manufacturing industries, of Britain and those of the Original Six in the EEC are similar. In other words, the degree of "complementarity"

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[30] Already cited in Footnote 28.

[31] Miller, M. H., and J. Spencer, "The Static Economic Effects of the U. K. Joining the EEC and Their Welfare Significance," London School of Economics (mimeographed), 1971.

on the production side between Britain and the latter group is very limited. Hence, the gain which would accrue to Britain as a result of a more efficient resource allocation,[32] upon her entry into the EEC is likely to be small, since the unit production cost differences between Britain and the Western European countries are small. On the other hand, the differences between the production-cost structures of Turkey and the Common Market countries are more profound than those of Great Britain and the Common Market countries (i.e., the Original Six). partly because of the much greater protection in Turkey; in 1967, the average tariff rate was about 40-50 percent[33] in Turkey, whereas, in U. K. it was about 10-15 percent.[34] Thus, it is obvious that the unit production costs

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[32]It is the increased resource allocation efficiency which would result from the relocation of production within the union: the country(ies) which produces a product relatively cheaper than the other members, before the formation of a customs union, will be the main supplier of the product to the rest of the members. This is called the trade creation effect of a customs union, and it leads to a more efficient allocation of resources within the union.

[33]See Table III in Appendix A.

[34]In 1960, the average tariff rate was estimated to be about 18.4 percent in U. K.: see, Randal Hinshaw, The European Community and American Trade: A Study in Atlantic Economics and Policy, (Frederick A. Praeger, Publishers; New York, 1964), Table 3, p. 86. However, until 1967, the tariff rates in U. K. were subjected to some reductions in (continued next page)

must have been higher in Turkey (particularly, in the industries which heavily depend on imported inputs) than they were in comparable industries in U. K., even if we assume that they had similar technologies in 1967. Also, Turkey's trade with the EEC made up a larger portion of her total trade volume than that of Britain in the last decade.[35] For example, in 1965, Turkey's imports from the EEC constituted 28.4 percent of her total imports, and her exports to the EEC were 33.8 percent of her total exports; whereas, in the same year, U. K.'s imports from the EEC were 17 percent of her total imports, and her exports to the EEC made up 20 percent of her total exports.[36]

Hence, because of the higher degree of complimentarity on the production side and of a relatively large volume of pre-union trade, it is not surprising that Turkey's gain from entry into the Common Market, as a proportion of her GNP, might be greater than that of Great Britain; as a LDC, Turkey might

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accordance with the Kennedy Rounds. Although the author was unable to find, from other sources, an estimate of a weighted or unweighted average tariff rate for U.K. in 1967, an average tariff rate of 10 to 15 percent can be considered a close approximation to the actual rate.

[35] Lawrence B. Krause, European Economic Integration, and the United States, op. cit., Table 6-6, p. 198, table 6-8, p. 202.

[36] Ibid.

gain more from this economic integration (in relative terms Turkey's percentage gain is even larger, if we consider the fact that only a small percentage of GNP comes from the protected industries in Turkey). This result also supports some of the conclusions derived in the customs union theory, which are: (i) gains from the formation of a customs union are larger the larger the difference between the production costs of the same commodity produced in the potential member countries;[37] (ii) "given a country's volume of international trade, a customs union is more likely to raise welfare the higher is the proportion of trade with the country's union partner and lower the proportion with the outside world."[38]

Based on the relative size of the estimate of Turkey's potential gain from free trade and the analysis presented above, it can be concluded that "relatively advanced"[39] LDCs

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[37] See H. Makower and G. Morton, "A Contribution Towards a Theory of Customs Union," Economic Journal, Vol. LXII, No. 249 (March, 1953), pp. 33-49.

[38] R. G. Lipsey, "The Theory of Customs Union: A General Survey," Economics Journal, op. cit., p. 508.

[39] Which are more industrialized, producing large numbers of semi-manufactured and manufactured products under protection. Thus, by using the term "relatively advanced LDCs," reference is made to the LDC's for which the degree of overlapping between the class of commodities produced (under protection) in these LDC's and in industrialized countries is large.

might gain more from a customs union with a group of industrialized countries than an industrialized country could, due to the larger differences between the cost structures of LDC's and industrialized countries. Gains could be even larger if the LDC under consideration has a large trading volume with the union members before the formation of a union.

4. The Free Trade Optimum Solution Values of the Production, Consumption, Export and Import Levels.

The optimum solution values of the production, consumption, export, and import levels are presented in Appendix C.[40] Since the optimum capacity utilization in each traded good sector and the optimum solution values of the consumption scalar were discussed earlier, it is not necessary to discuss the solution values of these macro variables again. Here only the solution results concerning the foreign trade pattern and the total export and import levels are examined.

a. Foreign Trade Pattern - In Table VIII, the traded good sectors are classified according to whether they are

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[40] Results of each free trade solution are presented in a separate table; thus, there are four tables in Appendix C.

TABLE VIII. Foreign Trade Pattern.[1]

		Free Trade Solutions			
		I. 1	I. 2	II. 1	II. 2
1.	Industrial crops	E	E	E	E
2.	Wheat, other cereals, hay, etc.	M	M	M	M
3.	Fruits	E	E	E	E
4.	Citrus Fruits	E	E	E	E
5.	Nuts	E	E	E	E
6.	Vegetables	M	E	M	E
7.	Forestry Products	M	E	M	M
8.	Livestock	E	E	E	E
9.	Fishing	E	E	E	E
10.	Other Mining	E	M	E	M
11.	Sugar	M	M	M	M
12.	Alcoholic Beverages	M	M	M	M
13.	Milk Industry-Canned Food	E	E	E	E
14.	Olive oil, Seed oils, Fats	M	M	M	M
15.	Other food sector	E	E	E	E
16.	Cotton Textile	E	M	E	E
17.	Wool Textile	M	M	M	M
18.	Knitting Industry	E	E	E	E
19.	Other Textile	E	M	E	M
20.	Clothing Industry	M	M	M	M
21.	Wood Products	M	M	M	M
22.	Paper, Printing, Stationeries	M	M	M	M
23.	Leather, and Leather Products	E	E	E	E
24.	Rubber, Plastics, and Products	M	M	M	M
25.	Chemicals, and Pharmaceuticals	M	M	M	M
26.	Fertilizers	M	M	M	M
27.	Petroleum Refineries, Coal Products	M	M	M	M
28.	Ceramics, Glass, and other non-metal. Products	M	E	M	E
29.	Cement	M	M	M	M
30.	Iron and Steel	M	M	M	M
31.	Non-ferrous Metal	E	E	E	E

TABLE VIII. (continued)

	I. 1	I. 2	II. 1	II. 2
32. Metal Products	M	M	M	M
33. Agri. and non-elect. Mach.	M	M	M	M
34. Elect. Mach. and Appliances	M	M	M	M
35. Transp. equip., Mainten., Repairs	M	M	M	M
36. Crude Petroleum	M	M	M	M
37. Iron-Ore Mining	O	O	O	O
38. Coal Mining	M	M	M	M
39. Tobacco Processing, Products	M	M	M	M
40. Animal Slaughtering	M	E	M	E
41. Other Transportation	E	E	E	E

[1] E identifies the exporting and M identifies the importing sectors. If a sector is neither exporting nor importing, letter O is used to identify such a sector.

exporting or importing in the free trade solutions.[41] Letter E identifies the exporting and the letter M identifies the importing sectors.

Among the agricultural sectors, the Industrial Crops, Fruits, Citrus-Fruits, Nuts, Livestock, and Fishing sectors appear as exporting sectors in all four free trade solutions. Whereas, the Vegetables, and Animal Slaughtering sectors appear as exporting sectors when the 20 percent capacity limits were applied (i.e., in the solutions I.2 and II.2), indicating that the expansion of output in these sectors might lead to an increase in the export volume of these products. The Forestry-Products sector appears as exporting in the solution I.2, but it is an importing sector in the rest of the solutions. The Wheat-Other

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[41] It should be remembered that the production levels of the traded good sectors can have only 10 or 20 percent increase (5 or 10 percent for agricultural sectors) in their output levels above the 1967 actual levels. Whether a sector produces at the upper output limit or not, however, a large amount of each product goes to increased consumption, since under the free trade conditions consumption levels are increased by 8 or 10 percent above their 1967 actual levels (as indicated by the free trade values of the consumption scalar). Thus, export and import levels of each commodity are dependent upon the values of the consumption scalar and capacity utilization in each sector.

Cereals-Hay sector, on the other hand, appears as an importing sector in all four free trade solutions; this is not a surprising result, however, especially considering the fact that Turkey has been a net importer of wheat in the 60's.

The Other Mining sector exports according to the two of the solution results (solutions I. 1 and II. 1) and imports in the other two (solutions I. 2 and II. 2). The Iron-Ore Mining sector appears as neither exporting nor importing in all four solutions.[42] The Coal Mining sector, however, appears as an importing sector in all solutions.

The non-traditional manufacturing export sectors which appear as exporting sectors consistently are: the Milk industry-Canned Food, Other Food, Knitting Industry, Leather and Leather Products, and Non-ferrous Metals sectors. The Cotton Textile sector exports according to the solution results in three free trade solutions (I. 1, II. 1, and II. 2), and imports in one of the solutions (I. 2). The Other Textile sector appears as exporting in two solutions (I. 1 and II. 1) and as importing in the other two solutions (I. 2 and II. 2); the same result holds

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[42] The solution results indicate a very small amount (less than a unit) of import for this sector; in the table letter 0 indicates that this sector is neither exporting nor importing.

for the Ceramics-Glass-and Non-metallic Products sector, except that it exports in the latter two solutions (i.e., in I.2 and II.2) and imports in the former two solutions (in I.1 and II.1). The only non-traditional manufacturing export sectors which appear as importing sectors consistently are the Olive oil-seed oils-Fats, and Wood Products sectors.

The results are very consistent as far as the free trade trading pattern of the import-substituting sectors are concerned. All import-substituting sectors, without any exception, appear as importing sectors in all four free trade solutions.

b. Trade Volume

The free trade optimum solution values of total exports and imports are presented in Table IX. The actual trade levels, realized under the restricted trade regime of 1967, are listed in the last row of the same table; exports and imports are valued at fixed international prices. The free trade total export levels are TL. 5,863 million, TL. 7,882 million, TL. 5,950 million, and TL. 8,619 million in the solutions I.1, I.2, II.1, and II.2 respectively. The 1967 actual total export level, however, is TL. 5,695 million, which is less than any of the free trade total export levels obtained from the solutions. Hence, the results indicate that the volume of Turkish exports

TABLE IX. Total Exports and Imports (valued at fixed international prices). (in millions of T. L.)

Free Trade Solutions	Total exports	Total competitive imports	Total non-com petitive imports
I. 1 First set of int. prices and 10 percent capacity limits	5, 863	7, 052	2, 504
I. 2 First set of int. prices and 20 percent capacity limits	7, 882	9, 253	2, 322
II. 1 Second set of int. prices and 10 percent capacity limits	5, 950	7, 139	2, 504
II. 2 Second set of int. prices and 20 percent capacity limits	8, 619	9, 980	2, 333
The 1967 actual levels[1]	5, 695	6, 636	2, 702

[1] The 1967 actual trade levels were derived from the augmented input-output table (Table I in Appendix B).

would increase if Turkey moved toward free trade with the EEC.

The free trade solution values of the total competitive import level also show an expansionary trend in comparison to the 1967 actual total competitive import level. The free trade solution levels of the total competitive imports are respectively TL. 7,052 million, TL. 9,253 million, TL. 7,139 million, and TL. 9,980 million in four free trade solutions. Whereas, the 1967 restricted trade value of the total competitive imports is TL. 6,636 million, and it is less than the free trade solution values of the total competitive imports.

From Table IX, it can also be observed that the free trade levels of non-competitive imports -- TL. 2,504 million, TL. 2,322 million, TL. 2,504 million, and TL. 2,333 million in the solutions I.1, and I.2, II.1, and II.2 respectively -- are all less than the 1967 actual level, TL. 2,702 million. The reason for this difference between the free trade and restricted trade intermediate demand for the non-competitive imports is the shift in the production structure. As we observed earlier, the production structure shifted toward export sectors under free trade conditions, i.e., most of the export sectors expanded

and import-substituting sectors contracted. Since the export sectors require less of the non-competitive imports as inputs per unit of output, the demand for non-competitive imports is lower under free trade.[43]

C. CONCLUSIONS

One of the conclusions derived from the application of the model is related to the major question of the study, which is "Where does Turkey's comparative advantage lie in free trade with the EEC?". As it was observed from the solution results discussed earlier, it appears that Turkey would have a comparative advantage in her traditional and non-traditional export sectors in free trade with the EEC. This conclusion is based upon the free trade optimum solution results that the export sectors are relatively more profitable, with the 1967 fixed coefficients, than the import-substituting sectors under free trade, and hence the international competitiveness of the export sectors is relatively higher. It was observed that, all agricultural sectors, except the Forestry Products, appear

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[43]See the non-competitive input coefficient row in the augmented input-output coefficient table (Table II in Appendix B).

profitable and highly competitive under free trade, with the fixed technology of 1967. Among the manufacturing sectors, the non-traditional export sectors are all relatively more profitable and more competitive than the import-substituting sectors under free trade. In particular, the Milk Industry-Canned Food, Other Food, Ceramics-Glass and Other Metallic Products, Knitting Industry, Leather and Leather Products, and Cotton Textile sectors, which are all non-traditional manufacturing export sectors, appear highly competitive. This is because they, except the Cotton Textile sector, which has a zero unit profit level, all show positive unit profits under free trade, with the fixed technology of 1967. Whereas, all import-substituting sectors show positive unit losses under free trade, and also their unit loss levels are relatively larger than the unit loss levels incurred by some of the non-traditional export sectors.

The above conclusion concerning the lines of production in which Turkey might have a comparative advantage in free trade with the EEC has an important economic policy implication. As discussed in Chapter I, the industrialization policy of the government has been biased toward import-substituting

production. The sectors which produce import-substitutes have been protected by import prohibition or quotas and/or high tariffs. Although some trade liberalization took place with the August 1970 devaluation, these industries are still highly protected, and with their monopolistic market structures, they continue to be inefficient and high-cost industries. This was also shown by the solution results, which indicated that all import-substituting sectors would incur unit losses if they were to produce under free trade conditions, with the 1967 fixed technical coefficients. Then, the implication is, if it is the economic and political goal of the Turkish government to join the Common Market as a full member, Turkey stands to lose from the continuation of the present industrialization policy. This is because it is not only biased toward the import-substitution production but also it does not contain any mechanism -- in itself or by use of the import regime -- whereby the producers in these sectors can be indirectly induced to improve their efficiency. On the other hand, Turkey would gain from increased emphasis on the development and growth of the non-traditional manufacturing export sectors. Exploitation of the potential export opportunities in these sectors, by additional incentives

(financial and/or otherwise), would certainly be helpful in increasing Turkish exports to the EEC and to third countries. Also, the government should indirectly induce the producers in the import-substituting sectors to increase their efficiency by allowing foreign competition in the domestic markets; this can be done by taking immediate steps toward the gradual elimination of quantitative restrictions. These steps would minimize the adjustment costs, upon the Turkish economy, of Turkey's entry into the Common Market, and hence increase Turkey's gain from free trade with the EEC.

In respect to the production structure, the solution results indicated that the import-substituting sectors would contract and most of the export sectors would expand under free trade because of the changes in relative commodity prices (in favor of exportables). In the solutions, it was also observed that, because of this shift in the production structure, the demand for labor services increased relative to the demand for the non-labor factor services since the expanding export sectors are relatively more intensive in labor services than the contracting import-substituting sectors. Consequently, the wage-rental ratio increased. Thus, although fixed factor proportions were assumed in the model, it can be speculated

that, upon Turkey's entry into the EEC, the factor proportions might change in the domestic industries. The changes would be in the same direction since the producers would try to substitute the relatively cheap factor, non-labor factor services, for the now expensive factor, labor services. The free trade solution results also indicated that if the expansion and contraction in the domestic industries was in the order of 20 percent of the 1967 production levels, then the changes in the nominal and real factor rewards would definitely be in the opposite directions: the nominal and real wage rate would increase, and the nominal and real rental rate would decline. The latter result implies that the income distribution might change in favor of workers, if Turkey moved toward free trade with the EEC.

Another important conclusion derived from the application of the model is related to gains from the formation of a customs union in general. As discussed earlier, in this chapter, the estimate of Turkey's gain[44] from free trade

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[44] It should also be mentioned here that the estimate of gains from free trade can also be thought of as an estimate of the costs of the present restrictionist trade regime in Turkey.

with the EEC is larger than the estimates of Great Britain's gain from joining the EEC derived in the other studies. In conclusion, it was stated earlier that relatively advanced LDC's might gain more from the formation of a customs union with a group of industrialized countries than an industrialized country might because of the greater differences between the production structures (i.e., a higher degree of complementarity on the production side) of LDC's and industrialized countries.

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APPENDIX A

The Derivation of the Weighted Sectoral Nominal Tariff Rates

IMPORT TAXES AND THE DERIVATION OF THE SECTORAL WEIGHTED NOMINAL TARIFF RATES

The indirect taxes levied upon the imported goods in Turkey were discussed in Chapter I. They are: tariff duties, municipality share, wharf duty, stamp duty, and production tax. Tariff duties and stamp duty are levied upon the c.i.f. value of imports. Whereas, the rest of the indirect import taxes are levied either upon the total tariff duties collected or on the tariff (plus other import taxes) inclusive value of imported goods, and hence the import taxes in the latter group have cascading tax structures.

Since in the application of the model the 1967 data were used, in estimating the sectoral weighted nominal tariff rates the indirect import tax rates of the 1967-1968 period were utilized. Also, the export and import levels of specific commodities utilized in determining the weights are the 1968 levels. Use of the 1968 export and import levels was necessary since 1968 is the only year for which commodity specific export and import data (disaggregated according to the six digit BTN commodity classification) were available.

a. The Estimation of the Sectoral Weighted "Unadjusted" Nominal Tariff Rates for the 1967-1968 Period in Turkey

The calculation of the overall tariff rate on the ith imported good

Let t_i be the overall tariff rate (i.e., the rate inclusive of all import taxes) on the ith imported good, and let the following notation identify the commodity specific import tax rates in 1967:

t_{id} = the tariff duty rate on the ith imported good (as a proportion of the c.i.f. value of the imported good); these rates were different for different commodities.

t_m = municipality share, which was 15 per cent of the tariff duty levied on each imported item.

t_s = stamp duty; it was 15 per cent of the c.i.f. value of the imported good.

t_w = wharf duty, which was 5 per cent of the sum of the c.i.f. value of the imported good plus tariff duty plus stamp duty and plus the municipality share levied on this commodity. If there was no production tax on an imported good, then the wharf tax was 5 per cent of the c.i.f. value of the commodity.[1]

t_{ip} = production tax rate on the ith imported good; the rate differed from commodity to commodity and was levied on (as a proportion of) the sum of the following amounts: the c.i.f. value of the imported good plus all other import taxes levied on it.

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[1]State Planning Organization, 1967 Input-Output Tablosu Çalışmaları: İthalattan Alınan Vergilerin Sektörel ve Yapısal Analizi, Vol. I, pub. no. 868 (Ankara: March, 1970), p. 15.

Let M_i be the c. i. f. value of the ith imported good, then the import taxes on the ith imported good are given by the following equalities:

tariff duty $= t_{id} \cdot M_i$

stamp duty $= t_s \cdot M_i$

municipality share $= t_m(t_{id} \cdot M_i)$

wharf duty $= t_w\{M_i(1 + t_{id} + t_s + t_m t_{id})\}$ or,

if production tax is zero

$= t_w M_i$

production tax $= t_{ip}\{(t_w+1)M_i(1+t_{id}+t_s+t_m t_{id})\}$

Then, the total amount of import tax paid for M_i amount of the ith imported good is equal to

$$M_i[t_{id}+t_s+t_m \cdot t_{id}+t_w+t_w \cdot t_{id}+t_w \cdot t_s+t_w \cdot t_m \cdot t_{id} + t_{ip}(t_w+1)(1+t_{id} +t_s+t_m \cdot t_{id})],$$

and by replacing $t_s = .15$, $t_m = .15$, and $t_w = .05$, we derive

$$t_i = .2075 + 1.2075t_{id}+1.2075t_{ip}+1.2075t_{id} \cdot t_{ip} \qquad \text{(A. 1)}$$

or (when the production tax rate is zero)

$$t_i = 1.15\ t_{id} + .2 \qquad \text{(A. 2)}$$

where t_i is the overall tariff rate on the ith imported good. By replacing the commodity specific tariff rate, t_{id}, and production tax rate, t_{ip}, in (A. 1) or in (A. 2) we find the

overall tariff rate, t_i, levied on the c.i.f. value of the ith imported good.

In Table I, a sample of the 1967 Turkish commodity specific tariff duty rates and production tax rates is presented. In the first column, the specific commodity (or commodities) is identified by its six digit BTN code, and in the second and third columns nominal tariff duty and production tax rates are listed respectively.

The Weighting Procedure Used to Determine the Unadjusted Sectoral Nominal Tariff Rates

First, the procedure is explained in simple terms using some notation. Then, the calculations made for one of the sectors of this study are presented in Table II.

Let j identify the jth traded good sector and i identify the ith traded commodity produced by the jth sector. Also, let there be n traded goods produced by the jth sector. Then, let

E_{ij} = f.o.b. value of exports of the ith commodity, $i = 1, \ldots, n$.

M_{ij} = c.i.f. value of imports of the ith commodity, $i=1, \ldots, n$.

T_j = the weighted unadjusted sectoral nominal tariff rate for the jth traded good sector, as a proportion of the c.i.f. value of the jth composite good, which is assumed to be produced by the jth sector.

TABLE I. A Sample of the 1967 Turkish Commodity Specific Nominal Tariff Rates and Production Tax Rates Levied on Imports.

BTN Code	Tariff Duty Rate (as a percentage of c. i. f. value)	Production Tax Rate (as a percentage of the sum of the c. i. f. value plus all other import taxes)
01.01.11	10	--
03.01.10	20	--
04.01.00	50	--
05.15.22	30	--
06.01.10	8	--
07.01.21	--	--
08.03.11	20	--
09.04.90	75	--
10.02.00	15	--
11.06	60	--
12.03.10	5	--
13.02.11	70	--
14.03	50	--
15.01.00	20	--
16.01.20	75	--
17.01.10	150	--
18.06.00	100	--
19.08	75	13
20.01.21	50	--
21.04.00	75	--
22.05.20	120	42
23.03.00	5	--
24.02.90	15	--
25.01.10	15	15
26.01.11	5	--
27.01.10	60	--
27.10.22	25	13
41.01.11	10	--
42.04.11	25	--
44.03.41	5	13
45.02.00	25	--

TABLE I. (continued)

45.02.00	25	--
50.01.00	30	--
53.01.41	25	--
54.03	40	--
60.06.10	50	18
64.02.21	100	40
84.41.20	50	--
94.03.10	100	10

Source: State Planning Organization, 1967 Input-Output Çalışmaları: İthalattan Alınan Vergilerin Sektörel ve Yapısal Analizi, (Ankara: March, 1970), pub. no. 868.

TABLE II. The Derivation of the Sectoral Weighted Nominal Tariff Rate (unadjusted) for the Knitting Industry

Knitting Industry-Specific Commodities BTN Code	(1) 1968 Import level (c.i.f. value) in TL M_{ij}	(2) 1968 Export level (f.o.b. value) in TL E_{ij}	(3) Tariff duty rate (in proportions) t_{id}	(4) Production tax rate (in proportions) t_{ip}	(5) Export subsidy rate (in proportions) t^e_{ij}	Overall tariff rate on imports t_i	Weighted commodity specific tariff rate t^w_i	$M_{ij}+E_{ij}$ (in 000TL)	Weights = $\frac{M_{ij}+E_{ij}}{\sum_{i=1}^{n}(M_{ij}+E_{ij})}$	Weight X t^w_i
60.01+60.02+60.03 +60.04+60.05	27,254	3,560,429	1.00	.18	.25	1.86	.27	3,588	.98355	.2655585
60.06.10	---	---	.50	.18	.25			---	---	---
60.06.20	49,667	10,395	1.00	--	.25	1.35	1.16	60	.01645	.0190820
									T_j = .2846405	

Thus the unadjusted weighted sectoral tariff rate for the Knitting Industry is 28 per cent.

TABLE II. (continued)

Sources: Columns (1) and (2):
State Institute of Statistics, Annual Foreign Trade Statistics: 1968, (Ankara, 1968), pub. no. 577.

Columns (3) and (4):
State Planning Organization, 1967 Input-Output Tablosu Çalışmaları: İthalattan Alınan Vergilerin Sektörel ve Yapısal Analizi, (Ankara: March, 1970), pub. no. 868; and

Tancı, Muhittin, et al. İçtihatlı ve En Son Değişiklikleri Muhtevi Gümrük Kanunu ve İstatistik Pozisyonlarına Bölünmüş Gümrük Giriş Tarife Cetveli, (Ankara, Balkanoğlu Matbaacılık, 1968).

Column (5):
State Planning Organization, Annual Programs; and _____, Yatırımların ve İhracatın Teşviki ve Uygulama Esasları, (Ankara: June, 1969), pub. no. 773, annexed tables 19, 20, pp. 175-197.

t^e_i = export subsidy on exports of the ith commodity (as a proportion of the f.o.b. value of exports), i=1, . . ., n.

t_i, t_{id}, and t_{ip} are defined as before. It was already established above that

$$t_i = .2075 + 1.2075 t_{id} + 1.2075 t_{ip} + 1.2075 t_{id} \cdot t_{ip}, \text{ or}$$

$$t_i = 1.15\ t_{id} + .2 \qquad \text{if } t_{ip} \text{ is zero.}$$

The data on E_{ij}'s, M_{ij}'s, t^e_{ij}'s, t_{id}'s and t_{ip}'s were available. Thus, first t_i's were calculated by utilizing the equations (A.1) and/or (A.2). Then, using the above data, the sectoral unadjusted weighted nominal tariff rates were derived from the following equation

$$T_j = \sum_{i=1}^{n} \left\{ \frac{E_{ij} + M_{if}}{\sum_{i=1}^{n} (E_{ij} + M_{ij})} \quad t^w_i \right\} \tag{A.3}$$

where

$$t^w_i = \left\{ \left(\frac{E_{ij}}{E_{ij} + M_{ij}}\right) t^e_{ij} + \left(\frac{M_{ij}}{E_{ij} + M_{ij}}\right) \quad t_i \right\} \qquad \text{is}$$

the weighted commodity specific nominal tariff rate on the ith traded good which is produced by the jth traded good sector.

b. The Adjusted Sectoral Nominal Tariff Rates

The unadjusted sectoral weighted nominal tariff rates were determined for the 41 traded good sectors by utilizing equation (A.3). These rates are presented in Table III, in the first column.

In the second, third, and fourth columns of Table III, three different sets of adjusted sectoral weighted tariff rates are listed respectively. It was explained in Chapter II that, due to monopolistic market structures and quantitative import controls, the nominal tariff rates did not represent the proportionate differences between the international prices and domestic prices of traded commodities. It is for this reason that the unadjusted sectoral tariff rates, which were determined by utilizing equation (A.3), were adjusted for additional discrepancies between the domestic and international prices. The adjustment process included: (1) direct price comparisons;[2] (2) utilization of some sectoral studies; and (3) adjustments based on the changes in the imports/domestic production ratio of importable goods between 1963 and 1967.

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[2] Prof. Ahmet Aker's study (then a faculty member of Boğaziçi University of Istanbul) on the comparison of domestic wholesale prices and landed cost prices of importables was utilized. His study is not published, but his results can be found in Krueger, op. cit., Part Three, Table V-12, p. 53.

TABLE III. The Unadjusted and Adjusted Sectoral Weighted Nominal Tariff Rates (as a percentage of c.i.f. prices).

	Unadjusted Rates	Adjusted Rates t(I)	t(II)	t(III)
1. Industrial Crops	1	1	1	1
2. Wheat, other cereals, hay, etc.	5	5	5	5
3. Fruits	8	8	8	8
4. Citrus Fruits	5	5	5	5
5. Nuts	0	0	0	0
6. Vegetables	5	5	5	5
7. Forestry Products	21	21	21	15
8. Livestock	9	9	5	5
9. Fishing	5	5	5	5
10. Other Mining	21	21	21	21
11. Sugar	16	16	145	145
12. Alcoholic Beverages	96	96	144	144
13. Milk industry- canned food	2	2	2	2
14. Olive oil, seed oils, fats	37	37	25	15
15. Other Food Sector	10	10	10	8
16. Cotton Textile	33	33	33	15
17. Wool Textile	43	43	43	43
18. Knitting Industry	28	28	28	20
19. Other Textile	65	65	40	25
20. Clothing Industry	88	88	88	50
21. Wood Products	66	66	66	35
22. Paper, printing, stationeries	75	75	113	113
23. Leather, and Leather products	25	25	25	15
24. Rubber, Plastics, and Products	109	109	228	228
25. Chemicals and Pharmaceuticals	73	73	110	110
26. Fertilizers	68	68	102	102

TABLE III. (continued)

		t(I)	t(II)	t(III)
27. Petroleum Refineries Coal Products	167	167	274	274
28. Ceramics, glass, and other non-metal products	71	71	30	20
29. Cement	70	70	126	126
30. Iron and Steel	67	67	144	144
31. Non-ferrous Metal	52	52	78	78
32. Metal Products	82	82	123	123
33. Agri. and non-elect. Mach.	64	64	105	105
34. Elect. Mach. and Appliances	72	72	108	108
35. Transp. equip., Mainten., Repairs	82	82	123	123
36. Crude Petroleum	423	423	423	423
37. Iron-ore Mining	13	13	13	13
38. Coal Mining	13	13	13	13
39. Tobacco Processing, Products	15	25	25	25
40. Animal Slaughtering	5	5	5	5
41. Other Transportation	0	0	0	0

The unadjusted sectoral tariff rates and the rates in the first set of adjusted rates are the same, except for the Tobacco Processing and Products sector. For the latter sector, the unadjusted rate is 15 per cent, whereas the adjusted rate is 25 per cent. The increase -- from 15 to 25 per cent -- in the tariff rate of the Tobacco Processing and Products sector reflects the adjustment for the tariff equivalent of quantitative restrictions on tobacco products. Thus, in comparing the unadjusted and adjusted rates, the first set of adjusted rates will be ignored.

The unadjusted tariff rates of some of the import-substituting sectors were increased on the basis of direct price comparisons, and that is how the corresponding rates for these sectors in the second and third sets of adjusted tariff rates (i.e., t (II)'s, and t (III)'s) were determined. The latter group of sectors include sectors 11, 12, 24, 27, 29, 30, and 33.

For a second group of import-substituting sectors, the adjusted rates in the second and third sets were determined by increasing the unadjusted rates by 50 per cent. Although this 50 per cent was chosen arbitrarily, its size was nevertheless supported by the sizes of decline in the

imports/domestic production ratios of these sectors. In this group, the following sectors are included: sectors 22, 25, 26, 31, 32, 34, and 35.

For a third group of sectors, which includes only the export sectors, the adjusted sectoral tariff rates are lower than the respective unadjusted rates.[3] It is believed that for these sectors, the unadjusted rates were higher than what they should be in reflecting the actual percentage difference between the domestic and international prices. This is supported by the fact that most of the commodity specific nominal tariff rates set for the commodities produced by these sectors are not operational. These products are mostly exportables, and most of them are exported at prices not much lower than the domestic prices. This group includes sectors 7, 8, 14, 15, 16, 18, 19, 20, 21, 23, and 28.

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[3] In determining the adjusted tariff rates for these sectors, the unadjusted tariff rates were decreased by some arbitrary percentages since it was impossible to make direct price comparisons.

APPENDIX B

The 1967 Augmented Turkish Input-Output Table and the Table of Factor-Intensity Coefficients

TABLE I. The 1967 Augmented Turkish Input-Output Flow Table (Figures are in millions of Turkish Lira; flows are valued at purchasers' prices).

Sectors*	1	2	3	4	5	6	7	8	9	10	11	12
1	143	--	--	--	--	--	--	166	--	--	740	1
2	--	1,629	--	--	--	--	--	5,375	--	--	--	14
3	--	--	20	--	--	--	--	--	--	--	--	39
4	--	--	--	8	--	--	--	--	--	--	--	--
5	--	--	--	--	12	--	--	--	--	--	--	--
6	--	--	--	--	--	224	--	--	--	--	--	--
7	--	--	--	--	--	--	--	--	--	10	--	2
8	401	1,247	178	22	44	334	--	45	--	--	--	--
9	--	--	--	--	--	--	--	5	--	--	--	--
10	--	1	--	--	--	--	--	--	--	1	16	--
11	--	--	--	--	--	--	--	39	--	--	24	1
12	--	--	--	--	--	--	--	--	--	--	--	15
13	--	--	--	--	--	--	--	--	--	--	--	--
14	--	--	--	--	--	--	--	196	--	--	--	--
15	--	--	--	--	--	--	--	453	1	--	--	47
16	--	--	--	--	--	--	--	--	--	--	--	--
17	--	--	--	--	--	--	--	--	--	--	--	--
18	--	--	--	--	--	--	--	--	--	--	--	--
19	15	2	2	1	1	6	1	1	6	1	40	--
20	--	--	--	--	--	--	--	--	--	--	--	--
21	--	--	17	2	5	28	--	--	--	--	1	9
22	--	--	7	1	--	--	14	--	--	--	4	3
23	--	--	--	--	--	--	--	--	--	1	--	--
24	15	47	5	1	1	4	--	--	--	--	1	--
25	20	63	7	1	1	4	5	47	--	8	--	17
26	85	265	28	4	8	16	--	--	--	--	--	--
27	66	195	25	4	7	52	9	1	11	19	7	2
28	--	--	--	--	--	--	--	--	--	6	1	43
29	--	--	--	--	--	--	--	--	--	--	--	--
30	3	7	1	--	--	--	--	--	--	--	8	--
31	--	--	--	--	--	--	--	--	--	--	2	--
32	2	21	4	1	1	5	11	13	1	16	8	9
33	41	128	14	1	4	8	--	--	--	17	1	2
34	1	6	1	--	--	--	--	--	--	--	2	1
35	--	--	--	--	--	--	13	2	1	2	1	--

TABLE I. (continued)

13	14	15	16	17	18	19	20	21	22	23	24	25
3	293	462	757	--	--	41	--	--	2	--	--	10
--	--	3,314	--	--	--	--	--	--	7	--	--	--
10	--	69	--	--	--	--	--	--	--	--	--	--
--	--	2	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
15	--	20	--	--	--	--	--	--	--	--	--	--
--	--	4	--	--	--	1	--	787	67	1	--	7
299	1	20	--	414	--	178	--	--	--	81	1	2
8	--	1	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	2	--	--	91
2	--	562	--	--	--	--	--	--	--	2	--	24
--	--	--	--	--	--	--	--	--	--	--	--	--
9	2	21	--	--	--	--	--	--	--	--	--	--
2	78	11	--	1	--	--	--	1	1	74	--	91
1	1	1,033	3	1	--	1	--	--	--	49	--	3
5	7	108	2,924	25	46	307	537	5	1	1	3	6
--	--	--	64	673	180	333	56	--	--	--	1	--
--	--	--	--	--	3	14	7	--	--	--	--	--
17	28	321	193	124	25	679	98	2	4	2	1	3
--	--	4	--	--	--	--	--	--	--	--	--	--
1	1	9	12	2	4	7	24	271	20	1	47	11
1	2	43	5	1	--	1	1	8	227	1	5	117
--	--	--	--	--	--	1	14	--	5	110	1	--
--	1	10	--	--	5	--	18	15	5	17	50	30
1	2	33	239	64	21	106	56	12	59	57	32	186
--	--	--	--	--	--	--	--	--	--	--	--	--
1	2	31	20	6	1	9	5	1	18	1	7	17
2	2	27	--	--	--	--	--	9	--	--	20	19
--	--	--	--	--	--	--	--	--	--	--	--	--
2	16	214	--	--	--	--	--	42	--	--	1	42
1	1	11	--	--	--	--	--	26	6	--	1	31
2	4	11	7	2	--	1	4	28	17	6	24	41
1	1	16	21	5	1	9	5	3	14	5	--	2
1	1	15	--	--	--	--	--	--	14	--	--	5
--	--	1	--	--	--	--	--	--	--	--	--	--

TABLE I. (continued)

Sectors*	26	27	28	29	30	31	32	33	34	35	36	37
1	--	--	2	--	--	--	--	--	--	--	--	--
2	--	--	--	--	--	--	--	--	--	--	--	--
3	--	--	--	--	--	--	--	--	--	--	--	--
4	--	--	--	--	--	--	--	--	--	--	--	--
5	--	--	--	--	--	--	--	--	--	--	--	--
6	--	--	--	--	--	--	--	--	--	--	--	--
7	--	--	--	--	--	--	--	--	--	--	--	--
8	--	--	1	--	--	--	--	--	--	--	2	--
9	--	--	--	--	--	--	--	--	--	--	--	--
10	--	--	168	58	35	17	19	3	1	1	--	--
11	--	--	--	--	--	--	--	--	--	--	--	--
12	--	--	--	--	--	--	--	--	--	--	--	--
13	--	--	--	--	--	--	--	--	--	--	--	--
14	--	--	--	--	--	--	1	--	--	--	--	--
15	--	--	--	--	--	--	--	--	--	--	--	--
16	--	--	1	--	--	--	1	--	--	2	--	--
17	--	--	--	--	--	--	--	--	--	--	--	--
18	--	--	--	--	--	--	--	--	--	--	--	--
19	--	--	--	4	2	--	2	2	2	20	--	--
20	--	--	--	--	--	--	--	--	--	--	--	--
21	--	--	17	--	4	--	12	35	1	46	--	--
22	6	--	6	55	5	1	6	2	6	--	--	--
23	--	--	--	--	--	--	--	--	--	5	--	--
24	--	--	--	--	1	3	13	36	18	50	--	--
25	1	8	6	4	16	--	55	12	25	16	1	1
26	--	--	--	--	--	--	--	--	--	--	--	--
27	--	268	36	65	500	6	6	4	2	60	7	4
28	--	--	56	2	42	1	14	5	13	12	1	--
29	--	--	54	--	5	--	--	--	--	--	--	--
30	--	102	18	4	685	17	526	252	31	248	--	--
31	--	--	2	--	25	157	246	25	109	47	--	--
32	2	15	4	21	62	20	93	48	33	169	4	4
33	1	7	31	13	61	9	30	334	28	49	4	2
34	--	--	--	2	33	1	9	32	89	44	--	--
35	--	10	--	9	--	--	--	22	4	362	--	1

TABLE I. (continued)

38	39	40	41	42	43	44	45	46	47	48	49	50
--	773	--	--	--	--	--	--	--	--	--	--	--
--	--	--	91	--	--	--	--	--	--	--	--	--
--	--	--	--	10	--	--	--	--	--	--	--	--
--	--	--	--	1	--	--	--	--	--	--	--	--
--	--	--	--	2	--	--	--	--	--	--	--	--
--	--	--	--	28	--	--	--	--	--	--	--	--
72	--	--	--	14	--	--	--	--	--	--	192	--
--	--	3,235	1	47	--	--	--	--	--	--	--	--
--	--	--	--	129	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	415	54
--	--	--	--	77	--	--	--	--	--	--	--	--
--	--	--	--	51	--	--	--	--	--	--	--	--
--	--	--	--	46	--	--	--	--	--	--	--	--
--	--	--	--	42	--	--	--	--	--	--	--	--
--	--	7	--	292	--	--	--	--	--	--	--	--
--	--	--	--	41	14	--	--	--	--	--	--	--
--	--	--	--	54	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
1	17	--	5	9	2	79	--	--	6	--	--	--
--	--	--	--	112	--	8	--	--	--	--	--	--
--	2	--	2	87	26	13	122	99	--	--	589	--
--	58	--	4	31	4	40	116	22	9	11	7	--
1	--	--	--	20	5	--	--	--	--	--	--	--
--	5	--	607	13	--	--	--	5	7	--	113	--
22	1	--	44	65	12	--	9	1	2	2	163	50
--	--	--	--	--	--	--	--	--	--	--	--	--
25	1	3	2,089	26	9	52	27	20	203	2	364	14
--	--	--	14	53	16	14	--	--	--	--	406	--
--	--	--	--	--	--	--	--	4	--	--	801	24
--	--	--	1	--	--	--	--	23	--	--	1,414	--
--	--	--	1	--	--	--	--	--	63	--	31	--
25	1	4	34	130	5	13	49	17	23	--	103	7
20	1	--	1	--	--	--	--	14	7	--	141	--
5	1	--	50	18	1	--	--	--	26	24	215	--
4	1	1	941	23	56	--	--	--	7	10	42	--

TABLE I. (continued)

Sectors*	1	2	3	4	5	6	7	8	9	10	11	12
36	--	--	--	--	--	--	--	--	--	--	--	--
37	--	--	--	--	--	--	--	--	--	--	--	--
38	--	--	--	--	--	--	--	--	--	19	64	8
39	--	--	--	--	--	--	--	--	--	--	--	--
40	--	--	--	--	--	--	--	--	--	--	--	--
41	11	19	12	9	3	4	266	--	--	8	16	1
42	11	34	4	1	1	2	39	46	1	10	7	--
43	3	8	--	--	--	--	4	--	--	5	20	10
44	31	--	125	17	20	31	--	--	--	2	23	1
45	86	267	29	4	8	16	10	23	1	15	60	15
46	12	8	6	1	2	13	1	2	--	--	2	4
47	1	2	1	--	--	--	--	1	--	3	6	3
48	--	1	--	--	--	--	1	2	--	2	3	1
49	--	--	--	--	--	--	--	--	--	--	--	--
50	--	--	--	--	--	--	--	--	--	--	--	--
51a[1]	947	3,950	486	78	118	747	374	6,417	22	145	1,057	248
51b[2]	87	106	6	2	2	8	6	5	--	--	1	3
51c[3]	18	22	2	--	--	2	3	2	--	--	--	1
51d[4]	842	3,822	478	76	116	737	365	6,410	22	--	1,056	244
52a[5]	102	124	7	2	2	10	1	--	--	--	3	13
52b[6]	88	107	6	2	2	9	1	2	--	2	2	9
52c[7]	14	17	1	--	--	1	--	1	--	--	1	4
53[8]	1,035	4,057	492	80	120	756	375	6,419	22	147	1,059	257
54a[9]	32	39	3	--	--	3	3	3	--	--	1	5
54b[10]	18	22	2	--	--	2	3	2	--	--	--	1
54c[11]	14	17	1	--	--	1	--	1	--	--	1	4
55[12]	6,479	19,318	2,114	300	600	1,196	1,671	14,418	414	1,172	2,472	706
56[13]	5,444	15,261	1,622	220	480	440	1,296	7,999	392	1,025	1,413	449
57[14]	--	--	--	--	--	--	--	2	--	6	571	176
58[15]	5,444	15,261	1,622	220	480	440	1,296	7,997	392	1,019	842	273

1 = Total Inputs (51b+51c+51d); 2 = Competitive Imports (c.i.f.); 3= Taxes on Competitive Imports; 4 = Domestic Inputs; 5 = Non-Competitive Imports; 6 = Non-Competitive Imports (c.i.f.); 7 = Taxes on non-comp. imports; 8 = 51a+52b; 9 = Total Import Taxes; 10 = Tax on Compet. Imports.; 11 = Tax on non-comp. imports; 12 = Output (at market prices); 13 = Value-added (55-53); 14 = Indirect Taxes on Output; 15 = Value-added at factor cost.

TABLE I. (continued)

13	14	15	16	17	18	19	20	21	22	23	24	25
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
1	1	9	18	4	1	7	4	4	--	1	4	23
--	--	--	--	--	--	--	--	--	--	--	--	--
--	5	1,934	--	--	--	--	--	--	--	96	--	--
--	8	22	--	--	2	--	12	--	--	--	13	30
1	1	14	4	1	--	1	3	--	--	--	--	2
--	5	50	--	--	--	--	--	--	--	--	--	2
--	18	7	--	--	2	1	100	--	--	--	79	34
1	4	45	102	26	8	42	22	25	14	9	10	70
1	1	14	5	1	--	2	1	--	--	--	--	--
1	7	93	63	16	5	26	13	32	29	30	14	20
1	1	14	3	1	--	1	4	4	6	1	3	2
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
390	494	8,575	4,440	1,367	304	1,768	984	1,275	518	545	317	921
3	1	53	157	170	12	63	34	29	190	82	55	179
1	--	19	63	68	5	25	14	14	106	21	25	77
386	493	8,503	4,220	1,129	287	1,680	936	1,232	222	442	237	665
6	1	81	103	110	8	39	22	16	49	33	790	771
4	1	55	73	79	6	28	16	12	34	24	546	565
2	--	26	30	31	2	11	6	4	15	9	244	206
394	495	8,630	4,513	1,446	310	1,796	1,000	1,287	552	569	863	1,486
3	--	45	93	99	7	36	20	18	121	30	269	283
1	--	19	63	68	5	25	14	14	106	21	25	77
2	--	26	30	31	2	11	6	4	15	9	244	206
787	1,066	13,791	8,059	1,985	698	3,483	1,918	2,567	1,139	1,100	1,576	3,728
393	571	5,161	3,546	539	388	1,687	918	1,280	587	531	713	2,242
--	--	163	191	49	15	78	41	59	33	--	2	65
393	571	4,998	3,355	490	373	1,609	877	1,221	554	531	711	2,177

TABLE I. (continued)

Sectors*	26	27	28	29	30	31	32	33	34	35	36	37
36	--	1,010	--	--	--	--	--	--	--	--	--	--
37	--	--	--	--	154	1	--	--	--	--	--	--
38	8	257	11	30	--	6	29	14	1	98	--	--
39	--	--	--	--	--	--	--	--	--	--	--	--
40	--	--	--	--	--	--	--	--	--	--	--	--
41	9	--	--	1	--	--	--	--	6	--	2	4
42	--	4	2	1	4	1	2	--	--	2	1	--
43	3	--	--	6	100	--	--	--	3	--	--	1
44	3	--	--	2	--	--	5	--	19	--	--	2
45	5	28	27	52	89	15	45	12	17	37	2	6
46	--	--	1	--	17	1	2	--	2	7	--	--
47	18	14	33	66	74	37	62	40	5	34	--	1
48	2	4	1	1	1	1	4	3	3	4	--	1
49	--	--	--	--	--	--	--	--	--	--	--	--
50	--	--	--	--	--	--	--	--	--	--	--	--
51a	58	1,727	480	396	1,915	294	1,182	882	418	1,303	24	27
51b	--	555	40	--	180	8	149	343	85	401	--	3
51c	--	217	17	--	62	3	66	131	60	145	--	1
51d	58	955	423	396	1,673	283	967	408	273	757	--	23
52a	16	35	57	1	25	109	240	227	201	228	--	2
52b	14	25	42	1	20	79	173	167	142	169	--	1
52c	2	10	15	--	5	30	67	60	59	59	--	1
53	72	1,752	522	397	1,935	373	1,355	1,049	560	1,472	24	28
54a	2	227	32	--	67	33	133	191	119	204	--	2
54b	--	217	17	--	62	3	66	131	60	145	--	1
54c	2	10	15	--	5	30	67	60	59	59	--	1
55	266	4,919	1,346	866	3,698	911	2,492	2,223	1,339	2,798	460	157
56	194	3,167	824	469	1,763	538	1,137	1,174	779	1,326	436	129
57	--	1,822	48	50	196	--	2	--	--	--	--	--
58	194	1,345	776	419	1,567	538	1,135	1,174	779	1,326	436	129

*See Chapter IV, Table IV, pages 224-226, for specific sector names.

TABLE I. (continued)

38	39	40	41	42	43	44	45	46	47	48	49	50
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	7	--	11	41	112	--	26	49	115	4	--	19
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	273	--	--	--	--	--	--	--	--
1	70	1	2	--	6	92	17	--	--	18	112	--
3	--	13	437	308	11	117	54	3	2	23	48	111
8	3	1	9	--	--	--	4	--	--	13	61	--
3	39	7	323	--	3	156	31	--	--	--	520	--
13	15	6	150	8	65	310	70	192	112	10	101	5
1	--	--	--	64	4	--	40	15	8	5	12	--
53	3	--	3	68	9	39	17	41	68	5	2	6
2	1	--	4	143	4	49	75	2	2	18	4	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	925	--	332	55	--	--	--	--	--
259	999	3,278	4,824	3,251	364	1,314	712	507	660	145	5,856	290
3	3	7	77	70	4	--	1	21	2	--	187	--
1	1	3	49	27	3	--	1	10	1	--	80	--
255	995	3,268	4,698	3,154	357	1,314	710	476	657	145	5,589	290
2	8	--	54	72	16	1	1	18	1	--	88	--
1	6	2	40	53	12	1	1	13	1	--	66	--
1	2	--	14	9	4	--	--	5	--	--	22	--
260	1,005	3,280	4,864	3,304	376	1,315	713	520	661	145	5,922	290
2	3	3	63	46	7	--	1	15	1	--	102	--
1	1	3	49	27	3	--	1	10	1	--	80	--
1	2	--	14	19	4	--	--	5	--	--	22	--
1,491	2,427	4,488	7,062	8,038	556	1,585	3,426	9,065	1,449	789	11,413	4,808
1,231	1,422	1,208	2,198	4,734	180	270	2,713	8,545	788	644	5,491	4,518
--	966	1	189	339	71	140	778	438	46	66	--	665
1,231	456	1,207	2,009	4,395	109	130	1,935	8,107	742	578	5,491	3,853

TABLE I. (continued)

Sectors	Total Inter-mediate Demand	Consumption	Capital For-mation	Changes in Stocks	Exports	Total Final Demand	Total Demand (at pur-chasers prices)	Comp-etitive imports (1)c.i.f. + tax (2)c.i.f.	Output (at pur-chasers prices)	Total Supply (at pur-chasers prices)
1	3,393				2,254	3,088	6,481	2(2)	6,479	6,481
2	10,430				14	8,911	19,341	29(23)	19,318	19,341
3	148				315	1,966	2,114		2,114	2,114
4	11			(-)	63	289	300		300	300
5	14				884	586	600		600	600
6	287				7	909	1,196		1,196	1,196
7	1,159				22	532	1,691	25(20)	1,671	1,691
8	6,551				216	7,991	14,542	145(124)	14,418	14,542
9	143				70	271	414		414	414
10	882				201	294	1,176	6(4)	1,172	1,176
11	731				75	1,741	2,472		2,472	2,472
12	66				5	646	712	9(6)	706	712
13	78				6	709	787		787	787
14	498				72	605	1,103	47(37)	1,066	1,103
15	1,892				297	11,985	13,877	112(86)	13,791	13,877
16	4,034				6	4,025	8,059		8,059	8,059
17	1,361				4	626	1,987	3(2)	1,965	1,987
18	24				4	674	698		698	698
19	1,724				15	1,885	3,609	177(126)	3,483	3,609
20	124				1	1,800	1,924	10(6)	1,918	1,924
21	1,517				1	1,056	2,573	8(6)	2,567	2,573
22	830				2	610	1,440	419(301)	1,139	1,440
23	163				52	938	1,101	1(1)	1,100	1,101
24	1,097				5	631	1,728	226(152)	1,576	1,728
25	1,557				33	2,681	4,238	745(510)	3,728	4,238
26	406					32	438	193(172)	266	438
27	4,310				5	763	5,073	259(154)	4,919	5,073
28	778				6	678	1,456	157(110)	1,346	1,456
29	888					3	891	35(25)	866	891
30	3,657				16	370	4,027	449(329)	3,698	4,027

TABLE I. (continued)

31	785	145	178	963	75(52)	911	963
32	1,125	2	1,857	2,982	705(490)	2,492	2,982
33	1,052	1	2,497	3,549	1788(1326)	2,223	3,549
34	597	1	1,105	1,702	508(363)	1,339	1,702
35	1,513	1	1,995	3,508	980(710)	2,798	3,508
36	1,010			1,010	765(550)	460	1,010
37	155		2	157		157	157
38	1,006		485	1,491		1,491	1,491
39			2,427	2,427		2,427	2,427
40	2,308		2,180	4,488		4,488	4,488
41	777	240	6,425	7,202	140(140)	7,062	7,202
42	1,330	368	7,044	8,374	345(336)	8,038	8,374
43	319	15	388	707	151(151)	556	707
44	1,604	35	35	1,639	54(54)	1,585	1,639
45	2,304	18	1,147	3,451	25(25)	3,426	3,451
46	255	216	9,053	9,308	243(243)	9,065	9,308
47	1,067		382	1,449		1,449	1,449
48	380		409	789		789	789
49			11,413	11,413		11,413	11,413
50	1,312		3,496	4,808		4,808	4,808

TABLE II. The 1967 Augmented Turkish Input-Output Coefficient Table.

Sectors	1	2	3	4	5	6	7	8	9	10	11	12
1	.02207	---	---	---	---	---	---	.01151	---	---	.29935	.00142
2	---	.08433	---	---	---	---	---	.37280	---	---	---	.01983
3	---	---	.00946	---	---	---	---	---	---	---	---	.05524
4	---	---	---	.02667	---	---	---	---	---	---	---	---
5	---	---	---	---	.02000	---	---	---	---	---	---	---
6	---	---	---	---	---	.18729	---	---	---	---	---	---
7	---	---	---	---	---	---	---	---	---	.00853	---	.00283
8	.06189	.06455	.08420	.07333	.07333	.27926	---	.00312	---	---	---	---
9	---	---	---	---	---	---	---	.00035	---	---	---	---
10	---	.00005	---	---	---	---	---	---	---	.00085	.00647	---
11	---	---	---	---	---	---	---	.00270	---	---	.00971	.00142
12	---	---	---	---	---	---	---	---	---	---	---	.02125
13	---	---	---	---	---	---	---	---	---	---	---	---
14	---	---	---	---	---	---	---	.01359	---	---	---	---
15	---	---	---	---	---	---	---	.03142	.00242	---	---	.06657
16	---	---	---	---	---	---	---	---	---	---	---	---
17	---	---	---	---	---	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---	---	---	---	---	---
19	.00232	.00010	.00095	.00333	.00167	.00502	.00060	.00007	.01449	.00085	.01618	---
20	---	---	---	---	---	---	---	---	---	---	---	---
21	---	---	.00804	.00667	.00833	.02341	---	---	---	---	.00040	.01275
22	---	---	.00331	.00333	---	---	.00838	---	---	---	.00162	.00425
23	---	---	---	---	---	---	---	---	---	.00085	---	---
24	.00232	.00243	.00237	.00333	.00167	.00334	---	---	---	---	.00040	---
25	.00309	.00326	.00331	.00333	.00167	.00334	.00299	.00326	---	.00683	---	.02408
26	.01312	.01372	.01325	.01333	.01333	.01338	---	---	---	---	---	---
27	.01019	.01009	.01183	.01333	.01167	.04348	.00539	.00007	.02657	.01621	.00283	.00283
28	---	---	---	---	---	---	---	---	---	.00512	.00040	.06091
29	---	---	---	---	---	---	---	---	---	---	---	---
30	.00046	.00036	.00047	---	---	---	---	---	---	---	.00324	---
31	---	---	---	---	---	---	---	---	---	---	.00081	---
32	.00031	.00109	.00189	.00333	.00167	.00418	.00658	.00090	.00242	.01365	.00324	.01275

TABLE II. (continued)

13	14	15	16	17	18	19	20	21	22	23	24	25
.00381	.27486	.03350	.09393	---	---	.01177	---	---	.00176	---	---	.00268
---	---	.24030	---	---	---	---	---	---	.00615	---	---	---
.01271	---	.00500	---	---	---	---	---	---	---	---	---	---
---	---	.00015	---	---	---	---	---	---	---	---	---	---
---	---	---	---	---	---	---	---	---	---	---	---	---
.01906	---	.00145	---	---	---	---	---	---	---	---	---	---
---	---	.00029	---	---	---	.00029	---	.30658	.05882	.00091	---	.00188
.37992	.00094	.00145	---	.20856	---	.05111	---	---	---	.07364	.00063	.00054
.01017	---	.00007	---	---	---	---	---	---	---	---	---	---
---	---	---	---	---	---	---	---	---	.00176	---	---	.02441
.00254	---	.04075	---	---	---	---	---	---	---	.00182	---	.00644
---	---	---	---	---	---	---	---	---	---	---	---	---
.01144	.00188	.00152	---	---	---	---	---	---	---	---	---	---
.00254	.07317	.00080	---	.00050	---	---	---	.00039	.00088	.06727	---	.02441
.00127	.00094	.07490	.00037	.00050	---	.00029	---	---	---	.04455	---	.00080
.00635	.00657	.00783	.36282	.01259	.06590	.08814	.27998	.00195	.00088	.00091	.00190	.00161
---	---	---	.00794	.33904	.25788	.09561	.02920	---	---	---	.00063	---
---	---	---	---	---	.00430	.00402	.00365	---	---	---	---	---
.02160	.02627	.02328	.02395	.06247	.03582	.19495	.05109	.00078	.00351	.00182	.00063	.02441
---	---	.00029	---	---	---	---	---	---	---	---	---	---
.00127	.00094	.00065	.00149	.00101	.00573	.00201	.01251	.10557	.01756	.00091	.02982	.00295
.00127	.00188	.00312	.00062	.00050	---	.00029	.00052	.00312	.19930	.00091	.00317	.03138
---	---	---	---	---	---	.00029	.00730	---	.00439	.10000	.00063	---
---	.00094	.00073	---	---	.00716	---	.00938	.00584	.00439	.01545	.03173	.00805
.00127	.00188	.00239	.02966	.03224	.03009	.03043	.02920	.00467	.05180	.05182	.02030	.04989
---	---	---	---	---	---	---	---	---	---	---	---	---
.00127	.00188	.00225	.00248	.00302	.00143	.00258	.00261	.00039	.01580	.00091	.00444	.00456
.00254	.00188	.00196	---	---	---	---	---	.00351	---	---	.01269	.00510
---	---	---	---	---	---	---	---	---	---	---	---	---
.00254	.01501	.01552	---	---	---	---	---	.01636	---	---	.00063	.01127
.00127	.00094	.00080	---	---	---	---	---	.01013	.00527	---	.00063	.00832
.00254	.00375	.00080	.00087	.00101	---	.00029	.00209	.01091	01493	.00545	.01523	.01100

TABLE II. (continued)

Sectors	26	27	28	29	30	31	32	33	34	35	36	37
1	---	---	.00149	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---	---	---	---
6	---	---	---	---	---	---	---	---	---	---	---	---
7	---	---	---	---	---	---	---	---	---	---	.00435	---
8	---	---	.00074	---	---	---	---	---	---	---	---	---
9	---	---	---	---	---	---	---	---	---	---	---	---
10	---	---	.12481	.06697	.00946	.01866	.00762	.00135	.00075	.00036	---	---
11	---	---	---	---	---	---	---	---	---	---	---	---
12	---	---	---	---	---	---	---	---	---	---	---	---
13	---	---	---	---	---	---	---	---	---	---	---	---
14	---	---	---	---	---	---	.00040	---	---	---	---	---
15	---	---	---	---	---	---	---	---	---	---	---	---
16	---	---	.00074	---	---	---	.00040	---	---	.00071	---	---
17	---	---	---	---	---	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---	---	---	---	---	---
19	---	---	---	.00462	.00054	---	.00080	.00090	.00149	.00715	---	---
20	---	---	---	---	---	---	---	---	---	---	---	---
21	---	---	.01263	---	.00108	---	.00482	.01574	.00075	.01287	---	---
22	.02256	---	.00446	.06351	.00135	.00110	.00241	.00090	.00448	---	---	---
23	---	---	---	---	---	---	---	---	---	.00179	---	---
24	---	---	---	---	.00027	.00329	.00522	.01664	.01344	.01787	---	---
25	.00376	.00163	.00446	.00462	.00433	---	.02207	.00540	.01867	.00572	.00217	.00637
26	---	---	---	---	---	---	---	---	---	---	---	---
27	---	.05448	.02675	.07506	.13521	.00659	.00241	.00180	.00149	.02144	.01522	.02548
28	---	---	.04160	.00231	.01136	.00110	.00562	.00225	.00971	.00429	.00217	---
29	---	---	.04012	---	.00135	---	---	---	---	---	---	---
30	---	.02074	.01337	.00462	.18524	.01866	.21108	.11336	.02315	.08863	---	---
31	---	---	.00149	---	.00676	.17234	.09872	.01125	.08140	.01680	---	---
32	.00752	.00305	.00297	.02425	.01677	.02195	.03732	.02159	.02465	.06040	.00870	.02548

TABLE II. (continued)

38	39	40	41	42	43	44	45	46	47	48	49	50
---	.31850	---	---	---	---	---	---	---	---	---	---	---
---	---	---	.01289	---	---	---	---	---	---	---	---	---
---	---	---	---	.00124	---	---	---	---	---	---	---	---
---	---	---	---	.00012	---	---	---	---	---	---	---	---
---	---	---	---	.00025	---	---	---	---	---	---	---	---
---	---	---	---	.00348	---	---	---	---	---	---	---	---
.04829	---	---	---	.00174	---	---	---	---	---	---	.01682	---
---	---	.72081	.00014	.00585	---	---	---	---	---	---	---	---
---	---	---	---	.01605	---	---	---	---	---	---	---	---
---	---	---	---	---	---	---	---	---	---	---	.03636	.01123
---	---	---	---	.00958	---	---	---	---	---	---	---	---
---	---	---	---	.00634	---	---	---	---	---	---	---	---
---	---	---	---	.00572	---	---	---	---	---	---	---	---
---	---	---	---	.00523	---	---	---	---	---	---	---	---
---	---	.00156	---	.03633	---	---	---	---	---	---	---	---
---	---	---	---	.00510	.02518	---	---	---	---	---	---	---
---	---	---	---	.00672	---	---	---	---	---	---	---	---
---	---	---	---	---	---	---	---	---	---	---	---	---
.00067	.00700	---	.00071	.00112	.00360	.04984	---	---	.00414	---	---	---
---	---	---	---	.01393	---	.00505	---	---	---	---	---	---
---	.00082	---	.00028	.01082	.04676	.00820	.03561	.01092	---	---	.05161	---
---	.02390	---	.00057	.00386	.00719	.02524	.03386	.00243	.00621	.01394	.00061	---
.00067	---	---	---	.00249	.00899	---	---	---	---	---	---	---
---	.00206	---	.08595	.00162	---	---	---	.00055	.00483	---	.00990	---
.01476	.00041	---	.00623	.00809	.02158	---	.00263	.00011	.00138	.00253	.01428	.01040
---	---	---	---	---	---	---	---	---	---	---	---	---
.01677	.00041	.00067	.29581	.00323	.01619	.03281	.00788	.00221	.14010	.00253	.03189	.00291
---	---	---	.00198	.00659	.02878	.00883	---	---	---	---	.03557	---
---	---	---	---	---	---	---	---	.00044	---	---	.07018	.00499
---	---	---	.00014	---	---	---	---	.00254	---	---	.12389	---
---	---	---	.00014	---	---	---	---	---	.04348	---	.00272	---
.01677	.00041	.00089	.00481	.01617	.00899	.00820	.01430	.00188	.01587	---	.00902	.00146

TABLE II. (continued)

Sectors	1	2	3	4	5	6	7	8	9	10	11	12
33	.00633	.00663	.00662	.00333	.00667	.00669	---	---	---	.01450	.00040	.00283
34	.00015	.00031	.00047	---	---	---	---	---	---	---	.00081	.00142
35	---	---	---	---	---	---	.00778	.00014	.00242	.00171	.00040	---
36	---	---	---	---	---	---	---	---	---	---	---	---
37	---	---	---	---	---	---	---	---	---	---	---	---
38	---	---	---	---	---	---	---	---	---	.01621	.02589	.01133
39	---	---	---	---	---	---	---	---	---	---	---	---
40	---	---	---	---	---	---	---	---	---	---	---	---
41	.00170	.00098	.00568	.03000	.00500	.00334	.15919	---	---	.00683	.00647	.00142
42	.00170	.00176	.00189	.00333	.00167	.00167	.02334	.00319	.00242	.00853	.00283	---
43	.00046	.00041	---	---	---	---	.00239	---	---	.00427	.00809	.01416
44	.00478	---	.05913	.05667	.03333	.02592	---	---	---	.00171	.00930	.00142
45	.01327	.01382	.01372	.01333	.01333	.01338	.00598	.00160	.00242	.01260	.02427	.02125
46	.00185	.00041	.00284	.00333	.00333	.01087	.00060	.00014	---	---	.00081	.00567
47	.00015	.00010	.00047	---	---	---	---	.00007	---	.00256	.00243	.00425
48	---	.00005	---	---	---	---	.00060	.00014	---	.00171	.00121	.00142
49	---	---	---	---	---	---	---	---	---	---	---	---
50	---	---	---	---	---	---	---	---	---	---	---	---
51(a)[a]	.14616	.20447	.22990	.26000	.19667	.62458	.22382	.44507	.05314	.12372	.42759	.35127
51(b)[b]	.01343	.00549	.00284	.00667	.00333	.00669	.00359	.00035	---	---	.00040	.00425
52[c]	.01358	.00554	.00284	.00667	.00333	.00753	.00060	.00014	---	.00171	.00081	.01275
53[d]	.15975	.21001	.23273	.26667	.20000	.63211	.22442	.44521	.05314	.12543	.42840	.36402
54[e]	.84025	.7899	.76727	.73333	.80000	.36789	.77558	.55479	.94686	.87457	.57160	.63598
55[f]	1.00	1.00	1.00	1.00	1.000	1.00	1.00	1.00	1.00	1.00000	1.00	1.00

a = Total Inputs; b = Competitive Imports (c.i.f.); c = Non-competitive Imports (c.i.f.);
d = 51(a) + 52; e = Value Added; f = Output (= 53 + 54).

TABLE II. (continued)

13	14	15	16	17	18	19	20	21	22	23	24	25
.00127	.00094	.00116	.00261	.00252	.00143	.00258	.00261	.00117	.01229	.00455	---	.00054
.00127	.00094	.00109	---	---	---	---	---	---	.01229	---	---	.00134
---	---	.00007	---	---	---	---	---	---	---	---	---	---
---	---	---	---	---	---	---	---	---	---	---	---	---
---	---	---	---	---	---	---	---	---	---	---	---	---
.00127	.00094	.00065	.00223	.00202	.00143	.00201	.00209	.00156	---	.00091	.00254	.00617
---	---	---	---	---	---	---	---	---	---	---	---	---
---	.00469	.14024	---	---	---	---	---	---	---	.08727	---	---
---	.00750	.00160	---	---	.00287	---	.00626	---	---	---	.00825	.00805
.00127	.00094	.00102	.00050	.00050	---	.00029	.00156	---	---	---	---	.00054
---	.00469	.00363	---	---	---	---	---	---	---	---	---	.00054
---	.01689	.00051	---	---	.00287	.00029	.05214	---	---	---	.05013	.00912
.00127	.00375	.00326	.01266	.01310	.01146	.01206	.01147	.00974	.01229	.00818	.00635	.01878
.00127	.00094	.00102	.00062	.00050	---	.00057	.00052	---	---	---	---	---
.00127	.00657	.00674	.00782	.00806	.00716	.00746	.00678	.01247	.02546	.02727	.00888	.00536
.00127	.00094	.00102	.00037	.00050	---	.00029	.00209	.00156	.00527	.00091	.00190	.00054
---	---	---	---	---	---	---	---	---	---	---	---	---
---	---	---	---	---	---	---	---	---	---	---	---	---
.49555	.46341	.62178	.55094	.68866	.43553	.50761	.51303	.49669	.45478	.49545	.20114	.24705
.00381	.00094	.00384	.01948	.08564	.01719	.01809	.01773	.01130	.16681	.07455	.03490	.04802
.00508	.00094	.00399	.00906	.03980	.00860	.00804	.00834	.00467	.02985	.02182	.34645	.15156
.50064	.46435	.62577	.56000	.72846	.44413	.51565	.52138	.50136	.48464	.51727	.54759	.39861
.49936	.53565	.37423	.44000	.27154	.55587	.48435	.47862	.49864	.51536	.48273	.45241	.60139
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

TABLE II. (continued)

Sectors	26	27	28	29	30	31	32	33	34	35	36	37
33	.00376	.00142	.02303	.01501	.01650	.00988	.01204	.15025	.02091	.01751	.00870	.01274
34	---	---	---	.00231	.00892	.00110	.00361	.01439	.06647	.01573	---	---
35	---	.00203	---	.01039	---	---	---	.00990	.00299	.12938	---	.00637
36	---	.20533	---	---	---	---	---	---	---	---	---	---
37	---	---	---	---	.04164	.00110	---	---	---	---	---	---
38	.03008	.05375	.00817	.03464	---	.00659	.01164	.00630	.00075	.03503	---	---
39	---	---	---	---	---	---	---	---	---	---	---	---
40	---	---	---	---	---	---	---	---	---	---	---	---
41	.03383	---	---	.00115	---	---	---	---	.00448	---	.00435	.02548
42	---	.00081	.00149	.00115	.00108	.00110	.00080	---	---	.00071	.00217	---
43	.01128	---	---	.00693	.02704	---	---	---	.00224	---	---	.00637
44	.01128	---	---	.00231	---	---	.00201	---	.01419	---	---	.01274
45	.01880	.00569	.02006	.06005	.02407	.01647	.01806	.00540	.01270	.01322	.00435	.03822
46	---	---	.00074	---	.00460	.00110	.00080	---	.00149	.00250	---	---
47	.06767	.00285	.02675	.07621	.02001	.04061	.02488	.01799	.00373	.01215	---	.00637
48	.00752	.00081	.00074	.00115	.00027	.00110	.00161	.00135	.00224	.00143	---	.00637
49	---	---	---	---	---	---	---	---	---	---	---	---
50	---	---	---	---	---	---	---	---	---	---	---	---
51(a)	.21805	.35109	.35661	.45727	.51785	.32272	.47432	.39676	.31217	.46569	.05217	.17197
51(b)	---	.11283	.02972	---	.04867	.00878	.05979	.15430	.06348	.14332	---	.01911
52	.05263	.00508	.03120	.00115	.00541	.08672	.06942	.07512	.10605	.06040	---	.00637
53	.27068	.35617	.38782	.45843	.52326	.40944	.54374	.47188	.41822	.52609	.05217	.17834
54	.72932	.64383	.61218	.54157	.47674	.59056	.45626	.52812	.58178	.47391	.94783	.82166
55	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

TABLE II. (continued)

38	39	40	41	42	43	44	45	46	47	48	49	50
.01341	.00041	---	.00014	---	---	---	---	.00154	.00483	---	.01235	---
.00335	.00041	---	.00708	.00224	.00180	---	---	---	.01794	.03042	.01884	---
.00268	.00041	.00022	.13325	.00286	.10072	---	---	---	.00483	.01267	.00368	---
---	---	---	---	---	---	---	---	---	---	---	---	---
---	---	---	---	---	---	---	---	---	---	---	---	---
---	.00288	---	.00156	.00510	.20144	---	.00759	.00541	.07937	.00507	---	.00395
---	---	---	---	---	---	---	---	---	---	---	---	---
---	---	---	---	.03396	---	---	---	---	---	---	---	---
.00067	.02884	.00022	.00028	---	.01079	.05804	.00496	---	---	.02281	.00981	---
.00201	---	.00290	.06188	.03832	.01978	.07382	.01576	.00033	.00138	.02915	.00421	.02309
.00537	.00124	.00022	.00127	---	---	---	.00117	---	---	.01648	.00534	---
.00201	.01607	.00156	.04574	---	.00540	.09842	.00905	---	---	---	.04556	---
.00872	.00618	.00134	.02124	.00100	.11691	.19558	.02043	.02118	.07729	.01267	.00885	.00104
.00067	---	---	---	.00796	.00719	---	.01168	.00165	.00552	.00634	.00105	---
.03555	.00124	---	.00042	.00846	.01619	.02461	.00496	.00452	.04693	.00634	.00017	.00125
.00134	.00041	---	.00057	.01779	.00719	.03091	.02189	.00022	.00138	.02281	.00035	---
---	---	---	---	---	---	---	---	---	---	---	---	---
---	---	---	---	.11508	---	.20946	.01605	---	---	---	---	---
.17371	.41162	.73039	.68309	.40445	.65468	.82902	.20782	.05593	.45549	.18378	.51310	.06032
.00201	.00124	.00156	.01090	.00871	.00719	---	.00029	.00232	.00138	---	---	---
.00067	.00247	.00045	.00566	.00659	.02158	.00063	.00029	.00143	.00069	---	.00578	---
.17438	.41409	.73084	.68876	.41105	.67626	.82965	.20811	.05726	.45618	.18378	.51888	.06032
.82562	.58591	.26916	.31124	.58895	.32374	.17035	.79189	.94264	.54382	.81622	.48112	.93968
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

TABLE III. The Primary Factor Intensities.
(Value of the non-labor primary factor services, per unit output, in mill. TL/value of the labor services per unit output in mill. TL.)

		k_j/l_j
1.	Industrial Crops	.20469
2.	Wheat, other cereals, hay, etc.	.38887
3.	Fruits	1.85566
4.	Citrus Fruits	1.85713
5.	Nuts	1.85714
6.	Vegetables	.41024
7.	Forestry Products	2.33167
8.	Livestock	5.24904
9.	Fishing	1.00000
10.	Other Mining	.61416
11.	Sugar	3.99301
12.	Alcoholic Beverages	13.48372
13.	Milk industry, canned food	3.18084
14.	Olive oil, seed oils, fats	2.22603
15.	Other food sector	6.13771
16.	Cotton Textile	2.70535
17.	Wool Textile	.38916
18.	Knitting Industry	3.56462
19.	Other Textile	6.70293
20.	Clothing Industry	6.11612
21.	Wood Products	2.69938
22.	Paper, printing, stationeries	1.86343
23.	Leather, and Leather Products	2.99247
24.	Rubber, Plastics, and Products	7.29045
25.	Chemicals, and Pharmaceuticals	4.54951
26.	Fertilizers	3.12768
27.	Petroleum Refineries, Coal Pro.	49.25995
28.	Ceramics, Glass, and other non-metal pro.	3.76293
29.	Cement	3.15052
30.	Iron and Steel	8.08769

TABLE III. (continued)

31.	Non-ferrous Metal	4.54621
32.	Metal Products	2.70371
33.	Agri. and non-elect. mach.	13.31607
34.	Elect. mach. and appliances	7.37682
35.	Transp. equip., Mainten, Repairs	1.85781
36.	Crude Petroleum	11.45670
37.	Iron-ore Mining	.49999
38.	Coal Mining	.40848
39.	Tobacco Processing Products	6.14599
40.	Animal Slaughtering	.63908
41.	Other Transportation	10.10021
42.	Professions, personal services	15.66997
43.	Railway Transportation	0.0/.32 = 0
44.	Trade	11.27305
45.	Banking, Insurance, Coop.	.31572
46.	Public Services	3.34857
47.	Electricity Generation, Trans.	1.77463
48.	Communications	.61404
49.	Construction	.72401
50.	Ownership of Dwellings	93968/.00

APPENDIX C

The Free Trade Optimum Solution Results

TABLE I. FREE TRADE SOLUTION I. 1.

SCALAR = 1.078144

	OUTPUT	INDUSTRY	CONSUMPTION	EXPORTS	IMPORTS	PRICE	UPPER RENT	LOWER RENT
1	8803.000	3172.810	8440.174	2711.014	0	.990000	.034450	0
2	18876.485	10599.722	9592.268	0	1719.385	.950000	0	0
3	2065.302	152.157	1780.020	139.136	0	.970000	0	0
4	319.000	11.711	243.461	59.428	0	.950000	.010254	0
5	630.000	14.754	150.549	464.795	0	1.000000	.043221	0
6	1750.000	993.729	970.488	0	26.219	.950000	.044374	0
7	1587.000	1090.371	540.855	0	43.228	.830000	0	.119746
8	15139.000	8364.812	8384.548	380.000	0	.950000	.002101	0
9	435.000	153.465	216.707	64.827	0	.950000	.004439	0
10	1053.000	877.174	100.268	77.548	0	.830000	0	.106417
11	2223.000	789.715	1748.192	0	360.804	.410000	0	.535715
12	635.000	68.123	841.092	0	124.219	.410000	0	.485138
13	865.000	94.154	473.841	108.103	0	.930000	.040114	0
14	654.000	487.394	528.292	0	56.488	.800000	0	.131505
15	15170.000	2065.542	11887.641	1212.777	0	.910000	.004759	0
16	7254.000	3634.127	3318.534	310.338	0	.750000	0	.109413
17	1787.000	1234.336	670.817	0	117.949	.700000	0	.135793
18	628.000	21.433	540.215	10.182	0	.780000	0	.075927
19	3135.000	1720.884	1248.493	165.820	0	.710000	0	.135735
20	1720.000	132.937	1723.546	0	136.953	.530000	0	.313593
21	2310.000	1539.918	1137.444	0	367.362	.600000	0	.252833
22	1125.000	724.478	655.513	0	424.891	.430000	0	.316434
23	966.000	152.095	711.577	128.329	0	.800000	0	.084133
24	1414.000	1141.700	473.841	0	307.549	.300000	0	.492434
25	3345.000	1488.952	2456.931	0	998.884	.400000	0	.422457
26	634.000	494.655	34.501	0	200.454	.500000	0	.432283
27	4427.000	4451.469	1248.493	0	1272.543	.270000	0	.470244
28	1211.000	790.730	404.153	0	104.893	.770000	0	.063844
29	774.000	846.756	3.234	0	170.990	.440000	0	.382449
30	3328.000	3581.775	381.664	0	445.430	.410000	0	.312414
31	420.000	720.298	35.579	64.125	0	.540000	0	.251437
32	2243.000	1085.545	1945.561	0	842.524	.450000	0	.365841
33	2011.000	597.705	2491.457	0	1487.758	.490000	0	.285678
34	1205.000	895.659	1190.274	0	584.339	.490000	0	.335341
35	2518.000	1584.472	2149.824	0	1218.298	.450000	0	.304524
36	419.000	908.994	0	0	494.894	.130000	0	.744897
37	164.000	136.449	2.154	0	.436	.880000	0	.045440
38	1345.000	884.318	522.501	0	167.211	.880000	0	.044399
39	2189.000	0	2401.032	0	217.032	.800000	0	.150200
40	4265.000	2510.458	2130.250	0	597.317	.950000	0	.004647
41	7760.000	764.729	6448.338	332.936	0	1.000000	.348301	0
42	8618.880	1418.975	7197.708			.944259		
43	715.489	313.538	402.140			.833820		
44	1498.524	1458.289	37.735			.874204		
45	3547.593	2311.346	1217.227			.925540		
46	5784.491	242.113	9527.570			.940253		
47	1431.479	1010.627	411.852			.847403		
48	835.553	344.542	400.562			.934339		
49	12304.884	0	12304.884			.765645		
50	5173.047	1402.648	3764.200			.939922		
FACTOR 1		33.320				0		
FACTOR 2		181.724				0		
FACTOR 3		356.094				0		
FACTOR 4		2105.540				0		
FACTOR 5		35535.000				.984469		
FACTOR 6		64940.000				.953083		
PAYMENTS		2503.908		7651.774	5862.848	1.000000		

TABLE II. FREE TRADE SOLUTION I.2.

SCALAR = 1.098602

	OUTPUT	INDUSTRY	CONSUMPTION	EXPORTS	IMPORTS	PRICE	UPPER RENT	LOWER RENT
1	6556.034	2891.395	918.234	2654.401	0	.990000	0	0
2	19013.176	11618.750	9774.265	0	2379.839	.950000	0	0
3	2325.000	158.836	1813.792	352.322	0	.930000	.116139	0
4	330.000	12.342	244.244	69.374	0	.950000	.130625	0
5	840.000	15.495	153.804	490.791	0	1.000000	.180779	0
6	1319.000	916.157	940.539	5.004	0	.950000	.083199	0
7	1838.000	990.768	580.797	288.945	0	.830000	.008474	0
8	15840.000	7311.058	8541.833	107.300	0	.950000	.120011	0
9	455.000	157.877	220.819	76.304	0	.950000	.085842	0
10	634.000	912.043	102.170	0	77.813	.830000	0	.071359
11	1978.000	845.704	1830.272	0	897.977	.410000	0	.420849
12	565.000	67.027	704.204	0	207.131	.410000	0	.326452
13	949.000	38.018	838.826	169.964	0	.980000	.132045	0
14	853.000	594.590	538.315	0	189.815	.800000	0	.045896
15	18549.000	2227.804	12113.190	2309.007	0	.910000	.088278	0
16	8447.000	3255.049	3391.498	0	180.587	.750000	0	.033427
17	1588.000	1176.918	883.231	0	272.248	.700000	0	.135031
18	838.000	20.402	607.527	210.071	0	.780000	.030947	0
19	2748.000	1434.249	1276.182	0	128.450	.710000	0	.026195
20	1534.000	138.406	1756.845	0	359.074	.530000	0	.200497
21	2059.000	1518.653	1194.025	0	623.678	.600000	0	.168447
22	611.000	755.423	867.650	0	512.273	.470000	0	.241653
23	1326.000	182.732	725.078	412.131	0	.800000	.004418	0
24	1261.000	1100.807	868.826	0	414.233	.300000	0	.499127
25	2582.000	1437.436	2904.099	0	1364.729	.480000	0	.297441
26	213.000	488.434	15.155	0	230.590	.500000	0	.292482
27	3535.000	4593.073	1276.182	0	1924.254	.270000	0	.292254
28	1613.000	810.814	420.710	183.076	0	.770000	.027632	0
29	893.000	979.435	3.294	0	289.739	.440000	0	.276541
30	2555.000	1450.846	388.505	0	881.746	.410000	0	.199584
31	729.000	654.284	38.254	38.462	0	.560000	0	.144291
32	1099.000	1437.584	2037.607	0	1381.401	.450000	0	.225870
33	1778.000	951.384	2742.111	0	1915.498	.490000	0	.153317
34	1071.000	584.646	1212.857	0	728.497	.480000	0	.220002
35	2235.000	1442.753	2140.613	0	1595.366	.450000	0	.236221
36	348.000	807.974	0	0	439.974	.190000	0	.513539
37	128.000	193.073	2.197	0	.170	.800000	0	.027342
38	1193.000	932.294	836.832	0	272.114	.800000	0	.037942
39	1562.000	0	2498.587	0	936.587	.800000	0	.019388
40	5348.000	2739.568	2398.653	251.479	0	.950000	.087236	0
41	8474.000	798.437	6794.856	880.717	0	1.000000	.486303	0
42	8820.350	1488.080	7334.269			.714151		
43	714.849	305.478	409.779			.881120		
44	1731.155	1492.704	38.451			.758645		
45	3528.572	2288.258	1240.322			.928438		
46	9971.169	242.820	9708.249			.771838		
47	1409.209	989.542	419.686			.741959		
48	845.935	396.408	449.328			.895021		
49	12538.349	0	12538.349			.733948		
50	5275.240	1434.826	3840.714			.677936		
FACTOR 1		34.155				0		
FACTOR 2		184.342				0		
FACTOR 3		343.240				0		
FACTOR 4		2114.639				0		
FACTOR 5		35535.000				1.091723		
FACTOR 6		64940.000				.670016		
PAYMENTS		2321.510		9253.168	7881.678	1.000000		

TABLE III. FREE TRADE SOLUTION II. 1.

SCALAR = 1.078129

	OUTPUT	INDUSTRY	CONSUMPTION	EXPORTS	IMPORTS	PRICE	UPPER RENT	LOWER RENT
1	6803.000	3192.410	899.159	2711.031	0	.990000	.037493	0
2	14876.503	10999.714	9547.110	0	1719.320	.950000	0	0
3	2665.935	1152.163	1779.590	137.782	0	.930000	0	0
4	315.000	11.711	243.657	59.672	0	.950000	.019172	0
5	435.000	14.754	150.538	464.708	0	1.000000	.043383	0
6	1249.000	302.724	976.472	0	26.194	.950000	.042656	0
7	1587.000	1000.347	549.846	0	49.212	.870000	0	.077995
8	15134.000	4366.056	8382.450	380.692	0	.950000	.002234	0
9	435.000	153.633	218.764	64.833	0	.950000	.006374	0
10	1052.000	877.128	100.266	77.606	0	.830000	0	.106767
11	2225.000	389.713	1748.162	0	364.874	.410000	0	.535777
12	435.000	60.123	641.040	0	174.203	.410000	0	.409929
13	865.000	94.155	473.830	108.115	0	.990000	.033305	0
14	549.000	407.396	528.203	0	56.679	.870000	0	.068923
15	15170.000	2049.578	11867.446	1212.977	0	.930000	.021132	0
16	7253.000	3424.125	3310.400	310.394	0	.870000	0	.036325
17	1387.000	1334.335	470.598	0	117.931	.700000	0	.143144
18	427.000	21.403	540.205	10.192	0	.830000	0	.020937
19	3135.000	1330.648	1348.473	165.839	0	.800000	0	.072799
20	1329.000	172.998	1721.928	0	134.927	.670000	0	.212657
21	2319.000	1539.604	1137.424	0	347.332	.740000	0	.132163
22	1023.000	304.476	455.502	0	424.982	.470000	0	.323528
23	590.000	152.094	711.585	126.341	0	.870000	0	.025043
24	1416.000	1141.539	473.030	0	397.530	.300000	0	.411425
25	3365.000	1488.945	2854.884	0	988.834	.480000	0	.425000
26	234.000	436.642	34.500	0	200.442	.500000	0	.437480
27	4427.000	4451.648	1248.473	0	1272.541	.270000	0	.487409
28	1211.000	393.732	499.143	0	104.074	.830000	0	.036424
29	779.000	844.741	3.234	0	173.974	.440000	0	.341439
30	3328.000	1591.752	381.650	0	445.407	.410000	0	.312744
31	824.000	330.235	34.578	64.127	0	.540000	0	.249447
32	2243.000	1085.561	1999.524	0	842.490	.450000	0	.335044
33	2001.000	937.306	2491.009	0	1497.715	.490000	0	.285979
34	1263.000	599.055	1140.254	0	594.309	.480000	0	.354202
35	2518.000	1504.470	2149.388	0	1218.958	.450000	0	.336437
36	419.000	908.995	0	0	434.994	.130000	0	.741472
37	141.000	139.408	2.156	0	.434	.880000	0	.045874
38	1342.000	584.306	526.532	0	167.199	.880000	0	.046613
39	2184.000	0	2400.542	0	216.992	.880000	0	.149888
40	4249.000	2519.654	2330.320	0	597.274	.950000	0	.004507
41	7748.000	764.732	6448.295	333.043	0	1.000000	.388576	0
42	8610.556	1419.070	7197.508			.907527		
43	715.470	313.434	402.142			.847059		
44	1699.555	1459.830	37.734			.883441		
45	3527.579	2310.372	1217.207			.930773		
46	9749.514	242.112	9527.422			.947123		
47	1431.470	1015.825	411.845			.847047		
48	835.544	394.590	440.555			.934149		
49	12308.681	0	12304.681			.776020		
50	5172.977	1403.640	3769.137			.930000		
FACTOR 1		33.320				0		
FACTOR 2		101.723				0		
FACTOR 3		356.194				0		
FACTOR 4		2109.535				0		
FACTOR 5		35535.000				.985954		
FACTOR 6		84040.000				.948825		
PAYMENTS		2503.905		7138.467	5949.572	1.000000		

TABLE IV. FREE TRADE SOLUTION II.2.

SCALAR = 1.097841

	OUTPUT	INDUSTRY	CONSUMPTION	EXPORTS	IMPORTS	PRICE	UPPER RENT	LOWER RENT
1	7127.000	7075.098	915.616	3134.398	0	.990000	.018160	0
2	1[illegible]263.595	11555.578	9747.471	0	3059.614	.950000	0	0
3	2325.000	158.869	1812.569	353.502	0	.970000	.052433	0
4	330.000	12.740	246.117	69.543	0	.950000	.049476	0
5	640.000	15.602	193.701	490.898	0	1.000000	.114457	0
6	1310.000	916.112	990.271	6.817	0	.950000	.045578	0
7	1505.000	990.603	554.509	0	44.812	.870000	0	.020099
8	15[illegible]00.000	7190.131	8535.871	125.944	0	.950000	.055994	0
9	455.000	157.448	220.470	76.862	0	.950000	.042231	0
10	930.000	912.456	102.101	0	74.560	.870000	0	.000970
11	1535.000	845.591	1924.037	0	498.418	.410000	0	.483523
12	545.000	87.645	703.720	0	204.574	.410000	0	.418741
13	545.000	87.934	498.143	169.981	0	.980000	.070889	0
14	853.000	504.432	537.[illegible]2	0	189.984	.870000	0	.020097
15	14547.000	2227.751	12105.018	2214.132	0	.930000	.008839	0
16	7304.453	3547.008	3376.717	362.328	0	.870000	0	0
17	1585.000	1103.978	882.870	0	279.548	.700000	0	.142892
18	830.000	20.402	607.117	210.481	0	.830000	.019353	0
19	2760.000	1455.124	1271.323	0	141.448	.800000	0	.023318
20	1535.000	134.241	1755.489	0	357.721	.670000	0	.141089
21	2054.000	1519.488	1158.244	0	623.732	.740000	0	.100195
22	911.000	353.134	667.500	0	809.804	.470000	0	.784674
23	1324.000	182.745	724.588	412.443	0	.870000	.014137	0
24	1261.000	1108.044	848.163	0	613.207	.300000	0	.543524
25	2582.000	1461.282	2907.138	0	1384.419	.480000	0	.349749
26	213.000	405.694	39.132	0	227.028	.500000	0	.347428
27	3935.000	4502.431	1271.223	0	1918.754	.270000	0	.389841
28	1415.000	816.417	420.292	184.291	0	.830000	.018617	0
29	643.000	870.824	3.794	0	289.128	.440000	0	.333798
30	2550.000	3449.773	788.643	0	888.418	.410000	0	.241338
31	724.000	654.453	38.229	38.917	0	.540000	0	.233144
32	1595.000	1035.402	2038.533	0	1077.934	.450000	0	.240410
33	1775.000	952.227	2740.262	0	1914.488	.430000	0	.224248
34	1071.000	506.417	1212.030	0	727.454	.480000	0	.263181
35	2239.000	1439.995	2189.135	0	1591.134	.450000	0	.275599
36	369.000	847.074	0	0	439.974	.130000	0	.637872
37	120.000	123.973	2.194	0	.169	.880000	0	.037538
38	1103.000	934.453	512.467	0	273.918	.880000	0	.043597
39	1942.000	0	2444.937	0	502.937	.800000	0	.090360
40	5388.000	2339.126	2393.337	953.936	0	.950000	.000856	0
41	8479.000	745.584	6798.272	938.145	0	1.000000	.430111	0
42	8807.353	1478.131	7369.221			.832402		
43	713.489	334.187	409.502			.859445		
44	1733.892	1495.377	38.425			.824038		
45	3539.745	2203.259	1239.485			.931179		
46	9585.688	253.885	9701.799			.847677		
47	1413.931	934.545	419.383			.888401		
48	845.690	396.664	449.025			.914794		
49	12529.890	0	12529.890			.761566		
50	5271.806	1432.684	3838.123			.817723		
FACTOR 1		33.718				0		
FACTOR 2		184.[illegible]8				0		
FACTOR 3		361.466				0		
FACTOR 4		2116.165				0		
FACTOR 5		35535.000				1.034380		
FACTOR 6		64940.000				.825893		
PAYMENTS		2332.619		9979.845	8619.464	1.000000		