

2 Trade Liberalization and Competitive Structure in Turkey during the 1980s

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1 INTRODUCTION

All present-day industrial and developing countries have, at one time or another, protected their manufacturing industries. Turkey is no exception. It has protected import-substituting industries over exports and industry over agriculture during the three decades 1950–79. During this period, Turkey followed an inward-oriented development strategy. Until the mid-1960s it was engaged in replacing the imports of non-durable consumer goods by domestic production. By the mid-1960s Turkey was able to satisfy the domestic demand for those commodities. It then had a choices of two strategies: it could either embark on exportation of manufactured goods, or it could move on to the second stage of import substitution. Turkey chose the latter strategy and replaced the imports of intermediate goods and consumer durables by domestic production. But these commodities had different characteristics from those replaced at the first stage. They were highly capital intensive, they required the availability of skilled and technical labour and were subject to economies of scale, with efficient plant size being large compared to domestic needs. Correspondingly high protection of these industries was required. High protection was achieved through tariffs, quotas and over-valued exchange rates. As a result, the incremental capital output ratio increased considerably and eventually the maintenance of the pace of growth became more and more costly.

The quadrupling of oil prices between 1973 and 1974 and the 1974–5 world recession adversely affected the Turkish economy. The oil bill rose sharply. The economic difficulties of the European economies led to a slowdown of emigration and a decline in workers remittances. Despite the external shocks amounting, according to Balassa (1981), to 5.4 per cent of GNP, Turkey attempted to preserve its growth momentum through rapid reserve decumulation and massive external borrowing.

Successive governments refused to adapt their economic strategies to the new environment and pursued expansionary policies. Under the impetus of the public sector, investment programmes grew sharply. The investment/GNP ratio increased from about 19.1 per cent in 1973 to 24.1 per cent in 1977. Since consumption was not simultaneously constrained, GNP grew at the unsustainable rate of 7.8 per cent per annum during 1974–6. The gap between national savings and investment widened. During this period, when financial markets were repressed by way of mandatory ceilings on deposit and borrowing rates, the public finances deteriorated sharply. As public investment programmes increased considerably, the government also imposed policies such as under-indexation of the prices of public enterprises and over-employment by these institutions. These policies, in turn, caused dramatical deterioration of the accounts of state economic enterprises. As a result, the public sector borrowing requirements increased to about 11.7 per cent of GNP in 1977. Money supply and, hence, inflation exploded. The government, in order to keep the inflation rate from increasing further, kept essentially to a fixed exchange-rate system. Although Turkey introduced a series of minor exchange-rate adjustments, the spread between Turkish and world-wide inflation rate increased. The real exchange rate appreciated. The government tried to avoid the adverse effects of the exchange-rate appreciation by increases in export rebate rates and increased control on foreign capital movements. But as a result of the policies followed, imports grew and exports stagnated. By 1977 the net capital inflow was nearly double that of export value. The heavy borrowing soon led to high external debt. The share of short-term debt increased rapidly. Consequently, the widening current account deficit developed into a payments crisis in 1977 and Turkey lost its international creditworthiness. Shortage of foreign exchange restricted the inflow of imports that were required for production as well as capacity expansions needed for future growth. The crisis was accompanied by recession and also political instability. By late 1970s it was apparent that the strategy followed was no longer sustainable.

In January 1980, the government introduced a comprehensive policy package designed to restore price stability, achieve viable growth, increase the efficiency of resource allocation through greater reliance on market forces and introduce 'outward orientation' in economic policy.

The stabilization programme introduced in January 1980 made use of a wide range of policy instruments. The financial position of state economic enterprises was improved through a combination of price increases, reduction in wage expenditure and scaling down of invest-

ment programmes. The budget deficit was reduced by widening the income tax base, raising some indirect tax rates and improving tax collection procedures. Monetary policy was tightened. Action was taken to increase the efficiency of the financial system and foreign trade and foreign exchange movements were liberalized to a very large extent. The liberalization episode that began in January 1980 marks a turning point in Turkish economic history. For the first time in its recent history, the country aimed explicitly at making the economy more 'market oriented'.

The purpose of this paper is to analyze quantitatively the trade liberalization episode to Turkey's liberalization experience that began during the 1980s. In Section 2 we consider the characteristics of the Turkish foreign trade regime, and in Section 3 the competitive structure of the Turkish economy. The paper concludes with policy recommendations towards the rationalization of the Turkish foreign trade system.

2 TRADE LIBERALIZATION

A trade system is called neutral if it operates under perfect competition as it would in the absence of government interference. Any movement in a trade regime towards neutrality is defined as trade liberalization, and a change which increases the deviation from neutrality is seen as reversal of liberalization. Trade liberalization, thus defined, manifests itself in three ways. First, trade liberalization is a move from rationing through government regulation to the use of price mechanisms in the form of tariffs. Second, a move towards neutrality lowers the average levels of nominal and effective protection and subsidy rates and reduces the dispersions within the system of these rates. The third manifestation of trade liberalization is a move towards a system where the real exchange rate and the sectoral real effective exchange rates remain relatively stable over time with no violent fluctuations.

2.1 Import regime

In the immediate post-war years, Marshall aid was granted to Turkey, and Turkey became a member of the Organization for European Economic Cooperation, thus promoting Turkey's ties with the West. In 1950s, the anti-etatist Democratic Party took power from the, until then, monopolistic Republican Party. At the beginning of the 1950s, the government followed liberal policies. But after the massive crop failure of

1954, the country turned to import substituting policies, and hence to protectionist foreign trade policies. Licensing was to be required for all imports, with many import commodities transferred to the quota list. All importers were required to possess an 'importer's certificate', and a system of multiple exchange rates was inaugurated. In 1954, Turkey replaced specific tariff rates with *ad valorem* rates, and tariff rates were increased considerably as reported by Baysan and Blitzer (1988).

In 1958, the government agreed on a stabilization programme prepared with the assistance of the IMF. The Turkish lira was devalued and Turkey moved towards a more unified exchange-rate system. The various separate lists of imports were replaced by import programmes, which stated import regulations and procedures that importers had to follow to obtain import licenses. The first import programme appeared in the *Official Gazette* on 23 September 1958. Thereafter, import programmes became the major instrument of import control.

During the 1960s, a new, socially progressive constitution was adopted. The constitution required the establishment of the State Planning Organization and formal economy-wide planning through five-year plans and annual programmes. With the introduction of economy-wide planning, economic policy exhibited greater concern for industrialization. During this period, Turkey explicitly followed an inward-oriented development strategy through high protection of industry. High protection was achieved through restrictions, regulation, tariffs, quotas and overvalued exchange rates.

During the 1960s and 1970s, all imports into Turkey were regulated by annual import programmes. Each programme was published in the *Official Gazette*. The import programme itemized commodities under the liberalization list, the quota list, and a list enumerating the commodities to be imported under bilateral trade arrangements. Importation of goods not enumerated in any of the lists was prohibited. Of these lists, the quota list and the liberalization list were of major importance. The liberalized lists contained commodities considered essential for the achievement of development plan objectives when domestic productive capacity was unavailable. They consisted mostly of capital goods and raw materials. The liberalization list was further divided into a free import list (liberalization list I) and a restricted list (liberalization list II). Commodities on the free import list consisted mainly of raw materials and spare parts, while commodities on the restricted list were mainly processed and semi-processed goods and raw materials.

The quota list covered commodities of which there was some domestic production or which were considered not essential by plan objec-

tives such as consumer goods. As soon as domestic production of an import competing product began, the import was transferred from the liberalized list to the quota list. When domestic production of a commodity was sufficient to meet the domestic demand, the item was removed from the quota list. Since commodities not specified on the import lists could not be imported, complete protection was then granted to local producers.

Importers wishing to import any commodity on liberalization lists I and II during the 1960s and 1970s had to go through a complex set of procedures. Procedures for items of liberalization list I were simpler than those for items on liberalization list II, which in turn were simpler than those on the quota list items.

Anyone wishing to import a liberalized list I item had to first obtain an 'importer's certificate' from the local Chamber of Industries or the Chamber of Commerce. The Chamber issued the certificate as long as the person was a bona fide producer or wholesaler. The certificate entitled the holder to select items relevant to the holder's business. Once the import programme was announced, the holder of an 'importer's certificate' valid for commodities on liberalization list I could make an application for an import licence from the Central Bank. The applicant gave the description of the goods he wished to import, the quantity and the unit price. He made a 'guarantee deposit' at the local bank, which would be transferred to the Central Bank. The guarantee deposit rates varied over time. They amounted in 1966 to 70 per cent for items on liberalization list I, 100 per cent for items on liberalization list II, and 10–30 per cent for items on the quota list. Thereafter, the Central Bank issued import permits for the amount applied for on a 'first-come, first-served' basis as long as foreign exchange was available. A licence, once issued, constituted a valid claim against foreign exchange. To import the commodity the holder of the import permit had to have a letter of credit in hand. The importer having the import permit and letter of credit could place his/her order. When the goods arrived at the customs office, the custom officials checked whether the imported items conformed to the description on the import permit. The importer then paid all duties and surcharges associated with importation and cleared the goods from customs.

An importer wishing to import items on liberalization list II had to obtain, in addition to the procedures described above, the approval of a government agency prior to the issuance of an import licence. The purpose of the 'permission certificate' was to increase the difficulties associated with importing, and thus to restrict imports. The import

programme specified the government agency the 'permission certificate' had to be obtained.

In the case of imports of goods on the quota list, the procedures were more complex than either of the liberalization list procedures. To study the procedures, first one must consider the way the value of each quota item in the import programme was determined. In that process, the State Planning Organization, the Ministry of Commerce, the Central Bank, the Ministry of Finance and the Union of Chambers of Commerce and Industry took part. The Union represented the interests of the private sector, whereas the Ministry of Finance represented the interests of public sector enterprises. There were two type of quotas: commodity specific and user specific. The commodity specific quotas were further allocated between industrialists and importers. Importers were those who imported for the purpose of resale without processing, whereas industrialists were those who were using the quota goods in their own production process. Legally, imports to industrialists could not be resold. Each commodity specific quota value was subdivided into the amount to be allocated to industrialists and the amount for importers. On the other hand, the user specific quotas were divided into investment goods quotas and those covering the needs of certain assemblers and manufacturers. Goods imported under these quotas required the approval of the State Planning Organization to insure that the activities were in conformity with the plan objectives.

Allocation of quotas after the publication of quotas followed different procedures for industrialists and importers. in the case of industrialists, the public and private sector shares of individual quotas were first worked out by the relevant ministries and Union of Chambers. Once the private sector share was determined, the problem was to allocate the amount among the industrialists. At that stage, we may note that some of the items in the import programmes were designated as being subject to the control of individual ministries. When no ministry was specified the application was made to the local chamber of industry which forwarded it to the Union of Chambers. Industrialists wishing to import those items applied to the relevant ministry for a 'requirements certificate'. These certificates were issued in proportion to the plant capacities of the applicants. The amount allocated to each importer was shown on the 'requirements certificate'. This certificate was forwarded to the Central Bank, with which the Central Bank issued the import license. On the other hand, the allocation procedures in the case of importers were simpler. Once the import list were published, importers made their requests with an authorized bank, which forwarded

the application to the Central Bank. The Central Bank summed the value of requests by quota categories, and when the sum exceeded the quota, the bank allocated the quotas by scaling down proportionately so that the quota was filled.

Imports were subject to tariffs and tariff-like charges. The latter consisted, as reported in Krueger (1974), Baysan and Blitzer (1991) and Krueger and Aktan (1992), mainly of the municipality tax, stamp duty, wharf tax and production tax.

The import regime explained above remained in force until the 1980s. In 1981, the quota list was partly phased out. In that year a large number of commodities were transferred from 'liberalization list II' to 'liberalization list I'. A major reform was introduced in January 1984, when all imports were classified into three lists: the 'prohibited list', 'imports subject to permission' and 'liberalized list'. Commodities that could not be imported under any circumstances, such as arms and ammunition, were specified in the 'prohibited list'. 'Imports subject to permission' specified the items that could be imported with prior official permission, and the 'liberalized list' enumerated the commodities that could be freely imported.

At the time of the import system reform, the government replaced the production tax, which applied to domestic production and import of certain commodities, with the value added tax (VAT), which applied to almost all commodities. Moreover, it imposed a new surcharge, the 'housing fund tax', on some imports to finance housing construction for poor and middle-income families. In addition, two surcharges on imports were imposed under the titles of the 'support and price stabilization fund tax' and 'resource utilization support fund tax'. Thereafter, the import duty and housing fund tax rates were revised at least once every year during the 1985–92 period.

During the 1980s, imports were subject to tariffs and several tariff-like charges: the municipality tax, transportation infrastructure tax, mining fund tax, stamp duty, value added tax, housing fund tax, resource utilization and support fund tax, and support and price stabilization fund tax.

2.1.1 Quantitative restrictions

As emphasized above, the quota list specified the dollar value of imports and implied a binding quantitative restriction on imports. It was partly phased out in 1981. Table 2.1 shows the share of commodities in the 'restricted list' (liberalization list II) in total imports. As can be seen from the table, the share of commodities in the 'restricted list'

TABLE 2.1 *Share of 'restricted list' imports in total imports*

	<i>Restricted imports (million US \$)</i>	<i>Total imports (million US \$)</i>	<i>Share of restricted imports in total imports (%)</i>
1970	192	948	20.3
1971	260	1171	22.2
1972	413	1563	26.4
1973	478	2086	22.9
1974	697	3778	18.4
1975	1163	4739	24.5
1976	1143	5129	22.3
1977	1160	5796	20.0
1978	784	4599	17.0
1979	973	5069	19.2
1980	947	7909	12.0
1981	831	8933	9.3
1982	272	8843	3.1
1983	163	9235	1.8
1984	17	10757	0.2

SOURCE: Various issues of the Annual Report, Central Bank of Turkey.

declined from 24.5 per cent in 1974 to 9.3 per cent in 1981 and 1.8 per cent in 1983.

In 1984, a major trade reform was introduced, when all imports were classified into three lists: the 'prohibited list', the 'imports subject to permission list' and the 'liberalized list'. Prior to 1984, a large number of commodities had already been transferred, starting with the 1981 import regime from the restricted list (liberalization list II) to the free import list (liberalization list I).

The 'prohibited list', introduced in 1984, originally contained about 500 commodities. The number of these commodities decreased substantially in the following year; the number was reduced to three in 1985 and was kept thereafter at that level.

Table 2.2 shows the share of commodities in the list 'imports subject to permission'. As can be seen from the table, this list constituted about 46.5 per cent of all imports in 1984. The share declined to 21.9 in 1986 and 6.1 per cent in 1988. In 1984, the list covered a wide range of commodities, but by 1988 it was used in only 11 of the 49 sectors, the most important of which included the pharmaceutical products, printing and publishing, and other non-metallic mineral products sectors. In the case of pharmaceutical products, the share of imports

TABLE 2.2 *Share of imports 'subject to permission' in sectoral imports (%)*

<i>I-O code</i>	<i>Sector name</i>	<i>1984</i>	<i>1986</i>	<i>1988</i>	<i>Total</i>
1	Agriculture	0.10	1.90	0.00	100
2	Animal husbandry	10.55	1.40	0.00	100
3	Forestry	0.00	0.00	0.00	100
4	Fishery	0.00	90.62	0.00	100
5	Coal mining	0.44	0.00	0.00	100
6	Crude petroleum	100.00	0.00	0.00	100
7	Iron ore mining	0.00	0.00	0.00	100
8	Other met. ore mining	0.00	0.00	0.00	100
9	Non-metallic mining	50.40	48.25	0.00	100
10	Stone quarrying	0.00	0.00	0.00	100
11	Slaughtering & meat	0.00	25.99	0.00	100
12	Fruits & vegetables	0.00	0.41	0.00	100
13	Vegetable & animal oil	0.00	0.00	0.00	100
14	Grain mill products	0.00	4.33	0.00	100
15	Sugar refining	3.41	53.10	0.00	100
16	Other food processing	0.25	1.10	0.00	100
17	Alcoholic beverages	94.52	0.04	0.00	100
18	Non-alcoholic beverages	0.00	100.00	0.00	100
19	Processed tobacco	0.00	100.00	0.00	100
20	Ginning	0.00	0.00	0.00	100
21	Textiles	7.95	3.71	0.00	100
22	Clothing	0.00	41.95	0.00	100
23	Leather & fur products	0.00	0.08	0.00	100
24	Footwear	0.00	0.00	0.00	100
25	Wood products	1.33	0.26	0.00	100
26	Wood furniture	0.00	100.00	0.00	100
27	Paper & paper products	0.08	7.47	6.18	100
28	Printing & publishing	0.03	39.64	39.41	100
29	Fertilizers	0.00	9.28	0.00	100
30	Pharmaceutical products	0.00	48.18	49.34	100
31	Other chemical products	0.00	9.74	5.58	100
32	Petroleum refining	99.09	0.00	0.00	100
33	Petroleum & coal products	0.00	0.00	0.00	100
34	Rubber products	27.22	5.43	0.00	100
35	Plastic products	93.13	94.23	0.00	100
36	Glass & glass products	12.38	20.56	0.00	100
37	Cement	0.00	0.00	0.00	100
38	Non-metallic mineral	53.28	32.40	30.29	100
39	Iron & steel	91.29	62.95	20.57	100
40	Non-ferrous metals	83.10	83.70	12.35	100
41	Fabricated metal products	65.51	49.53	0.05	100

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TABLE 2.2 *continued*

<i>I-O code</i>	<i>Sector name</i>	<i>1984</i>	<i>1986</i>	<i>1988</i>	<i>Total</i>
42	Non-electrical machinery	52.90	18.47	5.11	100
43	Agricultural machinery	46.63	7.38	0.00	100
44	Electrical machinery	31.95	31.67	13.09	100
45	Shipbuilding & repairing	100.00	95.42	0.00	100
46	Railroad equipment	0.00	0.00	0.00	100
47	Motor vehicles	58.48	57.08	13.39	100
48	Other transport equipment	1.24	1.24	0.00	100
49	Other man. industries	20.44	22.61	0.01	100
Mean		46.46	21.86	6.08	100

SOURCE: Author's calculations.

subject to permission was about 48.2 per cent of all sectoral imports in 1986, and 49.3 per cent in 1988.

By 1990 all of the different types of quantitative restrictions were completely phased out.

2.1.2 Nominal and effective protection rates

It is well known that in the absence of quantitative restrictions and foreign exchange controls, quota premiums will disappear. Hence any divergence between domestic ex-factory price and the tariff-inclusive landed cost of an imported commodity can be attributed to the trade margins of the wholesalers. This means that tariffs, levies and other expenses, e.g. the tariff equivalent of guarantee deposits required for imports, will represent the nominal protection rate (NPR) on the commodity.

Economists have long recognized that the profitability of a business activity can be changed by measures which affect the selling price of the final product, the costs of the intermediate material inputs, or a combination of both. The literature on effective protection maintains that when there are intermediate inputs, effective protection to value added is what matters and not the nominal protection. Put another way, if both the final product and the material inputs used to process that product can be bought or sold on world markets at given prices, under free trade conditions and with a given exchange rate, this would provide a certain value added (cost of labour, land and capital inclusive of an acceptable profit margin). Tariffs and tariff-like charges alter the

product price and the cost to the enterprise of the intermediate inputs, thus widening or narrowing the value added. Effective protection is simply the difference between the observed value added at tariff inclusive domestic prices and what the value added would be under free trade at world prices; and the effective protection rate is this difference expressed as a proportion or percentage of the free trade value added.

Table 2.3 provides estimates of nominal and effective protection rates. The nominal protection rates have been obtained under the assumption that there are no quantitative restrictions and that quota premiums are zero. From Table 2.3 it can be seen that the economy-wide nominal protection rate (NPR) has declined from 70.2 per cent in 1984 to 28.3 per cent in 1991. Noting the fact that quantitative restrictions had been eliminated completely by the end of 1980s, the reductions in nominal protection rates have been larger than indicated above. Similarly, the economy-wide effective protection rate (EPR) declined from 74.71 per cent in 1984 to 38.38 per cent in 1991. More significantly, recent policies have narrowed the inter-industry distribution of the NPR and EPRs, as evidenced by the values of standard deviation figures for NPR and EPR. When determining the average rates, we have weighted the sectoral nominal rates by sectoral outputs valued at world prices, and the sectoral effective rates by sectoral value added evaluated at world prices.

The most striking conclusion to be derived from Table 2.3 relates to the height of protection in Turkey. From the table we note that, among the 49 tradeable goods industries considered, there were 30 industries in 1983, 32 in 1984, 24 in 1988, 11 in 1990 and eight in 1991 which had NPRs higher than 50 per cent. On the other hand, there were five industries in 1983, three in 1984, seven in 1988, 15 in 1990 and 17 industries in 1991 which had NPRs less than 20 per cent. A similar consideration applies to the EPRs. There were 27 industries in 1983, 30 in 1984, 28 in 1988, 24 in 1990 and 23 industries in 1991 which had EPRs greater than 50 per cent. Similarly, there were seven industries in 1983, six in 1984, eight in 1988, nine in 1990 and eleven industries in 1991 which had non-negative EPRs less than 20 per cent. There were two industries in 1983, 1984 and 1988, which had negative EPRs between 0 and - 100 per cent; and the number of sectors with EPRs less than - 100 per cent amounted to four in 1983, three in 1984, two in 1988, zero in 1990 and one in 1991.

After having shown the level of protection we now turn to a more detailed examination of the characteristics of tariff revisions. For this purpose we compare the 1983 figures with the average of 1990-1 figures.

TABLE 2.3 Sectoral protection rates (%)

I-O code	Sector name	Nominal protection rates						Effective protection rates					
		NPR83	NPR84	NPR88	NPR90	NPR91		EPR83	EPR84	EPR88	EPR90	EPR91	
1	Agriculture	25.05	36.12	53.00	9.86	22.45		22.35	34.49	59.98	13.81	28.92	
2	Animal husbandry	21.66	25.89	21.65	11.57	12.72		13.91	15.24	7.32	21.13	16.13	
3	Forestry	36.37	41.11	17.61	4.68	5.90		45.62	50.38	19.11	13.50	16.21	
4	Fishery	40.67	45.03	82.82	55.93	55.25		38.43	42.74	88.10	64.42	63.88	
5	Coal mining	81.02	85.38	29.21	17.70	16.96		100.43	105.83	34.90	31.34	30.51	
6	Crude petroleum	24.36	29.49	24.34	34.11	30.91		39.11	44.48	44.05	46.66	43.29	
7	Iron ore mining	15.91	20.27	12.43	4.35	3.55		10.80	15.31	9.55	10.95	10.55	
8	Other met. ore mining	15.74	20.10	36.82	4.36	3.56		14.05	18.78	44.08	13.43	12.80	
9	Non-metallic mining	102.06	107.07	70.91	20.65	31.66		124.81	130.73	81.53	32.79	46.57	
10	Stone quarrying	25.80	27.59	17.55	8.20	7.28		21.95	23.37	18.15	15.58	15.03	
11	Slaughtering & meat	78.28	78.68	40.00	10.03	20.54		364.66	301.94	79.59	16.43	40.85	
12	Fruits & vegetables	140.71	145.54	94.85	69.97	69.30		-1949.80	383500.00	227.29	413.51	244.96	
13	Vegetable & animal oil	56.71	61.29	16.23	17.90	12.65		83.18	83.57	9.76	25.19	12.00	
14	Grain mill products	46.80	51.16	104.75	38.61	45.19		182.87	117.38	-793.92	512.60	261.01	
15	Sugar refining	139.66	144.43	103.17	44.71	44.09		-21.47	-24.86	-19.75	141.83	105.01	
16	Other food processing	108.36	131.73	104.24	39.79	48.36		-1159.90	-1580.20	346.76	93.21	107.93	
17	Alcoholic beverages	90.42	95.02	224.82	232.34	182.25		623.82	709.79	870.41	642.31	382.30	
18	Non-alcoholic beverages	63.99	68.35	172.62	152.37	151.70		129.73	142.73	-16921.00	902.08	1001.50	
19	Processed tobacco	372.79	378.68	78.16	87.63	86.96		-1841.20	-2815.80	97.58	180.96	157.38	
20	Ginning	7.42	9.67	22.52	4.35	3.55		-12.03	-15.62	-0.71	12.67	-2.55	
21	Textiles	109.07	104.44	64.20	34.37	34.49		330.77	285.01	114.50	70.32	68.43	
22	Clothing	154.89	160.46	169.45	122.03	123.07		234.38	258.88	25418.00	5969.60	6106.00	
23	Leather & fur products	152.48	157.05	40.77	15.85	17.36		779.91	819.27	55.46	30.97	27.76	
24	Footwear	157.00	161.75	57.56	54.48	51.89		187.95	191.10	74.82	93.66	86.95	
25	Wood products	83.25	88.67	24.64	42.30	39.33		154.14	162.91	36.47	128.31	109.15	
26	Wood furniture	129.49	133.85	163.32	84.72	46.04		198.92	205.79	657.91	151.94	68.79	
27	Paper & paper products	63.23	63.97	19.77	26.66	25.69		113.71	113.97	40.05	56.04	54.08	

28	Printing & publishing	26.07	26.83	21.70	35.13	12.17	11.04	12.03	27.00	53.89	17.04
29	Fertilizers	31.12	35.48	20.69	12.49	12.21	17.30	23.89	13.52	17.02	16.79
30	Pharmaceutical products	26.89	30.47	27.48	37.97	32.44	22.16	26.04	29.14	48.38	44.49
31	Other chemical products	51.46	45.17	47.48	28.93	25.43	61.23	48.54	66.61	49.04	43.04
32	Petroleum refining	57.60	62.88	41.27	26.24	24.49	105.41	110.84	82.07	27.14	27.14
33	Petroleum & coal products	65.26	69.85	11.36	23.84	13.78	76.30	82.09	0.02	32.12	13.31
34	Rubber products	53.78	61.70	52.78	37.93	37.00	49.43	63.34	68.07	61.09	60.59
35	Plastic products	250.98	256.34	105.04	54.91	50.80	-890.50	-753.93	310.20	124.99	116.66
36	Glass & glass products	67.13	74.29	146.51	79.75	40.62	91.00	102.29	238.68	123.39	59.88
37	Cement	48.16	5.87	8.41	32.52	25.22	103.35	4.05	8.35	82.70	62.34
38	Non-metallic mineral	54.05	58.75	42.31	42.57	34.74	74.66	88.71	64.51	76.71	62.77
39	Iron & steel	39.53	42.48	31.36	9.74	9.37	55.19	59.39	57.44	22.48	22.45
40	Non-ferrous metals	61.93	53.43	35.20	12.59	11.66	146.78	113.08	59.69	31.54	30.58
41	Fabricated metal products	82.17	86.87	95.91	35.77	33.94	159.43	179.10	388.68	96.44	91.48
42	Non-electrical machinery	53.58	57.06	73.43	23.62	21.17	55.78	59.84	107.66	39.54	35.85
43	Agricultural machinery	47.37	60.43	84.16	27.25	23.68	43.33	68.44	167.68	43.48	39.66
44	Electrical machinery	49.45	58.96	76.43	33.36	33.26	47.46	63.69	109.94	54.39	56.28
45	Shipbuilding & repairing	63.27	66.79	90.35	38.56	37.88	67.16	71.76	120.82	57.31	56.99
46	Railroad equipment	19.28	23.64	43.71	26.14	3.55	2.12	6.71	47.80	37.90	3.94
47	Motor vehicles	65.00	70.70	106.62	59.42	45.14	87.36	94.93	185.01	103.30	76.33
48	Other transport equipment	14.62	19.01	34.08	6.50	3.56	17.47	22.06	42.38	16.88	13.81
49	Other man. industries	70.09	125.76	69.12	21.30	19.52	75.62	197.39	92.44	38.56	36.50
Mean		65.22	70.19	55.42	28.68	28.25	70.99	74.71	68.56	39.12	38.38
Standard deviation		63.75	65.39	48.28	40.49	35.80	213.01	205.39	212.72	116.26	65.83

SOURCE: Author's calculations.

First, we note that in 1983 the highest NPRs were granted to the following sectors; processed tobacco and products (372.79), plastic products (250.98), and footwear (157). The highest EPRs in 1983 were provided to the leather and fur products (779.91), alcoholic beverages (623.82), and slaughtering and meat preservation (364.66) sectors. In the same year, the sectors receiving the lowest NPRs were ginning (7.42), other transport equipment (14.62), and other metallic ore mining (15.74). Similarly, the sectors receiving the lowest EPRs were fruit and vegetable canning (-1949.8), processed tobacco and products (-1841.2), and other food processing (-1159.9). Comparing the 1983 figures with the average figures for the period 1990-1, we note that NPRs have decreased in 44 sectors and increased in five. Among the five sectors for which the NPRs increased, the greatest increase occurred in the alcoholic and non-alcoholic beverages sectors. On the other hand, the greatest decrease in NPR occurred in processed tobacco and products, plastic products, and leather and fur products sectors. In the case of EPR, we note that during the period 1983-91, the protection rates have increased in 19, and decreased in 30 industries. The largest increase in EPR occurred in the sectors of clothing, fruit and vegetable canning, and processed tobacco and products, the largest decrease in EPR occurred in the sectors of leather and fur products, slaughtering and meat preservation, and textiles. By 1991, the sectors receiving the highest EPRs were alcoholic beverages (182.25), non-alcoholic beverages (151.70), and clothing (123.07); and the sectors receiving the highest NPRs were clothing (6106), non-alcoholic beverages (1001.5), and alcoholic beverages (382.3). During the same year, the sector of ginning (3.55), iron ore mining (3.55), and railroad equipment (3.55) were granted the lowest NPRs. Similarly, the lowest EPRs were provided to the sectors of ginning (-2.55), railroad equipment (3.94), and iron ore mining (10.55).

Ordering the sectors according to their EPR figures for the years 1990 and 1991, we note that among the first ten industries of the two orderings, the non-alcoholic beverages, alcoholic beverages, grain mill products, fruit and vegetable canning, processed tobacco and products, wood and cork products, sugar refining and plastic products sectors appear in both listings. Hence, these are the most protected sectors in the Turkish economy. The data further reveal that for sectors for which the EPR is less than zero but larger than -100 ($-100 < \text{EPR} < 0$) the value added at the official exchange rate is less than the value added of its foreign counterparts. As such, these industries represent the least protected sectors in the economy. The numbers of such sectors were

two in 1983, 1984 and 1988, zero in 1990 and one in 1991. From Table 2.10 it follows that the ginning sector has consistently been the least protected industry in the economy. Table 2.4 presents NPRs and EPRs for broad industry groups. In the upper part of this table, industries are classified into nine industry groups and in the lower part into four trade categories: export, export- and import-competing, import-competing, non-import-competing. The classification of the sectors into four trade categories follows the rule adopted in Balassa *et al.* (1982).

Calculations presented in the first part of Table 2.4 reveal significant characteristics of the tariff system. There is a marked tendency for tariff rates to escalate from lower to higher stages of fabrication. In general, the tariff rates are lowest for primary activities, followed by mining and energy, and highest for manufacturing. For instance, in 1990 the NPR (EPR) was 10.86 (16.5) per cent for primary activities, 18.27 (29.27) per cent for mining and energy, and 36.23 (53.09) per cent for manufacturing. The escalation of subsidy rates is also evident among the subsectors of manufacturing, within which the lowest protection rates apply to intermediate goods and higher rates to consumer and investment goods. For instance, in 1990 the NPR was 25.87 per cent on intermediate goods, 37.87 per cent on investment goods and 52.34 per cent on consumer goods. During the same year the EPR was 23.29 per cent on intermediate goods, 56.97 per cent on consumer goods, and 68.17 on investment goods.

The second part of Table 2.4 reveals that, throughout the 1980s, the protection rates on export industries were higher than those on export- and import-competing, and non-import-competing industries. This indicates that Turkey's recent success in expanding its exports has been achieved under protection. The government protected the export industries, as evidenced by the high values of EPR in export industries compared to those in other industries.

2.2 Export regime

Since the adoption of the first five-year development plan in 1963, Turkey has encouraged economic activity through a complex system of incentives. Domestic investments were encouraged through investment allowances, tax deductions, low-cost credits and tariff reductions, and exemptions on imported machinery and material inputs. Until 1980, domestic production was further assisted through import licensing, quantitative restrictions on imports and over-valued exchange rates. These measure discouraged exports by raising the profitability of

TABLE 2.4 Protection rates by major commodity groups and trade categories (%)

Commodity groups	Nominal protection rates				Effective protection rates					
	1983	1984	1988	1990	1991	1983	1984	1988	1990	1991
I. Primary activities ^a	24.57	33.14	42.15	10.86	19.21	22.03	31.17	46.50	16.52	26.09
II. Mining & energy ^b	56.05	60.10	28.92	18.27	17.83	73.92	78.64	37.45	29.85	30.01
III. Manufacturing	81.83	85.40	61.83	36.23	34.02	104.08	104.19	99.62	62.77	47.71
1. Consumer goods	129.09	133.98	88.07	52.34	53.33	178.34	162.91	24.96	79.06	51.14
Processed food ^c	92.92	102.99	77.13	32.40	38.31	192.70	159.23	-55.65	94.87	66.78
Beverages & tobacco ^d	316.22	321.84	103.86	111.40	103.85	623.82	709.79	870.41	642.31	382.30
Non-durable & durable consumer goods ^e	123.98	122.90	96.46	60.26	57.84	135.29	126.96	28.79	26.50	15.21
2. Intermediate goods ^f	57.97	59.21	38.04	25.87	22.37	73.41	74.23	102.38	52.38	41.06
3. Investment goods	61.53	68.00	87.87	37.87	33.05	89.52	102.65	208.94	72.93	64.90
Machinery ^g	61.69	68.51	83.31	31.57	30.05	93.59	108.69	223.13	66.69	64.14
Transport equipment ^h	61.06	66.57	100.60	55.47	41.43	76.96	84.01	165.16	92.18	67.24
4. Other manufacturing industries ⁱ	70.09	125.76	69.12	23.79	20.73	75.62	197.39	92.44	38.56	36.50

Trade categories

I. Export industries ^j	131.29	136.78	93.01	55.04	54.35	298.33	282.09	171.39	89.35	71.01
II. Export- and import- competing industries ^k	46.70	49.01	42.79	17.22	15.86	59.30	63.57	65.14	32.52	30.66
II. Import-competing industries ^l	52.95	58.20	51.13	30.95	26.66	63.39	69.92	64.08	44.27	39.88
IV. Non-import-competing industries ^m	47.16	52.61	45.14	21.02	24.11	52.30	59.48	67.64	32.21	37.14

NOTES:

- ^a Includes sectors nos 1-4.
^b Includes sectors nos 5-10.
^c Includes sectors nos 11-16.
^d Includes sectors nos 17-19
^e Includes sectors nos 21, 22, 24 and 26.
^f Includes sectors nos 20, 23, 25 and 27-40.
^g Includes sectors nos 41-44.
^h Includes sectors nos 45-48.
ⁱ Includes sectors no. 49.
^j Includes sectors nos 12, 16-23, 36 and 41.
^k Includes sectors nos 8, 9, 29, 31, 39, 40, 42, 43 and 49.
^l Includes sectors nos 3, 5, 6, 7, 10, 13, 27, 30 and 44-48.
^m Includes sectors nos 1, 2, 4, 11, 14, 15, 24-26, 28, 32-35, 37 and 38.

SOURCE: Author's calculations.

production for domestic markets over foreign markets. To counteract these adverse effects, incentives were provided to exports. Exports were encouraged through tax rebates, preferential credits, and tariff exemptions on imported inputs and packaging materials. However, these incentives were not sufficient enough to eliminate the then prevailing bias against exports.

In 1979, Turkey ran up against the limits of foreign borrowing and was forced to reschedule its debts to Western governments and foreign commercial banks. A precondition for rescheduling was the acceptance of the IMF's structural adjustment programme implemented on 24 January 1980. By 1985, Turkey's current account deficit was a manageable \$1 billion. The balance of payments turnaround during the 1980s was achieved largely by dramatic improvements in exports. Exports increased from \$2.9 billion in 1980 to \$13.6 billion in 1991. The increase in exports experienced during the 1980s was achieved through a consistent export-promotion policy, which relied on three main instruments: exchange rate policy, which affects every tradeable good, and credit policy and fiscal incentives, both of which tend to produce biased sectoral effects.

In January of 1980, the Turkish lira (TL) was devalued by almost 50 per cent, from TL 47.10 to TL 70 per dollar. The then existent multiple exchange-rate system was eliminated except for import of fertilizers, and fertilizer inputs. After May 1981, the exchange rate was adjusted daily against major currencies in order to maintain the competitiveness of Turkish exports. In August 1988, a major reform was introduced and a system of market-setting of foreign exchange rates was adopted. The real depreciation of the Turkish lira, achieved through the exchange-rate policy followed during that period, provided a great incentive to Turkish exporters. Besides the exchange-rate policy, the government also relied on credit policy and fiscal incentives.

The government extended credit at preferential rates of interest to producers/exporters of selected products. During the first half of the 1980s, a substantial difference existed between the general lending rate and the rate of interest applied to export credits. However, that system was abrogated in 1985. After 1987, preferential credits to exporters were extended via the newly established Eximbank.

The fiscal incentives provided to exporters during the 1980s included: export rate rebates; cash grants financed by the 'Support and Price Stabilization Fund'; duty-free imports of intermediates and raw materials; exemption from the production tax, which was replaced later by exemption from value added tax; foreign exchange allocations;

exemption from corporate income tax; rebates from the 'Resource Utilization Support Fund'; exemption from various taxes related to alternative export transactions, and exemptions from freight rates. In addition to these subsidies, the exports of certain agricultural commodities were and still are subject to tax.

Table 2.5 shows the subsidy rates for each of the 49 tradeable sectors. From the table it follows that the economy-wide nominal subsidy rate declined over the period from 31.98 per cent in 1983 to 13.04 per cent in 1990. More significantly, recent policies have narrowed the inter-industry distribution of nominal subsidy rates. The standard deviation of nominal subsidy rates declined from 19.76 in 1983 to 8.13 in 1990.

The most striking conclusion to be derived from Table 2.5 relates to the level dispersion of subsidies in Turkey. From the table we note that amongst the 49 tradeable goods industries considered, there were eight industries in 1983, one in 1984 and 1986, and no industries in 1988 and 1990, which had nominal subsidy rates higher than 50 per cent. Additionally, there were ten industries in 1983, 15 in 1984, 23 in 1986, 17 in 1988, and 39 industries in 1990 which had a non-negative nominal subsidy rate less than 20 per cent. In 1986 there was one industry, in 1988 two industries and in 1990 three industries with negative subsidy rates.

After having discussed the level of subsidy, we now turn to a more detailed examination of the characteristics of export incentive policies. First, we note that in 1983 the highest subsidy rates were granted to the sectors of fabricated metal products (101.055), printing and publishing (73.364), and paper and paper products (73.226). In the same year, the sectors receiving the lowest subsidies were ginning (3.618), processed tobacco (7.439), and agriculture (7.713).

In 1984, the subsidy rates were reduced over all sectors. The highest reductions in subsidy rates were achieved in fabricated metal products, wood and cork products, wood furniture and fixtures. Comparison of the nominal subsidy rates for 1986 with those for 1984 reveals that subsidy rates were raised in four sectors and were reduced in the remaining 45 sectors. The sectors for which the nominal subsidy rates were increased included leather and fur products, processed tobacco, and ginning. In contrast, the largest reductions in subsidy rates during 1986 were achieved in the sectors of fabricated metal products, clothing, and other food processing. During the period 1986-8, subsidy rates increased in 27 sectors, and decreased in 22 sectors. The sectors for which the subsidy rates increased during the period included the grain

TABLE 2.5 Sectoral subsidy rates (%)

I-O code	Sector name	Nominal subsidy rates						Effective subsidy rates			
		1983	1984	1986	1988	1990	1983	1984	1988	1990	
1	Agriculture	7.713	7.707	4.539	22.900	5.588	4.786	4.337	2.730	2.730	
2	Animal husbandry	9.880	9.032	6.120	6.169	4.175	12.553	10.606	4.006	4.006	
3	Forestry	8.420	7.965	6.803	3.293	-0.492	7.455	6.867	-1.703	-1.703	
4	Fishery	17.367	16.317	12.499	12.125	4.577	16.092	14.603	2.024	2.024	
5	Coal mining	12.243	10.323	9.796	10.895	9.816	12.584	9.616	9.303	9.303	
6	Crude petroleum	11.734	9.794	9.267	10.512	9.606	10.068	7.684	8.200	8.200	
7	Iron ore mining	21.177	18.985	17.598	17.485	10.596	20.860	17.904	9.049	9.049	
8	Other metallic ore mining	22.804	19.904	17.747	18.009	9.716	23.575	19.966	8.770	8.770	
9	Non-metallic mining	20.040	17.652	15.525	15.416	9.784	23.200	19.805	9.288	9.288	
10	Stone quarrying	33.252	28.467	23.721	12.585	9.448	34.979	28.578	6.536	6.536	
11	Slaughtering & meat	36.536	27.464	20.143	12.746	12.581	207.420	132.126	25.386	25.386	
12	Fruits & vegetables	26.203	19.265	13.858	16.247	8.679	-504.476	1324.200	35.423	35.423	
13	Vegetable & animal oil	27.056	22.181	18.879	20.591	13.264	49.854	35.388	20.720	20.720	
14	Grain mill products	16.332	11.257	10.877	39.745	14.338	74.865	32.559	109.344	109.344	
15	Sugar refining	29.334	22.735	18.184	16.625	16.616	42.526	29.228	44.062	44.062	
16	Other food processing	21.589	15.937	-1.992	-1.666	0.365	-220.038	-199.662	14.100	14.100	
17	Alcoholic beverages	31.286	23.903	18.461	21.295	7.586	84.157	63.494	14.601	14.601	
18	Non-alcoholic beverages	29.818	22.971	18.420	21.132	8.176	60.639	44.683	24.828	24.828	
19	Processed tobacco	7.439	1.127	11.768	11.570	13.485	-20.614	3.344	26.349	26.349	
20	Ginning	3.618	2.601	4.415	-11.469	7.366	1.863	-0.851	13.494	13.494	
21	Textiles	33.429	25.268	12.205	10.872	8.683	91.064	55.723	6.440	6.440	
22	Clothing	44.860	35.461	15.448	10.893	8.076	91.070	65.686	43.879	43.879	
23	Leather & fur products	44.847	36.803	117.327	24.339	20.648	254.957	188.171	36.670	36.670	
24	Footwear	41.116	31.663	25.737	32.261	26.658	59.160	43.222	42.042	42.042	
25	Wood products	72.747	31.360	23.999	25.825	8.835	227.758	90.742	22.402	22.402	

26	Wood furniture	70.572	29.617	25.386	26.186	9.145	153.458	58.940	14.429
27	Paper & paper products	73.226	33.068	27.157	31.290	31.610	164.989	60.449	59.418
28	Printing & publishing	73.364	32.457	25.886	24.006	10.965	103.976	39.764	12.098
29	Fertilizers	40.691	33.061	27.761	20.906	13.099	58.444	45.061	10.226
30	Pharmaceutical products	35.327	27.897	22.598	28.094	10.056	49.910	37.738	8.614
31	Other chemical products	35.895	30.088	26.998	26.730	16.082	52.783	37.852	16.216
32	Petroleum refining	41.837	39.223	36.783	36.322	28.329	78.282	58.044	13.050
33	Petroleum & coal products	45.664	42.401	39.962	34.109	22.379	55.949	41.995	12.568
34	Rubber products	39.237	36.219	26.177	33.723	19.414	46.602	42.537	22.105
35	Plastic products	40.296	36.292	26.300	25.606	12.578	-127.377	-90.872	8.681
36	Glass & glass products	33.313	24.271	19.916	20.658	9.714	44.012	29.346	6.884
37	Cement	34.855	26.318	21.874	20.725	9.736	70.423	31.915	9.303
38	Non-metallic minerals	37.577	28.193	22.949	28.834	17.309	55.225	38.604	21.641
39	Iron & steel	54.366	39.705	30.149	45.550	37.657	128.936	83.205	87.471
40	Non-ferrous metals	57.351	41.347	31.101	31.385	15.199	176.896	102.320	23.317
41	Fabricated metal products	101.055	54.914	27.912	31.201	11.299	305.249	151.465	14.744
42	Non-electrical machinery	43.694	40.731	25.370	26.045	14.941	72.973	65.848	20.647
43	Agricultural machinery	47.752	45.895	31.074	43.489	21.504	89.607	87.112	33.977
44	Electrical machinery	59.189	32.787	26.692	28.007	19.491	105.146	51.497	33.513
45	Shipbuilding & repairing	33.625	26.766	15.295	12.324	-2.208	38.790	29.407	-7.933
46	Railroad equipment	14.959	12.642	8.330	7.315	1.462	8.915	3.626	-11.224
47	Motor vehicles	40.766	34.745	23.354	37.474	4.077	66.455	50.406	-14.501
48	Other transport equipment	30.395	23.659	12.188	24.145	-4.008	40.068	30.254	-8.005
49	Other manufact. industries	41.001	32.850	34.367	30.603	12.148	63.479	62.065	15.183
	Mean	31.978	24.125	18.488	22.590	13.035	37.519	30.838	12.250
	Standard deviation	19.760	11.617	16.427	11.365	8.133	115.861	189.638	22.513

SOURCE: Author's calculations.

mill products, agriculture, and iron and steel industries. The sectors for which subsidy rates decreased included leather and fur products, ginning, and stone quarrying industries. During the period 1988–90, subsidy rates increased in four and decreased in 45 industries. The sectors for which subsidy rates increased included ginning, other food processing, and processed tobacco. The sectors for which subsidy rates decreased included motor vehicles, other transport equipment, and grain mill products. By 1990, the highest subsidy rates were paid to iron and steel (37.657), paper and paper products (31.61), and petroleum refinery (28.329). On the other hand, the sectors of other transport equipment (−4.008), shipbuilding and repairing (−2.208), and forestry (−0.492) received the lowest subsidy rates.

Table 2.6 present nominal subsidy rates for broad industry groups. In the upper part of the table industries were classified into nine industry groups, and in the lower part into four trade categories. Calculations presented in the first part of Table 2.6 reveal significant characteristics within the subsidy system. There is a marked tendency for subsidy rates to escalate from lower to higher stages of fabrication. In general, the subsidy rates are lowest for primary activities, followed by mining and energy, and highest for manufacturing. For instance, in 1984 the nominal subsidy rate was 8.31 per cent for primary activities, 15.43 per cent for mining and energy, and 31.64 per cent for manufacturing. The escalation of subsidy rates is also evident among the subsectors of manufacturing, within which the lowest subsidy rates apply to consumer goods. Higher rates were applied during the 1980s to investment goods and in 1990 to intermediate goods.

The second part of Table 2.6 reveals that, throughout the 1980s, the subsidy rates on export industries were lower than those on export- and import-competing industries, which, in turn, received the highest subsidy rates among the four trade categories.

Nominal subsidy is concerned with the impact of incentives on product prices. Effective subsidy (ESR) is concerned with the impact of incentives on production activities, taking into account incentives to outputs and tariffs and tariff-like charges to the intermediate inputs of these activities. Calculations of the ESR for 1983 and 1990 in Table 2.6 reveal that the average ESR for the economy as a whole decreased from 37.52 in 1983 to 12.25 in 1990. Furthermore, the inter-industry distribution of effective subsidy rates narrowed during the period. The standard deviation of effective subsidy rates declined from 115.861 in 1983 to 22.513 in 1990.

Consideration of the frequency distribution of ESRs reveals that

among the 49 tradeable sectors considered there were 10 (1) industries in 1983 (1990) which had an effective subsidy rate higher than 100 per cent. There were 16 (2) industries in 1983 (1990) with effective subsidy rates within the range of 20–50, and 8 (24) industries in the range of 0–20. In 1983 (1990) there was 1 (6) industry with negative effective subsidy rates with values greater than –100, and there were 3 (0) industries with effective subsidy rates less than –100.

In 1983, the sectors with the highest effective subsidy rates were fabricated metal products (305.249), leather and fur products (254.957) and wood products (227.758) industries. The sectors with the lowest effective subsidy rates were fruits and vegetables (–504.476), other food processing (–200.038), and plastic products (–127.377). In 1990, the sectors with the highest effective subsidy rates included the grain mill products (109.344), iron and steel (87.471), and agricultural machinery (59.418) industries. The sectors with the lowest effective subsidy rates were motor vehicles (–14.501), other food processing (–14.1), and railroad equipment (–11.224).

During the period 1983–4, effective subsidy rates increased in four and decreased in 45 industries. The largest increase in effective subsidy rates occurred in the sectors of fruits and vegetables, plastic products, and processed tobacco. The largest decreases in effective subsidy rates were achieved in the fabricated metal products, wood products, and paper and paper products industries. During the 1984–90 period, effective subsidy rates increased in eight, and decreased in 41 industries. The largest increases in effective subsidy rates were achieved in the sectors of other food processing, plastic products, and grain mill products. Effective subsidy rates decreased in the fruits and vegetables, leather and fur products, and fabricated metal products industries.

Table 2.6 present the effective subsidy rates for the broad industry groups introduced in Table 2.4. From the table we note that effective subsidy rates escalate from lower to higher stages of fabrication. The effective subsidy rates are lowest for primary activities, followed by mining and energy, and highest on manufacturing. In 1983 (1990) the effective subsidy rate was 6.38 (2.55) per cent for primary activities, 17.63 (8.64) per cent for mining and energy, and 77.80 (23.26) per cent for manufacturing. The second part of Table 2.6 reveals that in 1983 (1990) the highest effective subsidy rates applied to export- and import-competing industries, as in the case of nominal subsidy rates.

TABLE 2.6 Subsidy rates by major commodity groups and trade categories (%)

	Nominal subsidy rates					Effective subsidy rates				
	1983	1984	1986	1988	1990	1983	1984	1986	1988	1990
Commodity groups										
I. Primary activities ^a	8.62	8.31	5.29	16.54	4.86	6.38	5.62	5.62	5.62	2.55
II. Mining & energy ^b	18.06	15.43	13.78	12.16	9.71	17.63	14.10	14.10	14.10	8.64
III. Manufacturing	43.11	31.64	24.65	57.76	16.87	77.80	63.75	63.75	63.75	23.26
1. Consumer goods	30.08	22.05	12.57	13.60	9.42	19.58	71.91	71.91	71.91	23.79
Processed food ^c	26.24	19.84	11.14	13.85	9.13	-8.16	91.48	91.48	91.48	23.91
Beverages & tobacco ^d	15.01	8.40	13.92	14.69	11.63	-4.35	12.59	12.59	12.59	24.65
Non-durable & durable consumer goods ^e	38.99	28.16	14.52	12.99	9.44	130.46	89.86	89.86	89.86	22.36
2. Intermediate goods ^f	45.66	34.74	31.44	31.46	22.62	87.85	53.28	53.28	53.28	26.01
3. Investment goods	61.22	40.63	25.79	31.00	12.68	147.01	84.04	84.04	84.04	13.98
Machinery ^g	69.03	43.40	27.21	30.08	15.83	175.41	96.75	96.75	96.75	22.92
Transport equipment ^h	38.27	32.47	21.61	33.71	3.41	59.38	44.79	44.79	44.79	-13.60
4. Other manufacturing industries ⁱ	41.00	32.85	34.37	30.60	12.15	63.48	62.07	62.07	62.07	15.18

Trade categories								
I. Export industries ^l	38.97	26.15	16.21	11.38	7.95	23.91	55.02	14.30
II. Export- and import-competing industries ^k	46.16	36.62	28.53	33.77	23.20	87.39	62.04	37.20
II. Import-competing industries ^l	37.37	25.11	19.88	22.91	12.27	46.21	27.54	11.25
IV. Non-import-competing industries ^m	24.46	19.78	16.13	23.11	12.09	30.74	20.72	7.89

NOTES:

- ^a Includes sectors nos 1–4.
^b Includes sectors nos 5–10.
^c Includes sectors nos 11–16.
^d Includes sectors nos 17–19.
^e Includes sectors nos 21, 22, 24 and 26.
^f Includes sectors nos 20, 23, 25 and 27–40.
^g Includes sectors nos 41–44.
^h Includes sectors nos 45–48.
ⁱ Includes sectors no. 49.
^j Includes sectors nos 12, 16–23, 36 and 41.
^k Includes sectors nos 8, 9, 29, 31, 39, 40, 42, 43 and 49.
^l Includes sectors nos 3, 5, 6, 7, 10, 13, 27, 30 and 44–48.
^m Includes sectors nos 1, 2, 4, 11, 14, 15, 24–26, 28, 32–35, 37 and 38.

SOURCE: Author's calculations.

2.3 Real exchange rate

Towards the end of the 1970s, Turkey followed a fixed and multiple exchange-rate policy. With the stabilization measures of 1980, Turkey devalued the Turkish lira (TL) by almost 50 per cent. The multiple exchange-rate system was eliminated except for imports of fertilizers, and fertilizer inputs. After May 1981, the exchange rate was adjusted daily against major currencies in order to maintain the competitiveness of Turkish exports. In August 1988, major reform was introduced, and a system of market setting of foreign exchange rates was adopted.

The success of liberalization policies depends in the long term on developments of the real exchange rate. The appreciation of the real exchange rate contributes in the long run to expansion and the depreciation to reduction of the trade deficit.

From Table 2.7 we note that the real exchange rate is defined as

$$\phi = (Ep^s/p)$$

where E denotes the exchange rate, the price of foreign currency in terms of Turkish lira, p^s is the foreign price index measured by the GDP price deflator, and p is the domestic price index measured by GDP price deflator. The real exchange rate appreciated considerably during the 1970s, leading to the balance-of-payments problems of the late 1970s. During the 1980s, the real exchange rate depreciated until 1988, contributing to a large increase in exports. Thereafter, the trend in the real exchange rate was reversed.

2.4 Anti-export bias and sectoral real effective exchange rates

A natural question that arises is whether the expanded export incentives and the tariff reductions analyzed above have reduced the bias against exports entailed by import-protection and export-promotion measures. This question may be answered by calculating the profitability of producing for export relative to domestic market, approximated using the measure

$$\pi = (1 + s) / (1 + t),$$

where s denotes the subsidy rate and t the protection rate. In the following, we consider for the subsidy rates the nominal and effective subsidy, and for the protection rates the nominal and effective protection rates.

Table 2.8 presents the anti-export bias figures for the 49 tradeable sectors evaluated using the figures given in Tables 2.3 and 2.5. From the table it follows that, on average, anti-export bias prevailed during the 1980s. The average value of anti-export bias evaluated using nominal figures was 0.864 in 1983, 0.792 in 1984, 0.83 in 1988, and 0.914 in 1990. The average value of anti-export bias evaluated using effective figures was 0.896 in 1983, 0.79 in 1984, and 0.84 in 1990. The figures indicate anti-export bias, since the average figures for the economy as a whole are less than unity throughout this period. The average value of anti-export bias continues to increase over time. This development clearly represents changes in a healthy direction. Since, under a liberal trade regime, the measure of anti-export bias would equal unity and variance zero, we note that there still remains an area for considerable improvement.

Consideration of sectoral anti-export measures using nominal subsidy and protection figures reveals that in 1983, 12 industries had π values greater than unity (indicating export bias), and 37 sectors had π values less than unity (indicating anti-export bias). During 1983, the highest π figures applied to the printing and publishing (1.375), other transport equipment (1.138), and iron and steel (1.106) sectors; and the lowest figures to the processed tobacco and products (0.524), plastic products (0.4), and fruit and vegetables canning (0.524) sectors. By 1990, the ordering had changed and 11 industries had π values greater than unity, while 38 industries had π values less than unity. During 1990, the highest π figures applied to the iron and steel (1.254), iron ore mining (1.06), and other metallic ore mining (1.05) sectors. The alcoholic beverages (0.324), non-alcoholic beverages (0.429), and clothing (0.487) sectors were receiving the lowest π figures. The trade policies that were followed during the period 1983–90 resulted in considerable increases in the π values of the leather and fur products, processed tobacco and products, and plastic products sectors, and in decreases in π values of the printing and publishing, and alcoholic and non-alcoholic beverages sectors.

Consideration of sectoral anti-export measures using effective subsidy and protection figures reveals that in 1983, 18 industries had π values greater than unity (indicating export bias), and 31 sectors had π values less than unity (indicating anti-export bias). During 1983, the highest π figures applied to the printing and publishing (1.837), sugar refining (1.815), and fabricated metal products (1.562) sectors; and the lowest figures to the processed tobacco and products (-0.046), plastic products (0.035), and other food processing (0.113) sectors. By

TABLE 2.7 Real exchange rate

	IL/\$	DM/\$	TL/DM ^c	Effective exchange rate (TL/\$) ^d	Turkish GDP deflator (1968=1) ^e	OECD		Islamic countries		Share of Islamic countries in		Real exchange rate (AVG=100) ^j
						GDP deflator (1968=1) ^f	GDP deflator (1968=1) ^g	Turkish exports (%) ^h	Turkish exports (%) ^h	Foreign price (1968=1) ⁱ		
1960	4.870	4.200	1.160	4.8120	0.6580	0.7557	0.8751	1.00	0.7569	39.782		
1961	9.000	4.033	2.231	8.9814	0.6861	0.8029	0.9013	1.80	0.8047	75.704		
1962	9.000	4.000	2.250	9.0000	0.7513	0.8254	0.9085	0.00	0.8254	71.062		
1963	9.000	4.000	2.250	9.0000	0.7938	0.8485	0.9249	0.30	0.8487	69.162		
1964	9.000	4.000	2.250	9.0000	0.8143	0.8732	0.9471	1.60	0.8744	69.463		
1965	9.000	4.000	2.250	9.0000	0.8486	0.8993	0.9670	0.50	0.8996	68.577		
1966	9.000	4.000	2.250	9.0000	0.9021	0.9317	0.9931	0.70	0.9321	66.840		
1967	9.000	4.000	2.250	9.0000	0.9622	0.9615	0.9921	0.70	0.9617	64.652		
1968	9.000	4.000	2.250	9.0000	1.0000	1.0000	1.0000	1.70	1.0000	64.686		
1969	9.000	3.943	2.282	9.0324	1.0533	1.0500	1.0073	2.50	1.0489	64.647		
1970	11.500	3.660	3.142	11.7671	1.1738	1.1130	1.1395	2.30	1.1136	80.237		
1971	14.920	3.491	4.274	15.4641	1.3843	1.1787	1.2056	2.10	1.1793	94.682		
1972	14.150	3.189	4.438	15.0502	1.6112	1.2411	1.2599	5.90	1.2422	83.397		
1973	14.150	2.673	5.294	15.9070	1.9644	1.3342	1.4060	4.84	1.3377	77.853		
1974	13.930	2.588	5.383	15.8305	2.5101	1.4930	1.6479	6.80	1.5035	68.152		
1975	14.440	2.460	5.869	16.6992	2.9206	1.6587	1.9741	11.31	1.6944	69.630		
1976	16.050	2.518	6.374	18.4116	3.4364	1.7864	2.3097	8.80	1.8325	70.564		
1977	18.000	2.322	7.751	21.2513	4.2811	1.9222	2.6446	11.48	2.0051	71.539		
1978	24.280	2.009	12.088	30.2980	6.1490	2.0664	2.9276	13.41	2.1819	77.269		
1979	31.080	1.833	16.957	40.2667	10.4917	2.2337	3.1794	15.84	2.3835	65.748		
1980	76.040	1.818	41.833	98.8631	21.2201	2.4415	3.5546	22.30	2.6897	90.066		

1981	111.220	2.260	49.212	132.6274	30.1334	2.6563	3.9704	41.10	3.1964	101.114
1982	162.550	2.427	66.987	188.8992	38.5755	2.8476	4.3119	45.00	3.5065	123.414
1983	225.460	2.553	88.301	257.3964	49.7612	2.9871	4.6482	41.10	3.6698	136.434
1984	366.680	2.846	128.845	403.8550	74.3234	3.1126	4.9178	42.00	3.8708	151.170
1985	518.340	2.944	176.067	564.8220	106.9784	3.2309	5.0654	42.00	4.0014	151.842
1986	669.390	2.172	308.262	810.3045	140.8393	3.3408	5.4909	35.00	4.0933	169.266
1987	857.210	1.797	476.071	1118.9785	194.5983	3.4410	6.1937	30.30	4.2751	176.682
1988	1422.350	1.756	808.997	1875.7595	323.7451	3.5545	7.2714	30.30	4.6807	194.919
1989	2121.680	1.880	1128.074	2719.3340	533.9499	3.6932	8.2676	24.70	4.8231	176.544
1990	2608.640	1.616	1620.640	3577.1200	817.0131	3.8372	9.4250	19.30	4.9156	154.686

SOURCE:

- ^a Various issues of *International Financial Statistics Yearbook*, line 'rf'.
^b Various issues of *International Financial Statistics Yearbook*, line 'rf'.
^c The exchange rate has been obtained using the information given in the first two columns.
^d Effective exchange rate is given by the relation $EE = 0.75 (TL/\$) + 0.25 (TL/DM) (68DM/\$)$. where (68DM/\$) refers to the price of US dollars in terms of German marks in 1968.
^e *Statistical Yearbook*, State Institute of Statistics, Turkey.
^f Various issues of *International Financial Statistics Yearbook*, GDP deflator of industrial countries.
^g Various issues of *International Financial Statistics Yearbook*, GDP deflator of middle eastern countries.
^h *Statistical Yearbook*, State Institute of Statistics, Turkey.
ⁱ Foreign price is determined by the relation $p_i = A p_{isl} + (1-A) p_{ind}$ where A denotes the share of Islamic countries in Turkish exports, p_{isl} the price level of Islamic countries, and p_{ind} the price level of industrial countries.
^j Real exchange rate equals $RE = (EE p_i)/p_{Turkey}$ where p_{Turkey} denotes the Turkish GDP deflator.

TABLE 2.8 Anti-export bias

<i>I-O</i>	<i>Sector name</i>	<i>Using nominal rates</i>				<i>Using effective rates</i>				<i>Development over time</i>
		<i>AEB83</i>	<i>AEB84</i>	<i>AEB88</i>	<i>AEB90</i>	<i>AEB83</i>	<i>AEB84</i>	<i>AEB88</i>	<i>AEB90</i>	
1	Agriculture	0.861	0.791	0.803	0.961	0.856	0.776	0.903	0.903	+
2	Animal husbandry	0.903	0.866	0.873	0.934	0.988	0.960	0.859	0.859	-
3	Forestry	0.795	0.765	0.878	0.951	0.738	0.711	0.866	0.866	+
4	Fishery	0.834	0.802	0.613	0.671	0.839	0.803	0.621	0.621	-
5	Coal mining	0.620	0.595	0.858	0.933	0.562	0.533	0.832	0.832	+
6	Crude petroleum	0.898	0.848	0.889	0.817	0.791	0.745	0.738	0.738	-
7	Iron ore mining	1.045	0.989	1.045	1.060	1.091	1.022	0.983	0.983	-
8	Other met. ore mining	1.061	0.998	0.863	1.051	1.084	1.010	0.959	0.959	-
9	Non-metallic mining	0.594	0.568	0.675	0.910	0.548	0.519	0.823	0.823	+
10	Stone quarrying	1.059	1.007	0.958	1.012	1.107	1.042	0.922	0.922	-
11	Slaughtering & meat	0.766	0.713	0.805	1.023	0.662	0.578	1.077	1.077	+
12	Fruits & vegetables	0.524	0.486	0.597	0.639	0.219	0.004	0.264	0.264	+
13	Vegetable & animal oil	0.811	0.758	1.038	0.961	0.818	0.738	0.964	0.964	+
14	Grain mill products	0.792	0.736	0.683	0.825	0.618	0.610	0.342	0.342	-
15	Sugar refining	0.540	0.502	0.574	0.806	1.815	1.720	0.596	0.596	-
16	Other food processing	0.584	0.500	0.481	0.718	0.113	0.067	0.445	0.445	+
17	Alcoholic beverages	0.689	0.635	0.373	0.324	0.254	0.202	0.154	0.154	-
18	Non-alcoholic beverages	0.792	0.730	0.444	0.429	0.699	0.596	0.125	0.125	-
19	Processed tobacco	0.227	0.211	0.626	0.605	-0.046	-0.038	0.450	0.450	+
20	Ginning	0.965	0.936	0.723	1.029	1.158	1.175	1.007	1.007	-
21	Textiles	0.638	0.613	0.675	0.809	0.444	0.404	0.625	0.625	+
22	Clothing	0.568	0.520	0.412	0.487	0.571	0.462	0.024	0.024	-
23	Leather & fur products	0.574	0.532	0.883	1.041	0.403	0.313	1.044	1.044	+
24	Footwear	0.549	0.503	0.839	0.820	0.553	0.492	0.733	0.733	+
25	Wood products	0.943	0.696	1.010	0.765	1.290	0.726	0.536	0.536	-

26	Wood furniture	0.743	0.554	0.479	0.591	-	0.848	0.520	0.454	-
27	Paper & paper products	1.061	0.812	1.096	1.039	+	1.240	0.750	1.022	+
28	Printing & publishing	1.375	1.044	1.019	0.821	-	1.837	1.248	0.728	-
29	Fertilizers	1.073	0.982	1.002	1.005	-	1.351	1.171	0.942	-
30	Pharmaceutical products	1.066	0.980	1.005	0.798	-	1.227	1.093	0.732	-
31	Other chemical products	0.897	0.896	0.859	0.900	-	0.948	0.928	0.780	-
32	Petroleum refining	0.900	0.855	0.965	1.017	+	0.868	0.750	0.889	+
33	Petroleum & coal products	0.881	0.838	1.202	0.988	+	0.885	0.780	0.852	+
34	Rubber products	0.905	0.842	0.875	0.866	-	0.981	0.873	0.758	-
35	Plastic products	0.400	0.382	0.613	0.727	+	0.035	-0.014	0.483	+
36	Glass & glass products	0.798	0.713	0.489	0.610	-	0.754	0.639	0.478	-
37	Cement	0.910	1.193	1.114	0.828	-	0.838	1.268	0.598	-
38	Non-metallic minerals	0.893	0.808	0.905	0.823	-	0.889	0.734	0.688	-
39	Iron & steel	1.106	0.980	1.106	1.254	+	1.475	1.149	1.531	+
40	Non-ferrous metals	0.972	0.921	0.972	1.023	+	1.122	0.950	0.937	-
41	Fabricated metal products	1.104	0.829	0.670	0.820	-	1.562	0.901	0.584	-
42	Non-electrical machinery	0.936	0.896	0.727	0.930	-	1.110	1.038	0.865	-
43	Agricultural machinery	1.003	0.909	0.779	0.955	-	1.323	1.111	0.934	-
44	Electrical machinery	1.065	0.835	0.726	0.896	-	1.391	0.926	0.865	-
45	Shipbuilding & repairing	0.818	0.760	0.590	0.706	-	0.830	0.753	0.585	-
46	Railroad equipment	0.964	0.911	0.747	0.804	-	1.067	0.971	0.644	-
47	Motor vehicles	0.853	0.789	0.665	0.653	-	0.888	0.772	0.421	-
48	Other transport equipment	1.138	1.039	0.926	0.901	-	1.192	1.067	0.787	-
49	Other manufact. industries	0.829	0.588	0.772	0.925	+	0.931	0.545	0.831	+
	Mean	0.864	0.792	0.830	0.914		0.896	0.790	0.840	
	Standard deviation	0.213	0.195	0.201	0.178		0.409	0.354	0.275	

SOURCE: Author's calculations.

1990, the ordering had changed and five industries had π values greater than unity, while 44 industries had π values less than unity. During 1990, the highest π figures applied to the iron and steel (1.531), slaughtering and meat (1.077), and leather and fur products (1.044) sectors. The clothing (0.024), non-alcoholic beverages (0.125), and alcoholic beverages (0.154) sectors were receiving the lowest π figures.

In Table 2.8, the columns showing the development of π values over time have been obtained by regressing the π value on time (t)

$$\pi = \alpha + \beta t.$$

In the table, the sectors for which β is positive (negative) are shown with a '+' ('-') sign. The table indicates that when anti-export bias is estimated by using nominal effective subsidy and protection rates, anti-export bias has been decreasing for 23 (18) sectors and increasing for 26 (31) sectors. For the economy as a whole, anti-export bias has been decreasing (constant) over time.

Table 2.9 shows the sectoral profitabilities of producing for exporting relative to home production, measured by the relation $v_i = (E p_i^s (1 + s_i) / p)$ where s_i denotes the nominal subsidy rate of sector i . From the table, it follows that the economy-wide v increased over the period 1983–8, but decreased substantially over 1988–90. Thus, the incentives provided to production of exportables relative to domestic production decreased substantially over the period 1988–90.

3 COMPARATIVE ADVANTAGE

It has been shown by various economists that free trade policy is the optimal policy for a small country in the world economy. Under free trade, the country will produce and export (import) the commodities in which it has comparative advantage (disadvantage). Theoretically, comparative advantage can be determined by comparing the autarkic equilibrium price vector with the free trade price vector. But difficulties are encountered when trying to evaluate the autarkic equilibrium price vector empirically. For the determination of the sectors with comparative advantage, we first consider domestic resource costs and then revealed comparative advantage. As is well known, empirical measures of comparative advantage can help to identify the overall direction and thrust which a country's investment and trade should take in order to exploit international differences in product and factor supply and demand.

TABLE 2.9 *Sectoral real effective exchange rates*

<i>I-O code</i>	<i>Sector name</i>	1983	1984	1986	1988	1990
1	Agriculture	1.000	1.050	1.079	1.278	0.830
2	Animal husbandry	1.000	1.042	1.074	1.082	0.802
3	Forestry	1.000	1.046	1.096	1.067	0.777
4	Fishery	1.000	1.041	1.066	1.070	0.754
5	Coal mining	1.000	1.033	1.088	1.107	0.828
6	Crude petroleum	1.000	1.032	1.088	1.108	0.830
7	Iron ore mining	1.000	1.031	1.079	1.086	0.773
8	Other metallic ore mining	1.000	1.026	1.066	1.076	0.756
9	Non-metallic mining	1.000	1.030	1.070	1.077	0.774
10	Stone quarrying	1.000	1.013	1.033	0.946	0.695
11	Slaughtering & meat	1.000	0.981	0.979	0.925	0.698
12	Fruits & vegetables	1.000	0.993	1.003	1.032	0.729
13	Vegetable & animal oil	1.000	1.010	1.041	1.063	0.755
14	Grain mill products	1.000	1.005	1.060	1.346	0.832
15	Sugar refining	1.000	0.997	1.016	1.010	0.763
16	Other food processing	1.000	1.002	0.897	0.906	0.699
17	Alcoholic beverages	1.000	0.991	1.004	1.035	0.694
18	Non-alcoholic beverages	1.000	0.995	1.015	1.045	0.705
19	Processed tobacco	1.000	0.989	1.157	1.163	0.894
20	Ginning	1.000	1.040	1.121	0.957	0.877
21	Textiles	1.000	0.986	0.935	0.931	0.689
22	Clothing	1.000	0.982	0.886	0.857	0.631
23	Leather & fur products	1.000	0.992	1.669	0.962	0.705
24	Footwear	1.000	0.980	0.991	1.050	0.760
25	Wood products	1.000	0.799	0.798	0.816	0.533
26	Wood furniture	1.000	0.798	0.818	0.829	0.542
27	Paper & paper products	1.000	0.807	0.816	0.849	0.643
28	Printing & publishing	1.000	0.803	0.808	0.801	0.542
29	Fertilizers	1.000	0.994	1.010	0.963	0.680
30	Pharmaceutical products	1.000	0.993	1.008	1.060	0.688
31	Other chemical products	1.000	1.006	1.039	1.045	0.723
32	Petroleum refining	1.000	1.031	1.073	1.077	0.766
33	Petroleum & coal products	1.000	1.027	1.069	1.031	0.711
34	Rubber products	1.000	1.028	1.008	1.076	0.726
35	Plastic products	1.000	1.021	1.001	1.003	0.679
36	Glass & glass products	1.000	0.979	1.000	1.014	0.697
37	Cement	1.000	0.984	1.005	1.003	0.689
38	Non-metallic minerals	1.000	0.979	0.994	1.049	0.722
39	Iron & steel	1.000	0.951	0.938	1.056	0.755
40	Non-ferrous metals	1.000	0.944	0.927	0.935	0.620
41	Fabricated metal products	1.000	0.809	0.708	0.731	0.469
42	Non-electrical machinery	1.000	1.029	0.970	0.983	0.677

cont. on page 38

TABLE 2.9 *continued*

<i>I-O code</i>	<i>Sector name</i>	1983	1984	1986	1988	1990
43	Agricultural machinery	1.000	1.037	0.987	1.088	0.696
44	Electrical machinery	1.000	0.876	0.885	0.901	0.635
45	Shipbuilding & repairing	1.000	0.997	0.960	0.942	0.619
46	Railroad equipment	1.000	1.029	1.048	1.046	0.747
47	Motor vehicles	1.000	1.006	0.975	1.094	0.626
48	Other transport equipment	1.000	0.996	0.957	1.066	0.623
49	Other manufact. industries	1.000	0.990	1.060	1.038	0.673
Mean		1.000	0.997	1.011	1.059	0.738

SOURCE: Author's calculations.

3.1 Domestic resources cost

The concept of domestic resource cost was developed during the early 1960s in Israel. It measures the resource cost of earning foreign exchange through exporting commodities or saving foreign exchange through import substitution. The concept is closely related to the concept of effective rate of protection. This relation can be shown using the measure of effective protection coefficient given by

$$VA_d / VA_w$$

where VA_d denoted valued added at domestic prices and VA_w value added at world prices. Since $VA_w = E VA_w^{\$}$, where $VA_w^{\$}$ denotes value added at world prices measured in foreign currency and E the exchange rate, we note that the effective protection coefficient is the same thing as the DRC ratio. Hence the DRC coefficient can be calculated as

$$DRC = VA_d / VA_w^{\$} = (1 + EPR/100) E$$

where EPR denote the effective protection rate.

The domestic resources cost (DRC) coefficients for the tradeable sectors are shown in Table 2.10. In the calculation of DRC coefficients, we used the average value of the exchange rate of 521.98 TL/\$ for the year 1985, the year in which the input-output table was prepared and the effective protection coefficients calculated by Togan (1993). The last column of Table 2.1 shows the development of the DRC coefficient

over time. For that purpose, we regress the value of the DRC on time (t).

$$\text{DRC} = \alpha + \beta t,$$

and show the sectors for which β is positive (negative) with a '+' ('-') sign. In Table 2.10 the sectors are divided into four cells. The top two cells contain sectors with decreasing DRC values over time and the lower two cells the sectors with increasing DRC values over time. The top (lower) two cells have been ordered according to their DRC values, and the dividing measure is the average value of DRC for the economy as a whole. The upper (lower) cell contains the sectors with lower (higher) DRC values than the average. The broad mix of goods appearing in the upper cell may be considered as the sectors having comparative advantage. By contrast, we can say that the sectors in the lower cell of Table 2.10 have comparative disadvantage according to the DRC criteria.

3.2 Revealed comparative advantage

It is generally recognized that the disaggregated exports of a country indicate where the domestic industries display international competitiveness, while a country's imports pinpoint where it lacks such competitiveness. Following Volrath (1991), we calculate the 'revealed comparative advantage' by the formula.

$$\text{RCA}_i = \ln [(X_i/X) / (X_i^w/X^w)]$$

where X_i denotes exports of commodity i by the country, X total exports of the country, X_i^w world exports of commodity i excluding the exports of the country, X^w world exports excluding the exports of the country, and 'ln' the natural logarithm of the variable.

In this study, the RCA indexes were calculated for two digit SITC classification of trade data over the period 1980–8. Turkey's leading export industries are those in the uppermost cell of Table 2.11 – products with high and rising RCAs. A broad mix of goods appear in this cell. By contrast, the lowest cell of Table 2.11 lists products with low and falling RCAs, hence commodities with comparative disadvantage according to RCA criteria. Weak but improving export positions are evident in the cell 'low and rising RCA', which contains commodities with increasing but with negative RCA values greater than -1 . In the following, we call the sectors which have RCA values greater than -1

TABLE 2.10 *Comparative advantage according to domestic resource cost (DRC)*

<i>I-O code</i>	<i>Sector name</i>	<i>DRC 1990-1</i>
Low and falling		
7	Iron ore mining	578.0929
8	Other met. ore mining	590.4377
3	Forestry	599.5201
10	Stone quarrying	601.8690
48	Other transport equipment	602.0778
29	Fertilizers	610.2207
13	Vegetable & animal oil	619.0422
1	Agriculture	633.5010
39	Iron & steel	639.2428
33	Petroleum & coal products	640.5478
32	Petroleum refining	663.6454
11	Slaughtering & meat	671.4751
23	Leather & fur products	675.2594
5	Coal mining	683.4023
40	Non-ferrous metals	684.1070
49	Other man. industries	717.8791
42	Non-electrical machinery	718.7404
9	Non-metallic mining	729.1017
43	Agricultural machinery	738.9671
31	Other chemical products	762.2996
High and falling		
27	Paper & paper products	809.3822
45	Shipbuilding & repairing	820.2916
21	Textiles	884.1036
38	Non-metallic minerals	886.0089
37	Cement	900.5199
47	Motor vehicles	990.7963
24	Footwear	993.3540
36	Glass & glass products	1000.2964
41	Fabricated metal products	1012.4324
26	Wood furniture	1098.0632
25	Wood products	1141.7269
12	Fruits & vegetables	2240.5209
17	Alcoholic beverages	3196.1096
Low and rising		
20	Ginning	548.3922
2	Animal husbandry	619.2249
46	Railroad equipment	631.1782

28	Printing & publishing	707.1002
6	Crude petroleum	756.7405
30	Pharmaceutical products	764.3614

High and rising

44	Electrical machinery	810.8176
34	Rubber products	839.5526
4	Fishery	856.8302
16	Other food processing	1046.9353
35	Plastic products	1152.6623
15	Sugar refining	1166.2077
19	Processed tobacco	1405.0136
14	Grain mill products	2541.0

SOURCE: Author's calculations.

TABLE 2.11 *Comparative advantage according to the values of revealed comparative advantage*

<i>SITC</i>	<i>1989-90</i>	
High and rising RCA		
57	Explosives	3.0118
52	Inorganic chemicals	2.7275
84	Clothing	2.0696
42	Fixed vegetable oils and fats	1.1894
67	Iron and steel	1.1450
09	Animal oils and fats	0.8408
56	Fertilizers, manufactured	0.6109
55	Essential oils and perfume materials	0.4640
83	Travel goods	0.3333
43	Animal and vegetable oils and fats, proc.	0.1363
81	Sanitary, plumbing, heating	0.0954
41	Animal oils and fats	0.0906
07	Miscellaneous edible products	0.0680
28	Metalliferous ores and metal scrap	0.0662
Medium and rising RCA		
68	Non-ferrous metals	-0.1639
62	Rubber manufactures	-0.1688
54	Medicinal and pharmaceutical products	-0.4432
69	Manufactures of metal	-0.6177
51	Organic chemicals	-0.7472
85	Footwear	-0.8179
33	Petroleum and petroleum products	-0.8421

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TABLE 2.11 *continued*

<i>SITC</i>	1989-90
Low and rising RCA	
53 Dyeing, tanning, and colouring materials	-1.0306
72 Electrical machinery	-1.1781
64 Paper	-1.5627
59 Chemical materials and products	-1.7483
23 Crude rubber	-1.7498
61 Leather manufactures	-1.8614
08 Feeding stuff for animals	-2.1977
71 Machinery, other than electric	-2.2259
58 Plastic materials	-2.3168
86 Scientific instruments and optical goods	-3.4336
High and falling RCA	
05 Vegetables and sugar preparations	2.1225
12 Tobacco	2.0279
00 Live animals chiefly for food	1.9369
27 Crude fertilizers and crude minerals	1.7021
65 Textiles	1.2806
26 Textile fibres and their wastes	1.1097
29 Crude animal and vegetable materials	0.4641
66 Non-metallic mineral manufactures	0.1273
Medium and falling RCA	
04 Cereals and cereal preparations	-0.5363
03 Fish and fish preparations	-0.5625
06 Coffee, tea, cocoa, spices	-0.5656
Low and falling RCA	
63 Wood manufactures	-1.5015
01 Meat and meat preparations	-1.5302
24 Cork and wood	-1.6937
82 Furniture	-1.6987
22 Oil seeds and oleaginous fruit	-1.7888
89 Miscellaneous manufactured articles	-1.8514
11 Beverages	-1.8658
02 Dairy products	-1.9274
73 Transport equipment	-2.2525
21 Hides, skins and fur-skins, raw	-3.8368
32 Coal	-4.8407
25 Pulp and waste paper	-5.0133

SOURCE: Author's calculations.

TABLE 2.12a *Correlation coefficients of Turkish RCA values for the period 1986-8 with the RCA values of different countries for the periods 1986-8, 1983-5 and 1980-2*

	1986-8	1983-5	1980-2
Argentina	0.1319	0.1385	0.3344
Brazil	0.2455	0.1697	0.1996
Indonesia	0.2827	0.1118	0.0427
Spain	0.1810	0.2442	0.2959
Korea	0.4484	0.3809	0.4823
Malaysia	0.2983	0.2381	0.2644
Portugal	0.0797	0.1116	0.0908
Thailand	0.2431	0.3072	0.4226
Greece	0.5334	0.4094	0.4281

SOURCE: Author's calculations.

TABLE 2.12b *Correlation coefficients of Turkish RCA values for the period 1989-90 with the RCA values of different countries for the periods 1989-90, 1986-8, 1983-5 and 1980-2*

	1989-90	1986-8	1983-5
Argentina	0.0806	0.1381	0.1675
Brazil	0.2725	0.2874	0.2261
Indonesia	0.2572	0.1958	0.1404
Spain	0.2828	0.3141	0.3207
Korea	0.2832	0.4235	0.3745
Malaysia	0.2757	0.1126	0.0791
Portugal	0.0210	0.1413	0.2008
Thailand	0.2900	0.0034	0.1081
Greece	0.3820	0.5699	0.3785

SOURCE: Author's calculations.

and which are increasing over time 'industries with comparative advantage according to RCA criteria'.

To see where Turkey's export pattern, evidenced by RCA values, fits among those of other countries, we examine the similarity of Turkish RCA indexes to those calculated for other economies. The results are presented in Table 2.12a and b, in which we have considered the mean RCA values for the periods 1980-2, 1983-5, 1986-8 and 1989-90, and determined in Table 2.12a the correlation coefficients between Turkish RCA values for the period 1986-8 with those for period 1986-8, 1983-5 and 1980-2. Table 2.12b shows the correlation coefficients between

TABLE 2.13 Revealed comparative advantage (RCA) of Greece and Korea, 1989-90

Greece		Korea			
SITC	Commodity	RCA	SITC	Commodity	RCA
Increasing and high RCA values					
42	Fixed vegetable oils and fats	2.5843	85	Footwear	2.0466
84	Clothing	1.9187	72	Electrical machinery	0.7226
26	Textile fibres and their wastes	1.0213	89	Miscellaneous manufactured articles	0.6808
04	Cereals and cereal preparations	0.8745	61	Leather manufactures	0.4308
68	Non-ferrous metals	0.7172	52	Inorganic chemicals	0.0170
11	Beverages	0.6637	Increasing and medium RCA values		
67	Iron and steel	0.4715	26	Textile fibres and their wastes	-0.3764
33	Petroleum and petroleum products	0.2440	58	Plastic materials	-0.3931
56	Fertilizers, manufactured	0.2366	81	Sanitary, plumbing, heating	-0.6154
03	Fish and fish preparations	0.1250	71	Machinery, other than electric	-0.6642
02	Dairy products	0.0189	82	Furniture	-0.8278
Increasing and low RCA values					
53	Dyeing, tanning, and colouring materials	-0.2541	Increasing and low RCA values		
06	Sugar and sugar preparations	-0.3247	53	Dyeing, tanning, and colouring materials	-1.0377
54	Medicinal and pharmaceutical products	-0.3339	68	Non-ferrous metals	-1.1877
55	Essential oils and perfume materials	-0.4249	23	Crude rubber	-1.2795
62	Rubber manufacture	-0.7232	33	Petroleum and petroleum products	-1.5715
Increasing and low RCA values					
07	Coffee, tea, cocoa, spices	-1.1886	54	Chemical materials and products	-1.7422
01	Meat and meat preparations	-1.3962	54	Medicinal and pharmaceutical products	-1.9690
22	Oil seeds and oleaginous fruit	-1.4144	04	Cereals and cereal preparations	-2.3923
34	Gas, natural and manufactured	-1.4827	07	Coffee, tea, cocoa, spices	-2.7409
24	Cork and wood	-1.4827	21	Hides, skins and fur skins, raw	-3.0893
71	Machinery, other than electric	-1.6269	08	Feeding stuff for animals	-3.1966
25	Pulp and waste paper	-2.2577	41	Animal oils and fats	-4.8938
23	Crude rubber	-3.2300	32	Coal	-5.8073
		-4.1863	00	Live animals chiefly for food	-6.5640

Decreasing and high RCA values			
05	Vegetables and fruit	2.2411	
12	Tobacco and tobacco manufactures	2.0797	2.2525
27	Crude fertilizers and crude minerals	1.3447	1.4786
61	Leather manufactures	0.9786	1.0629
21	Hides, skins and fur skins, raw	0.6818	0.8564
65	Textiles	0.6488	0.6028
66	Non-metallic mineral manufactures	0.6215	0.5076
28	Metalliferous ores and metal scrap	0.0131	0.2673
			0.2096
Decreasing and medium RCA values			
85	Footwear	-0.0438	
81	Sanitary, plumbing, heating	-0.2840	-0.2423
09	Miscellaneous edible products	-0.3838	-0.3322
69	Manufactures of metal	-0.5410	-0.3482
63	Cork and wood manufactures	-0.5882	-0.6343
08	Feeding stuff for animals	-0.6331	-0.7975
29	Crude animal and vegetable materials	0.6838	
51	Organic chemicals	-0.8999	
64	Paper	-0.9883	
59	Chemical materials and products	-0.9974	
Decreasing and low RCA values			
89	Miscellaneous manufactured articles	-1.1151	
43	Animal and vegetable oils and fats	-1.3214	-1.0375
57	Explosives	-1.3460	-1.1432
83	Travel goods	-1.4749	-1.2123
58	Plastic materials	-1.5490	-1.3400
72	Electrical machinery	-1.6385	-1.3848
82	Furniture	-2.3885	-1.4353
00	Live animals chiefly for food	-2.5636	-1.8756
73	Transport equipment	-3.4663	-1.8805
41	Animal oils and fats	-5.5222	-2.1347
52	Inorganic chemicals	-5.5625	-1.8805
32	Coal	-7.8328	-2.3445
Decreasing and high RCA values			
83	Travel goods		2.2525
84	Clothing		1.4786
65	Textiles		1.0629
03	Fish and fish preparations		0.8564
62	Rubber manufactures		0.6028
67	Iron and steel		0.5076
69	Manufactures of metal		0.2673
29	Crude animal and vegetable materials		0.2096
Decreasing and medium RCA values			
56	Fertilizers, manufactured		-0.2423
06	Sugar and sugar preparations		-0.3322
73	Transport equipment		-0.3482
66	Non-metallic mineral manufactures		-0.6343
27	Crude fertilizers and crude minerals		-0.7975
Decreasing and low RCA values			
51	Organic chemicals		-1.0375
64	Paper		-1.1432
05	Vegetables and fruit		-1.2123
09	Miscellaneous edible products		-1.3400
63	Cork and wood manufactures		-1.3848
12	Tobacco and tobacco manufactures		-1.4353
57	Explosives		-1.8756
55	Essential oils and perfume materials		-1.8805
24	Cork and wood		-2.1347
11	Beverages		-2.2822
01	Meat and meat preparations		-2.3445
28	Metalliferous ores and metal scrap		-2.5260
34	Gas, natural and manufactured		-3.9006
43	Animal and vegetable oils and fat		-3.9538
22	Oil seeds and oleaginous fruit		-6.3042
02	Dairy products		-6.5227
42	Fixed vegetable oils and fats		-6.6314
25	Pulp and waste paper		-7.0263

SOURCE: Author's calculations.

Turkish RCA values for the period 1989–90, with RCA values for other countries for the periods 1989–90, 1986–8, 1983–5 and 1980–2. From the table, it follows that Turkish exports are similar to Greek and Korean exports with a mean lag of two years. Table 2.13 shows the RCA values for Greece and Korea.

In the following, we consider the sectors which satisfy the criteria for having comparative advantage according to at least two of the three criteria (DRC, RCA and locomotive sector for either Greece or Korea) as the industries in which the country has comparative advantage. The approach leads to the conclusion that Turkey has comparative advantage in the production of the following sectors:

- (i) agriculture (I–O code 1);
- (ii) iron ore mining (I–O code 7);
- (iii) vegetable and animal oils and fats (I–O code 13);
- (iv) other food processing (I–O code 16);
- (v) clothing (I–O code 22);
- (vi) leather and fur products (I–O code 23);
- (vii) footwear (I–O code 24);
- (viii) fertilizers (I–O code 29);
- (ix) pharmaceutical products (I–O code 30);
- (x) other chemical products (I–O code 31);
- (xi) petroleum refinery (I–O code 32);
- (xii) iron and steel (I–O code 39);
- (xiii) non-ferrous metals (I–O code 40);
- (xiv) non-electrical machinery (I–O code 42);
- (xv) agricultural machinery (I–O code 43).

4 CONCLUSION

During the 1980s, Turkey successfully liberalized its import and export regimes. The economy-wide average level of nominal and effective protection and subsidy rates were reduced substantially over the period. However, the rates are still high – as evidenced by the nominal and effective protection rates for some of the industrial and developing countries shown in Table 2.14a–d. Furthermore, there exists considerable variation in the inter-industry distribution of incentives. The EPRs are far from being equalized among the industries. It is well known that for maximization of consumption possibilities, the EPRs must be equalized among the industries, and if some sectors are

TABLE 2.14a *Nominal and effective protection rates in selected developed countries (1962)*

	USA		United Kingdom		EEC		Japan	
	Nominal	Effective	Nominal	Effective	Nominal	Effective	Nominal	Effective
Intermediate goods I	8.8	17.6	11.1	23.1	7.6	12	11.4	23.8
Intermediate goods II	15.2	28.6	17.2	34.3	13.3	28.3	16.6	34.5
Consumer goods	17.5	25.9	23.8	40.4	17.8	30.9	27.5	50.5
Investment goods	10.3	13.9	17	23	11.7	15	17.1	22
Mean	11.6	20	15.5	27.8	11.9	18.6	16.2	29.5

SOURCE: Balassa (1967).

TABLE 2.14b *Nominal protection rates in manufacturing sectors of selected developed countries*

	1925	1950	1976	1987
Germany ^a	20	26	–	7
UK ^a	5	23	–	7
USA ^a	37	14	–	7
Greece ^b	–	–	22	–
Portugal ^b	–	–	13.4	–
Spain ^b	–	–	16.2	–

SOURCE: ^aWorld Bank (1991).^bDonges *et al.* (1982).TABLE 2.14c *Nominal and effective protection rates in Germany (1970)*

<i>Sector name</i>	<i>Nominal protection</i>	<i>Effective protection</i>
Mining	0.3	–1.1
Textiles & clothing	11.0	21.2
Chemicals	11.4	13.3
Rubber & plastic	10.3	13.6
Hides & leather	12.3	15.5
Wood products	11.0	15.0
Glass, ceramics and cement	12.6	14.9
Metals	5.5	20.6
Metal products	6.0	25.2
Machinery other than electrical	7.9	3.3
Electrical machinery	9.5	6.8
Transportation equipment	11.2	8.3
Other manufacturing products		

SOURCE: Donges *et al.* (1973).

TABLE 2.14d *Nominal and effective rates in selected developing countries*

Sector name	Korea, 1968		Singapore, 1967		Taiwan, 1969		Argentina, 1969	
	Nominal protection	Effective protection	Nominal protection	Effective protection	Nominal protection	Effective protection	Nominal protection	Effective protection
Agriculture	17	18	-	-	2	-4	-10	-13
Mining	7	3	-	-	0	-7	30	32
Intermediate goods I	10	14	2	3	11	10	27	142
Intermediate goods II	19	24	5	10	12	16	67	122
Non-durable consumer goods	9	-9	2	0	10	8	56	48
Durable consumer goods	31	51	7	10	14	29	88	144
Machinery	28	43	5	6	9	1	87	117
Transport equipment	54	164	1	-1	27	55	109	207
Mean	13	11	5	6	10	6	55	96

SOURCE: Balassa *et al.* (1982).

to be given priority, there must be a common difference in the EPRs of priority and non-priority sectors. There also still exists anti-export bias in the economy, and the real exchange rate must depreciate over time in order to reduce the trade deficit in the long run. Finally, the sectoral effective real exchange rates fluctuated considerably over the period, and decreased substantially over the period 1988–90. Thus, there still remains considerable room for improvement. Finally, it should be emphasized that the tariff and subsidy system prevailing in Turkey is too complicated and is not transparent. A simplification of the system is desirable. The protection and subsidy rates could be further lowered and the inter-industry dispersion of protection and subsidy rates could be further narrowed down. Such attempts should also note that frequent alterations in tariff and subsidy rates cause uncertainty for importers and exporters, creating unnecessary difficulties in planning for future production.

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