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## The Role of Ports in the Economic Development of Turkey

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# THE ROLE OF PORTS IN THE ECONOMIC DEVELOPMENT OF TURKEY

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Dublin, Ireland**

## **ABSTRACT**

*Today ports have become even more important than they were previously as they play a role of utmost significance to an economy in transition. Ports are one of the primary components of the general transportation sector and are nowadays linked to the expanding world economy. One might say that ports are a means of integration into the global economic system.*

*There are various characteristics of ports that make them important. First of all they perform roles as important links of hinterlands to points overseas. In fact, it is generally accepted that countries without ports are lacking a vital necessity. On the other hand, countries also require inner linkages, such as links to other ports, airport and railway connections if they are to perform their role efficiently.*

*Ports, after all, are part of the mass transportation system. Secondly, sea conveyance is the cheapest way of transportation when considered in terms of fuel consumption and investment. When compared to other transportation systems, railway transportation requires twice as much energy consumption, while road transportation requires ten times as much as sea conveyance. During the past few decades the world has become increasingly environmentally conscious and, with its lower energy consumption, marine transportation is obviously more environmentally friendly than other means*

*Today countries enjoying the greatest shares of world-wide trade have both strong sea way linkages and strong merchant marine fleets. The Turkish Merchant Fleet is continuing to grow and develop and is becoming one of the strongest merchant fleets in the world. In 1993 the Turkey Merchant Fleet ranked 23<sup>rd</sup> in the world. By 1996 it had jumped to the 16<sup>th</sup> rank.*

*Turkey has a considerable geographic advantage as is surrounded by seas and because it enjoys a strategic location. It has a coast almost 8333 kilometers long and its industrial activity is located in close proximity to each of its international ports. Turkey has about 153 ports and wharves located along its coasts.*

*Utilizing regression analysis, the role of ports on a nation's development as a part of transportation services is examined. In the regression analysis, Gross National Income is taken as the dependent variable and port length, total traffic figures, imports and exports, ship visits, number of workers and storage/warehousing are considered to be the independent variables.*

# **THE ROLE OF PORTS IN THE ECONOMIC DEVELOPMENT OF TURKEY**

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## **1. INTRODUCTION**

The transportation sector is a strong factor in terms of economic and regional balanced development, as well as also having a great influence on national integration to the world economic market.

Today a great majority of world's burden transportation is carried out by maritime transportation. In terms of load carried seaway transportation is the cheapest and most effective transportation system compared to other systems. Seaway transportation energy consumption is approximately 2 times lower than railway and 10 times lower than highway transportation for carrying a particular burden a particular distance.

Ports have various unique characteristics that make them important. Ports are significant as they link any country's hinterlands with overseas points. A port that cannot perform that function are insignificant to the country. On the other hand, the country's inner linkages such as links to other ports, airport and railway connections are also vital elements to the efficient working of the port.

Hinterland production and logistic functions are vital elements to economic development. Today's ports are multi-functional centers including not only docking facilities, but also shipyards for maintenance, repair, and ship construction, offices for insurance companies and custom's offices.

Turkey is considered to be a fortunate country in terms of geographic and strategic location. There are numerous wharves and docks, including international ports, with Turkey's largest industrial regions located directly at their hinterlands along a 8333 kilometer strip of coasts. Turkey has a total of 153 ports and wharves positioned along the coasts at the north, south and west of the country. When the smallest port facilities

like yachting marinas and other docks are included in the count, the number climbs to about 300 [1].

## **2. ECONOMIC DEVELOPMENTS AND FOREIGN TRADE OF TURKEY**

The world is in the midst of a process of widespread economic development. Worldwide growth has been defined as two-part economic integration. Part one is regional (or territorial) integration, exemplified by the creation of huge markets and free zones such as the European Community and Asia-Pacific Economic Cooperation (APEC). Part II is the process of globalization. Today, all over the world, international trade is becoming easier due to the widespread lifting of international barriers and tariffs, the strengthening of communication, and the sharing of technological experiences [2].

These developments have had considerable consequences in respect to ports. Today countries having the greatest shares of worldwide trade, such as the Netherlands, have both strong seaway linkages and strong merchant fleets.

According to World Trade Organization's (WTO) statistics, global trade increased 4% in 1996 and resulted in revenues of 5.1 billion USD. During the last decade the world economy has increasingly expanded, except for a few years deviation. Since 1996, however, the global economy has entered a recession due to the crisis in Asia and economic stability in Europe. The USA, Japan, and Germany are leading countries in the worldwide economy in terms of exports and imports. Japan ranks second and Germany third [3][4].

The same economic trends have also occurred in Turkey. After weathering an economic crisis in 1994, Turkey began a process of economic growth. The growth rate in 1996 was 7.9%. Table 1 shows the growth rate of Turkey between years 1987-1996. The growth rate between 1987-1994 demonstrates a floating pattern, but after 1995 the growth rate began to accelerate. The general elections at the end of the year 1995 and the resulting short-term, governmental macroeconomics resulted in inconsistencies. In 1998 the Turkish economic began to experience a period of economic stagnation [5].

Turkey's inclusion into the European Customs Union in 1996 had positive impacts on imports of industrial goods from EU countries and the Common Customs Tariff was now enforced for exportation of goods to third world countries. One major effect of Turkey's entrance into the Customs Union was that importation increased while

exports stayed stable. The increase in imports compared to exports thus resulted in a trade deficit [6].

Table 1. Growth rate of Turkey (%)

Years	Growth Rate (%)
1988	1.5
1989	1.6
1990	9.4
1991	0.3
1992	6.4
1993	8.1
1994	6.0
1995	8.1
1996	7.9

Source: D.Ý.E. Yýllýk Ekonomik Göstergeler (1987-1996)

Imports and exports totaled 59 million tons in 1987, while they reached 93 million tons in 1995. Seaway transport of exports and imports in 1995 amounted to 84 million tons while it had been 48 million tons in 1987. Seaway transportation accounts for a major share in Turkey's total trade transportation. Although the proportion of seaway transportation within total transportation tends to fluctuate, its overall share still demonstrates a tendency to increase.

Table 2 shows the share of seaway transportation within that of total transportation between the years 1987-1995. Seaway transportation had a share of 81.1% in 1987. The share reached 98.4% in 1991 and then a rapid decrease was seen until 1995 when it the share again climbed to 89.5% [7].

Table 2. Improvements in Turkey's Trade and Seaway Transportation

Years	Total imports and exports (Ton)	Total imports and exports carried by seaway (Ton)	Share of Seaway transportation within total transportation (%)	Share of Turkish Fleet (%)
1987	59.813.400	48.528.681	81.1	43.3
1988	68.195.900	52.517.767	77.0	37.5
1989	64.589.300	55.200.862	85.4	37.3
1990	69.536.700	59.117.087	85.0	37.7
1991	71.321.900	70.235.137	98.4	32.3
1992	76.624.700	72.419.133	94.5	40.8
1993	87.101.300.	82.977.537	95.2	40.4
1994	85.470.100	74.743.615	87.4	49.5
1995	93.999.700	84.181.116	89.5	41.8

Source: D.Ý.E. Dýþ Ticaret Ýstatistikleri (Foreign Trade Statistics) (1997-1995)

Table 3 shows in descending order the top 8 countries to which Turkey exports. As can be noticed, exports to Germany were at the first order both in 1996 and 1997. USA, Russia and Italy follow respectively.

Table 3. Countries to which Turkey exports in descending order

Countries	1996		1997	
	Export (million USD)	Share (%)	Export (million USD)	Share (%)
GERMANY	5.168	22.4	5.252	35.2
USA	1.616	7.0	2.020	13.5
RUSSIA	1.482	6.4	1.788	9.3
ITALY	1.444	6.3	1.388	5.3
ENGLAND	1.248	5.4	1.505	10.1
FRANCE	1.042	4.5	1.162	7.8
NETHERLANDS	765	3.3	778	5.2
S. ARABIA	441	1.9	534	3.6

Source: Deniz Ticaret Odası 1996-1997 Deniz Sektörü Raporu (1997-1998) (Maritime Sector Report of the Chamber for Maritime Trade) (1997-1998)

Exports of Turkey to Germany had a share of 22.4% in 1996 and 35.2% in 1997 within total exportation. The same share for the USA in 1996 was 7.0% and 13.0% in 1997. Also exports to Russia displayed the same increasing trend with 6.4% in 1996 and 9.3% in 1997. Decrease in exports to Italy both in 1996 and 1997 were noticed, with 6.3% and 5.3% respectively [8].

Table 4. Countries that Turkey imports to in descending order

Countries	1996		1997	
	Import (million USD)	Share (%)	Import (million USD)	Share (%)
GERMANY	7.464	17.8	8.011	26.9
ITALY	4.176	9.8	4.453	14.9
USA	3.203	7.5	4.345	14.6
FRANCE	2.680	6.3	2.964	9.9
ENGLAND	2.444	5.8	2.757	9.3
RUSSIA	1.846	4.3	2.000	6.7
S. ARABIA	1.728	4.1	1.018	3.4
JAPAN	1.382	3.3	2.040	6.9
NETHERLAND	1.377	3.2	1.483	4.9

Source: Deniz Ticaret Odası 1996-1997 Deniz Sektörü Raporu (Maritime Sector Report of the Chamber for Maritime Trade) (1997-1998)

Table 4 shows the top 9 countries that Turkey imports to in descending order. As noticed, Germany was again at first order. There was a slight, two-year increase when Germany had shares of 17.8% in 1996 and 26.9% in 1997. In 1996 shares for Italy were 9.8%, for USA 7.5% and for France 6.3%. The order of the countries remained the same while shares changed in 1997 [8].

There was an increase of 5.6% in exports income in 1996 when compared to the amount of 13 billion 223 million USD in 1995; total export income was 23 billion USD in 1996 with 61% gained from the exports to OECD countries. Exports to EU had a share of 49.6% in 1996 and there was an increase of 3.4% compared to the previous year. Islamic Countries follow EU with a share of 16.8%.

On the other hand, total imports reached 42 billion USD with an increase of 18.9% in 1995. Imports from OECD Countries had the greatest share of 68.7% and EU followed with a share of 52.6% (Table 5) [8].

Table 5. Developments in Turkish Foreign Trade According to Economic Alliance. (1995-1996) (Million USD)

	Exports					Imports				
	1995		1996		Change	1995		1996		Change
		%		%	%		%		%	%
Total	21635	100	23082	100	6.7	35709	100	42464	100	18.9
OECD	13223	61.1	13960	60.5	5.6	23595	66.1	29189	68.7	23.7
EU	11077	51.2	11455	49.6	3.4	16860	47.2	22335	52.6	32.5
EFTA	293	1.4	345	1.5	17.8	892	2.5	1223	2.9	37.1
BEC	2425	11.2	2867	12.4	18.2	3998	11.2	3654	8.6	-8.6
ECO	910	4.2	1125	4.9	23.6	1136	3.2	1174	2.8	3.4
CSI	2065	9.5	2632	11.4	27.5	3314	9.3	2676	6.3	-19.3
TR	545	2.5	744	3.2	36.5	287	0.8	280	0.7	-2.4
ITO	3520	16.3	3873	16.8	10.0	4509	12.6	5483	12.9	21.6

Source: Deniz Ticaret Odası 1996 Deniz Sektörü Raporu (Maritime Sector Report of the Chamber for Maritime Trade) (1997)

### 3. IMPROVEMENTS OF PORTS AND TRADE IN TURKEY

In the second half of the 1980s, Turkey entered a period of rapid industrial development. During the 1980s, Turkey successfully liberalized its import and export regimes. Liberal policies led to aggrandizement in foreign trade volume and due to this development seaway transportation became increasingly important.

The many projects carried out to support economic development have been a catalyst to the shaping of policies regarding trade with overseas countries. The South-Eastern Development Project (GAP) has had an especially strong impact on the development of the transportation system in Turkey's South-East regions.

In addition to the GAP project, the Black Sea Economic Cooperation has had an important impact on northern regions. Cooperation with former Soviet Union Countries in international trade of Turkey has provided in profitable trade relations. Trade volume in Turkey's northern ports have increased. Another impact on northern ports is the economic relations between Turkey and the Central Asian Turkic Republics. Another potential foreign trade catalyst will be the completion of the connecting waterways along the Danube and Rhine Rivers.

Due to the above-mentioned developments, Turkey's total foreign trade reached 112,373,431 tons in 1997 while the same value was 33,322,851 in 1983. Through the 14 years between 1983-1997, foreign trade values have shown a stable increase. It was only in 1994 that trade decreased to 74,743,615 tons from 1993's total of 82,977,537 tons. In 1995 the total again increased, achieving a value of 84,181,116 tons [9].

The Turkish Merchant Marine Fleet is growing steadily and is taking a place among the strongest Merchant Fleets of the world. According to 1993 data, Turkey had a merchant fleet of 6.8 million tons DWT ranking Turkey in 23<sup>rd</sup> place. In 1996 capacity increased to 10 million tons DWT and Turkey moved up to the 16<sup>th</sup> position. Due to the freight crisis in 1997 and resulting loss of fleets, capacity increased to 10.3 million tons but Turkey slid down to 17<sup>th</sup> place (Table 6).

Turkey has the second fastest growing merchant fleet among its neighbors. The fastest growing merchant fleet in the region belongs to Iran. On the other hand, Greece, South Cyprus, the Turkish Republics and Russia have the largest strongest merchant fleets.

In 1997, exports reached 37,009,695 tons, climbing from the 1983 figure of 9,414,402 tons in 1983. Imports also reached 75,363,736 tons in 1997 while it was 23,908,449 tons in 1983 (Table 8).

Unfortunately, the share of Turkish fleet has decreased within the whole trade transportation. The share of Turkish ships in transportation was 49.8% in 1983 while in 1991 same share was only 32.3%. There had been an increase until 1994 up to 49.5% but then the decreasing trend continued to 29.2% in 1997.

On a numeric basis, 16,592,207 tons of total transportation was held by Turkish ships in 1983. The same value was 32,835,901 tons in 1997.



Table 6.The Turkish Merchant Marine Fleet Ranking Among World Merchant Marine Fleets

Date of 1.1.1993			Date of 1.1.1997		
Countries	Number	Million DWT	Countries	Number	million DWT
Liberia	1548	95.9	Panama	4579	120.9
Panama	3820	79.3	Liberia	1574	94.8
Greece	1407	46.3	Greece	1308	47.5
Norway	1194	36.5	Bahamas	1031	37.0
Japan	3792	36.3	S. Cyprus	1552	36.7
S. Cyprus	1384	36.5	Norway	1138	32.8
Bahamas	914	32.5	Malta	1171	31.6
USA	502	22.4	Singapore	875	25.7
China	1577	19.7	Japan	3351	25.7
Malta	837	17.9	China	2061	23.7
Singapore	600	15.4	Hong Kong	304	13.7
Russia	1662	13.9	Philippine Is.	907	13.6
Philippine Is.	834	13.6	USA	380	13.4
Hong Kong	269	12.0	Russia	1874	11.2
Korea	645	10.3	India	392	10.9
Italy	791	10.1	Korea	722	10.5
India	347	10.0	TURKEY	822	10.3
Taiwan	239	8.9	S. Vincent	793	9.7
Brazil	277	8.5	Taiwan	238	9.2
Iran	184	8.2	England	447	8.1
CSI	719	7.2	Mars. Isl.	112	7.9
S.Vincent	595	6.9	Italy	647	7.9
TURKEY	703	6.8	Denmark	513	7.6

Source: Deniz Ticaret Odası 1996 Deniz Sektörü Raporu (Maritime Sector Report of the Chamber for Maritime Trade) (1997)

Table 7. A Comparison of Turkish and Neighboring Country Merchant Marine Fleets and Annual Percentages Achieved (1997)

COUNTRIES	DWT (1000)	Yearly Change (% DWT)
GREECE	47582	-7.5
S.CYPRUS	36761	-6.4
RUSSIA	11823	-13.0
TURKEY	10302	2.2
IRAN	6151	33.6
ROMANIA	3440	0.6
UKRANIA	3440	-0.6
EGYPT	1757	-3.4

BULGARIA	1613	-0.8
IRAK	775	-41.9

Source: D.Ý.E. Deniz Taþýma Ýstatistikleri,(Maritime Transportation Statistics) 1983-1997

Table 8. Improvements of Foreign Trade and Seaway Transportation (1983-1997)

Years	Seaway transportation			Turkish Fleets	
	Total	Exports (Ton)	Imports (Ton)	Ton	(%)
1983	33.322.851	9.414.402	23.908.449	16.592.207	49.8
1984	39.680.082	11.147.966	28.532.116	18.266.959	46.0
1985	41.171.602	11.461.866	29.709.736	18.276.881	44.4
1986	42.390.814	13.394.068	29.026.746	17.652.419	41.6
1987	48.528.681	12.941.086	35.587.595	21.018.494	43.3
1988	52.517.767	19.707.519	32.810.248	19.704.929	37.5
1989	49.037.362	15.367.500	33.669.862	20.590.616	42.0
1990	59.117.087	15.238.654	43.878.433	22.307.334	37.7
1991	70.235.137	20.343.438	49.891.699	22.710.337	32.3
1992	72.419.133	21.915.110	50.504.023	29.539.326	40.8
1993	82.977.537	18.102.360	64.875.117	33.487.499	40.4
1994	74.743.615	22.112.827	52.630.778	36.986.641	49.5
1995	84.181.116	20.174.562	64.006.554	35.157.163	41.8
1996	91.680.312	18.846.238	72.834.074	36.057.963	39.3
1997	112.373.431	37.009.695	75.363.736	32.835.901	29.2

Source: D.Ý.E. Deniz Taþýma Ýstatistikleri,(Maritime Transportation Statistics) 1983-1997

#### 4. REGRESSION ANALYSIS

In this study, a multiple regression analysis is conducted to analyze the relationships between Gross National Income of the cities in which ports are located, and port length, total burden, exports and imports, ship visits, number of workers and stock capacity. The Gross National Income of the Turkish cities in which 28 ports are located is taken as the dependent variable while port size, total burden, exports and imports, ship visits, number of workers and stock capacity are taken as independent variables [10].

At the first step, a “ship visit” independent variable is included in the analysis. Regression coefficient is 0.65. This amount is considered to be close to 1, so we can make the assumption that the relation between number of ships visited is positively related with G.N.I.

The significance of the overall variables in the equation is measured with the F test. At the first step  $F=49.02$ .  $F$  in the  $F$  table is 4.23.  $F$  supplied in the analysis is greater than  $F$  table. The assumption that the number of ship visits is positively related with G.N.I. is accepted.

Another way to assess the significance of variables is the  $t$  test.  $T$  at the first step is 7.001. On the other hand degrees of freedom is 26. That means that the  $t$  value is equal to 2.056 from  $t$  table.  $T$  supplied from the analysis is again greater than  $t$  table. Once again, the relation between number of ships visits is positively related with G.N.I is proved.

At the second step, the “export” variable is also included with number of ships visits variable. The regression coefficient is 0.74. The relation between the two independent variables and the dependent variable is now stronger. Also  $F$  from the analysis is again greater than  $F$  table;  $34.79 > 3.39$ ,  $t$  in the analysis is 8.304 and  $t$  table is 2.060. A strong relation is once again proved.

At the third step “burden embarked-disembarked” is added in the analysis. This time  $r^2 = 0.78$  is closer to 1.  $F=28.71$  in the analysis while  $F_{table}=2.80$ . Strong relation is supported.

On the other hand  $t$  value for number of ships visited is 8.576.

$T$  value for exports is -3.569.

Finally,  $t$  for embarkments-disembarkments is 2.261.

$T$  table is 2.64. All  $t$  values in the analysis are greater than  $t$  table. There is a strong relation between above mentioned three independent variables and the dependent variable.

At the fourth and the last step, “imports” independent variable is included in the analysis. Regression coefficient is now much higher;  $r^2=0.87$ .

For last step calculated  $F$  value is 39.111 and  $F_{table}$  is 2.80.

$T$  values for the independent variables are as follows:

$T$  value for number of ship visits is 4.986.

T value for embarkments-disembarkments is -3.947.

T value for exports is -4.013.

Finally, t value for imports is 4.7301.

T value of the table is 2.069. t values for all independent variables are greater than t table value. At the final step both F and f tests approve that relation between number of ships visited, embarkments-disembarkments, export and imports and gross national income is positively correlated.

## **5. CONCLUSION**

International trade volumes are constantly increasing and much of the freight being carried out around the world is being transported by sea. Trade being carried out at ports and by means of seaway transportation is one of the fundamental elements have a direct effect on the macro-economy of any country and is one of the factors affecting that country's economic development.

Not only is Turkey fortunate in regards to her long coastal waters and, therefore, her predominance of harbors and ports, its specific geographic location also has a positive effect on its potentials as a country that can utilize seaway transportation most effectively. In addition to those two important factors, the political changes that have occurred in the Balkans and former Soviet States has also increased Turkey's potential of becoming a major center of commerce.

Turkey has still not been fully able to utilize all of its geographical and political advantages. Its ports are operating well below capacity levels and harbors do not have the required equipment and adequate transport lines with its hinterlands. If in coming years Turkey develops a maritime policy that makes it able to utilize correctly the opportunities it possesses, it can become one of the world's leading countries in terms of sea trade.

This study consists of an analysis of the effect of seaway transportation on Turkey's economic development. Here the Gross National Product of cities that include a total of 28 ports of Turkey is taken as the dependent variable while port size, total burden, exports and imports, ship visits, number of workers and stock capacity are taken as independent variables.

Within the regression analysis, it was determined that total burden exports and imports and ship visits are highly correlated with the gross national incomes of the cities.

On the other hand, the assumption that port size, number of workers and stock capacity are related with gross national income has failed.

The statistical analysis in this study is considered to be useful on the settling of a transportation policy, transportation model and determining the transportation needs. This study may also be instrumental in the determination of a transportation policy for Turkey as it embarks upon a new millennium.

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