7-5 Forecast of Vessel Sizes at Filyos

In this section, the maximum size of vessels by ship type is analysed for planning purposes.

7-5-1 Iron Ore Carrier

(1) Vessel Size envisaged by TDCI

The TDCI envisaged the following sizes of iron ore and coal carriers for the expansion of the Karabuk Steel Works:

    40 - 60,000 DWT up to 1995
   100 - 150,000 DWT from 1995 onward

(2) World Fleet

As shown in Fig. 7-5-1, vessels of less than 150,000 DWT account about 60% of the world iron ore carrier fleet while 100 - 150,000 DWT vessels make up about 30% of the world fleet.

Table 7-5-1 shows the vessel size distribution by area in the world. This shows ore import in the Mediterranean Area is predominantly carried out by vessels of 60,000 DWT or more, of which '60-150,000 DWT vessels' and '150,000 DWT and over vessels' have an equal share.

Fig. 7-5-2 depicts the year of launch for ore carriers in the world by DWT class and shows that many new (built after 1981) vessels can be found in the 40,000 - 60,000 DWT class and the 60,000 - 80,000 DWT class.

The capacities of the world's main iron ore loading ports are shown in Table 7-5-2. It can be said that most of them have capacities above 100,000 DWT.

Fig. 7-5-1   Ship Size Distribution of Dry Bulk Carriers

Fig. 7-5-1   Ship Size Distribution of Dry Bulk Carriers

Legend:
- □ >150
- ▨ 100-150
- ▨ 60-100
- ◩ >100
- ▤ 80-100
- ⊠ 60-80
- ■ 40-60
- ▨ <40
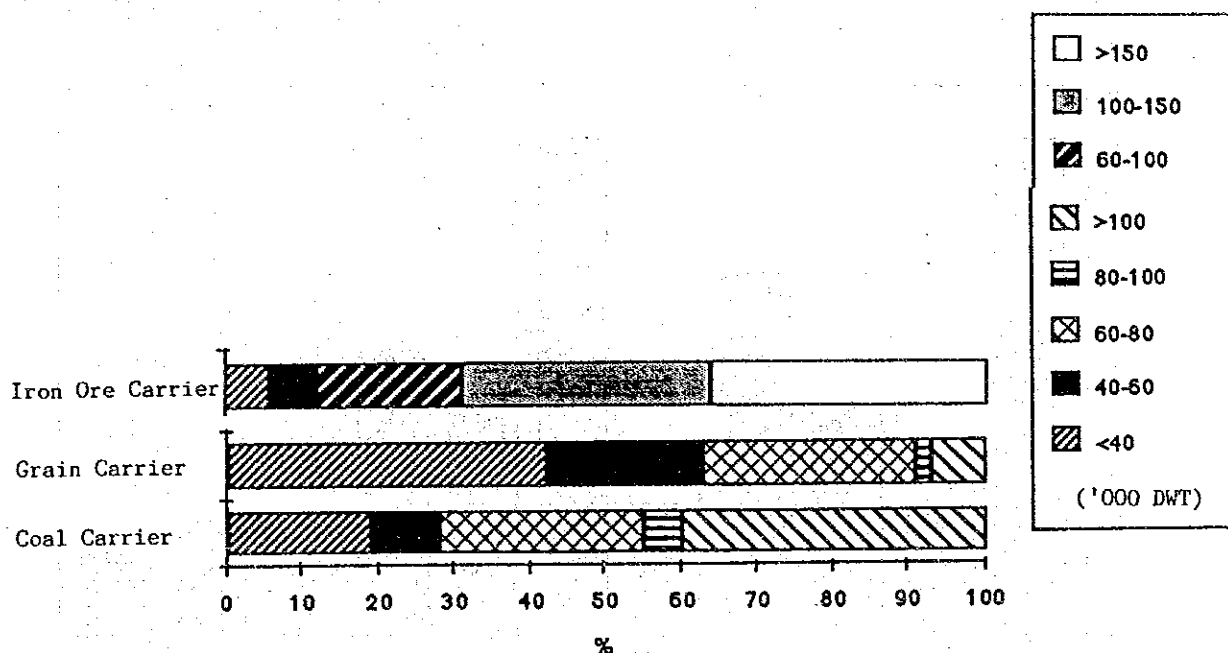
('000 DWT)

(Fearnleys [World Bulk Trades])

Table 7-5-1 Ship Size Distribution by Area

Figures in % of total seaborne trade of each area.				1987.		
	Size groups of vessels in '000 dwt					
	-40	40-60	60-100	100-150	150+	Total
Exporting areas						
Scandinavia	11	1	26	51	11	100
West Africa	6	3	53	34	4	100
Other Africa	4	4	9	17	66	100
North America	3	5	26	48	18	100
S. America Atl.	4	8	18	25	45	100
S. America Pac.	9	2	7	19	63	100
Asia	24	15	16	32	13	100
Australia	2	2	9	39	48	100
Importing areas						
UK/Continent	4	1	26	37	32	100
Mediterranean	3	4	27	18	48	100
Other Europe	23	20	30	24	3	100
USA	12	7	50	28	3	100
Japan	6	3	5	34	52	100
Other Far East	3	6	18	36	37	100
Others	15	31	18	23	13	100
Total 1987	6	6	19	33	36	100
Total 1986	8	7	22	33	30	100

Note: Percentages for vessels below 40,000 dwt are residuals, calculated as the difference between total quantity of iron ore movements and shipments by vessels over 40,000 dwt.

(Fearnleys [World Bulk Trades])

Fig. 7-5-2 Year of Launch of Ore Carriers in the World by DWT Class

No. of Vessels

Prior to 1965   1966-70   1971-75   1976-80   1981-85   1986-90
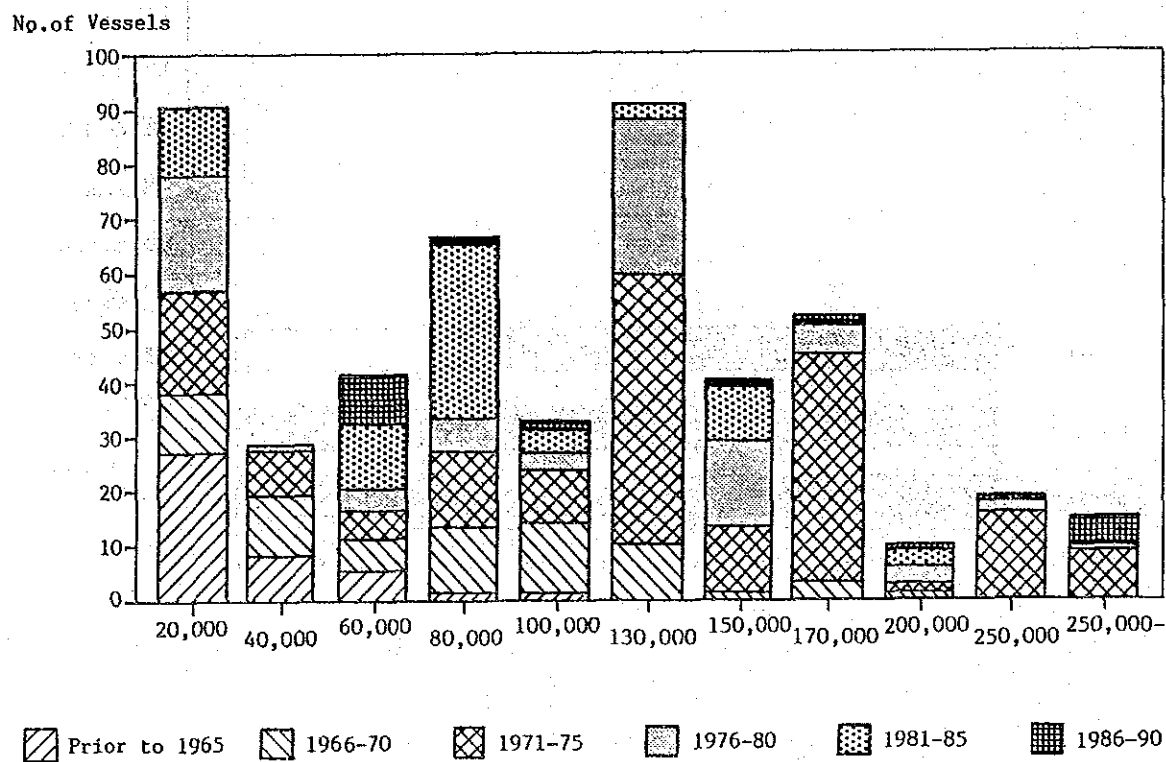
(analysed by Port & Harbour Research Institute,
Japan based on "Lloyd's Register of Ship")

Table 7-5-2 Capacity of Main Iron Ore Loading Ports

Area	Ore Brand	Loading Port	PORT CAPACITY									MAXIMUM ACCOMMODATION			
			Water Depth				Width of Channel	Length of Berth	Loader (nominal T/H)	Loading Rate (T/h)	Stock-pile Capacity (10,000 tons)	Draft (A+B-C)	L.O.A.	Beam	D.W.T
			Channel (A)	Berth Front	Average Tide (B)	Keel Clearance (C)									
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
India	Basic Grade	Madras Outer Harbour (A) 1st Phase	15.8 m	14.6 m	3' (0.9 m)		244 m at straight reach and 305 m at southern end of channel	730' (222 m) Dolphin to Dolphin 357.50 m	4000 x 2	40,000	80	46' (14 m)			88,000
		(B) 2nd Phase (completion undecided)	17.6 m	15.55 m T											100,000
		Paradeep	39' (11.89 m)	39' (11.89 m)	3' (0.9 m)		558' (170 m)	508' (155 m)	2500 x 1	12,000	40	38' (11.58 m)	700' (213.36 m)	105' (32.2 m)	45,000
	Bailadila	Visakhapatnam Outer Harbour (VOH)	54'1" (16.50 m)	54'1" (16.50 m)			656'2" (200 m)	1233'7" (376 m)	8000 x 1	40,000	90	50'2" (15.30 m)	885'10" (270 m)	137'10" (42 m)	120,000
	All Brands	Marmugao Berth No.9	45' (13.7 m)	43' (13.1 m)	4' (1.2 m)	3' (0.9 m)	820' (250 m)	984' (300 m)	4000 x 2	60,000	100	43' (13.1 m) 15.0 m Future	660' (201 m)	104' (31.7 m)	60,000 / 100,000 (Future)
		Marmugao No.6 Berth	30' (9.1 m)	28' (8.5 m)	4' (1.2 m)	3' (0.9 m)		722' (220 m)	1000 x 1	7,000	22	29' (8.8 m)	561' (170.4 m)	75' (22.86 m)	20,000
	Choulgule	Offshore Loading (addl. loading by Marstha Transhipper)							900 x 1	6,000		42' (12.80 m)	725' (220.5 m)	104' (31.7 m)	100,000
	Salgao-car	Marmugao (Transfer Vessel)							1050 x 1	12,000		51'6" (15.7 m)	856' (261 m)	132' (40.25 m)	160,000
	Dempo	Marmugao "PRIYADAR-SSINI" Loading Station		47'7" (14.5 m)		7'4" (2.25 m)		352'0" (107.50m)	1250 x 2 (Capacity 250 x 3)	12,000	50(conc.) 15 (pellets)	40'02" (12.2 m)	738' (225 m)	105' (32.0 m)	Not avail-able
	MMDRESHCH	New Mangalore Port	13.5 m	13.0 m	1.585 m	0.9 m	245 m	288 m	6000 x 1			12.5 m	245 m		60,000

SOURCE : 1981-82 IRON ORE MANUAL PUBLISHED BY THE TEX REPORT CO., LTD. (Revised with available information on Indian Ports)

Table 7-5-3(1) Capacity of Main Iron Ore Loading Ports

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Australia	Mt. Goldsworthy	Port Hedland	42' (12.8m)	42' (12.8 m)	12'7" (3.9 m)	6'7" (2.0 m)	600' (182.9 m)		4500 x 1	60,000	80	48' (14.6 m)	1000' (304.8 m)	138' (42.1 m)	160,000
	Hamersley	Port Dampier (1) Parker Point	52' (15.85 m)	53' (16.15 m)	7'5" (2.29 m)	3' (0.91 m)	500' (152.40 m)	882' (268.90m)	6000 x 1 (ORE) 4500 x 2 (PELLET)	100,000 80,000	170	1463 m	260.6 m	42.67 m	130,000
		(2) East Intercourse Island	52' (15.85 m)	61' (18.59 m)	7'5" (2.29 m)	5' (1.52 m)	549'11" (167.60 m)	1380' (421 m)	7600 x 1	100,000 L/T	300	56' (17.07 m)	1030' (313.93 m)	156' (47.55m)	160,000
	Mt. Newman	Port Hedland	11.8 m	No.1 16.0 m No.2 16.0 m	4.8 m	2.1 m	183 m	A 306 m B 352 m	No.1 8000 x 1 No.2 10000 x 1	110,000	350	48' (14.63 m)	1000' (305 m)		160,000
	Robe River	Port Walcott	12.8 m	Southern Berth 17.3 m Northern Berth 19.2 m	3.96 m	2.1 m		366 m	6000 x 1	100,000	200	48' (14.63 m) (Max. Recept. Record) 16.70 m	(Max. Recept. Record) 335.64 m	53.64 m (short loaded)	260,412
	Savage River (Pellet)	Port Latta	50' (15.24 m)						2750 x 2	48,000	103	42' (12.8 m)	820' (250 m)	121' (37 m)	100,000
	Iampl Sound	Koolan Island		45' (13.71 m)	30' (9.1 m)	4' (1.2 m)		790' (240.79m)	3000 x 1	38,000	6	47' (14.3 m)	780' (237.74 m)	118' (35.97m)	100,000
		Cockatoo Island		42' (12.80 m)	30' (9.1 m)	4' (1.2 m)		780' (237.67m)	800 1000	24,000	6	43'6" (13.4m)	735' (224.03 m)	104' (31.70 m)	
South America (Atlantic Coast)	Rio Doce	Tubarao No. 1	70'6" (21.5 m)	70'6" (21.5 m)	4'11" (1.5 m)	4'11" (1.5 m)	918'6" (280 m)	1722'6" (525 m)	8000 x 1 6000 x 1	80,000 L/T	450	65'7" (20 m)	1148'4" (350 m)	183'9" (56 m)	295,000
		No. 2	73'8" (22.5 m)				Outer 918'6" (280 m) Inner 1082'8" (330 m)	1295'11" (395 m)	16000 x 2				1279'53" (390 m)	200'13" (61 m)	350,000
	M B R	Sepetiba	73'10" (22.5 m)	Outer 78'9" (24 m) Inner 62'4" (19 m)		8'2" (2.5 m)			7000 x 1	50,000 L/T		Outer 65'7" (20 m) Inner 54'2" (16.50 m)	1148'6" (350 m)	183'9" (56 m)	300,006
													1148'6" (350 m)	183'9" (56 m)	300,000

Table 7-5-3(2)　Capacity of Main Iron Ore Loading Ports

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Chile	Algarrobo	Huasco (Guacolda Pier)	50'10" (15.5 m)	50'10" (15.5 m)	2'7" (0.8 m)	9'2" (2.8 m)	-	600' (183 m)	2500 x 1	25,000	35	44'4" (13.5 m)	853' (260 m)	128' (39 m)	80,000
		Huasco (New Pier)	85'4" (26 m)	85'4" (26 m)	2'7" (0.8 m)	6'7" (2 m)	-	990' (302 m)	6000 x 1	100,000 (assumed)	100	59' (18 m)	1030' (314 m)	156' (47.5 m)	160,000
	Romeral	Guayacan	55' (16.76 m)	55' (16.76 m)	2'7" (0.8 m)	5'7" (1.71 m)	-	705'5" (215 m)	3000 x 1	35,000	100	52' (15.85 m)	919' (280 m)	135' (41 m)	about 110,000
	Santa Barbara	Caldera	-	42'8" (13 m)					2000 x 1	about 25,000	35	42' (12.8 m)	853' (260 m)	131' (40 m)	80,000
		Huasco (Las Losas Pier)		52'6" (16 m)					2500 x 1	about 32,000	40	48'11" (14.9 m)	951' (290 m)	144' (44 m)	80,000
	Santa Fe	Chanaral	-	41' (12.50 m)					2000 x 1	about 15,000	55	40' (12.2 m)	794' (242 m)	118' (36 m)	80,000
Peru	Marcona	San Nicolas	-	62' (18.9 m)				1000' (305 m)	4500 x 1	50,000	211	59' (18 m)	958' (292 m)	146' (44.5 m)	160,000
Canada	Tam	Tam Harbour		44'3" (13.5 m)				500' (152.4 m)	2800 x 1	about 35,000 L/T (Performance base)	21	44'11" (13.4 m)	795'7" (243 m)	105'10" (32 m)	68,500
	Carol Lake	Seven Islands	no limit	60' (18.3 m)	10'6" (3.2 m)	3' (0.9 m)	no limit	985' (282 m)	7500 x 2	about 100,000 L/T	550	60' (18.3 m)	1600' (488 m)	184' (56.1 m)	260,000
Africa	Iscor	Port Elizabeth	38' (11.6 m)	40' (12.2 m)	3'2" (1.0 m)	2'5" - 4' (0.8 - 1.2 m)	1286' (392 m)	840' (256 m)	760 x 2	20,000 L/T	46	38' (11.6 m)	825' (251 m)		55,000
		Saldanha Bay	77' (23.5 m)	76' (23.25 m)	-	9' (2.75 m)	1230' (375 m)	2073' (632 m)	10000 x 2	160,000 L/T	250	67' (20.5 m)	1148' (350 m)	184' (56.1 m)	250,000
	Swaziland	Mapato		40' (12.19 m)	(2 - 4 M)		328'1" (100 m)	667' (208 m)	2700 x 2	20,000 L/T	58	36' (11 m)	820' (250 m)	Outreach 70' (21.35m)	
	Lamco	Buchanan	48' (14.6 m)	42' (12.8 m)	3' (0.9 m)	3' (0.9 m)	Over 754'6" (over 230m)	843' (257 m)	6000 x 1	40,000 L/T	210	39' (11.89 m)	850' (259 m)	131' (40 m)	100,000
	Mauritania	Nouadhibou	54' (16.5 m)		3'2" (1.0 m)	5'4" (1.65 m)	1300' (396 m)		5000 x 1	80,000 L/T	156	52' (15.85 m)	1000' (305 m)	144' (44 m)	135,000

Table 7-5-3(3)　Capacity of Main Iron Ore Loading Ports

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Krivorog	Iljicborsk	39'4" (12m)		7.57" (20 cm)		328' (100 m)	2296' (700 m)		15,006 L/T	25	38' (11.58 m)	820' (250 m)	118' (36 m)	69,833
		Grigorovsky	56'(17 m) 1st phase 18 - 20 m 2nd phase					No.1-400m No.2-350m No.3-350m	8000 x 3			56' (17.0 m)	(305 m)	(42 m)	100,000
															170,000

(3) Assumed Vessel Size

   Two alternatives for vessel size are set forth as follows taking into consideration 1) TDCI'S plan 2) world feet 3) capacities of major loading ports in the world' as explained above. The dimensions, i.e., LOA and draft etc., are determined based on the 75% envelope of the existing iron ore carriers' dimensions as are shown in Fig. 7-5-3 - 7-5-6.

   The final vessel size shall be determined taking into account the technical feasibility and comparison of the construction cost of a jetty to accommodate the two alternatives.

   60,000 DWT vessels can be deployed in the short term (up to 2000) taking into account the cargo volume expected during the period.

Assumed Vessel Size

Vessel Size (DWT)	LOA (m)	Full Draught (m)	Beam (m)	Molded Depth (m)
100,000	250	15	40	20
150,000	280	17	45	23
60,000	210	12.6	34	17

Fig. 7-5-3 LOA - DWT Relationship (Iron Ore Carrier)
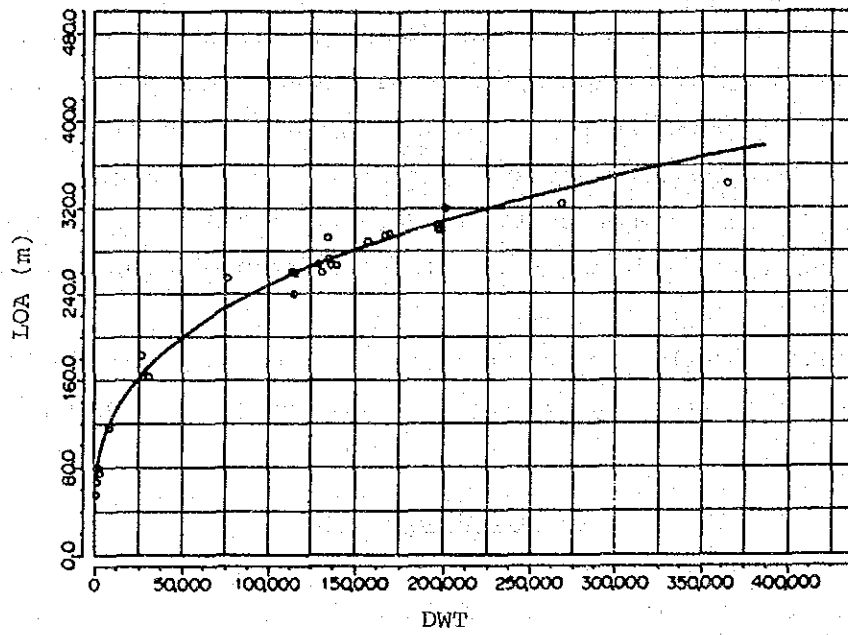

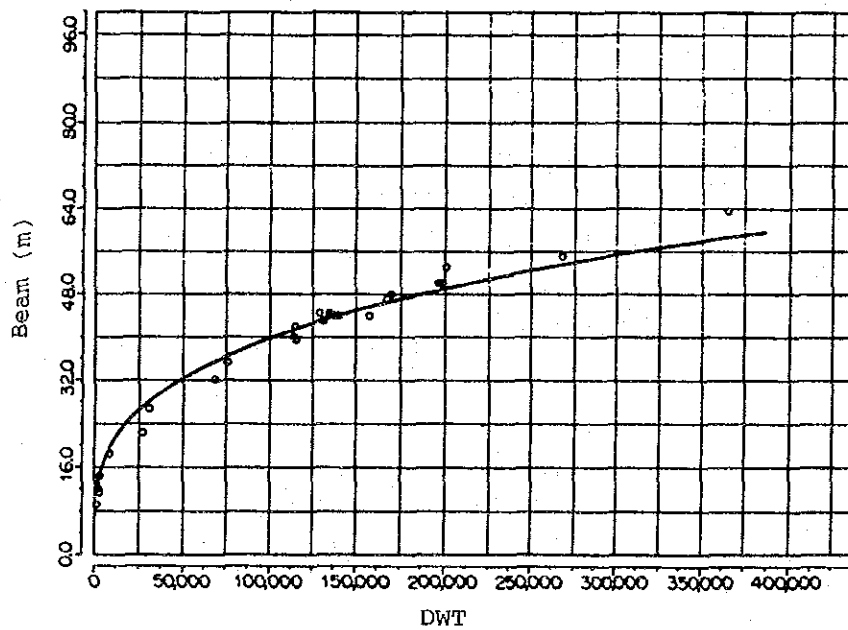Fig. 7-5-4 Beam - DWT Relationship
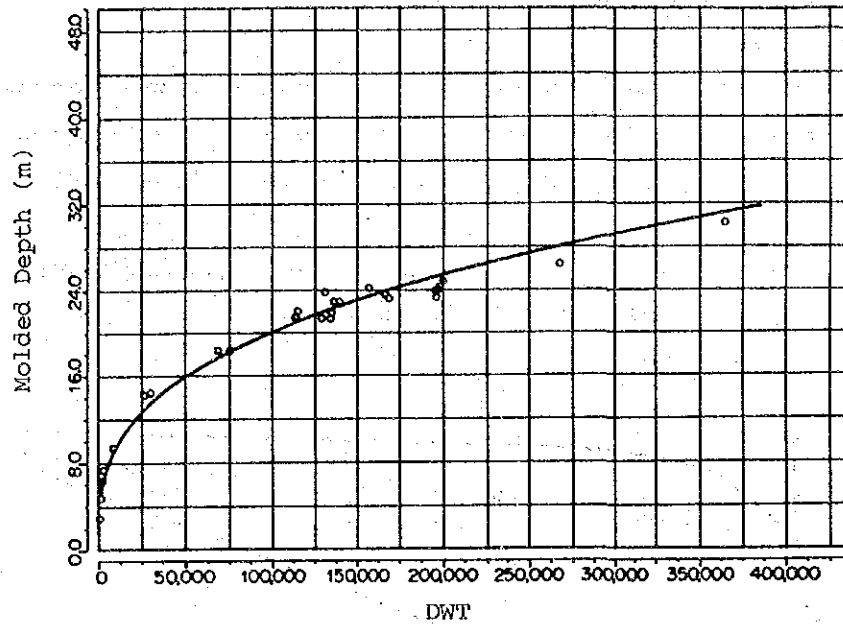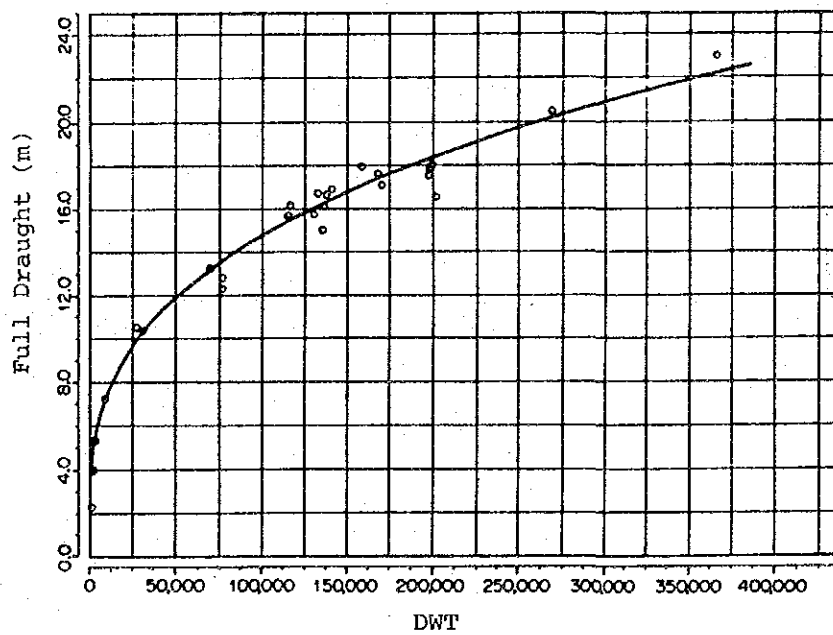
Fig. 7-5-5 Molded Depth - DWT

Fig. 7-5-6 Full Draught - DWT Relationship

7-5-2　General Cargo Vessel

(1) Foreign Trade Conventional Vessels

1) Vessels calling at Turkish Ports

Fig. 7-5-7 shows the distribution of vessel sizes (accumulated) calling at Turkey in 1989 and before. This shows almost all the general cargo vessels calling at Turkish Ports are less than 15,000 DWT.

Fig. 7-5-7　Distribution of Vessel Size (Accumulated) called at Turkey
Source : Ge Si Bil (1989 and before)
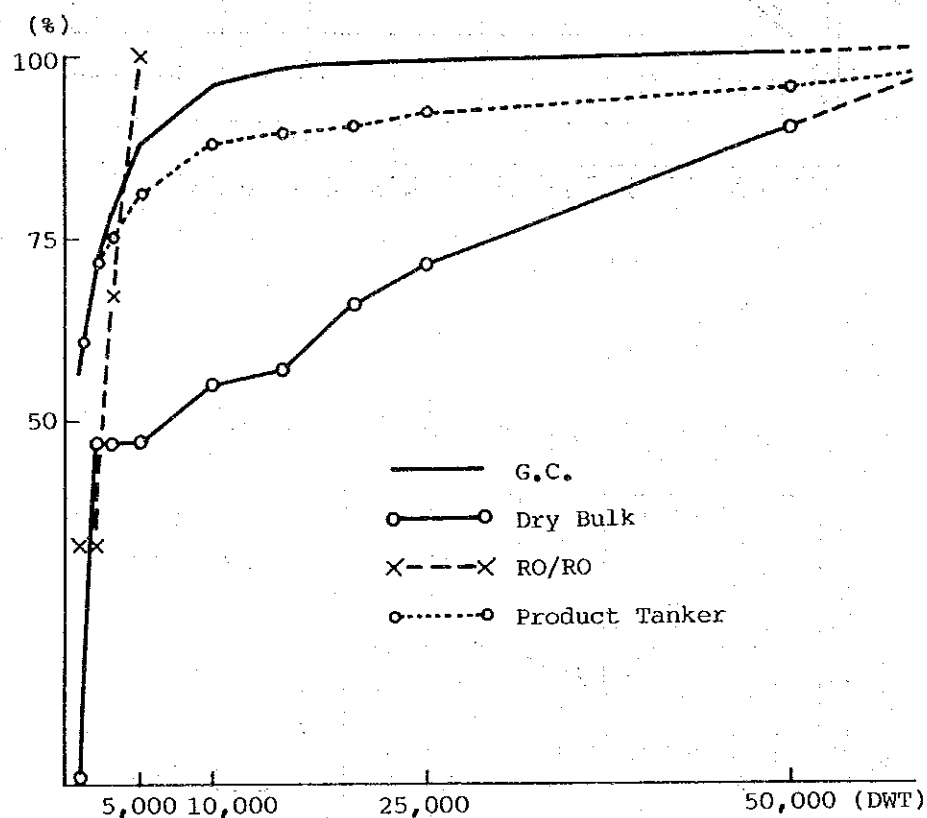
2) World Fleet

Fig. 7-5-8 shows the size distribution of the general cargo fleet in the world as of 1988. This shows 86% of the fleet is less than 15,000 DWT, and the greatest number of vessels are under the range of 5,000 - 10,000 DWT.

Fig. 7-5-9 shows the distribution in terms of ship age. This shows the vessels of 10,000 DWT or plus are increased recently.

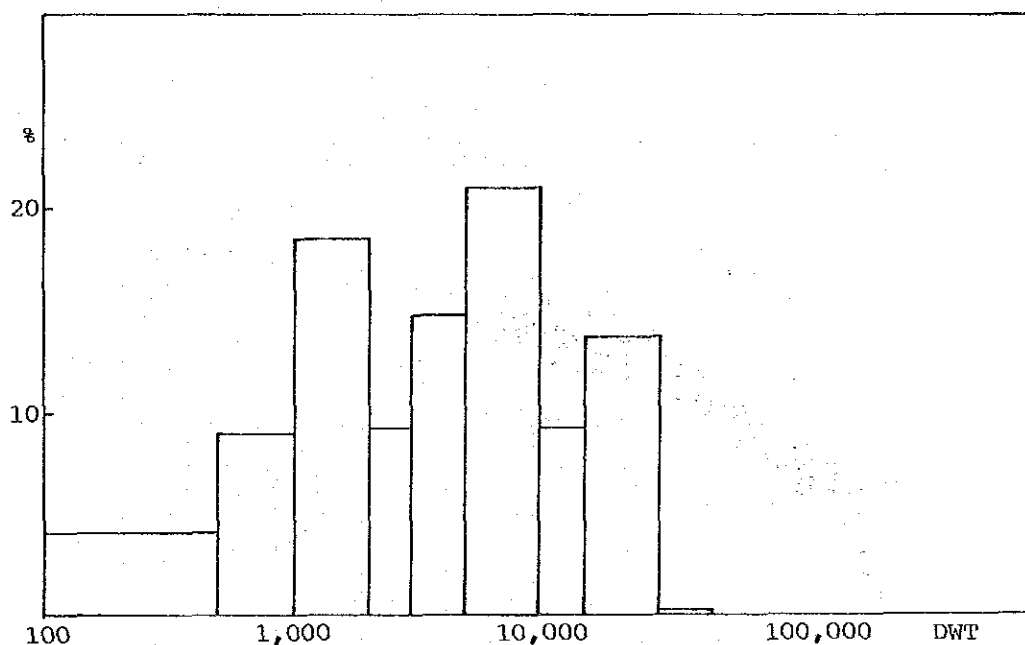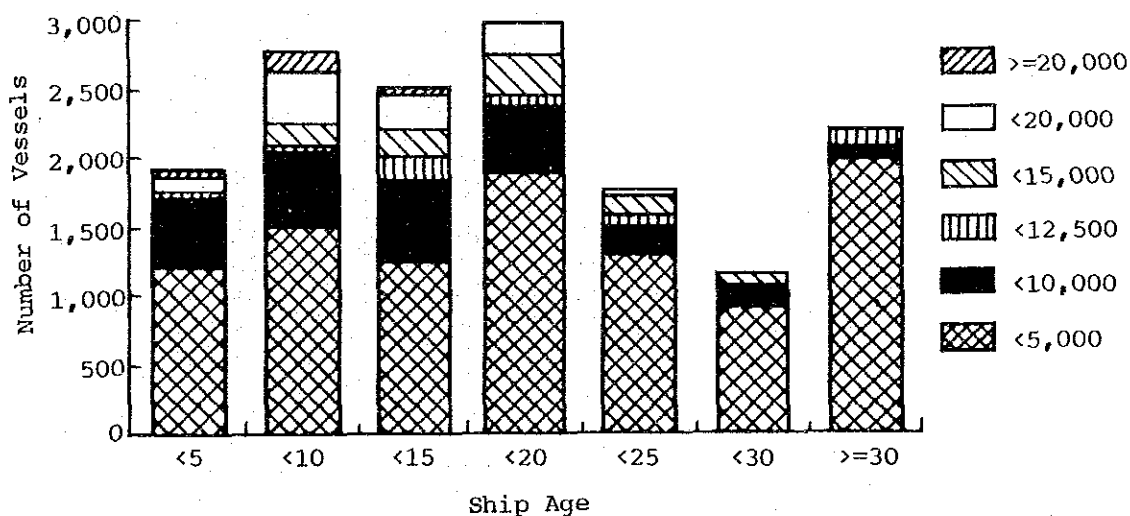Fig. 7-5-8 General Cargo Vessel Size Distribution

Fig. 7-5-9 Ship Age Distribution of G.C. Vessels

3) Assumed Vessel Size

The size of G.C. vessels is assumed as follows taking into account the size of vessels calling at Turkey and those of the world fleet.

The dimensions of the vessel are determined based on Fig. 5-2-3 ~ 7-5-13.

Vessel Size (DWT)	LOA (m)	Full Draught (m)	Beam (m)	Molded Depth (m)
15,000	153.9	8.8	20.6	11.8

Fig. 7-5-10   LOA - DWT Relationship

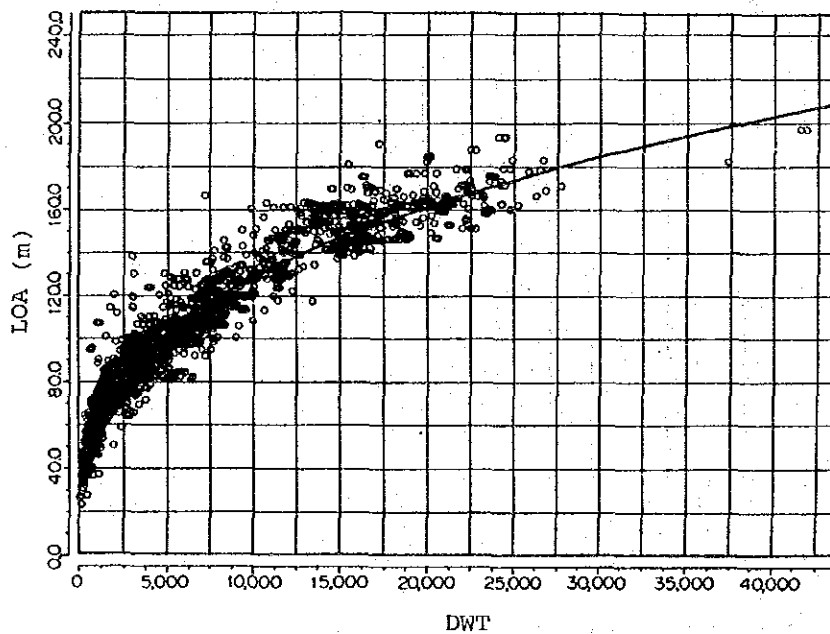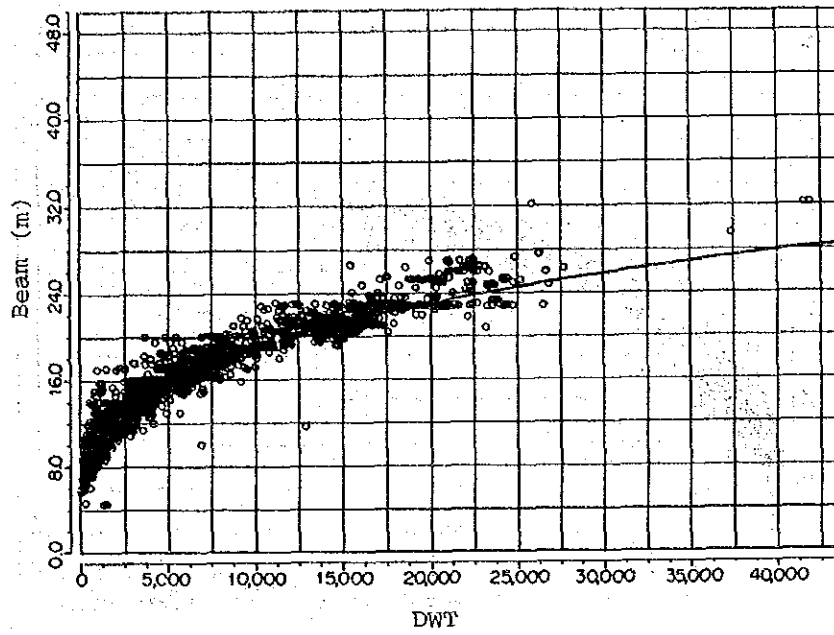Fig. 7-5-11   Beam - DWT Relationship
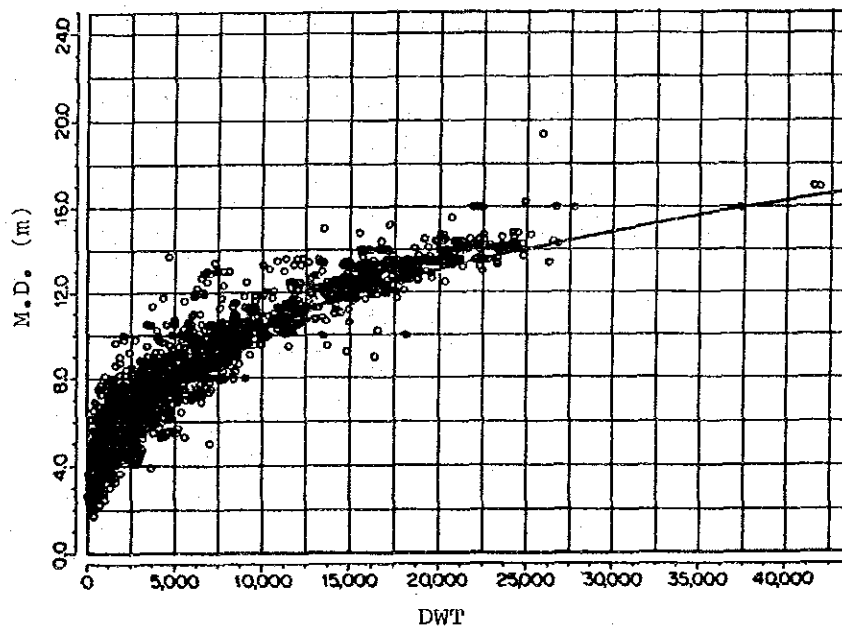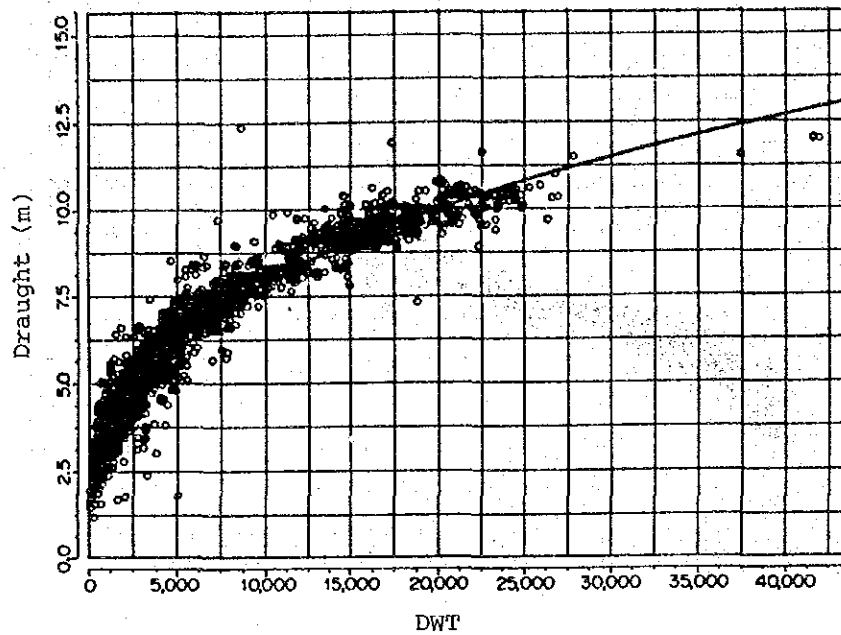

Fig. 7-5-12   M.D. - DWT Relationship

Fig. 7-5-13 Draught - DWT Relationship

(2) Coastal Trade G.C. Vessels

They are usually 5,000 DWT class because of the relatively short navigation. The dimensions are as follows.

Vessel Size (DWT)	LOA (m)	Full-Dranght (m)	Beam (m)	Molded depth (m)
5,000	103	6.3	15.8	8.3

7-5-3 Container Vessels

(1) Assumed Size at Filyos

The following vessels are assumed to call at Filyos according to the international container traffic analysis.

    Multi-purpose vessels (semi - con vessels) --- Direct Call

        up to 25,000 DWT

    Full cellular vessels   --- Direct Call

        up to 1,500 TEU (32,000 DWT)

    Full cellular vessels   --- Feeder

        up to 800 TEU (12,000 DWT)

The dimensions of vessels are determined based on Fig. 7-5-10 - 7-5-13 for multi-purpose vessels and Fig. 7-5-14 - 7-5-17 for full cellular vessels, as follows:

Type of Vessel	Vessel Size (DWT)	LOA (m)	Full Draught (m)	Beam (m)	Molded Depth (m)
Multi-Purpose	25,000	174	10.9	24.5	14
Full	32,000	218	11.2	29.9	17.6
Container	12,000	150	8.1	22.3	11.7

Fig. 7-5-14　LOA - DWT (Container)
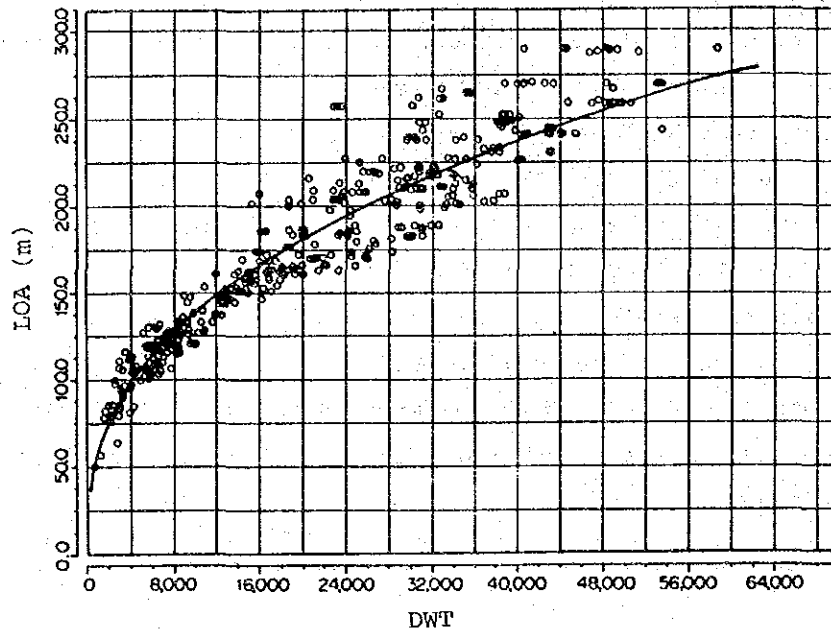

DWT

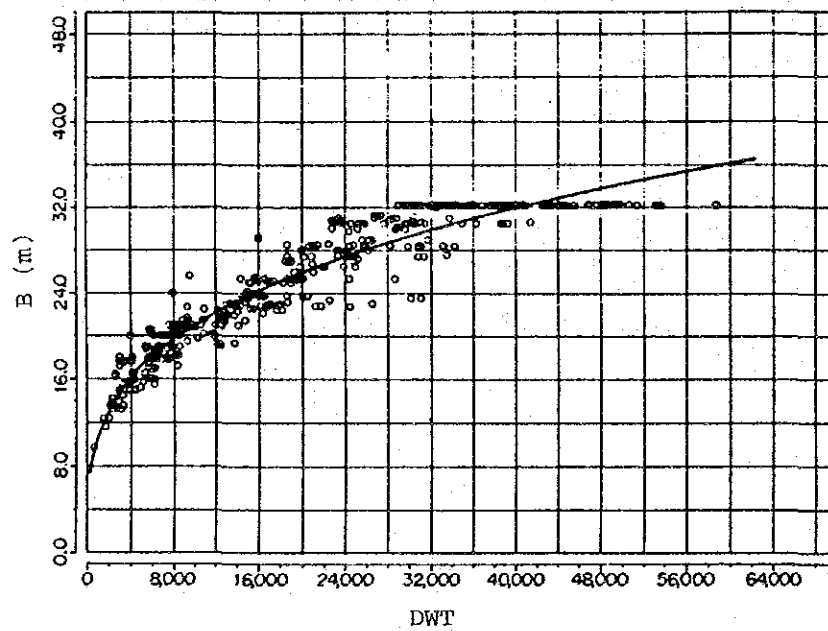Fig. 7-5-15　Beam - DWT (Container)

DWT

Fig. 7-5-16   Molded Depth - DWT (Container)
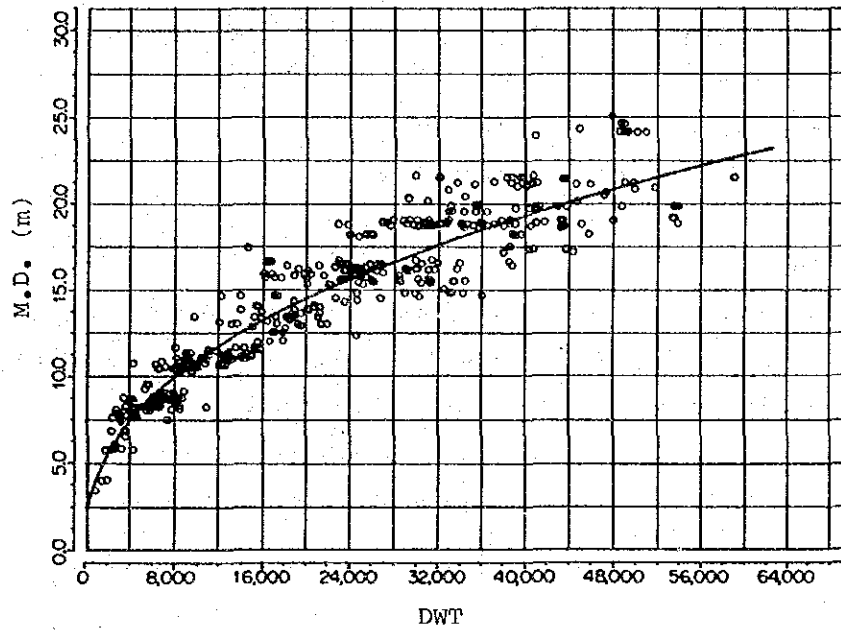

Fig. 7-5-17   Draught - DWT   Relationship
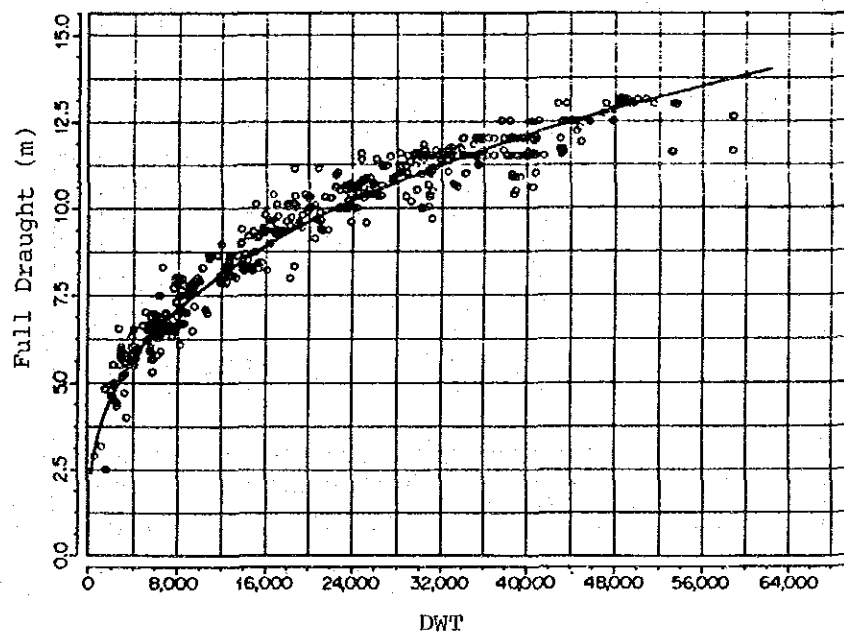
7-5-4 Coal Carrier

(1) Vessel Size envisaged by TDCI

The TDCI envisages coal carriers of a size similar to iron ore carriers as follows:

   40 - 60,000 DWT   up to 1995

   100 - 150,000 DWT   from 1995 onward

(2) World Fleet

The DWT of coal carriers is smaller than that of iron ore carriers, As shown in Table 7-5-4, the vessel sizes of coal carriers in the Mediterranean Sea is mostly less than 100,000 DWT.

Table 7-5-4 Ship Size Distribution by Area

Figures in % of total seaborne trade of each area.					1987.	
	Size groups of vessels in '000 dwt					
	-40	40-60	60-100	100-150	150+	Total
Exporting areas						
East Europe	59	14	15	1	11	100
Other Europe	73	1	8	3	15	100
North America	6	9	32	7	46	100
Australia	11	6	28	6	49	100
South Africa	19	11	25	4	41	100
Others	41	11	24	5	22	100
Importing areas						
UK/Continent	10	7	24	4	55	100
Mediterranean	9	19	24	11	37	100
Other Europe	37	10	29	3	21	100
South America	5	13	50	2	30	100
Japan	18	6	26	8	42	100
Other Far East	28	3	25	1	43	100
Others	11	31	24	-	34	100
Total 1987	19	9	27	5	40	100
Total 1986	21	9	26	6	38	100

Note: Percentages for vessels below 40,000 dwt are residuals, calculated as
      the difference between total quantity of coal movements and shipments
      by vessels over 40,000 dwt.

(Fearnleys [World Bulk Trades])

3) Assumed Vessel Size

The following vessel size is assumed for coal carriers calling at Filyos, taking into account the view of TDCI and the world fleet, as explained above. The dimensions are determined based on Fig. 7-5-18 - Fig. 7-5-21. 60,000 DWT vessels can also be deployed in the short term (up to 2000) taking into account the cargo expected during the period.

Vessel Size (DWT)	LOA (m)	Full Draught (m)	Beam (m)	Molded Depth (m)
100,000	251	14.4	39.6	20.7
60,000	214	12.6	33.5	17.7

Fig. 7-5-18 LOA - DWT Relation (Coal Carrier)
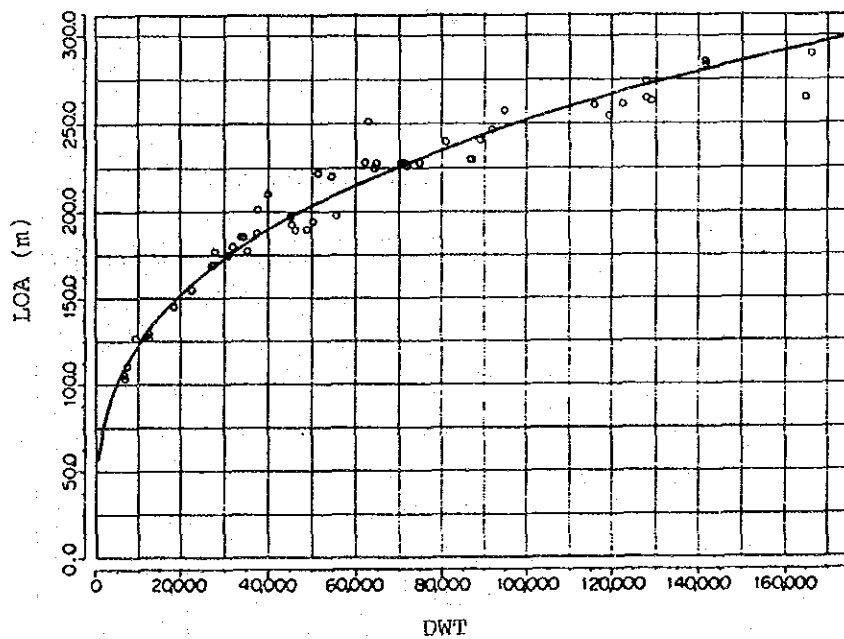
Fig. 7-5-19   Beam - DWT Relation
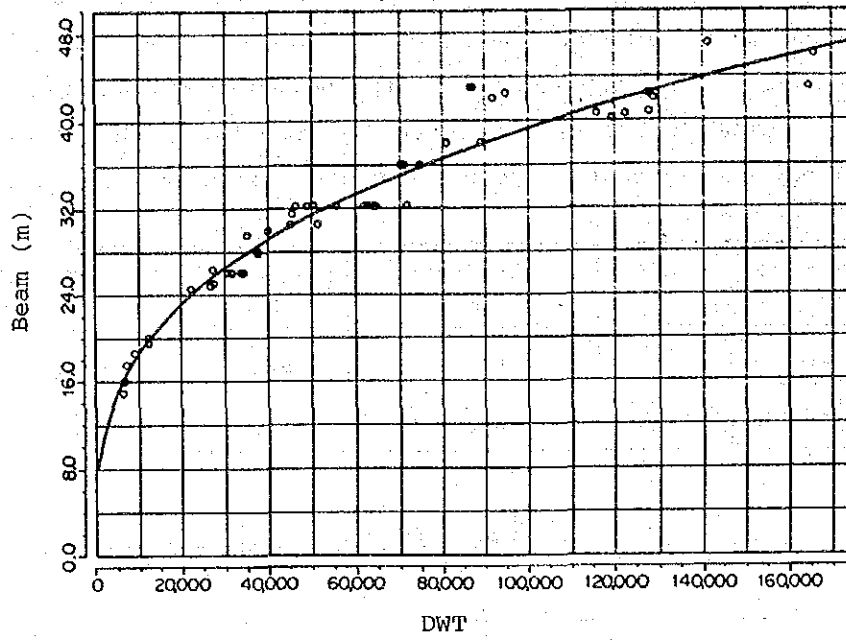
Fig. 7-5-20   Molded Depth - DWT
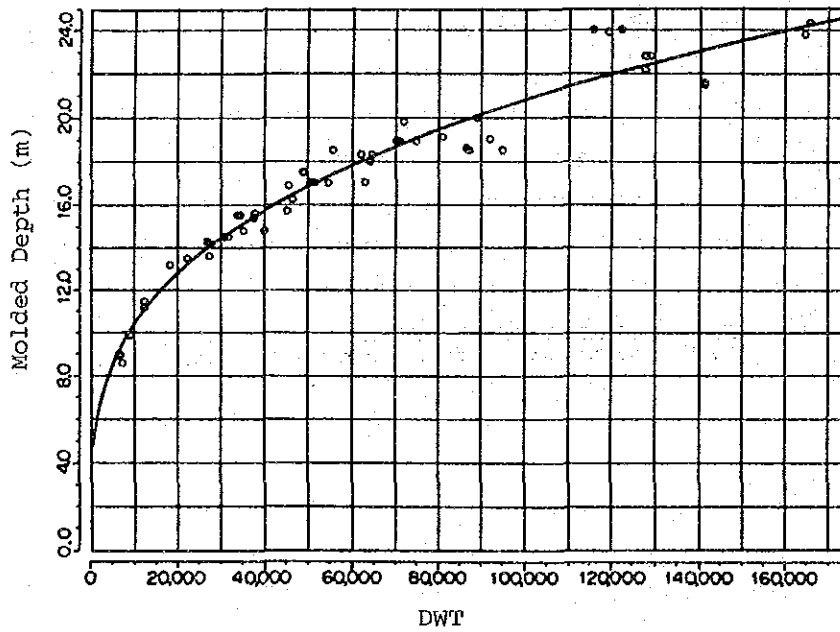
Fig. 7-5-21 FUll Draught
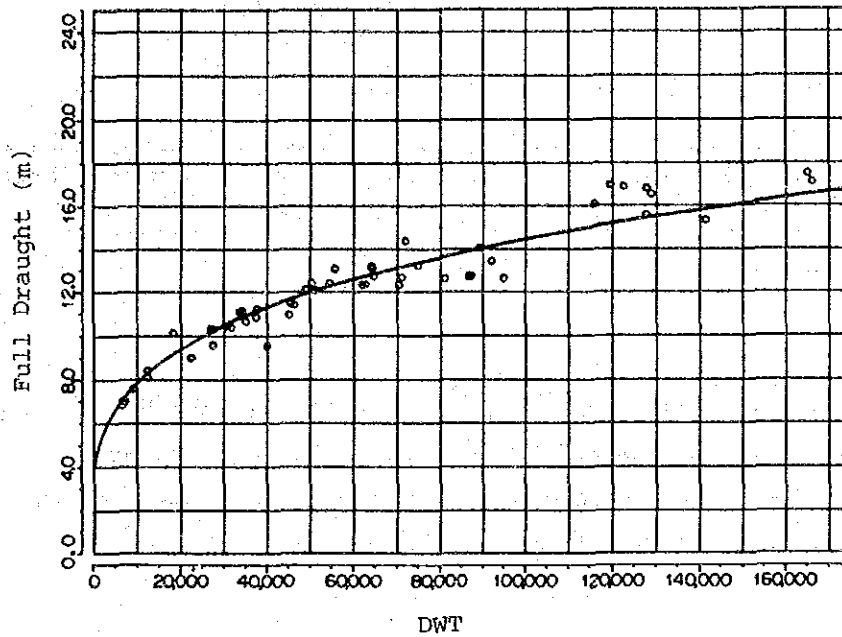
7-5-5 Other Dry Bulk Carriers

(1) Vessels calling at Turkish Ports

As shown is Fig. 7-5-7, dry bulk carriers calling at Turkish Ports are mostly less than 50,000 DWT.

(2) World Fleet

As shown in Fig. 7-5-22, dry bulk carriers of less than 50,000 DWT amount to over three quarters in the world fleet.

Fig. 7-5-22 (Source : PHRI) as of 1988
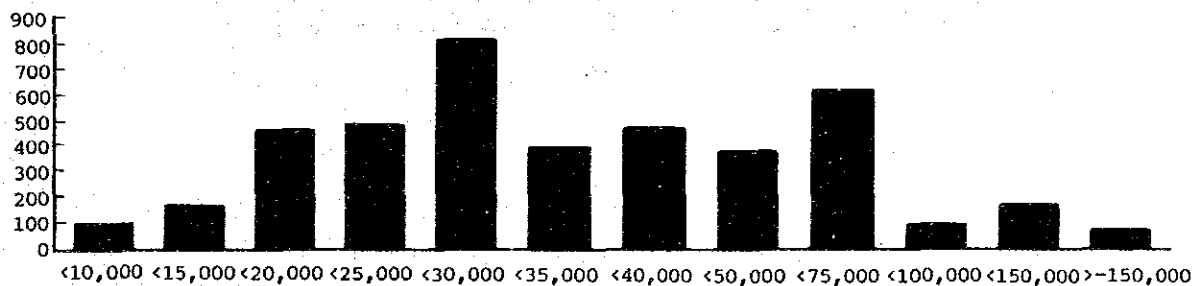
(3) Assumed Vessel Size

The following vessel size is assumed for other dry bulk carriers calling at Filyos, taking into account the above analyses. The demensions are determined based on Fig. 7-5-23 - 7-5-26.

Vessel Size (DWT)	LOA (m)	Full Draught (m)	Beam (m)	Molded Depth (m)
50,000	207	12.2	30.4	17.0

As regards grain carrier and timber carrier, 30,000 DWT vessels and 15,000 DWT vessels are assumed respectively, taking into account the cargo volumes to be handled. Panamax-type grain carrier should be also catered to in response to the view of the TMO.

Fig. 7-5-23   LOA - DWT (Dry Bulk Carrier)
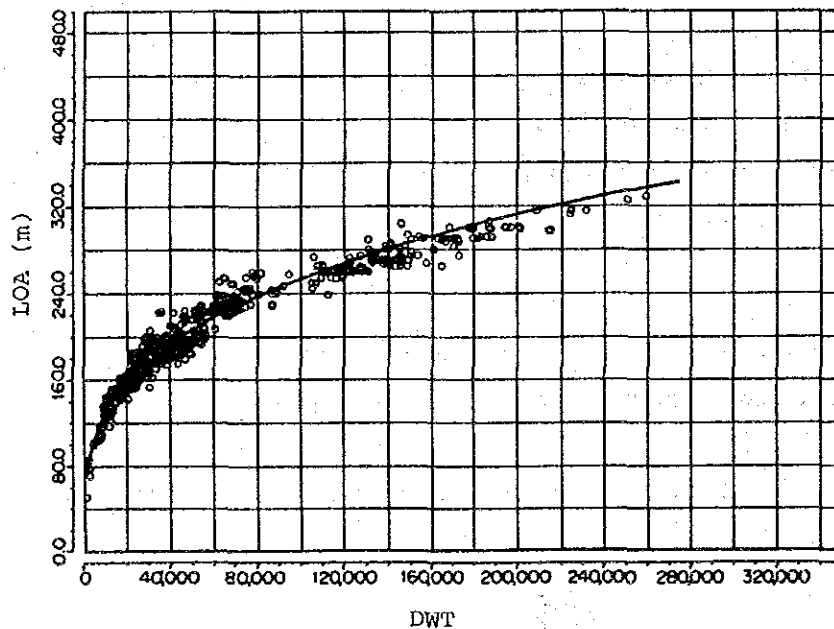
Fig. 7-5-24   Beam - DWT
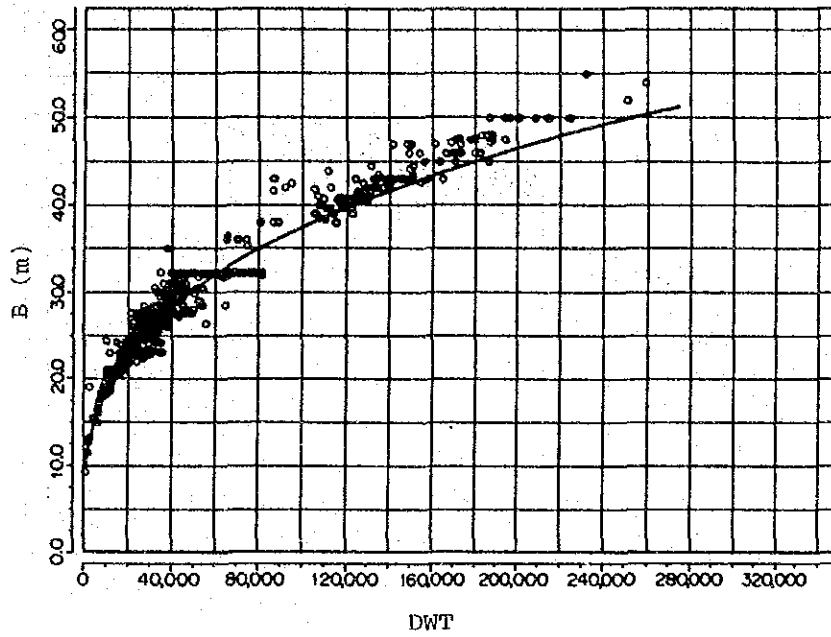
Fig. 7-5-25   Molded Depth - DWT
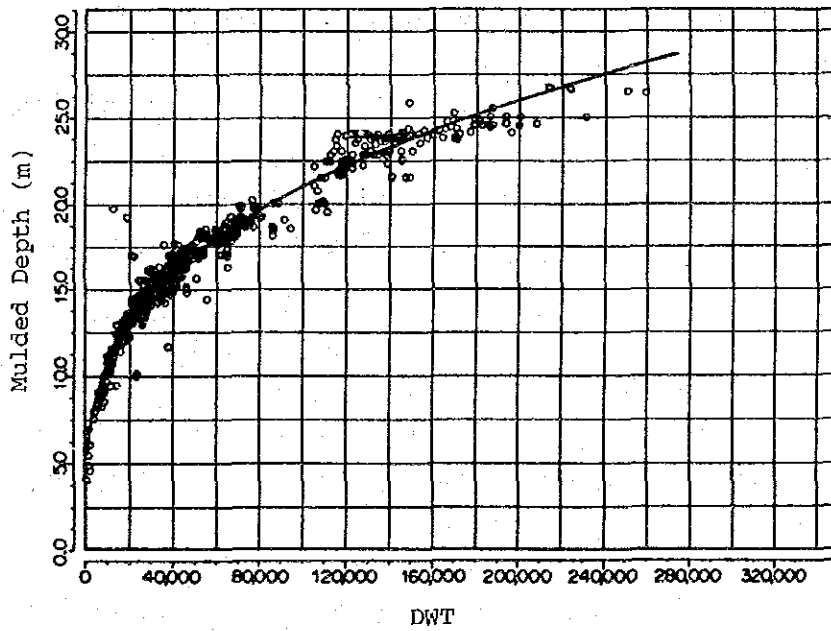
Fig. 7-5-26 Full Draught - DWT
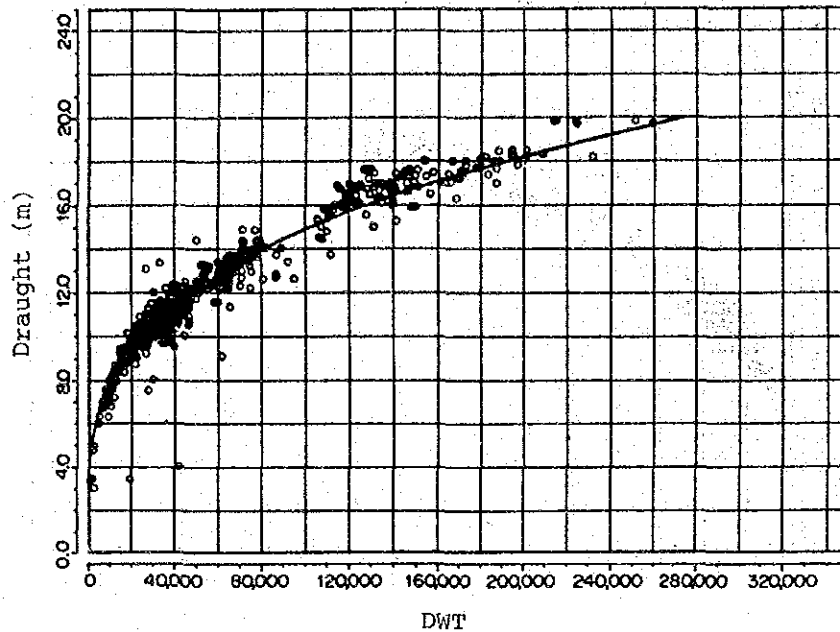
7-6 Forecast of Vessel Traffic

7-6-1 Average Vessel Size and Loaded Cargo per Vessel

(1) Iron Ore Carrier / Coal Carrier

  ① Average Vessel Size   100,000 DWT (Long-term), 60,000DWT (Short-term)

  ② Loaded Cargo   Assuming 0.8 for load factor,

                           100,000 x 0.8 = 80,000 tons per vessel

                           60,000 x 0.8 = 48,000 tons per vessel

(2) Other Dry Bulk Carrier

  ① Average Vessel Size

    The Average DWT of the dry bulk vessels calling at Turkish ports (over 5,000 DWT) is 31,000 DWT while that of the world fleet is 37,000 DWT. 37,000 DWT is assumed here.

  ② Loaded Cargo   Assuming 0.8 for load factor,

                          37,000 x 0.8 = 30,000 tons per vessel

(3) General Cargo Vessel

① Average Vessel Size

The Average DWT of the G.C. vessels calling at Turkish ports (over 5,000 DWT) is 11,000 DWT while that of the world fleet is 12,000 DWT. 12,000 DWT is assumed here.

② Loaded Cargo　　　Assuming 0.7 for load factor,

12,000 x 0.7 = 8,400 tons per vessel

(4) Container Vessel

According to the international container traffic analysis, the followings are assumed:

The average loaded TEU is　　400 TEUs　in 2000

800 TEUs　in 2010

(5) Grain Carrier

Assuming 0.9 for load factor, 30,000 x 0.9 = 27,000 tons per vessel.

7-6-2 Vessel Traffic

The future vessel traffic is forecast based on the projected cargo traffic and average vessel sizes at Filyos in 2000 and 2010 as follows:

Type of Vessels	Cargo Throughput (1000 tons)			Average DWT	Ave. Handling Vol.(tons)	Number of Calling Vessels	
	Commodity	2000	2010			2000	2010
[Foreign Trade]							
(Dry Bulk)							
Iron Ore Carriers	Iron Ore	700	3,700	100,000 (2010)	80,000	8.8	46.3
				60,000 (2000)	48,000	(14.6)	
Coal Carriers	Coal	800	3,600	100,000 (2010)	80,000	10.0	45.0
				60,000 (2000)	48,000	(16.7)	
Grain Carriers	Grain	-	240	30,000	27,000	-	8.9
(General Cargo)							
Conventional	G.C.	800	800	12,000	8,400	95.2	95.2
	Iron/Steel	1,170	1,570	15,000	12,000	97.5	130.5
Container	Container	TEUs 97,000	TEUs 270,000	400 TEUs(2000)	400 TEUs	121.3	168.8
				800 TEUs(2010)	800 TEUs		
Timber Vessel	Timber/Logs	-	370	15,000	10,500	-	35.2
[Domestic Trade]							
Dry Bulk Carrier (jetty)	Iron Ore	1,000	1,000	15,000	12,000	83.3	83.3
G.C. Vessel	Iron/Steel	1,850	3,450	15,000	12,000	154.2	287.5

Chapter VIII   INDUSTRIAL DEVELOPMENT STUDY FOR FILYOS PORT AREA

8-1   Industrialization of the Turkish Economy

     In this section, the direction and strategies for industrialization of
the Turkish economy shall be investigated, and an analysis about the
characteristics of the industrial structure will be presented.

8-1-1   General Paths of Industrial Development and Growth of the National
        Economy

     The industrial development plan in the Filyos Region must be
harmonious with the general direction of development of national economy.
Therefore, the assumed direction of economic development in Turkey shall be
presented below.

 (1) General Paths of Industrialization

     Experiences of economic development in advanced countries show that
there must be some general paths of industrialization which developing
countries can follow.

 1) Primary Stage: Self Sufficient Society before Industrialization

     A primary society, relatively isolated from other societies, could be
assumed in the early stage of development in almost every country even in
advanced countries. Some of them have some relations with other economies
in the trade of particular products, mostly mineral resources and
agricultural- , fishery- or forestry-products. Isolated economies have
gradually been integrated into the international market.

 2) Initial   Stage of   Industrialization: Further Processing of Materials
    and Import Substitution in the Earlier Stage of Industrialization

     Increase in foreign currency obtained from exports is balanced by the
purchasing of manufactured products from abroad, because manufacturing
industries have still not grown to meet increasing domestic demand.   In

many cases, the amount of foreign currency required for the imports of manufactured goods exceeds the foreign currency earned by exports of resources and primary products. Such a situation makes it possible to find two ways of industrialization. One is the further processing of exported materials and the other is the substitution of imports by promotion of domestic production. These are popular strategies for industrialization in its earlier stage.

3) Mature Stage of Industrialization: Diversification or Integration of Industrial Structure and Development of Industrial Technology

In the earlier stage of industrialization only a very few industrial sectors often grow, but it's difficult to run these specific sectors efficiently, because of the lack of supporting industries which produce materials, intermediate inputs, parts, machine and equipment. Then, more kinds of industries must be developed in the later stage, which can be called the "Mature Stage of Industrialization". In this stage, the inter-linkage between industries can be strengthened, and industrial technology can also be improved. These make it possible to improve efficiency and competitiveness in the world market. Since more manufactured goods can be exported, the economic growth in this stage is characterized as "Export Oriented Growth". Asian NIEs are going through this, and Turkey will enter this stage in the coming decades.

4) Effects of Export Processing Zones on Industrialization

Many developing countries adopt a policy of establishing Free Trade Zones (FTZ) or Export Processing Zones (EPZ) at a relatively early stage in order to attract foreign capital and achieve technology transfer even though domestic industries are still in a primary stage of development. The effect of absorption of abundant labour forces is expected, as well as earning of foreign currency, technology transfer, regional development and organizing inter-linkage with domestic industries. When the FTZs or EPZs are organized and managed well, they can bring expected effects on the national economy as a whole to go into a further stage of development.

5) Advancing into A Post Industrial Society

An economy, which has reached the mature stage of industrialization, faces some difficulties in continuing to increase manufacturing industries, particularly those depending heavily on exports. As increasing production costs weaken the competitiveness in the world market, some industries move their operations abroad, and more and more manufactured products, which are made in other countries, are imported. Since some manufacturers have enough market share abroad to set up factories overseas, they establish manufacturing plants in place of sales offices in these market areas. In this stage, the Post Industrial Stage, the domestic industrial structure tends toward service industries instead of manufacturing industries. After the rapid economic growth depending on exports of manufactured goods, the Japanese economy is gradually moving toward a post-industrial society, following the U.S.

These general paths of industrialization, as explained above, are shown on Figure 8-1-1. In conclusion, it can be assumed that the Turkish economy will move into the latter half of the Mature Stage in the coming decades. The industrial development plan in Filyos District shall be based on this assumption.

Fig. 8-1-1 General Paths of Industrialization

BEFORE INDUSTRIALIZATION

ISOLATED AND SELF-
SUFFICIENT SOCIETY

ENTRY ATO THE WORLD ECONOMY

EXPORTS OF
PRIMARY PRODUCTS

IMPORTS OF
MANUFACTURED PRODUCTS

EXPORT SUBSTITUTION

IMPORT SUBSTITUTION

INITIAL STAGE OF INDUSTRIALIZATION

DEVELOPMENT
OF EXPORT
PROCESSING
ZONE

MATURE STAGE OF
INDUSTRIALIZATION

INTEGRATION
OF INDUSTRIAL
STRUCTURE

DEVELOPMENT
OF ADVANCED
TECHNOLOGY

EXPORTS OF VARIOUS
MANUFACTURED PRODUCTS

POST-INDUSTRIAL SOCIETY

INCREASE OF
IMPORTS
MANUFACTURED
OVERSEAS

INCLINATION OF
ECONOMIC STRUCTURE
TO SERVICES

DIRECT
INVESTMENT
OVERSEASE

(2) Cross Section Analysis by Countries on the Relation between the National Economy and Industrial Development

It's well known that there is a close relation between the per capita income level and the stage of industrialization. The "World Development Report" published by the World Bank indicates GDP per capita of 120 countries and economies which are classified into several groups with different levels of development as shown on Table 8-1-1 and Table 8-1-2. The average of GDP per capita in 1987 was $273 for "Low Income Economies", $1,188 for "Lower Middle Income Economies", $2,492 for "Upper MIddle Income Economies" and $15,921 for "High Income Economies". These figures show that there was a very wide difference between developing economies and advanced economies.

Such differences reflect the level of industrialization. Gross Domestic Product (GDP) and Value Added in Manufacturing Industry (VAM) both in term of per capita in 1987 of 23 countries with bigger population than 30 million are indicated on Table 8-1-3. It can be found that there is a close relation between two variables. The quantitative relations of these variables and also a coefficient of correlation (R) can be estimated by using a function defined as below.

$$Ln[GDP] = \beta + \alpha \, Ln[VAM]$$
$$Ln[VAM] = \delta = \sigma \, Ln[GDP]$$

The value of a parameter α indicates a elasticity ratio of the growth rate of GDP against that of VAM. Estimated values of parameters are follows:

α = 0.8444 (T. Value: 29.0340) σ = 1.1554 (T.Value: 29.0340)
β = 2.5483 (T. Value: 14.5655) δ = -0.8046 (T.Value: -9.3326)
R = 0.9878   R = 0.9878

$$Ln[GDP] = 2.5483 + 0.8444 \, Ln[VAM]$$
$$Ln[VAM] = -2.8049 + 1.1554 \, Ln[GDP]$$

In a conclusion, it can be estimated that 8 per cent growth of VAM brings a growth of GDP at a rate of 6.755 per cent, while 8 per cent growth of GDP produces a growth of VAM at a rate of 9.243 per cent.

Table 8-1-1 GDP Per Capita by Country

	COUNTRY	POPULATION (millions) mid-1987	GDP (US$:millions) Y1987	GDP per capita (US $) Y1987		COUNTRY	POPULATION (millions) mid-1987	GDP (US$:millions) Y1987	GDP per capita (US $) Y1987
1	ETHIOPIA	44.80	4,800	130	62	ECUADOR	9.90	10,600	1,040
2	BHUTAN	1.30	250	150	63	BOTSWANA	1.10	1,520	1,050
3	CHAD	5.30	980	150	64	TUNISIA	7.60	8,450	1,180
4	ZAIRE	32.60	5,770	150	65	TURKEY	52.60	60,820	1,210
5	BANGLADESH	106.10	17,600	160	66	COLOMBIA	29.50	31,940	1,240
6	MALAWI	7.90	1,110	160	67	CHILE	12.50	16,950	1,310
7	NEPAL	17.60	2,560	160	68	PERU	20.20	45,150	1,470
8	LAO P.D.R.	3.80	700	170	69	MAURITIUS	1.00	1,480	1,490
9	MOZAMBIQUE	14.60	1,490	170	70	JORDAN	3.80	4,270	1,560
10	TANZANIA	23.90	3,080	180	71	COSTA RICA	2.60	4,310	1,610
11	BURKINA FASO	8.30	1,650	190	72	SYRIAN ARAB REP.	11.20	23,990	1,640
12	MADAGASCAR	10.90	2,070	210	73	MALAYSIA	16.50	31,230	1,810
13	MALI	7.80	1,960	210	74	MEXICO	81.90	141,940	1,830
14	BURUNDI	5.00	1,150	250	75	SOUTH AFRICA	33.10	74,260	1,890
15	ZAMBIA	7.20	2,030	250		LOWER MIDDLE INCOME	582.30	667,950	1,188
16	NIGER	6.80	2,160	260	78	BRAZIL	141.40	299,230	2,020
17	UGANDA	15.70	3,560	260	79	URUGUAY	3.00	6,420	2,190
18	CHINA	1,068.50	293,380	290	80	HUNGARY	10.60	26,060	2,240
19	SOMALIA	5.70	1,890	290	81	PANAMA	2.30	5,490	2,240
20	TOGO	3.20	1,230	290	82	ARGENTINA	31.10	71,530	2,390
21	INDIA	797.50	220,830	300	83	YUGOSLAVIA	23.40	59,980	2,480
22	RWANDA	6.40	2,100	300	84	ALGERIA	23.10	64,600	2,680
23	SIERRA LEONE	3.80	900	300	85	KOREA, REP.	42.10	121,310	2,690
24	BENIN	4.30	1,570	310	86	GABON	1.10	3,500	2,700
25	CENTRAL AFRICAN REP.	2.70	1,010	330	87	PORTUGAL	10.20	34,290	2,830
26	KENYA	22.10	6,930	330	88	VENEZUELA	18.30	49,610	3,230
27	SUDAN	23.10	8,210	330	89	GREECE	10.00	40,900	4,020
28	PAKISTAN	102.50	31,650	350	90	TRINIDAD AND TOBAGO	1.20	4,260	4,210
29	HAITI	6.10	2,250	360	92	OMAN	1.30	8,150	5,810
30	LESOTHO	1.60	270	370		UPPER MIDDLE INCOME	319.10	795,310	2,492
31	NIGERIA	106.60	24,390	370		LOW AND MIDDLE INCOME	881.40	1,463,270	1,660
32	GHANA	13.60	5,080	390	96	SPAIN	38.80	287,970	6,010
33	SRI LANKA	16.40	6,040	400	97	IRELAND	3.60	21,910	6,120
34	YEMEN P.D.R.	2.90	840	420	98	SAUDI ARABIA	12.60	71,470	6,200
35	MAURITANIA	1.90	840	440	99	ISRAEL	4.40	35,000	6,800
36	INDONESIA	171.40	69,670	450	100	NEW ZEALAND	3.30	31,650	7,750
37	LIBERIA	2.30	990	450	101	SINGAPORE	2.60	19,900	7,940
	LOW INCOME ECONOMIES	2,861.60	732,990	273	102	HONG KONG	5.60	36,530	8,070
43	SENEGAL	7.00	4,720	520	103	ITALY	57.40	748,620	10,350
44	BOLIVIA	6.70	4,470	580	104	UNITED KINGDOM	56.90	675,740	10,420
45	ZIMBABWE	9.00	5,240	580	105	AUSTRALIA	16.20	183,260	11,100
46	PHILIPPINES	58.40	34,580	590	106	BELGIUM	9.90	142,300	11,480
47	YEMEN ARAB REP.	8.50	4,270	590	107	NETHERLAND	14.70	214,420	11,860
48	MOROCCO	23.30	16,750	610	108	AUSTRIA	7.60	117,660	11,980
49	EGYPT, ARAB REP.	50.10	34,470	680	109	FRANCE	55.60	873,370	12,790
50	PAPUA NEW GUINEA	3.70	3,030	700	110	GERMANY, FED.REP.	61.20	1,117,780	14,400
51	DOMINICAN REP.	6.70	4,910	730	111	FINLAND	4.90	77,900	14,470
52	COTE D'IVOIRE	11.10	7,650	740	113	DENMARK	5.10	65,480	14,930
53	HONDURAS	4.70	3,530	810	114	CANADA	25.90	373,590	16,180
54	NICARAGUA	3.50	3,200	830	115	SWEDEN	8.40	137,660	15,550
55	THAILAND	53.60	48,200	850	116	JAPAN	122.10	2,376,420	15,760
56	EL SALVADOR	4.90	4,750	860	117	UNITED ARAB EMIRATES	1.50	23,720	15,830
57	CONGO, PEOPLE'S REP.	2.00	2,150	870	118	NORWAY	4.20	63,080	17,190
58	JAMAICA	2.40	2,860	940	119	UNITED STATES	243.80	4,497,220	18,530
59	GUATEMALA	8.40	7,040	950	120	SWITZERLAND	6.50	170,860	21,330
60	CAMEROON	10.90	12,660	970		HIGH-INCOME ECONOMIES	772.80	12,303,850	15,921
61	PARAGUAY	3.90	4,570	1172					

Source: World Bank "World Development Report"

Table 8-1-2 Per Capita Income by Country Group

(US$, in 1987)

	GDP PER CAPITA
LOW INCOME ECONOMIES	273
LOWER MIDDLE INCOME	1,188
UPPER MIDDLE INCOME	2,492
HIGH-INCOME ECONOMIES	15,921
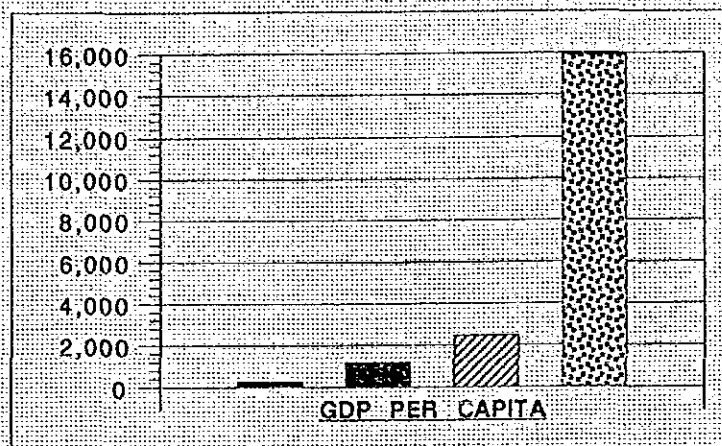
LOW INCOME ECONOMIES
LOWER MIDDLE INCOME
UPPER MIDDLE INCOME
HIGH-INCOME ECONOMIES

Table 8-1-3　CORRELATION BETWEEN G.D.P. AND V.A.M. BY COUNTRIES (US $ in 1987) FOR COUNTRIES WITH BIGGER POPULATION THAN 30 MILLION

COUNTRY	VAM PER CAPITA	GDP PER CAPITA
ETHIOPIA	12	130
BANGLADESH	12	160
CHINA	86	290
INDIA	48	300
PAKISTAN	49	350
NIGERIA	49	370
INDONESIA	62	450
PHILIPPINES	130	590
EGYPT, ARAB REP.	88	680
THAILAND	181	850
TURKEY	254	1,210
MEXICO	390	1,830
SOUTH AFRICA	371	1,890
BRAZIL	491	2,020
ARGENTINA	691	2,390
KOREA, REP.	698	2,690
SPAIN	1,155	6,010
ITALY	2,440	10,350
UNITED KINGDOM	2,075	10,420
FRANCE	2,888	12,790
GERMANY, FED.REP.	4,817	14,400
JAPAN	4,697	15,760
UNITED STATES	3,428	18,530

X axis : Value Added in Manufacturing (VAM)
Y axis : Gross Domestic Product (GDP)

Source: The World Bank, "World Development Report, 1989"

(3) Chronological Analysis of Industrialization of Turkish Economy

In this section, the chronological trends of the Turkish economy, mainly in the 1980s, are analyzed to get the basic knowledge for forecasting the possibility of industrial development of Turkey and particularly of Filyos district through the year 2010.

1) TRENDS OF MAJOR ECONOMIC VARIABLES

Table 7-1-4 shows such variables as Gross Domestic Product (GDP), Value Added in Manufacturing industry (VAM), Population (POP), GDP per capita (GDP/POP) and VAM per capita (VAM/POP) from 1978 to 1989 in Turkey. These data indicate the growth trend of the national economy. At first, the trend of each variable shall be independently analyzed for whole range of years in logarithmic features. The changing tendencies shall be presented in equations as follows.

Ln[GDP] = 0.0421 T + 5.6862

R: 0.9774

Ln[VAM] = 0.0589 T + 4.1676

R: 0.9573

Ln[POP] = 0.0243 T + 10.9477

R: 0.9997

Ln[GDP/POP] = 0.0177 T + 8.5540

R: 0.9003

Ln[VAM/POP] = 0.0345 T + 7.0354

R: 0.8947

The parameters of the independent variable "T" in equations mean the average annual growth rate of the dependent variable. That is 4.21%, 5.89%, 2.43%, 1.77% and 3.45% for GDP, VAM, POP, GDP/POP and VAM/POP, respectively.

2) TREND ANALYSIS FOR DATA SINCE 1980

If data in the 1980s alone are adopted, the parameters in assumed equations must be raised. Then, the same simple regressions as before

shall be made. The results are as follows:

Ln[GDP] = 0.0489 T + 5.7148
R: 0.9950
Ln[VAM] = 0.0724 T + 4.2245
R: 0.9944
Ln[POP] = 0.0248 T + 10.9496
R: 1.0000
Ln[GDP/POP] = 0.0241 T + 8.5806
R: 0.9798
Ln[VAM/POP] = 0.0477 T + 7.0903
R: 0.9871

Annual Average Growth Rate of Variables

	From 1978 To 1989	From 1980 To 1989
GDP	4.21%	4.89%
VAM	5.89%	7.24%
POP	2.43%	2.48%
GDP/POP	1.77%	2.41%
VAM/POP	3.45%	4.77%

The growth rate in this later analysis is greater than in the previous analysis, 4.89%, 7.24%, 2.48%, 2.41% and 4.77% for GDP, VAM, POP, GDP/POP, and VAM/POP, respectively. When these two assumptions of the growth rate are applied to coming years, values of variables are estimated as shown in Tables 8-1-5, 6, 7, 8, 9 and Figures 8-1-2, 3, 4, 5 and 6. These analyses will make it possible to assume two cases of major economic indicators in future, as presented in Table 8-1-10.

3) ANALYSIS OF THE CORRELATION BETWEEN G.D.P. AND V.A.M.

There are historical correlations between GDP and VAM as shown below:

$$Ln[GDP] = 0.6950 \; Ln[VAM] + 2.7822$$
$$R: 0.9930$$
$$Ln[VAM] = 1.4188 \; Ln[GDP] - 3.8947$$
$$R: 0.9930$$

Per capita values on GDP and VAM produce other correlation as follows:

$$Ln[GDP/POP] = 0.5036 \; Ln[VAM] + 5.0084$$
$$R: 0.9865$$
$$Ln[VAM/POP] = 1.9321 \; Ln[GDP] - 9.4937$$
$$R: 0.9865$$

The correlation equations above tell that the elasticity of the growth rate of VAM per capita against the growth rate of GDP per capita is 0.5036, considerably less than that of cross section analysis with various countries described in the previous section, 0.8444. It means that other sectors have contributed more to the GDP than the manufacturing sector in Turkey compared with the average of other countries. These results are shown on Table 8-1-11, 8-1-12 and 8-1-13.

Up till now performances of economic growth of Turkey have been quantitatively analyzed. Although these results provide some effective suggestions for the future, the economic development plan has to account for faster-than-ever growth. Thus the targeted figures in any development plan are usually set as growing at a more rapid rate than the observed rate.

Table 8-1-4 GDP, Value Added in Manufacturing (VAM) and Population in Turkey
(at 1968 constant prices)

YEAR	G.D.P.	V.A.M.	Population	Per capita GDP	Per capita VAM
Y1978	190.6	36.8	42,640	4,470	863
Y1979	189.5	34.9	43,530	4,353	802
Y1980	188.5	32.7	44,438	4,242	736
Y1981	195.3	35.7	45,540	4,289	784
Y1982	204.2	37.7	46,688	4,374	807
Y1983	212.2	40.9	47,864	4,433	855
Y1984	224.9	45.1	49,070	4,583	919
Y1985	234.3	47.6	50,306	4,657	946
Y1986	251.4	52.2	51,546	4,877	1,013
Y1987	267.7	57.3	52,845	5,066	1,084
Y1988	280.0	58.8	54,176	5,168	1,085
Y1989	282.6	60.8	55,541	5,088	1,095
	(billions of TL)	(billions of TL)	(thousad persons)	(TL/person)	(TL/person)

Sources: "Main Economic Indicators, November 1989", by DPT(SPO), and "Population Census", by SIS

Table 8-1-5   Trend Analysis of G.D.P.
(in billions of TL)

YEAR	OBSERVED	ESTIMATED(1)	ESTIMATED(2)
1978	190.6	177.86	168.68
1979	189.5	185.51	177.13
1980	188.5	193.49	186.01
1981	195.3	201.80	195.33
1982	204.2	210.48	205.12
1983	212.2	219.53	215.40
1984	224.9	228.97	226.20
1985	234.3	238.82	237.53
1986	251.4	249.09	249.44
1987	267.7	259.80	261.94
1988	280.0	270.97	275.06
1989	282.6	282.62	288.85
1990		294.77	303.32
1991		307.45	318.52
1992		320.67	334.49
1993		334.45	351.25
1994		348.84	368.85
1995		363.83	387.34
1996		379.48	406.75
1997		395.80	427.13
1998		412.82	448.54
1999		430.57	471.02
2000		449.08	494.63
2001		468.39	519.41
2002		488.53	545.44
2003		509.54	572.78
2004		531.45	601.48
2005		554.30	631.63
2006		578.13	663.28
2007		602.99	696.52
2008		628.92	731.43
2009		655.96	768.08
2010		684.17	806.58

Fig. 8-1-2   Trend Analysis of G.D.P.

— OBSERVED   ----- ESTIMATED(1)   — ESTIMATED(2)
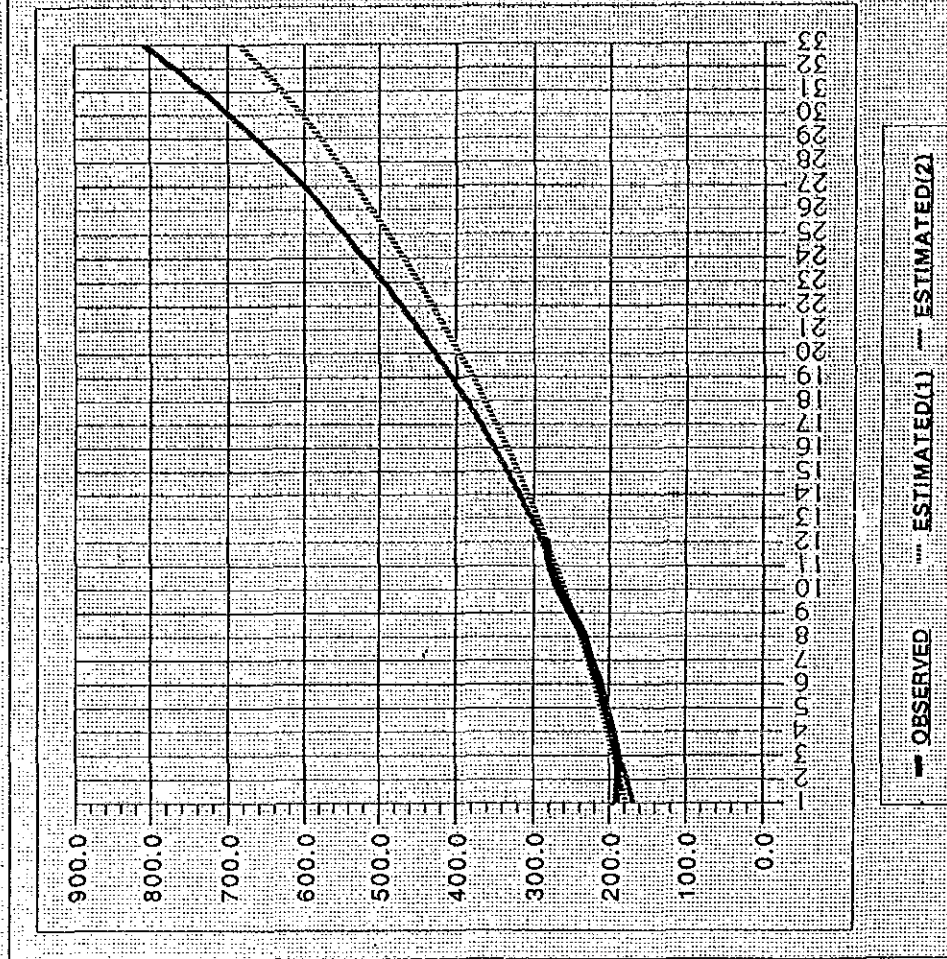
Table 8-1-6 Trend Analysis of V.A.M.

(in bilions of TL)

YEAR	OBSERVED	ESTIMATED(1)	ESTIMATED(2)
1978	36.8	31.84	28.67
1979	34.9	33.77	30.82
1980	32.7	35.82	33.13
1981	35.7	38.00	35.62
1982	37.7	40.30	38.29
1983	40.9	42.75	41.17
1984	45.1	45.34	44.26
1985	47.6	48.09	47.58
1986	52.2	51.01	51.16
1987	57.3	54.10	55.00
1988	58.8	57.39	59.13
1989	60.8	60.87	63.57
1990		64.56	68.34
1991		68.48	73.47
1992		72.63	78.99
1993		77.04	84.92
1994		81.71	91.30
1995		86.67	98.15
1996		91.93	105.52
1997		97.50	113.44
1998		103.42	121.96
1999		109.69	131.12
2000		116.35	140.96
2001		123.41	151.55
2002		130.90	162.93
2003		138.84	175.16
2004		147.26	188.31
2005		156.19	202.45
2006		165.67	217.65
2007		175.72	234.00
2008		186.38	251.56
2009		197.69	270.45
2010		209.68	290.76

Fig. 8-1-3 Trend Analysis of V.A.M.

(in bilions of TL)

OBSERVED ······ ESTIMATED(1) — ESTIMATED(2)
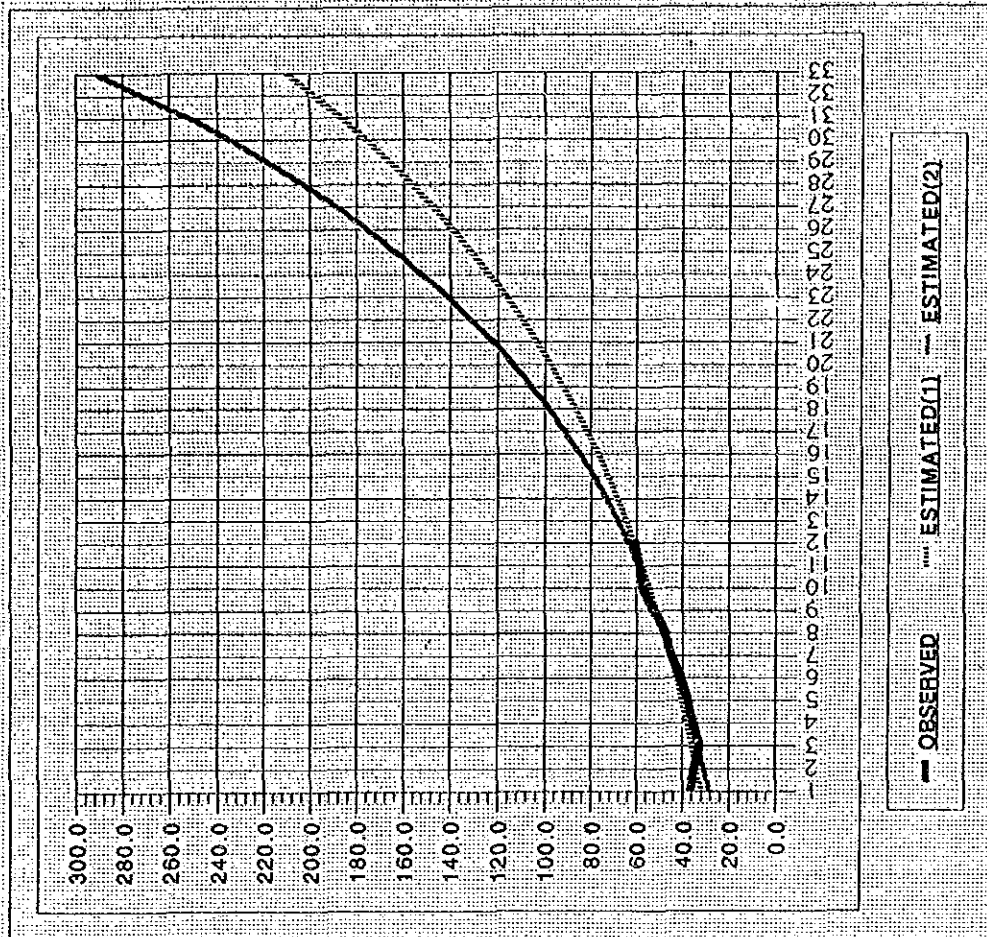
Table 8-1-7 Trend Analysis of Population
(in thousand persons)

YEAR	OBSERVED	ESTIMATED(1)	ESTIMATED(2)
1978	42,640	42,451	42,277
1979	43,530	43,495	43,339
1980	44,438	44,565	44,427
1981	45,540	45,661	45,542
1982	46,688	46,784	46,686
1983	47,864	47,935	47,858
1984	49,070	49,114	49,060
1985	50,306	50,322	50,292
1986	51,546	51,560	51,555
1987	52,845	52,828	52,849
1988	54,176	54,128	54,176
1989	55,541	55,459	55,537
1990		56,823	56,931
1991		58,221	58,361
1992		59,653	59,826
1993		61,120	61,329
1994		62,624	62,868
1995		64,164	64,447
1996		65,742	66,065
1997		67,360	67,724
1998		69,016	69,425
1999		70,714	71,168
2000		72,453	72,955
2001		74,236	74,787
2002		76,062	76,665
2003		77,933	78,590
2004		79,850	80,563
2005		81,814	82,586
2006		83,826	84,660
2007		85,888	86,786
2008		88,001	88,965
2009		90,165	91,199
2010		92,383	93,489

Fig. 8-1-4 Trend Analysis of Population
(in thousand persons)

— OBSERVED   --- ESTIMATED(1)   — ESTIMATED(2)
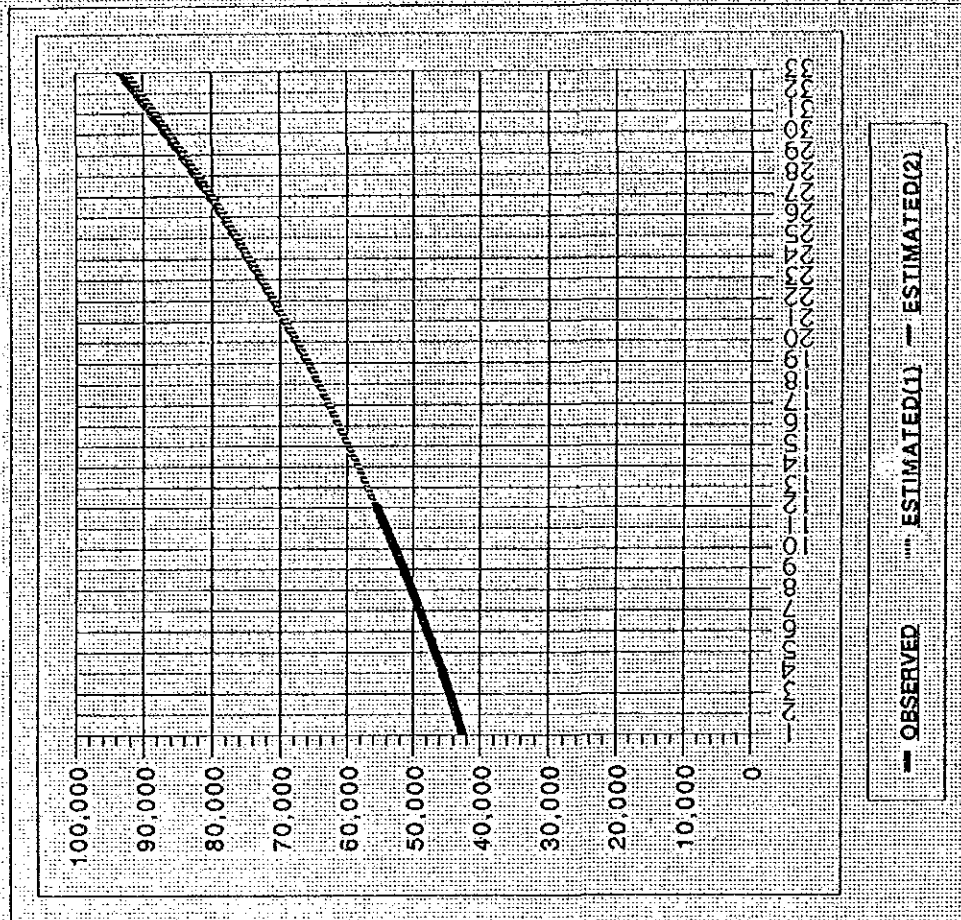
Table 8-1-8 Trend Analysis of Per Capita G.D.P.

YEAR	OBSERVED	ESTIMATED(1)	ESTIMATED(2)
1978	4,470	4,195	3,989
1979	4,353	4,270	4,087
1980	4,242	4,346	4,186
1981	4,289	4,424	4,289
1982	4,374	4,503	4,393
1983	4,433	4,583	4,500
1984	4,583	4,665	4,610
1985	4,657	4,748	4,723
1986	4,877	4,833	4,838
1987	5,066	4,919	4,956
1988	5,168	5,007	5,077
1989	5,088	5,096	5,200
1990		5,187	5,327
1991		5,280	5,457
1992		5,374	5,590
1993		5,470	5,727
1994		5,568	5,866
1995		5,667	6,010
1996		5,769	6,156
1997		5,872	6,306
1998		5,977	6,460
1999		6,083	6,618
2000		6,192	6,779
2001		6,302	6,944
2002		6,415	7,114
2003		6,530	7,287
2004		6,646	7,465
2005		6,765	7,647
2006		6,886	7,834
2007		7,009	8,025
2008		7,134	8,221
2009		7,261	8,421
2010		7,391	8,627

Fig. 8-1-5 Trend Analysis of Per Capita G.D.P.

OBSERVED   ESTIMATED(1)   ESTIMATED(2)
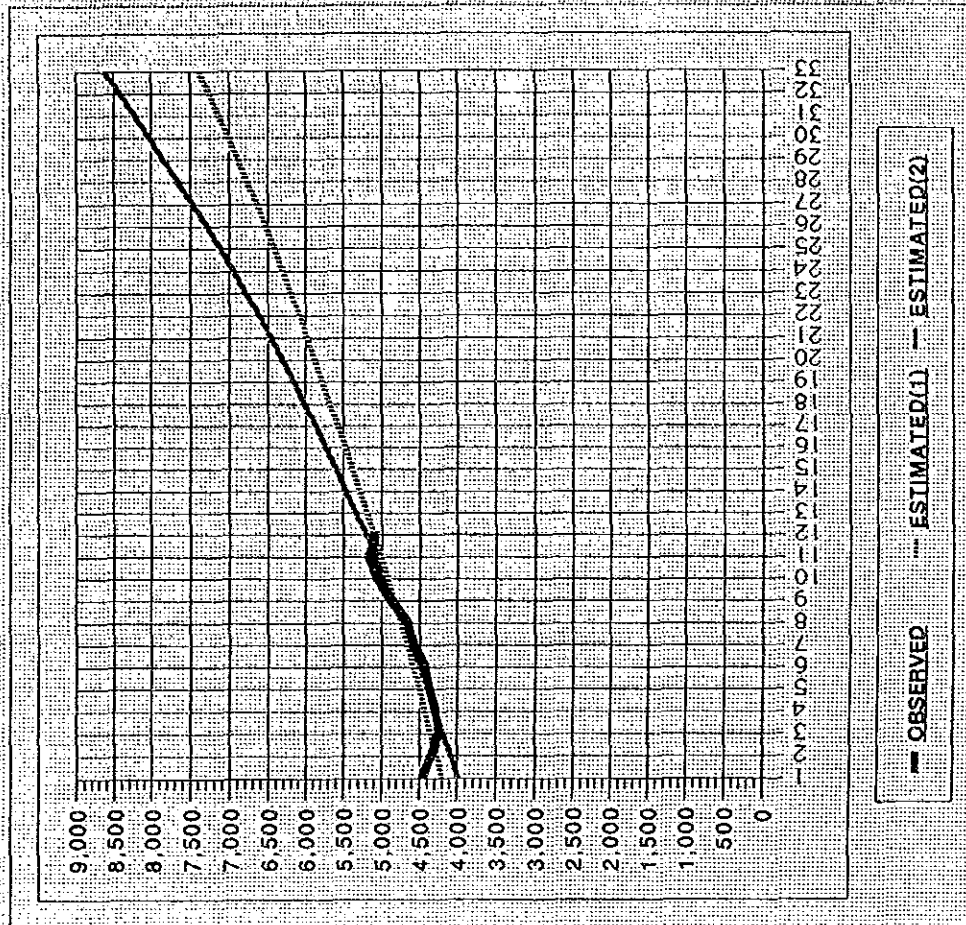
Table 8-1-9 Trend Analysis of Per Capita V.A.M

YEAR	OBSERVED	ESTIMATED(1)	ESTIMATED(2)
1978	863	751	677
1979	802	777	710
1980	736	805	745
1981	784	833	781
1982	807	862	820
1983	855	892	860
1984	919	924	902
1985	946	956	946
1986	1,013	990	992
1987	1,084	1,024	1,040
1988	1,085	1,060	1,091
1989	1,095	1,098	1,144
1990		1,136	1,200
1991		1,176	1,259
1992		1,217	1,320
1993		1,260	1,385
1994		1,304	1,453
1995		1,350	1,524
1996		1,397	1,598
1997		1,446	1,676
1998		1,497	1,758
1999		1,550	1,844
2000		1,604	1,934
2001		1,661	2,028
2002		1,719	2,127
2003		1,779	2,231
2004		1,842	2,340
2005		1,906	2,455
2006		1,973	2,575
2007		2,042	2,701
2008		2,114	2,832
2009		2,188	2,971
2010		2,265	3,116

Fig. 8-1-6 Trend Analysis of Per Capita V.A.M.

── OBSERVED   ···· ESTIMATED(1)   ── ESTIMATED(2)

Table 8-1-10 Preliminary Estimations of Variables
by Independent Simple Regression (at constant prices in 1968)

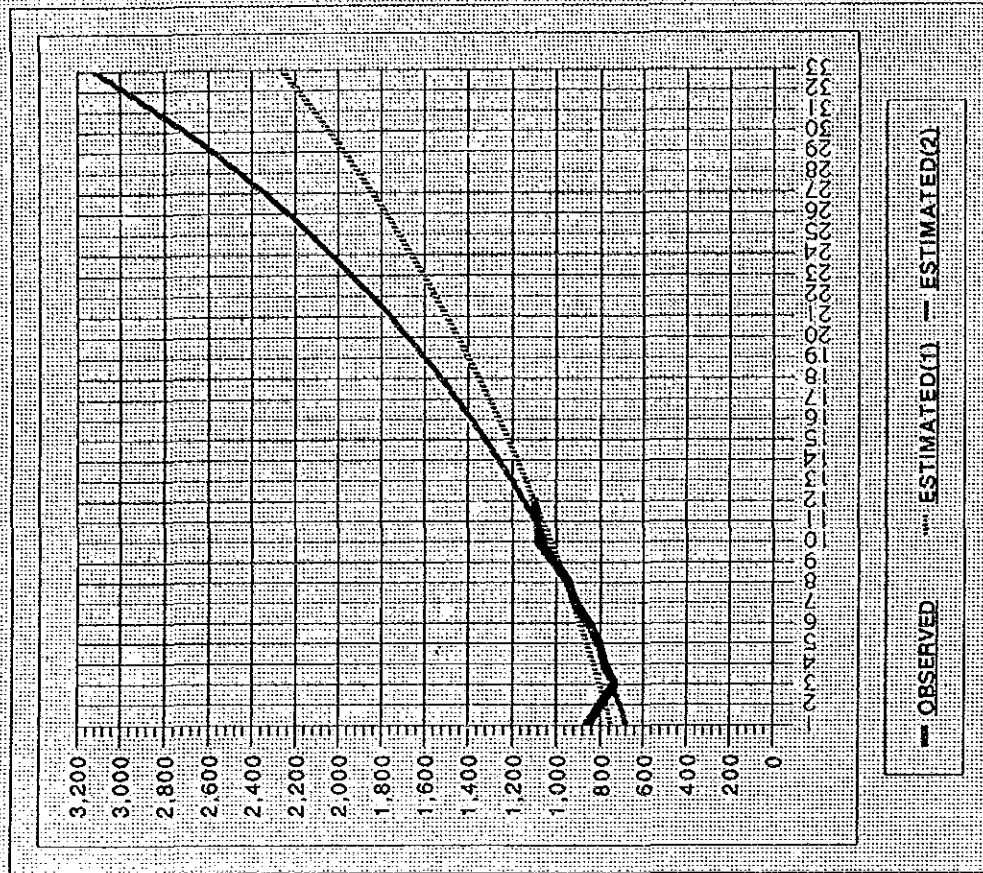|	GDP		VAM		INDEPENDENT ESTIMATION GDP/POP		VAM/POP		POPULATION		DEPENDENT ESTIMATION GDP/POP		VAM/POP	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Y1988(OBS)	280	280	59	59	5,168	5,168	1,085	1,085	54,176	54,176	5,168	5,168	1,089	1,089
Y1988(EST)	271	275	57	59	5,007	5,077	1,060	1,091	54,128	54,176	5,007	5,076	1,053	1,089
Y1990	295	303	65	68	5,187	5,327	1,136	1,200	56,823	56,931	5,192	5,322	1,144	1,194
Y1995	364	387	87	98	5,667	6,010	1,350	1,524	64,164	64,447	5,673	6,005	1,356	1,521
Y2000	449	495	116	141	6,192	6,779	1,604	1,934	72,453	72,955	6,197	6,785	1,601	1,933
Y2005	554	632	156	202	6,765	7,647	1,906	2,455	81,814	82,586	8,771	7,653	1,907	2,446
Y2010	684	807	210	291	7,391	8,627	2,265	3,116	92,383	93,489	7,404	8,632	2,273	3,113
	(in billion of TL.)				(in TL)		(in TL)		(in thousand)		(in TL)		(in TL)	

Price Exchange Factor in 1988

	AT 1968 PRICES	AT CURRENT PRICES	INFLATOR
G.D.P.	280.0	91547.2	326.95
V.A.M.	58.8	23960.8	407.50

Estimated Values at 1988 Prices

	GDP		VAM		INDEPENDENT ESTIMATION GDP/POP		VAM/POP		POPULATION		DEPENDENT ESTIMATION GDP/POP		VAM/POP	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Y1988(EST)	88,603	89,911	23,226	24,043	1,637,039	1,659,925	431,950	444,583	54,128	54,176	1,636,925	1,659,614	429,122	443,785
Y1990	96,450	99,066	26,488	27,710	1,695,890	1,741,663	462,920	489,000	56,323	56,931	1,697,380	1,740,104	466,140	486,730
Y1995	119,010	126,530	35,453	39,935	1,852,826	1,964,970	550,125	621,030	64,164	64,447	1,854,775	1,963,313	552,529	619,656
Y2000	146,801	161,840	47,270	57,458	2,024,474	2,216,394	653,630	788,105	72,453	72,955	2,026,149	2,218,357	652,423	787,575
Y2005	181,130	206,632	63,570	82,315	2,211,817	2,500,187	778,695	1,000,413	81,814	82,586	2,213,928	2,502,027	777,006	996,719
Y2010	223,634	263,849	85,575	118,583	2,416,497	2,820,598	922,988	1,269,770	92,383	93,489	2,420,725	2,822,243	926,307	1,268,411
	(in billion of TL)				(in TL)		(in TL)		(in thousand)		(in TL)		(in TL)	

Table 8-1-11   Analysis of Correlation Between G.D.P. and V.A.M.

(both in per capita)

YEAR	OBSERVED VALUE				ESTIMATED VALUE			
	GDP	VAM	Ln [GDP]	Ln [VAM]	Ln [EST (GDP)]	Ln [EST (VAM)]	EST (GDP)	EST (VAM)
Y1978	4,470	863	8.41	6.76	8.41	6.75	4,505	851
Y1979	4,353	802	8.38	6.69	8.38	6.69	4,341	808
Y1980	4,242	736	8.35	6.60	8.33	6.64	4,158	769
Y1981	4,289	784	8.36	6.66	8.36	6.67	4,292	785
Y1982	4,374	807	8.38	6.69	8.38	6.70	4,357	816
Y1983	4,433	855	8.40	6.75	8.41	6.73	4,483	837
Y1984	4,583	919	8.43	6.82	8.44	6.79	4,650	893
Y1985	4,657	946	8.45	6.85	8.46	6.83	4,719	921
Y1986	4,877	1,013	8.49	6.92	8.49	6.91	4,883	1,007
Y1987	5,066	1,084	8.53	6.99	8.53	6.99	5,054	1,083
Y1988	5,168	1,085	8.55	6.99	8.53	7.03	5,056	1,126
Y1989	5,088	1,095	8.53	7.00	8.53	7.00	5,078	1,092

Table 8-1-12 Observed and Estimated G.D.P.

	OBSERVED	ESTIMATED
Y1978	4,470	4,505
Y1979	4,353	4,341
Y1980	4,242	4,158
Y1981	4,289	4,292
Y1982	4,374	4,357
Y1983	4,433	4,483
Y1984	4,583	4,650
Y1985	4,657	4,719
Y1986	4,877	4,883
Y1987	5,066	5,054
Y1988	5,168	5,056
Y1989	5,088	5,078

— OBSERVED ---- ESTIMATED

Table 8-1-13 Observed and Estimated V.A.M.

	OBSERVED	ESTIMATED
Y1978	863	851
Y1979	802	808
Y1980	736	769
Y1981	784	785
Y1982	807	816
Y1983	855	837
Y1984	919	893
Y1985	946	921
Y1986	1,013	1,007
Y1987	1,084	1,083
Y1988	1,085	1,126
Y1989	1,095	1,092

— OBSERVED ---- ESTIMATED

(4) Target of National Development Plan and Industrial Development Strategy in the Plan

The Sixth National Development Plan started in 1990 and covers 5 years through 1994. According to targeted economic values, the industrial sector is expected to lead the development of the national economy. That is, the average growth rate of the industrial sector assumed as 8.1% during the plan period, while the annual growth rate of GDP is planned as 6.8% as shown on Table 8-1-14. GDP and Manufacturing Value Added are planned to grow at higher rates than ever. The planned growth rate can be compared with growth rates obtained by trend and correlation analysis. The growth rate of Manufacturing Value Added differs remarkably from the methods of estimation.

```
Annual Average Growth Rate of GDP:
        by Trend from 1978 to 1989          4.21% (TREND 1)
        by Trend from 1980 to 1989          4.89% (TREND 2)
        by 6th Development Plan             6.81% (6TH PLAN)
        by Correlation with Growth Rate of Manufacturing
            Value Added in 6th Plan         5.77% (CORRELT)


Annual Average Growth Rate of Manufacturing Value Added:
        by Trend from 1978 to 1989          5.89% (TREND 1)
        by Trend from 1980 to 1989          7.24% (TREND 2)
        by 6th Development Plan             8.30% (6TH PLAN)
        by Correlation with Growth Rate
                of GDP in 6th Plan          9.66% (CORRELT)
```

If the targeted value by the 6th plan is adopted until 1994 and several rates above were to be applied after 1994, GDP and VAM can be estimated as shown on Table 8-1-15 and Table 8-1-16.

The industrial sector contains three sub-sectors; Mining, Manufacturing and Energy. The structure of these sub-sectors is shown in Table 8-1-17. The relatively higher growth of the Energy Sub-sector and Manufacturing Sub-sector are emphasized by 11.2% and 8.3% per annum, respectively. This means that the government intends to enter a new stage of industrialization, as stated in the 6th Plan as below.

(Section 17) In the manufacturing industry, the development of an outward-oriented and competitive structure and the continuity and diversification of exports shall be emphasized, and necessary structural transformation and the raising the efficiency of present facilities as well as new investments of optimal scale shall be encouraged.

(Section 336) The increasing of production and export in a structure that can compete is essential in the manufacturing industry.

(Section 337) In the plan period, the increasing role of the private sector in industrialization, realization of continuity and diversity of exports, determination of industrial policies by taking the changing structures of production and marketing into consideration and realization of new investments by directing them in this context have been allowed for.

(Section 338) The Manufacturing industry shall be one of the main sectors realizing the development targeted in the industry.

(Section 339) In the Plan period, production has been targeted to grow by 8.3% per year on average. The highest rate of growth within subsections shall be realized in the investment goods sub sector. The share of investment goods in the total production of the manufacturing industry, which was 16.4% in 1989, shall increase to 18.7% at the end of the Plan period, and the share of intermediary goods shall fall from 45.1% to 43.6%. The share of consumption goods, on the other hand, shall stay at the same level.

(Section 340) In the Plan period, the sectors producing investment goods and of the intermediary goods sectors the leather and fur processing, tyre, plastic, chemical, glass, iron-steel and, non-iron metals, of the consumer goods producers the textile-clothing and shoe shall be the sectors having production increases above the average.

(Section 341) The share of the production of the manufacturing industry in the total production has been targeted to increase to 44.6%, its share in total investments shall reach 20.0%, and of exports to 90.5%. The electricity consumed in industry is expected to show an annual growth rate of 11.6 % on average. Per capita steel consumption, which is a basic indicator of industrial development, shall rise to 175 kg/year in 1994 and per capita consumption of cement shall increase to 594 kg/year.

(Section 342) Total exports of the manufacturing industry during the Plan period shall increase to 18.5 billion U.S. dollars from 11.7 billion U.S. dollars by an average annual increase of 11.7%. Export of consumer goods shall increase by 12.2%, and export of

investment goods shall increase by 18.5%, while the growth of exports by the sectors producing intermediary goods shall be below the average for the manufacturing industry at 8.8%. In exports, the foodstuff, textile-clothing and iron-steel sectors shall preserve their continuity. The share of these sectors of total exports shall increase from 56.5% in 1989 to 57.3% in 1994. The share of the sectors producing investment goods of total exports shall rise from 8.3% to 11.5% during the Plan period.

(Section 343) As a result of these planned developments in export, the share of export in production shall reach 14.2% in the sectors producing investment goods, to 15.1% in the sectors producing intermediary goods, to 30.8% in the sectors producing consumer goods and to 20.9% in the aggregate manufacturing industry.

(Section 344) Imports by the manufacturing industry shall reach 18.6 billion U.S. dollars in 1994 by increasing at an annual average rate of 10.2% during the Plan period. The share of the manufacturing industry of total imports, which was 75.6% in 1989, shall reach 79.2% in 1994, while the share of sectors producing investment goods shall inverse from 32.9% to 34.8%. The continuation of the liberalization policy in imports shall enable the manufacturing industry to attain a more competitive structure.

(Section 345) The rate of exports meeting the imports shall reach 99.4% in total manufacturing industry. This rate shall be 28.9% in investment goods. and 62.8% in intermediary goods. In consumer goods, on the other hand, exports shall reach 9 times imports.

(Section 346) The sectors producing consumer goods together with the tyre, ceramic, glass and agricultural machinery sectors shall go on yielding an excess foreign trade balance during the Plan period.

(Section 347) In the Plan period, the large-scale enterprises engaged in the manufacturing industry are expected to develop in a way to adapt to international markets by realizing necessary physical and technological investments as well as other structural adaptations, while the small and medium-scale enterprises are targeted to specialize by carrying on their modernization and institutionalization and to attain a structure which enables them to integrate into large-scale industry.

(Section 348) In order to realize the determined targets in the manufacturing industry the undertaking of the modernization investments able to increase the productivity and the creation of new capacities shall be made attractive. The foodstuff, textile-

clothing and iron-steel industries, which comprise an important part of exports, have been targeted to have the highest share in investment during the plan period and to receive a total share of 35.5% in manufacturing industry investments shall increase and reach 84.9%.

(Section 349) In the Plan period, industrialization shall be an essential factor of development.

(Section 350) In the manufacturing industry, the development of a structure which is outward looking and has the power of competition, and the realization of the continuity and diversity of exports shall be regarded as essential; the realization of necessary structural transformation in the existing establishments, improvement of productivity and the execution of new investments at optimal scales shall be encouraged.

(Section 351) New investments shall be made attractive by taking into consideration the principle of competitiveness; in this context, the matters such as the creation of high value added, to have the power of competition in external markets, conformity with the economy of scale, use of modern technology, to be in conformity with the changing and developing world the structure of production and market shall be taken into consideration.

(Section 352) The private sector shall continue to play an effective role in industrialization.

(Section 353) In order to increase the power of competition of the sector, the procurement of the inputs at world prices shall be made possible, especially the rates of fund and custom duty in import inputs shall be reviewed.

(Section 354) In small and medium-scale industry, the improvement of the level of technology, the increasing of the productivity and the realization of integration with large industry shall be encouraged.

(Section 355) The manufacturing industry shall be protected against unjust external competition arisen in the dorms of dumping prices, low-quality products and special marketing methods.

(Section 356) The development of qualified manpower required for industry shall be given importance and, the use of quality control techniques and the extension of conformity with standards shall be taken as essential matters.

(Section 357) In the manufacturing industry, the balance between the power of competition and the protection of the environment shall be given importance, the necessary support shall be provided for the industrial establishments to conform with environmental policy.

Development targets and policy implications for each sub-sector of manufacturing industries shall be cited in a later section of this report.

After examining the performances of major economic indicators and analyzing the relation between GDP and VAM, the study team will have an assumed framework of Turkish economy in the future, in the year 2000 and in 2010. The industrial development plan in the Filyos Port area shall be investigated hereinafter in line with this framework which has been presented in the previous chapter. They shall be summarized as below:

	G.D.P.	VALUE ADDED IN INDUSTRY SECTOR	POPULATION
1989	104.546	38,379	55,225
1994	145,317	56,612	61,825
2000	203,812	83,605	69,741
2010	358,168	160,135	82,364
	(in billions of TL)	(in billions of TL)	(thousands of persons)

Note: Figures in 1989 and 1994 are from 6th Development Plan, and in 2000 and 2010 are estimated by the study team.

Table 8-1-14 Economic Target in 6th National Development Plan

(in 1988 prices, billions TL)

	Y1989		Y1994		Annual Average
	Value Added	Share	Value	Share	Growth Rate
I. Agriculture	16,469.5	15.75%	20,134.2	13.86%	4.10%
II. Industry	38,378.9	36.71%	56,612.2	38.96%	8.08%
III. Services	49,697.2	47.54%	68,570.6	47.19%	6.65%
GDP	104,545.6	100.00%	145,317.0	100.00%	6.81%
GNP	103,692.0		145,547.2		7.02%

Source: 6 th National Development Plan

Table 8-1-15 Alternate Development Targets

(1) GDP (in billions TL at 1988 prices)

	6TH PLAN	TREND 1	TREND 2	CORRELT
Y1989	104,545.6	104,545.6	104,545.6	104,545.6
Y1994	145,317.0	145,317.0	145,317.0	145,317.0
Y1995	155,213.1	151,434.8	152,423.0	153,701.8
Y2000	215,768.4	186,111.3	193,517.8	203,465.8
Y2005	299,949.0	228,728.2	245,692.2	269,341.9
Y2010	416,972.2	281,103.8	311,933.3	356,546.8

— 6TH PLAN   — TREND 1   ---- TREND 2   — CORRELT

Y1989 Y1994 Y1995 Y2000 Y2005 Y2010
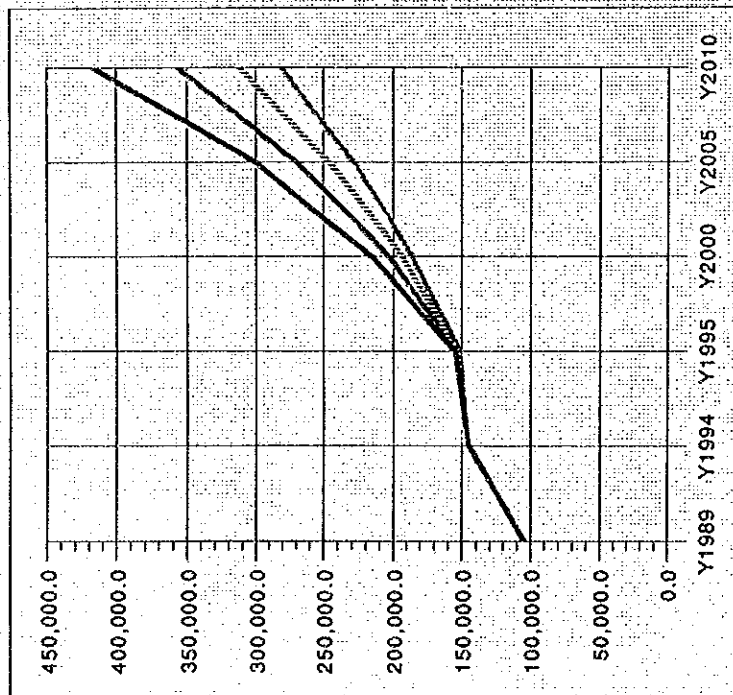
Table 8-1-16 Alternate Development Targets

(1) VAM (in billions TL at 1988 prices)

	6TH PLAN	TREND 1	TREND 2	CORRELT
Y1989	30,703.1	30,703.1	30,703.1	30,703.1
Y1994	45,289.8	45,289.8	45,289.8	45,289.8
Y1995	49,048.8	47,957.3	48,568.7	49,664.8
Y2000	73,075.3	63,845.4	68,887.6	78,757.1
Y2005	108,871.2	84,997.2	97,706.8	124,890.9
Y2010	162,201.7	113,156.4	138,582.7	198,048.6

— 6TH PLAN   — TREND 1   ---- TREND 2   — CORRELT

Y1989 Y1994 Y1995 Y2000 Y2005 Y2010
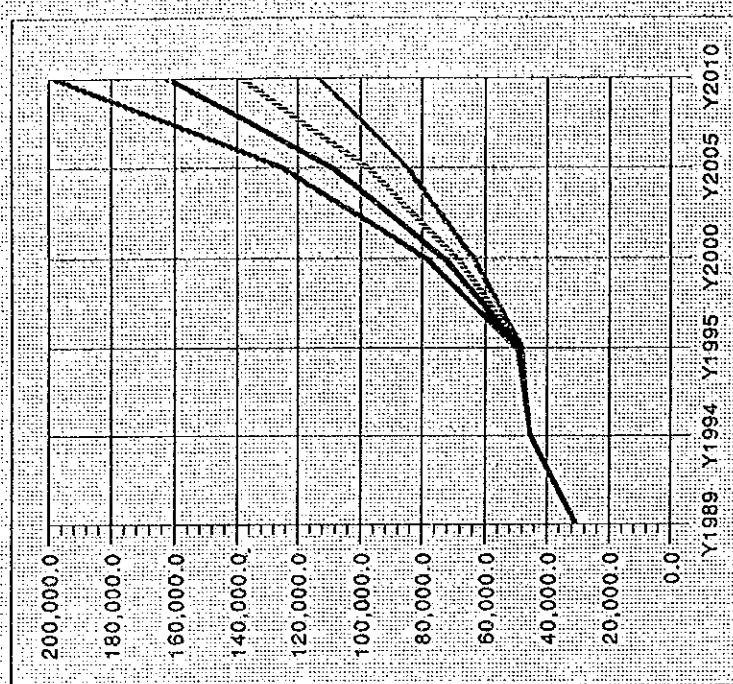
Table 8-1-17 Structure of Industry Sector in Output Value

(in 1988 prices, billions TL)

	Y1989		Y1994		Annual Average
	Output Value	Share	Output Value	Share	Growth Rate
1.Mining	3,653.7	3.94%	4,951.1	3.57%	6.27%
2.Manufacturing	84,416.1	91.07%	125,741.7	90.74%	8.30%
3.Energy	4,627.3	4.99%	7,883.3	5.69%	11.24%
INDUSTRY	92,697.1	100.00%	138,576.1	100.00%	8.37%

Source: 6 th National Development Plan

8-1-2 Industrial Structure of Turkey

(1) Contribution of Value Added in Manufacturing Sector to G.D.P.

     In 1988 the domestic output of the manufacturing sector was TL
23,960.8 billions at current prices, which is equivalent to 26.3% of G.D.P.
This percentage has been continuously increased. The contribution of the
increase of manufacturing value added to the increase of G.D.P. was 26.2%
in the decade after 1978. (sea TABLE 7-1-18 and 7-1-19), while the 6th
Five Year Development Plan proposes that the increase of value added in the
industry sector, which involve the manufacturing sub-sector, should occupy
44.7% of the increase of G.D.P. as a whole, it suggests that the industrial
sector has to play the major role in the economic development of Turkey
during the Plan period.

(2) Growth Rate of the Manufacturing Industry

     Although the value added in the manufacturing sector declined in 1979
and 1980 because of the second oil crisis, it later grew at a relatively
higher rate until 1987 in constant 1968 prices. However, the growth of it
has been sowing down in 1988 and 1989. It was probably affected by the
enormous inflation from which the Turkish economy has suffered very much
(FIGURE 8-1-7). The 6th Five Year Development Plan proposed a high
industrial output growth at 8.3% annually, while the average growth rate of
GDP is assumed as 7.3%. This indicates the importance of the industrial
sector, particularly the manufacturing sector, in the development of the
national economy.

(3) Structure of the Manufacturing Sub-sector

     According to the census of industry and business in 1985, the sub-
sector of Fabricated metal, machinery and equipment occupies the largest
share in terms of number of establishments, 24.00% of manufacturing
establishments, followed by the Textile, wearing apparel and leather
products sector and the Food, beverage and tobacco sector, at 23.95% and
21.39%, respectively. But, in terms of number of persons engaged, the
Textile, wearing apparel and leather sector had the largest share of

manufacturing industry, followed by the Fabricated metal, machine and equipment sector and the Food, beverage and tobacco sector. In the term of value of output, Chemicals, petroleum, coal, rubber and plastics sector was the largest sub-sector with 30.24% of manufacturing output, followed by Food, beverages and tobacco sector and Fabricated metal, machine and equipment sector with 18.73% and 16.63%, respectively. It should be noted that the share of minor sub-sectors has been gradually rising. This means the industrial structure is diversifying (see TABLE 8-1-20).

The manufacturing industry can be classified by the type of its products, like Consumer Goods, Intermediate Goods and Capital Goods. In this classification, the share of the Intermediate Goods group has increased from 1984 to 1988 as shown on TABLE 8-1-20. It has 44.7% of manufacturing production in 1988 while it was 41.3% in 1984. In the 6th Five Year Plan the encouragement of the "Capital Goods" group is expressed. In particular, such sub-sectors as Shipbuilding, Instruments for professional and scientific measurement, Non-electric machinery, Agricultural machinery, Road vehicles, and Electronics have been given relatively high growth rates. This is the most remarkable characteristic of the Plan. And another remarkable point is the stressing of the promotion of export-oriented sub sectors like as Clothes and leather wear even in the Consumer Goods group.

(4) Spatial Structure of Manufacturing Industries

Besides the information and data for the spatial distribution of large scale industries, the census data in 1985 shows the spatial distribution by provinces for the small scale industries as shown on TABLE 8-1-22. When the value added of each province is divided by population, spatial differences on the industrial development stage between regions can be measured. The score of economic development and industrialization could be defined as below:

$$Ln[EST/GRDP] = 0.3722\ Ln\tfrac{1}{2}VAM] + 0.8852\ Ln[POP] - 2.6837$$

VAM......Value Added in Manufacturing Industry

POP......Population

EST/GRDP......Estimated Regional Domestic Product

Parameters are estimated by the National Account

SCORE = ([EST/GRDP] - AVERAGE)/[STD]

EST/GRDP......Estimated Regional Domestic Product

AVERAGE......National average of [VAM/POP]

STD......Standard Deviation of Variables

The score is standardized to compare the differences. A "0" score means the level of economic development and industrialization are as almost same as the national average. It is estimated that there are 9 provinces with larger share of value added than 2 percent of national total, and that the development score of these 9 provinces are also beyond the national average of per capita GDP. By using these development score, five groups of provinces could be classified in accordance with the development levels or stages.

Group"A"   Highest Industrialized Provinces (2 Provinces)
Group"B"   Higher Industrialized Provinces (3 Provinces)
Group"C"   Middle Industrialized Provinces (11 Provinces)
Group"D"   Lower Industrialized Provinces (16 Provinces)
Group"E"   Lowest Industrialized Provinces (35 Provinces)

Zonguldak, Bolu belong to "D" Group and Kastamonu and Cankiri belong to "E" Group. The development of a new port and improvement of infrastructure will bring an opportunity to encourage industrial investment and to strengthen the economic base of the region. By utilizing effectively this opportunity, the economic development level of the region must be realized.

Table 8-1-18　Growth and Composition of G.D.P at 1969 Prices

	Y1978	Y1979	Y1980	Y1981	Y1982	Y1983	Y1984	Y1985	Y1986	Y1987	Y1988	Y1989
G.D.P. (IN BILLIONS OF TL)												
INDUSTRY	46.0	43.4	40.8	43.9	46.0	49.7	54.7	58.1	63.2	69.2	71.9	74.2
MANUFACTURING	36.8	34.9	32.7	35.7	37.7	40.9	45.1	47.6	52.2	57.3	58.8	60.8
GDP AT FACTOR COST	190.6	189.5	188.5	195.3	204.2	212.1	224.9	234.3	251.4	267.7	280.0	282.6
GROWTH RATE OF OUTPUT(%)												
INDUSTRY	6.6	-5.6	-6.0	7.4	4.9	8.0	10.1	6.3	8.7	9.6	3.8	3.3
MANUFACTURING	3.6	-5.3	-6.4	9.5	5.4	8.7	10.2	5.5	9.6	9.9	2.6	3.4
GDP AT FACTOR COST	4.3	-0.6	-0.5	3.6	4.5	3.9	6.0	4.2	7.3	6.5	4.6	0.9
COMPOSITION OF G.D.P. (%)												
INDUSTRY	24.10%	22.90%	21.60%	22.50%	22.50%	23.40%	24.30%	24.80%	25.10%	25.80%	25.70%	26.30%
MANUFACTURING	19.30%	18.40%	17.30%	18.30%	18.50%	19.30%	20.10%	20.30%	20.80%	21.40%	21.00%	21.50%

Source; Turkey, Main Economic Indicators, November, 1989, by SPO(DPT)

Table 8-1-19　G.D.P. by Sectors at Current Prices in Billions of TL

	Y1978		Y1979		Y1980		Y1981		Y1982		Y1983		Y1984		Y1985		Y1986		Y1987		Y1988		Y1989	
AGRICULTURE	301.3	25.30%	465.8	23.10%	925.0	22.60%	1,325.4	22.00%	1,678.9	20.80%	2,118.1	19.60%	3,397.1	19.60%	4,790.3	18.80%	6,585.8	18.50%	9,532.3	18.00%	15,822.9	17.30%	26,247.5	16.80%
INDUSTRY	273.4	23.00%	479.3	23.80%	1,024.2	25.00%	1,572.3	26.10%	2,101.5	26.10%	3,096.4	27.10%	5,110.1	29.50%	8,059.5	31.60%	11,352.8	31.90%	16,847.5	31.80%	29,819.8	32.80%	50,770.2	32.50%
MINING	19.8	1.70%	31.0	1.50%	74.8	1.80%	134.5	2.20%	170.9	2.10%	253.4	2.30%	388.1	2.30%	650.4	2.50%	756.0	2.10%	1,060.0	2.00%	1,834.4	2.00%	3,118.5	2.00%
MANUFACTURING	232.1	19.50%	416.7	20.70%	865.1	21.10%	1,309.6	21.10%	1,812.8	21.70%	2,592.8	22.40%	4,208.3	23.90%	6,408.4	25.10%	8,997.8	25.30%	13,597.0	25.70%	23,960.8	26.20%	41,081.0	26.30%
ENERGY	21.5	1.80%	32.2	1.60%	84.3	2.10%	128.2	2.10%	207.9	2.60%	250.1	2.40%	515.8	3.00%	1,001.5	3.90%	1,598.9	4.50%	2,192.5	4.10%	4,024.7	4.40%	6,570.7	4.20%
SERVICES	615.4	51.70%	1,069.6	53.10%	2,148.7	52.40%	3,126.3	52.40%	4,210.4	51.90%	5,603.0	38.70%	8,841.9	32.30%	12,655.4	34.80%	17,809.2	34.60%	26,545.1	49.60%	45,904.5	50.20%	79,379.1	50.10%
CONSTRUCTION	64.0	5.40%	103.9	5.20%	213.0	5.20%	285.4	4.70%	357.1	4.40%	447.0	4.40%	697.4	4.10%	951.2	3.70%	1,410.5	4.00%	2,152.0	4.10%	3,563.0	3.90%	6,146.3	3.90%
TRADE	165.0	13.80%	331.8	15.00%	650.8	15.00%	1,011.5	15.90%	1,370.1	16.80%	1,905.6	17.00%	3,139.9	18.10%	4,377.0	17.20%	8,093.1	17.10%	9,320.2	17.60%	16,089.2	17.60%	27,383.7	17.50%
TRANSPORTATION & COMMUNICATION	110.1	9.30%	199.6	9.90%	421.1	9.90%	623.6	10.30%	841.9	10.40%	1,136.3	10.40%	1,785.4	10.30%	2,711.2	10.60%	3,662.3	10.30%	5,325.4	10.10%	9,291.6	10.10%	16,037.0	10.30%
PUBLIC SERVICES	133.1	11.20%	235.2	11.70%	377.6	9.20%	481.1	8.00%	688.6	8.50%	860.9	8.00%	1,056.5	6.10%	1,441.0	5.60%	2,073.3	5.80%	3,219.0	6.10%	5,326.5	5.80%	9,659.1	6.20%
OTHER SERVICES	142.3	12.00%	229.1	11.40%	486.2	11.90%	724.5	12.00%	954.8	11.80%	1,251.5	11.80%	2,162.8	12.50%	3,175.0	12.40%	4,449.9	12.50%	6,528.5	12.30%	11,034.1	12.30%	20,153.1	12.70%
GDP AT FACTOR COST	1,190.1	100.00%	2,015.3	100.00%	4,098.0	100.00%	6,024.0	100.00%	8,080.6	100.00%	10,817.4	100.00%	17,349.1	100.00%	25,526.1	100.00%	35,527.8	100.00%	52,924.9	100.00%	91,547.2	100.00%	156,398.8	100.00%

Source: Turkey, Main Economic Indicators, November, 1989, by SPO(DPT)
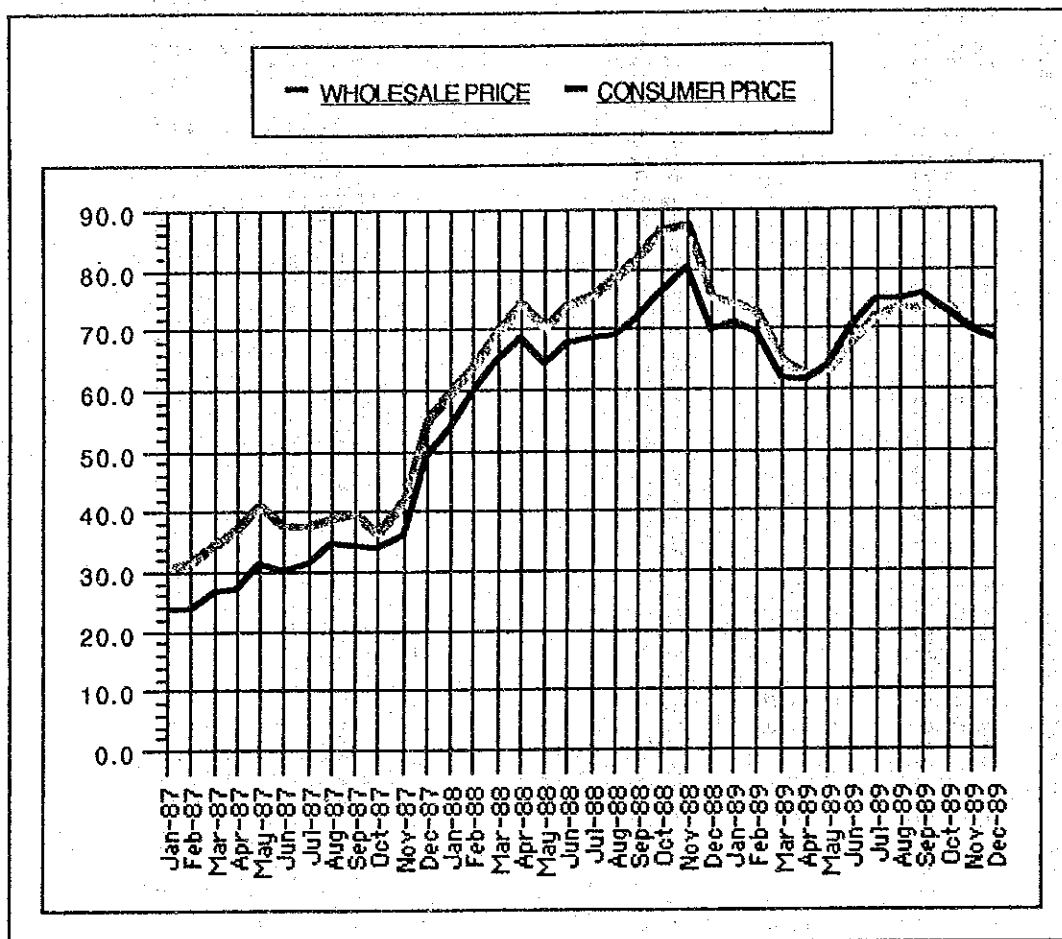
Fig. 8-1-7 Inflation of Turkey
Annual inflation rate (%)

One of the most serious problems which Turkey is now facing is continuing inflation. It began at the end of 1987 and climbed up to 80.2% in November 1988 as compared to the same month in 1987. Although having calmed down in the first half of 1989, it rose in the latter half. However, it came down again after August 1989 because of government efforts to overcome inflation, as shown above. The economic development of Turkey is heavily dependent on whether the government will win or not in the fight against inflation.

Table 8-1-20 Structure of Large Scale*

Manufacturing Industry in Turkey by Major Sub-sectors

Number of Establishment

	1980	1985 10~24	1985 25~	1985 TOTAL
31	1,851 / 21.25%	1,350	927	2,277 / 21.39%
32	1,688 / 19.38%	1,414	1,136	2,550 / 23.95%
33	352 / 4.04%	327	170	497 / 4.67%
34	367 / 4.21%	262	192	454 / 4.26%
35	1,009 / 11.58%	517	503	1,020 / 9.58%
36	596 / 6.84%	234	447	681 / 6.40%
37	492 / 5.65%	214	277	491 / 4.61%
38	2,274 / 26.11%	1,396	1,159	2,555 / 24.00%
39	81 / 0.93%	63	59	122 / 1.15%
TOTAL	8,710 / 100.00%	5,777	4,870	10,647 / 100.00%

Number of Persons Engaged

	1980	1985 10~24	1985 25~	1985 TOTAL
31	188,160 / 23.65%	20,042	173,390	193,432 / 20.65%
32	185,807 / 23.35%	22,384	213,164	235,548 / 25.15%
33	17,172 / 2.16%	4,915	16,762	21,677 / 2.31%
34	28,508 / 3.58%	4,121	32,215	36,336 / 3.88%
35	75,553 / 9.50%	8,426	80,381	88,807 / 9.48%
36	59,258 / 7.45%	3,921	67,396	71,317 / 7.61%
37	74,612 / 9.38%	3,418	77,485	80,903 / 8.64%
38	163,452 / 20.54%	22,356	180,715	203,071 / 21.68%
39	3,128 / 0.39%	983	4,666	5,649 / 0.60%
TOTAL	795,650 / 100.00%	90,566	846,174	936,740 / 100.00%

OUTPUT (millions TL)

	1980	1985 10~24	1985 25~	1985 TOTAL
31	447,039 / 19.99%	225,049	3,119,528	3,344,577 / 18.78%
32	290,277 / 12.98%	234,524	2,256,472	2,490,996 / 13.99%
33	26,130 / 1.17%	35,378	173,254	208,632 / 1.17%
34	62,718 / 2.80%	43,487	509,940	553,427 / 3.11%
35	700,418 / 31.32%	99,875	5,286,556	5,386,431 / 30.24%
36	116,930 / 5.23%	17,155	817,740	834,895 / 4.69%
37	225,389 / 10.08%	40,240	1,933,559	1,973,799 / 11.08%
38	363,178 / 16.24%	159,516	2,801,914	2,961,430 / 16.63%
39	4,429 / 0.20%	5,862	50,572	56,433 / 0.32%
TOTAL	2,236,508 / 100.00%	861,086	16,949,535	17,810,621 / 100.00%

Source: Census of industry and business establishments, 1980, 1985, by SIS
Note: "Large scale" means establishments with 25 and more of employees in 1985, but with 10 and more in 1980.

Table 8-1-21 Targeted Production of Manufacturing Sub-sectors

(in 1988 prices, billion TL)

SECTORS	1984 realized	share %	1988 temporal	share %	1989 estimated	share %	1994 targeted	share %	ANNUAL GROWTH(%) V th	VI th
1 CONSUMER GOODS	25,098	40.1	30,559	38.3	32,456	38.4	47,447	37.7	5.3	7.9
Food	13,685	21.8	15,386	19.3	16,493	19.5	22,596	18.0	3.8	6.5
Beverages	1,034	1.7	1,283	1.6	1,289	1.5	1,645	1.3	4.5	5.0
Tobacco	1,417	2.3	1,427	1.8	1,429	1.7	2,142	1.7	0.2	8.4
Textile	5,337	8.5	7,378	9.2	7,851	9.3	11,414	9.1	8.0	7.8
Clothes	1,741	2.8	2,573	3.2	2,772	3.3	5,204	4.1	9.7	13.4
Leather Wear	584	0.9	867	1.1	859	1.1	1,760	1.4	8.9	14.5
Wood & Furniture	536	0.9	743	0.9	791	0.9	1,162	0.9	8.1	8.0
Shoes	765	1.2	903	1.1	936	1.1	1,532	1.2	4.1	10.2
2 INTERMEDIATE GOODS	25,888	41.3	35,625	44.7	38,112	45.1	54,793	43.6	8.0	7.5
Fermentation	950	1.5	1,039	1.3	958	1.1	1,116	0.9	0.2	3.1
Wooden Products	1,762	2.8	2,329	2.9	2,469	2.9	3,142	2.5	7.0	4.9
Paper	1,463	2.3	1,627	2.0	1,943	2.3	2,752	2.2	5.7	7.3
Printing	479	0.8	559	0.7	581	0.7	783	0.6	3.9	6.1
Leather and Fur	708	1.1	995	1.2	1,032	1.2	1,783	1.4	7.8	11.5
Rubber	866	1.4	1,081	1.4	1,141	1.4	1,845	1.5	5.7	10.1
Plastics	1,111	1.8	1,790	2.2	1,903	2.3	3,180	2.5	11.4	10.8
Chemicals	2,426	3.9	3,667	4.6	3,947	4.7	6,194	4.9	10.2	9.4
Petrochemicals	1,459	2.3	3,118	3.9	3,386	4.0	4,400	3.5	18.3	5.4
Oil Products	6,261	10.1	8,045	10.1	8,430	10.0	10,468	8.3	6.1	4.4
Fertilizers	1,013	1.6	1,072	1.6	1,128	1.3	1,638	1.3	2.2	7.8
Cement	976	1.6	1,406	1.8	1,550	1.8	2,294	1.8	9.7	8.2
Baked Clay	605	1.0	946	1.2	1,124	1.3	1,673	1.3	13.2	8.3
Ceramics	362	0.6	462	0.6	538	0.6	793	0.6	8.3	8.1
Glass	702	1.1	968	1.2	1,117	1.3	1,743	1.4	9.8	9.3
Iron and Steel	3,656	5.8	5,304	6.6	5,548	6.6	8,795	7.0	8.7	9.7
Non-ferrous Metals	1,090	1.7	1,218	1.5	1,325	1.6	2,191	1.7	4.0	10.6
3 CAPITAL GOODS	11,662	18.6	13,582	17.0	13,848	16.4	23,501	18.7	3.5	11.2
Metal Products	3,557	5.7	4,020	5.0	3,905	4.6	5,872	4.7	1.9	8.5
Non-electric Machines	1,515	2.4	1,822	2.3	1,913	2.3	3,601	2.9	4.8	13.5
Agricultural Machines	796	1.3	601	0.8	580	0.7	1,090	0.9	-6.1	13.4
Prof. Scient. Measure	71	0.1	127	0.2	146	0.2	332	0.3	15.4	17.9
Electric Machines	1,249	2.0	1,640	2.1	1,762	2.1	2,738	2.2	7.1	9.2
Electronics	1,054	1.7	1,598	2.0	1,610	1.9	2,900	2.3	8.8	12.5
Road Vehicles	2,604	4.2	2,950	3.7	3,029	3.6	5,582	4.4	3.1	13.0
Railway Vehicles	122	0.2	67	0.1	131	0.2	143	0.1	1.4	1.8
Shipbuilding	186	0.3	108	0.1	136	0.2	329	0.3	-6.1	19.4
Aircraft Manufacturing	6	0.0	10	0.0	11	0.0	16	0.0	12.0	7.0
Other Manufacturing	501	0.8	640	0.8	625	0.7	898	0.7	4.6	7.5
TOTAL	62,647	100.0	79,767	100.0	84,416	100.0	125,742	100.0	6.1	8.3

Source: SPO 'The 6th Five Year Development Plan, TABLE 55'

Table 8-1-22   Regional Differences of VAM & GRDP

Province	VAM	SHARE	POP	SHARE	EST[GRDP]	GRDP/POP	SCORE
Istanbul	348,619	41.39%	5,842.99	11.53%	17044.02	2,917,005	4.34
Ankara	56,643	6.73%	3,306.33	6.53%	5235.16	1,583,376	1.06
Bursa	33,127	3.93%	1,324.02	2.61%	1907.19	1,440,462	0.71
Adana	34,499	4.10%	1,725.94	3.41%	2448.33	1,418,551	0.65
Manisa	28,417	3.37%	1,050.13	2.07%	1467.26	1,397,220	0.60
Izmir	31,199	3.70%	2,317.83	4.57%	3061.78	1,320,969	0.41
Gaziantep	23,442	2.78%	966.49	1.91%	1269.09	1,313,089	0.39
Malatya	18,218	2.16%	665.81	1.31%	830.76	1,247,743	0.23
Samsun	17,614	2.09%	1,108.71	2.19%	1288.44	1,162,110	0.02
Maras	14,360	1.70%	840.47	1.66%	934.46	1,111,832	-0.10
Hatay	14,007	1.66%	1,002.25	1.98%	1081.98	1,079,547	-0.18
Canakkale	10,650	1.26%	417.12	0.82%	449.70	1,078,097	-0.19
Balikesir	11,900	1.41%	910.28	1.80%	935.13	1,027,294	-0.31
Usak	8,189	0.97%	271.26	0.54%	278.63	1,027,149	-0.31
Sakarya	9,668	1.15%	610.50	1.20%	607.50	995,089	-0.39
Eskisehir	8,697	1.03%	597.40	1.18%	573.16	959,424	-0.48
Siirt	8,119	0.96%	524.74	1.04%	498.08	949,190	-0.50
Icel	9,930	1.18%	1,034.09	2.04%	978.65	945,392	-0.51
Kocaeli	8,635	1.03%	742.25	1.47%	692.74	933,305	-0.54
Denizli	8,211	0.97%	667.48	1.32%	618.89	927,204	-0.56
Zonguldak	9,130	1.08%	1,044.95	2.06%	957.34	916,162	-0.59
Aydin	7,766	0.92%	743.42	1.47%	666.86	897,016	-0.63
Adyanman	6,149	0.73%	430.73	0.85%	377.12	875,542	-0.69
Isparta	5,772	0.69%	382.84	0.76%	331.85	866,804	-0.71
Konya	9,237	1.10%	1,769.05	3.49%	1532.35	866,198	-0.71
Diyarbakir	7,323	0.87%	934.51	1.84%	798.89	854,879	-0.74
Bilecik	4,000	0.47%	160.91	0.32%	134.42	835,350	-0.79
Antalya	6,528	0.78%	891.15	1.76%	733.93	823,574	-0.81
Kayseri	6,401	0.76%	864.06	1.71%	708.92	820,453	-0.82
Tekirdag	4,443	0.53%	402.72	0.79%	314.85	781,811	-0.92
Bolu	4,489	0.53%	504.78	1.00%	386.01	764,714	-0.96
Kutahya	4,468	0.53%	543.38	1.07%	411.31	756,846	-0.98
Tokat	4,173	0.50%	679.07	1.34%	488.47	719,315	-1.07
Trabzon	3,744	0.44%	786.19	1.55%	534.10	679,344	-1.17
Ordu	3,679	0.44%	763.86	1.51%	517.23	677,135	-1.18
Corum	3,101	0.37%	599.20	1.18%	391.50	653,364	-1.23
Afyon	3,173	0.38%	666.98	1.32%	434.16	650,943	-1.24
Burdur	2,319	0.28%	248.00	0.49%	160.92	648,873	-1.25
Mardin	2,958	0.35%	652.07	1.29%	414.55	635,744	-1.28
Edrine	2,351	0.28%	389.64	0.77%	241.29	619,266	-1.32
Erzurum	2,934	0.35%	856.18	1.69%	525.96	614,316	-1.33
Sinop	2,063	0.24%	280.14	0.55%	171.61	612,592	-1.33
Mugla	2,304	0.27%	486.29	0.96%	291.38	599,184	-1.37
Amasya	2,055	0.24%	358.29	0.71%	213.06	594,702	-1.38
Kirklareli	1,883	0.22%	297.10	0.59%	174.74	588,156	-1.39
Urfa	2,544	0.30%	795.03	1.57%	467.13	587,563	-1.40
Sivas	2,421	0.29%	772.21	1.52%	446.95	578,799	-1.42
Kars	2,344	0.28%	722.43	1.43%	416.26	576,194	-1.42
Rize	1,790	0.21%	374.21	0.74%	210.34	562,107	-1.46
Kirsehir	1,688	0.19%	260.16	0.51%	145.81	560,489	-1.46
Yozgat	1,973	0.23%	545.30	1.08%	304.36	558,155	-1.47
Giresun	1,628	0.19%	502.15	0.99%	263.42	524,591	-1.55
Elazig	1,564	0.19%	483.72	0.95%	251.05	519,009	-1.57
Nigde	1,368	0.16%	560.39	1.11%	272.06	485,489	-1.65
Nevsehir	941	0.11%	278.13	0.55%	127.31	457,723	-1.72
Kastamonu	1,011	0.12%	450.35	0.89%	200.33	444,822	-1.75
Van	1,062	0.13%	547.22	1.08%	242.49	443,140	-1.75
Bitlis	871	0.10%	300.84	0.59%	132.60	440,746	-1.76
Agri	796	0.09%	421.13	0.83%	172.69	410,051	-1.83
Erzincan	700	0.08%	299.99	0.59%	121.97	406,572	-1.84
Gumushane	672	0.08%	283.75	0.56%	114.31	402,845	-1.85
Cankiri	623	0.07%	263.96	0.52%	104.28	395,043	-1.87
Tuncell	414	0.05%	151.91	0.30%	54.90	361,424	-1.95
Artvin	457	0.05%	226.34	0.45%	81.06	358,158	-1.96
Bingol	430	0.05%	241.55	0.48%	83.99	347,724	-1.99
Mus	299	0.04%	339.49	0.67%	99.13	291,997	-2.12
Hakkari	156	0.02%	182.65	0.36%	44.99	246,339	-2.24
National Total	842,231	100.00%	50,664.46	100.00%	58471.21	1,154,087	0.00
	(million TL)		('000)		(billions of TL)	(TL/person)	