A COMPARATIVE ANALYSIS OF THE TURKISH AND EUROPEAN UNION PASSENGER FERRY MARKET IN THE EASTERN MEDITERRANEAN

by

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Abstract

A comparative analysis of the Turkish and European Union passenger ferry market in the Eastern Mediterranean, by Hatice Funda Yercan

This thesis covers Turkish and EU maritime policies for the passenger ferry industries. It concentrates on the positioning of ferry operators in the passenger ferry market in the Eastern Mediterranean.

A general background to Turkey and to its maritime industry is drawn before developing a model. A positioning model is developed in a quantitative approach to this research. Furthermore, it is operationalised by using the Multidimensional Scaling (MDS) Technique within multivariate analysis. A specific programme, MDPREF, from the MDS(X) Series of MDS Programmes is used for the calculation and illustration of the analysis.

The positions of the Turkish and EU passenger ferry operators in the Eastern Mediterranean are measured and identified, within the positioning model, by data and information from the operators, for 1994, that were received from questionnaires and data files. The data and information are based on the "7P"s of the service marketing mix, which are product, price, place, promotion, people, physical evidence and process, since passenger ferry operations are widely considered to be services for people.

The results of the analysis indicate the positions of the Turkish and EU passenger ferry market in the Eastern Mediterranean with the Turkish and EU operators grouping together at different places in the market place. An exception is made by one of the EU operators illustrating similarity with the Turkish operators by positioning its place close to them in the market place. It was also discovered that only the Greek operators appear to represent the EU because Greece is an EU country and there were no operators other than the Greeks in 1994. However, Greece does not totally reflect the characteristics of the EU maritime policy.

The discussion concludes that the Eastern Mediterranean passenger ferry market is a dynamic and a growing market with potential points for further research.

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List of Abbreviations

7Ps:	Product, price, place, promotion, people, physical evidence and process
AAYB:	Association of Aegean Young Businessmen
AIIB:	Association of Independent Industrialists and Businessmen
ATIB:	Association of Turkish Industrialists and Businessmen
COM:	Commission of the European Communities
Dwt:	Deadweight tonnage
EC:	European Community
ECO:	Economic Cooperation Organisation
ECU:	European Community Unit
EEC:	European Economic Community
EU:	European Union
GDP:	Gross Domestic Product
GNP:	Gross National Product
Grt:	Gross tonnage
IMO:	International Maritime Organisation
LSM:	Lloyd's Ship Manager
MDS:	Multidimensional Scaling
NATO:	North Atlantic Treaty Organisation
OECD:	Organisation for Economic Cooperation and Development
OPEC:	Organisation of the Petroleum Exploration Countries
SIS:	State Institute of Statistics
TML:	Turkish Maritime Lines
TMO:	Turkish Maritime Organisation
UN:	United Nations

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AUTHOR'S DECLARATION

At no time during the registration for the degree of Doctor of Philosophy has the author registered for any other University award.

Relevant scientific seminars and conferences were regularly attended at which work was often presented; external institutions and various shipowners and ferry operators were visited for consultation purposes and several papers prepared for publication.

Publications:

- Paper (1995a) *Proceedings*, Conference of International Maritime Association of Mediterranean-IMAM, Dubrovnik, Croatia, 10-12/04/95;
- Paper (1995b) *Conference Proceedings*, Technical University of Istanbul, Turkey, 24-26/11/95;
- Article (1995c) *Shipping Periodical*, Mersin Chamber of Shipping, August, Mersin, Turkey;
- Forthcoming paper (1997) *Conference Proceedings*, International Maritime Association of Mediterranean-IMAM, Istanbul, Turkey;

Presentations and Conferences Attended:

- Presentation (1995a) Conference of International Maritime Association of Mediterranean-IMAM, Dubrovnik, Croatia, 10-12/04/95;
- Presentation (1995b) Conference of Shipping and Marine Technology, Technical University of Istanbul, Istanbul, Turkey, 24-26/11/95;
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PART I:

INTRODUCTION

CHAPTER 1: INTRODUCTION

1.1. INTRODUCTION

Turkey has played an important role in Europe regarding both its geographical and geopolitical position since its establishment in 1923. Turkey, as a developing country, has continued to have strong relations with European countries, together with membership of various European organisations, as well as NATO, OECD, ECO and the UN and through these organisations Turkey has been attempting to integrate into the Western world.

Turkey's relations with the European Union began in 1959 (Aksam, 1995; Evrensel-Brown, 1991) with the application of the country for entrance to the Community. However, Turkey's cultural, economic and political systems were considered to be incompatible with the Community (Evrensel-Brown, 1991) and as a result talks and relations between Turkey and the Community ceased, although the application of Turkey for entrance was accepted by the EEC's Council of Ministers. Turkey started to increase relationships with the European Union following the Ankara Association Agreement, signed in September 1963 which came into force in 1964 (Evrensel-Brown, 1991). The policy that was adopted by this agreement was the integration of Turkey and the EU by giving Turkey full membership at the end of a three-phase process. Although, Turkey is not an EU country today, a protocol agreement was signed in 1973 with the EU for Customs Union for the free movement of goods. This protocol is an additional agreement to the Ankara Agreement with a completion period of 22 years (Aksam, 1995). The period was completed and approved by the EU Parliament in December 1995 and the Customs Union came into force on 1 January 1996 (EC News, 1996a). The aim of Turkey has been to have more substantive economic and political relations with the EU countries during its developing stage.

Turkey, with an approximate population of 65 million, is both a young and dynamic market for Europe. It is forecast, within the targets of the customs union, that the trade volume between Turkey and the EU will increase by 100% in the early 2000s (Chamber of Shipping, 1996a; Observation, 1996). Therefore, shipping in Turkey inevitably will be affected by the increased economic relations between Turkey and the EU and the volume of sea trade will also be increased, year by year.

A further relationship between Turkey and the EU stems from the 2.5 million Turkish people living in various European countries. In addition to the potential of Turkish people living in Europe who wish to spend their summer holidays in Turkey, this country has also new potential for tourism for foreigners.

A state owned company, Turkish Maritime Lines, started to operate ferries on the Adriatic Line in the Italy-Greece-Turkey corridor in the Eastern Mediterranean in the late 1960s. As a result of the war that took place in the former Yugoslavia in the early 1990s, Turkish people living in Europe, who once usually travelled to Turkey by car during the summer, started to travel either by sea or air transport. The majority has been using ferries since the early 1990s with a rapid growth shown each year.

New ferry operators from the Turkish private sector and even from the EU have started to operate in this corridor in addition to Turkish Maritime Lines. Therefore, ferry operations in the Italy-Greece-Turkey corridor has become a growing and a dynamic ferry market in the Eastern Mediterranean and it is the only place where regular international ferry services of Turkish passenger shipping competes with EU operators.

The broad objective of this research is to examine the position taken up by the Turkish ferry industry in comparison with EU ferry operators in the same market place. More specifically, the objectives are:

-- To review the Turkish ferry industry in the context of the EU ferry industry in the Eastern Mediterranean.

-- To develop a model to provide an analytical basis to assess the Turkish and the EU ferry operators, in the Eastern Mediterranean.

-- To measure and to identify the positioning of the Turkish and the EU ferry operators in the Eastern Mediterranean ferry market.

There are various expected problems for this research, i.e. obtaining the relevant data of ferry operators for statistical analysis and finding the optimum technique for the analysis. Additionally, the fluctuating peace in the former Yugoslavia may also have an effect on the ferry services in the medium term.

The originality of this research needs to be noted because there is possibly no similar research related to model developments of the positioning of ferry operators in this or other areas of the world. A multidimensional scaling technique derived from multivariate analysis is possibly used for the first time in the shipping industry to analyse the data and information from the market.

1.2. STRUCTURE OF THE THESIS

The thesis is divided into the following five parts:

- Introduction

- Background

- Development and operationalisation of the model

- Conclusions, discussion and recommendations

- Appendices and references.

Chapter 1 of Part I is this introductory part. Part II consists of chapters 2 and 3, which form the background to the thesis. General information about Turkey, the Turkish maritime industry and the relations between Turkey and the EU are explained in Chapter 2. The maritime policies of the EU and Turkey, which concludes with the comparison of these policies are given in the first section of Chapter 3. The Eastern Mediterranean passenger ferry industry together with the details of the ferry services in the market area are explained in the second section of Chapter 3.

Part III of the thesis consists of the development and operationalisation of the model using a quantitative approach (Chapter 4 and 5). The positioning model is developed in Chapter 4 and operationalised by using the multidimensional scaling technique of multivariate analysis techniques to identify positioning of ferry operators in the market in Chapter 5. The results of the positioning model are discussed in Chapter 6.

Conclusions of the thesis and discussion and recommendations of the researcher are explained in Chapter 7 in Part IV. Appendices and list of references are given in the final part (Part V).

PART II:

INDUSTRY AND POLICY

CHAPTER 2: BACKGROUND TO TURKEY, THE EU AND ITS MARITIME SECTOR

2.1. INTRODUCTION

The first section of this chapter provides a general background to Turkey. A general review of the Turkish maritime industry is given in the second section. Finally, the third section concentrates upon Turkey's economic, political and cultural relationships with the European Union to provide a general view before reviewing in detail the maritime policy and ferry industry of Turkey in the context of the EU maritime sector.

2.2. TURKEY

Turkey is situated at the junction of the European and Asian continents. This location on two continents has been a central feature of Turkish history, culture and politics. The Turkish people have been living on the peninsula of Anatolia, which is situated in the southeast of Europe, west of Asia, north of the Middle East and south of former Soviet Union, for the past 1000 years. Historically, two Turkish empires, the Great Seldjuklu Empire and Ottoman Empire, were established on Anatolia. The Republic of Turkey was founded by Mr.Ataturk on the same land, in 1923 after the collapse of a 600-year-old Ottoman Empire. The capital city, Ankara, is the second biggest city and it is located in the Central Anatolia region.

2.2.1. Geography

Turkey is a developing and an industrialising country situated in a land area of approximately 775,000 square kilometres, which is more than twice the size of Germany, the largest country in the EU. The country is situated at a geographical position within the southeast of Europe, southwest of Asia, northwest of the Middle East and south of the former Soviet Union, as noted earlier. Turkey has been classified within different political categories due to her geographical situation, i.e. being considered both as a Middle Eastern country and a European country. However, the political and economic structures of Turkey are, in many ways, different from those of Middle Eastern countries. Furthermore, the only Islamic country with a secular and a liberal political system has been Turkey. As a consequence, Turkey can be considered to be a western country for the Middle East, an eastern country for Europe and an Islamic but a liberal, secular and western type democratic country.

The neighbours of Turkey are Greece and Bulgaria to the northwest, Georgia, Armenia and the autonomous Nahcivan of Azerbaijan once part of the former Soviet Union to the northeast, Iran to the east, Iraq and Syria to the southeast. The Anatolia peninsula has coasts to four seas, which are the Black Sea to the north, Marmara Sea to the northwest between the two straits, Bosphorus and Dardanelles, the Aegean Sea to the west and the Mediterranean Sea to the south. The geographical situation of Turkey is illustrated in Figure 1 (Sabah, 1995).

Turkey consists of seven geographical regions: Marmara where the biggest metropolitan city, Istanbul, is situated, Middle Anatolia where the capital and the second biggest metropolitan city, Ankara, is situated, Aegean where the third biggest metropolitan city, Izmir, is situated and the Mediterranean, Black Sea, East Anatolia and Southeast Anatolia regions. The northwest of the Marmara region, which is approximately 25,000 square kilometres, is situated in the southeast of the European continent while the rest of Marmara region and the other regions are situated in the very southwest of the Asian continent, which is called the peninsula of Anatolia. The seven regions of Turkey are illustrated in Figure 2 (Sabah, 1995).

Middle, East and Southeast Anatolia regions are generally mountainous. The Black Sea, Marmara, Aegean and Mediterranean regions are named after the seas of which they have

Figure 1: Geographical situation of Turkey

Source: Sabah (1995).

Figure 2: Regions of Turkey

Source: Sabah (1995).

coasts. In other words, Turkey is situated in such a way that it has an approximate total of 8000 kilometres of a coastline to the north, northwest, west and south. Civilisation, industrialisation and development have been generally positioned in the Marmara, Aegean and Mediterranean regions due to the ease of transport related to geographical positions.

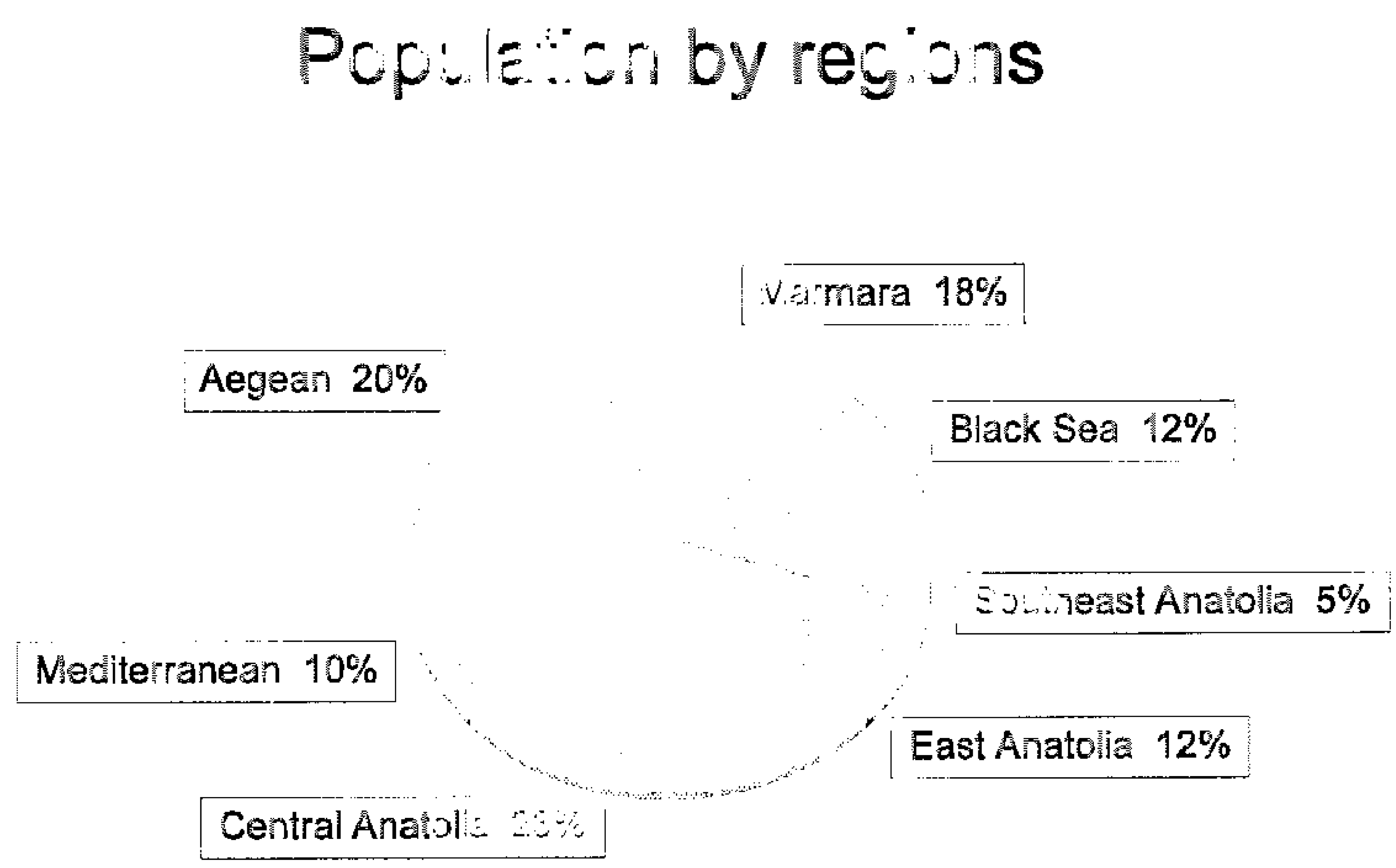
2.2.2. Population

The population of Turkey was 56,473,000 and the number of inhabitants per square kilometre was 73 in 1990 and estimated as 63.9 million and the number of inhabitants per square kilometre as 82 in 1996 (SIS, 1995) giving an annual growth rate of 21.71%. In 1990, 34.9% of the population was under 15 years of age, 60.7% was between 15 and 64, and 4.4% was aged 65 or over (European Marketing Pocket Book, 1994).

The distribution of the population by regions, in 1990, is illustrated by Figure 3 revealing: Black Sea 12%, Marmara 18%, Aegean 20%, Mediterranean 10%, Central Anatolia 23%, East Anatolia 12% and Southeast Anatolia 5% (SIS, 1991). The population is higher within the Marmara and Aegean regions compared with the rest of the country. For instance, the current population of Istanbul in Marmara region is 14 million and Izmir in the Agean region is 4 million (SIS, 1996).

There has been a movement of people from the rural areas to urban areas within the last thirty years, particularly from the eastern and southeastern regions to the western and northwestern regions. Therefore, the cities in the west and northwest have been growing rapidly and have become metropolitan cities. The cities shared 46% of the total population in the late 1980s (OECD, 1988). The movement of people has been increasing rapidly due to the transformation of Turkey from an agricultural to an industrialised country stemming from industrialisation in certain regions.

Figure 3: The distribution of the population of Turkey by regions (1990)



Source: SIS (1991).

There are a number of ethnic groups throughout Turkey. For instance, groups of Greeks living in the west next to the coast of the Aegean Sea, Jewish and Armenian people living in Istanbul next to the coast of the Marmara Sea, Georgeans and Caucasians living in the northeast next to the borders of Georgia and Armenia and Kurdish people living in the southeast near the borders of Syria and Iraq (Middle East Research Institute, 1985).

Today approximately a population of 2.5 million Turkish people are living in various European countries, particularly in Germany, a figure which has developed since the 1960s, to match the high supply of work during the rapid growth of industrialisation after World War II (Yeni Asir, 1995). These "guest workers" are employed mainly as automobile workers, miners and workers of heavy industries. Furthermore, there are tens of thousands of other Turkish people who have migrated to the Middle East, particularly to Libya and Iraq, mainly as construction workers and engineers (Middle East Research Institute, 1985).

2.2.3. Resources

Turkey's principal human and natural economic potential is still unexploited. Turkey has most of the natural resources to support rapid economic development. The country has fertile land and rainfall for a strong agricultural sector. About one-third of the total land area is under cultivation and about one-half of the cultivated area is devoted to cereals. Turkey produces a regular surplus of food and exports it to European countries.

Turkey has enough coal, but lacks enough high grade iron ore for efficient development of a steel industry. Turkey's electrical energy is largely produced through two large dams situated in Southeast Anatolia and is exported to various countries, such as Bulgaria. The main energy source for Turkey is dependent on petroleum and about 80% of requirements is imported from the Middle Eastern countries while about 20% is supplied by domestic production. Natural gas is also imported from Russia. A part of the energy is supplied by thermal energy which is produced in the Aegean region.

2.2.4. Foreign relations

Turkey, as a member of UN, NATO, OECD and ECO, has a political and strategic importance due to its geographical situation between Europe, Asia, Balkans, Caucasia and the Middle East. Turkey continues to have economic and cultural relations with various countries, such as Macedonia, Albania, Bosnia, Israel, Palestinian Authority, Turkish Republic of Northern Cyprus and Turkish Republics in Caucasia and Middle Asia, as well as the neighbouring countries, various European countries and the U.S.A.

New growing political and economic relations with the former Soviet Republics with Turkish connections started in 1991 after their independence (Kurdas, 1994), including Azerbaijan, Turkmenistan, Kazakhstan, Kyrgizstan, Tadjikestan and Uzbekistan in Caucasia and Middle

Asia. Economic and cultural relations started during this period, particularly, after signing the Black Sea Economic Cooperation mainly between Turkey and these countries. Turkey has played a pivotal role and placed a strong position for trading connections in the Black Sea area in the 1990s (LSM, 1994a; Seatrade, 1993).

2.2.5. Political situation

Through the Prime Ministry of Mr.Turgut Ozal, in 1983, the Turkish economy was converted to a more developing and internationally competitive industrialisation and liberal economy. Turkey was brought into a new era where great changes in politics and economics were taking place. Mr.Ozal's efforts to reshape the economy during 1980-93, took place in three different phases of political change. First, economic policies, known as "24 January decisions", were formulated in 1980, under an authoritarian military government during 1980-83 (Oyan, 1989). The policy of outward-looking economy and growth based on a free market economy was adopted (Kazgan, 1985). Second, with the Prime Ministry of Mr.Ozal, Turkey started to move from military rule to limited political liberalisation during 1983-87. Third, a movement towards a greater political opening and redemocratisation took place after 1987 (Sayari, 1992). Turkish politics were also affected by these economic changes. This was a new era for the economic, political and structural development of Turkey and liberalisation in political economy was developed during the Ozal period (Oyan, 1989). A rapid growth for the whole economy and a growth in exports, in particular, brought a credibility to Turkey within international markets (Kazgan, 1985).

Even though the development of Turkey was affected by the westernised politics that it applied for many years, this development did not help to increase the living standards of Turkish people compared to European countries. Therefore, the domestic politics of Turkey have moved against those in favour of westernising and the Welfare Party from the conservative movement and Islamic wing was the leading party in the December 1995 general elections. A coalition was required to establish a new government which involved the leading and third parties with Mrs.Ciller becoming the Deputy Prime Minister.

This instability and uncertainty in politics and economics has negatively affected steps towards a powerful, stable and encouraging future. The economic liberalisation movements, since 1983, remained incomplete and the privatisation movement for state owned companies and institutions has been very slow (Observation, 1996). The privatisation programme, which continued from the Ciller Government, includes many maritime institutions, particularly the major four shipyards and three small state owned shipyards situated in Istanbul and Izmir, various ports and the cargo carrier - Turkish Cargo Lines, which is owned by Turkish Maritime Organisation (also the owner of the ferry operator - Turkish Maritime Lines) (Uysal and Mazgit, 1996; Lloyd's List, 1994b; LSM, 1994a).

2.2.6. Economic structure

Turkey had a long tradition of state controlled and inward-oriented economic strategies before Mr.Ozal. After implementing inward-oriented economic policies, Turkey started to adopt a new outward-oriented model in its external economic relations from 1980 onwards. Liberalisation of the economy was a result of the outward-looking policy (Oyan, 1989). In other words, Ozal's neoliberal strategy of economic growth, with an outward-looking economy, represented a significant new phase for the development of Turkish politics and economics (Sayari, 1992). Various reforms, such as tax policy, wages policy, monetary policy, privatisation plans and programmes, plans of forming a middle class and plans for pulling inflation down were developed (Oyan, 1989; Oyan, 1987) and capital movements were freed and foreign trade and foreign exchange regime were liberalised (Togan *et.al.*, 1987).

The effectiveness of economic policies have benefitted greatly from large scale foreign financial assistance, particularly during the initial period of the adjustment. The most successful elements of the recovery were the growth of exports and certain services, such as construction, transport and tourism (Kopits, 1986). The importance of exports has been considerable for the economic growth of Turkey. Export earnings enabled Turkey to import capital goods for the investment necessary for economic growth and to purchase the intermediate inputs required to keep the economy producing at its full potential. In addition, the GNP per capita more than doubled from US$ 1,280 to US$ 2,700 in 1992 after massive exports from the country (Lloyd's List, 1994b).

The transition of the economy from a bureaucratic system based on restrictions to a liberal system operated by customs tariffs and free market conditions proceeded well on the reputation of the country (Kazgan, 1985). After the loss of international creditworthiness in the 1970s due to the crises in the balance payments and increased exports, international financial credibility was regained by Turkey (Togan *et.al.*, 1987).

Turkey signed an agreement, called the "Black Sea Economic Cooperation", in 1992 with the Turkish republics, also known as the Turkic republics, on the north Black Sea shore and in Central Asia, for intensive economic and political relationships with these countries, as noted earlier.

A new middle class was formed and foreign capital was brought in to take advantage of a growing domestic market. In addition to these developments, the issue of free trade zones also started to attract the foreign investors to Turkey. There were more than 2,600 foreign companies operating in the country during mid-1994. 54% of these companies were operating in manufacturing industry, 43% in services sector and 3% in other sectors (Lloyd's List, 1994b).

However, the economy of Turkey was running out of control and the rapid growth of the economy started to slow down with the unfinished liberalisation policies during the Prime Ministry of Mrs.Ciller and after the sudden death of President Mr.Ozal at the beginning of 1993. The Turkish Government started to adopt total liberalisation policies again together with privatisation as a cure for economic decline (Seatrade, 1993).

An overvalued Turkish Lira and a high consumer demand resulted in a massive increase in the trade deficit (Lloyd's List, 1994b). Turkey was growing quickly, but the growing rate of population was also increasing quickly. Therefore, the rate of increase of national revenue per capita was not enough. The total annual values of exports and imports over the period between 1990 and 1995, are illustrated separately in Table 1. The total value of trades declined to US$ 41.4 billion in 1994 from US$ 44.7 billion in 1993.

Table 1: The Turkish foreign trade between 1990-1995

(US$ billion)

	1990	**1991**	**1992**	**1993**	**1994**	**1995**
Exports	13.0	13.6	14.7	15.3	18.1	21.7
Imports	22.3	21.0	22.9	29.4	23.3	35.7
Difference (+:surplus, -:deficit)	-9.3	-7.4	-8.2	-14.1	-5.2	14.0
Total foreign trade volume	**35.3**	**34.6**	**37.6**	**44.7**	**41.4**	**57.4**

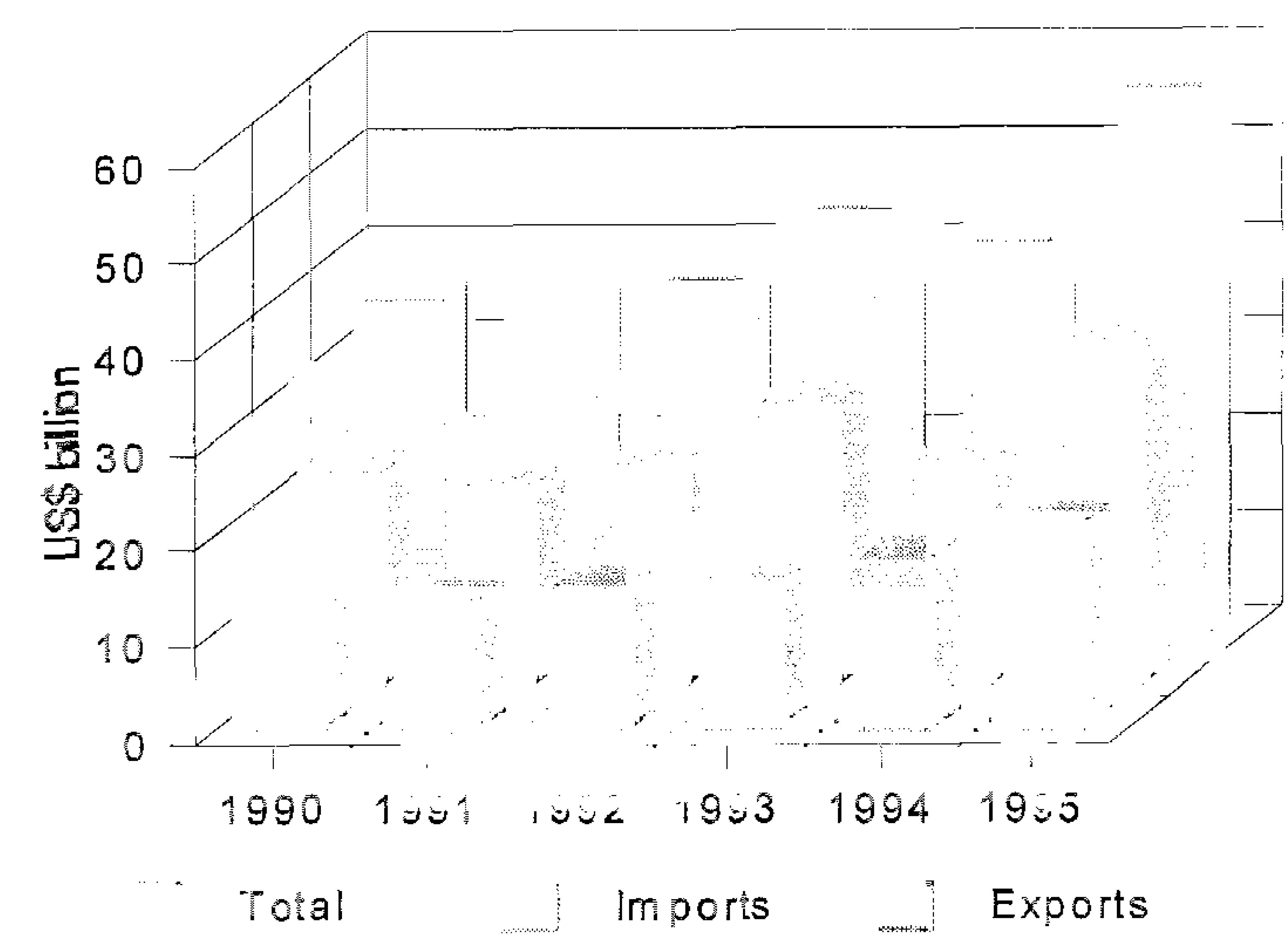
Sources: Containerisation International (1995);
SIS (1995).

The Turkish economy was dominated in 1994 by efforts to recover from the financial currency crisis in January. State owned companies of the public sector were the root cause of the financial crisis. The crisis caused GNP per capita to drop to US$ 2,193 in 1994 from US$

2,300 in 1993 (Europe Review, 1995). Additionally, the annual average inflation rate for 1994 was 116% (AAYB, 1996), even sometimes reaching 139% (Lloyd's List, 1994b) and peaking at 146.7% (AAYB, 1995). The Turkish Lira was devalued by 15% and the US dollar exchange rate against the Turkish Lira was up to 100% in the first four months in 1994 (Lloyd's List, 1994a). Interest rates were more than 10% a month.

Exports increased from US$ 18.1 billion, in 1994, to US$ 21.7 billion, in 1995. Additionally, the imports increased from US$ 23.3 billion, in 1994, to US$ 35.7 billion, in 1995. Therefore, the trade deficit nearly tripled from US$ 5.2 billion, in 1994, to US$ 14 billion, in 1995 (AIIB, 1996; SIS, 1996; ATIB, 1996a; ATIB, 1996b). Figure 4 illustrates the exports, imports and total trade volume of Turkey from 1990 until 1995.

Figure 4: Total foreign trade of Turkey between 1990-1995 (billion US$)



Source: SIS (1996).

An ambitious rescue plan was unveiled by Mrs.Ciller on 5 April 1994. This plan provided a structural programme for price increases on many state monopoly goods, acceleration of the privatisation programme, plans to grant autonomy to the Central Bank to free it from financing the budget deficit and a stabilisation programme for the economy (Erkan, 1994). The main objective of this economic package was to bring macroeconomic stabilisation to the Turkish economy. However, it has not been achieved and the economy continues to shrink (Europe Review, 1995).

The State Planning Organisation's Seventh Five-Year Plan for Development, for 1996-2000, (Temel, 1996) envisaged a decline in inflation of 6% and minimum annual growth rates of 8.1%, that was based on successful progress of the EU customs union, more privatisation of state owned companies and institutions, taxation reform and a reconstruction programme in the southeast region of Turkey, - "The Southeast Anatolia Project" (State Planning Organisation 1996a; Europe Review, 1995). The development plan also proposes new developments for trade relationships between Turkey and the European Union, Islamic countries, the Turkish Republics in Caucasia and the Central Asia and the countries of Black Sea Economic Cooperation (Temel, 1996).

2.2.7. Social structure

The liberalisation policy in the outward growing Turkish economy has had various social consequences. There is a great division between urban and rural inhabitants that differentiates the social characteristics of the Turkish population. Education, dress, outlook, traditions and wealth are the main elements that differentiate these social characteristics. Cities are the home of Turkey's western-educated, modern and elite people, who provide the general direction of the Government. People living in the rural areas are engaged mainly in agriculture (Middle East Research Institute, 1985). Urban and educated women have achieved impressive access to professional life. Economic necessity and increasing educational levels have combined to encourage many women into different careers, as well as business and politics.

Turkey is rapidly becoming urbanised due to the growth of the centres of industrialisation. Over 75% of the country was rural in the 1950s; however, the annual change in urban population was 5% in 1985 while annual rate of natural population increase was 2.2.% (OECD, 1988). Furthermore, the percentage of cities in terms of total population was approximately 65% and the annual growth rate of cities was 4.3% in 1995 (Buyukdeniz, 1996). On the other hand, the proportion of rural population was 35% and the annual growth rate in rural areas was -6% in the same year. Istanbul in the Marmara region, Ankara in the Central Anatolia region and Izmir in the Aegean region, as the three largest cities, have become the strongest magnets for migration from the rural areas (Yalcintas, 1996).

High competition rules, with increasing foreign investment and capital, based on free market conditions have some impacts on employment. Unemployment rates have been increasing with low qualified people in various fields because the market is a rapid growing dynamic market based on high competition. Additionally, rapid increase in the total population with an annual rate of 2% in 1994 and 62.5% of the total population as the workforce between the ages 15-64 (State Planning Organisation, 1996a) have impacts on the increase of unemployment. Although there is social insurance for working people, unfortunately, there is still no unemployment insurance for people without jobs (Uslu, 1996).

In addition to these aspects, high inflation with an average annual rate of 86% in 1995 (SIS, 1996) is one of the other major disadvantageous effects of the economy over social life in Turkey. The purchasing power of people is getting smaller everyday and thus eating away at the welfare of the society. Although the annual average net income per capita was $2,193 in 1994 (ATIB, 1995), this amount decreased to $529 in the poorest division (20% of the population), again decreased to $1,448 in the middle division (60% of the population) and increased to $5,932 in the richest division (20% of the population) in 1994 (Hurriyet, 1996b).

The growth rates of private final consumption expenditures of people decreased from 8.4% in 1993 to -5.3% in 1994 because of the economic crisis in Turkey; however, it recovered and again increased to 7.6 in 1995 (ATIB, 1996b). These economic indicators also reflect the social life of the Turkish people because strong ties exist between economic and social issues. These indicators include the annual growth rates of consumptions of food, beverages, durable goods, semi-durable and nondurable goods, energy, transportation, communication, services and ownership of dwelling.

The movement of people from the rural areas to the industrialising and developing urban areas causes various problems, such as increase as in recession and unemployment. Social pressures also increase on the people living in the cities with massive number of uneducated and lowerqualified people settling in the surrounding of the major cities. These people directly affect the increases in unemployment and problems arising from housing, transportation, substructures, education, healthcare and environmental protection (Ozturk, 1996). These also have direct and indirect effects upon the employment in the shipping industry.

In addition, the Turkish economy was in crisis in 1994 as noted previously. The annual average inflation rate was 116% in 1994 (AAYB, 1995). Employment was highly affected by the crisis and the annual rate of unemployment was 11.1% in urban areas and 5.1% in rural areas (AIIB, 1996). As a result of this situation in the economy, the employment in the state sector of the shipping industry was affected. The shipyard workers, in particular, were affected and the unions of these workers were trying to protect the rights of the workers against low wages and job losses. However, the economic crisis in Turkey did not affect the private sector of the shipping industry directly because of the shipping staff as well as the industry earning hard currency (Chamber of Shipping, 1996c).

In addition to the above social issues, the indicators related to education emphasise the lack of higher education. Only 26.7% of the total population completed higher education while 53% completed a secondary school in 1994 (Buyukdeniz, 1996). These indicators also have various direct and indirect effects upon the shipping industry because lack of higher education and maritime schools and faculties in Turkey arise as a problem for the industry.

2.2.8. Tourism

The Marmara, Aegean and Mediterranean regions have been the regions where tourism has been increasing apart from growing foreign and domestic trade volumes and industrialisation (Olali and Timur, 1992). The reason for that is considered to be the historical and cultural structures, places, monuments, antique seaports and famous natural beauties situated at the seacoasts together with golden sands. Therefore, transport modes have developed more in these regions compared with the rest of Turkey because of the growing volumes of trade and tourism. For example, the biggest airports of Turkey are Ataturk airport (Istanbul) in Marmara, Esenboga airport (Ankara) in Middle Anatolia, A.Menderes airport (Izmir) and Dalaman airport (Mugla) in the Aegean, and Antalya airport (Antalya) in the Mediterranean regions.

This movement of tourism has also been supported by the domestic ferry lines during the high tourism seasons. For instance, there has been growth within the Istanbul-Izmir and Istanbul-Black Sea domestic ferry lines (TML, 1993). Furthermore, the Aegean and Mediterranean regions have become places for extensive yachting and cruise shipping during the summer seasons.

2.2.9. Transport

Transport has developed within the strategic places where industrialisation is developing and growing. Therefore, seaports have also been affected by this development. For instance, the Ports of Istanbul and Izmir have been the biggest ports for exports and imports and are situated at the centre of trade movements. The first three ports of Turkey with the highest volume of external trades during the years 1990-95 were the Port of Istanbul in Marmara region, the Port of Izmir in Aegean region and the Port of Mersin in Mediterranean region (Mersin Chamber of Shipping, 1995).

2.3. TURKISH MARITIME INDUSTRY

The Turkish maritime industry is outlined in this section to give a broad picture of its significance. The Turkish maritime industry has continued to show consistent growth since the middle of the 1980s reflecting the general liberalisation policies of the Turkish economy. The industry preserves its position as one of the locomotive industries of the country, noted by Mr.Goksu, the Chairman of the Assembly of the Chamber of Shipping (Chamber of Shipping, 1996c).

2.3.1. The Turkish merchant fleet

The size of the Turkish shipping fleet is continuing to grow with an increasing trend as the Turkish economy further liberalises, and therefore, Turkish ship owners gain greater access to funding enabling the fleet to be modernised. Turkish ship operations transformed dramatically the operation of 300-400 dwt of vessels in the 1940s to a fleet reaching a total of 1.5 million dwt in 1980 and 2 million dwt in 1982 with the support of Government subsidies, the Chamber of Shipping and the Association of Shipowners (Lloyd's Ship Manager, 1993). The size of the Turkish merchant fleet reached 5.81 million dwt in 1985 and 10.31 million dwt by the end of 1995 with an increase of 77.5%. The annual growth of the total fleet is listed in Table 2 and illustrated in Figure 5.

During the Prime Ministry of Mr.Ozal in the beginning of the 1980s with an increase in economic liberalisation policies, the self reliance of Turkey increased and the doors of the country were opened wide. In parallel to this, international activities and relations increased and the maritime industry has consequently grown stronger. The Turkish merchant fleet exceeded 10 million dwt by the end of 1995 (Table 2 and Figure 5) (Chamber of Shipping, 1996a). The annual distribution between 1985-1995 of the Turkish merchant fleet by vessel types is listed in Table 3 and illustrated in Figure 6.

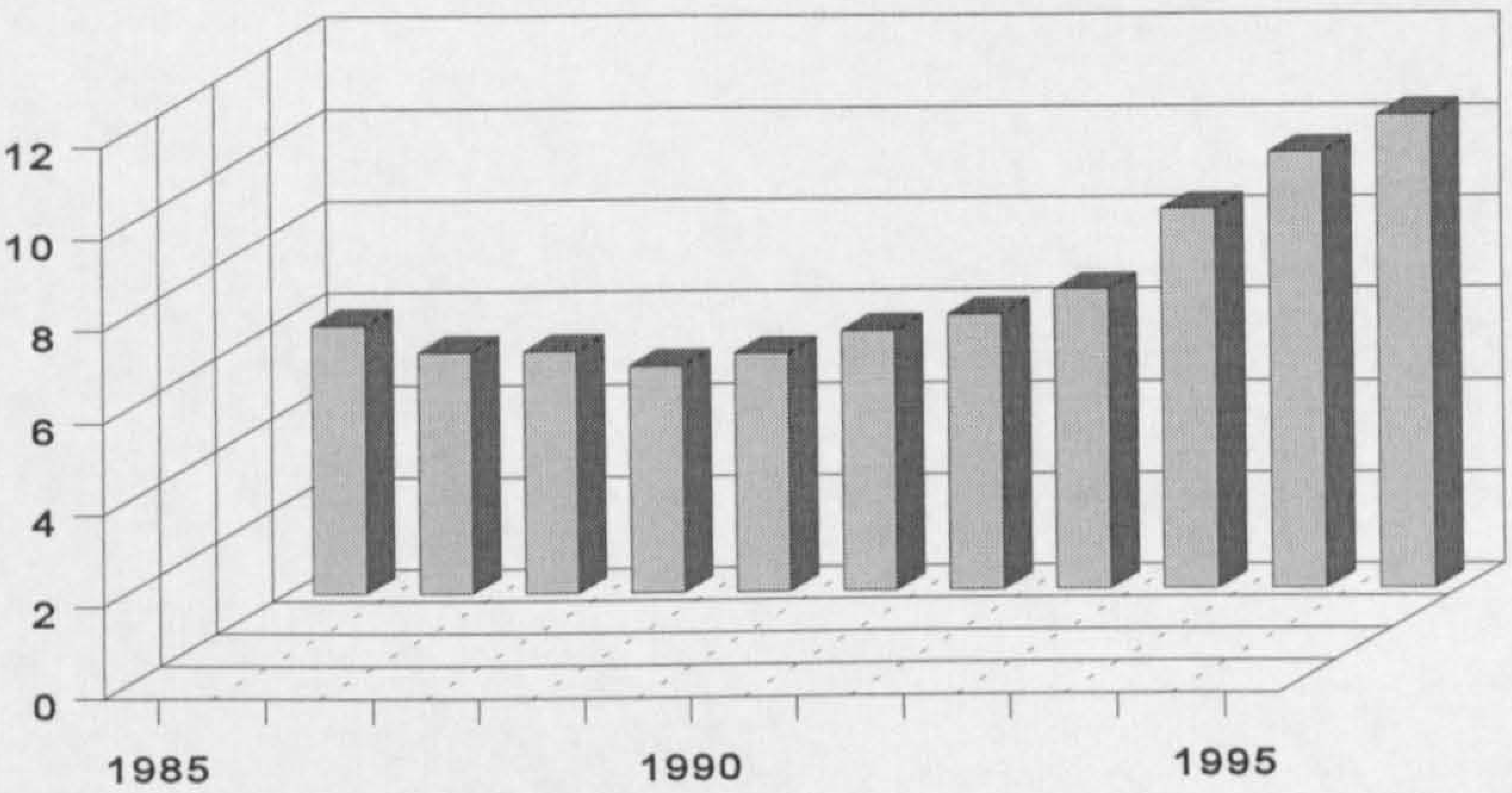
Table 2: Annual growth of the Turkish merchant fleet between 1985-1995 (million dwt)

Year	Total merchant fleet (million dwt)
1985	5.81
1986	5.23
1987	5.24
1988	4.91
1989	5.17
1990	5.64
1991	5.97
1992	6.50
1993	8.26
1994	9.50
1995	10.31

Sources: Chamber of Shipping (1995a);
Chamber of Shipping (1996a).

The Turkish fleet constituted approximately 8 million dwt of approximately 1000 vessels with an average age of more than 20 years, in 1993 (Fairplay, 1993). The dominant sector has been bulk carriers accounting for 80% of the fleet in dwt. The Turkish merchant fleet consists mainly of handysize and panamax bulkers and also some 45,000 dwt bulkers the majority Turkish flagged (Lloyd's List, 1994b). Most of the handysize vessels are owned in Istanbul, Turkey's commercial heart, and are cross trading in a competitive market in the Black Sea to Bulgarian, Romanian, Ukranian and Russian ports (Fairplay, 1994).

Figure 5: Annual growth of the Turkish merchant fleet (million dwt)



Sources: as Table 2.

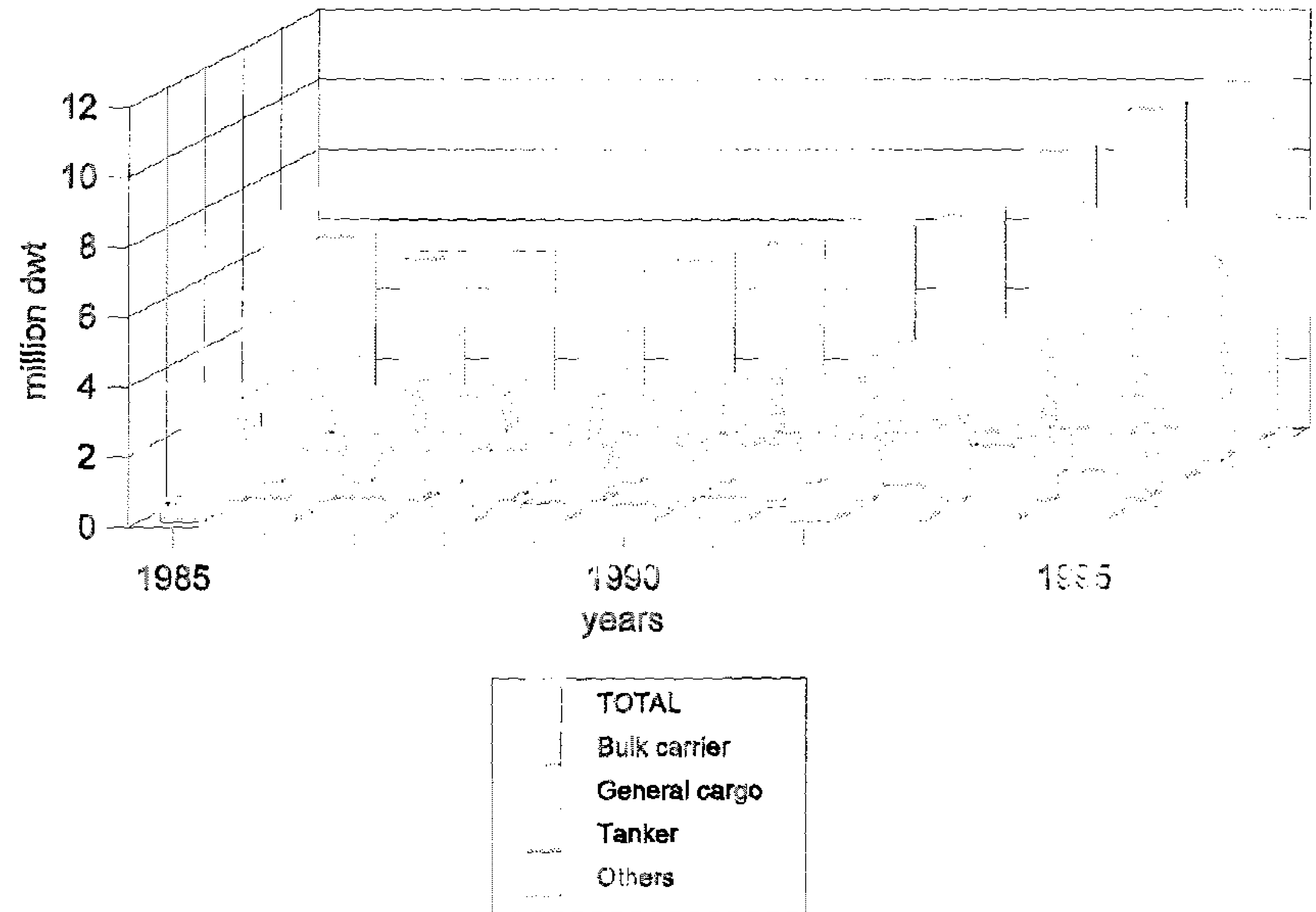
Table 3: The distribution of the Turkish merchant fleet between 1985-1995 (million dwt)

Vessel type	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
General cargo	1.27	1.31	1.39	1.39	1.34	1.34	1.37	1.34	1.40	1.47	1.46
Bulk carrier	1.78	1.92	1.84	1.74	1.79	2.27	2.40	2.72	3.84	4.27	5.76
Container	0	0	0.01	0.01	0.01	0	0	0	0	0.01	0.02
OBO	0.36	0.52	0.52	0.29	0.38	0.38	0.53	0.53	0.80	0.96	1.04
Tanker	2.29	1.37	1.38	1.38	1.53	1.56	1.56	1.78	2.08	1.67	1.70
Ro/Ro & Ferry	0.02	0.02	0.02	0.03	0.03	0.02	0.03	0.04	0.03	0.09	0.14
Others	0.09	0.09	0.08	0.07	0.09	0.07	0.08	0.09	0.11	1.03	0.19
Total	**5.81**	**5.23**	**5.24**	**4.91**	**5.17**	**5.64**	**5.97**	**6.50**	**8.26**	**9.50**	**10.31**

Sources: Chamber of Shipping (1995a);
Chamber of Shipping (1996a);
Chamber of Shipping (1996c).

The capacity of the Turkish merchant fleet reached 10.31 million dwt with 1142 vessels by 31 December 1995 (Table 3 and Figure 6) (Chamber of Shipping, 1996a; Chamber of Shipping, 1996c). The distribution of the Turkish merchant fleet by vessel type, tonnage and number of vessels, by 31.12.1995, is listed in Table 4. Regarding vessel types and tonnages listed in Table 4, the percentages of the vessel types of the total dwt of the Turkish merchant fleet in 1995 are illustrated in Figure 7.

Figure 6: The distribution of the Turkish merchant fleet (1985-1995)



Sources: as Table 3.

Table 4: The distribution of the Turkish merchant fleet (31.12.1995)

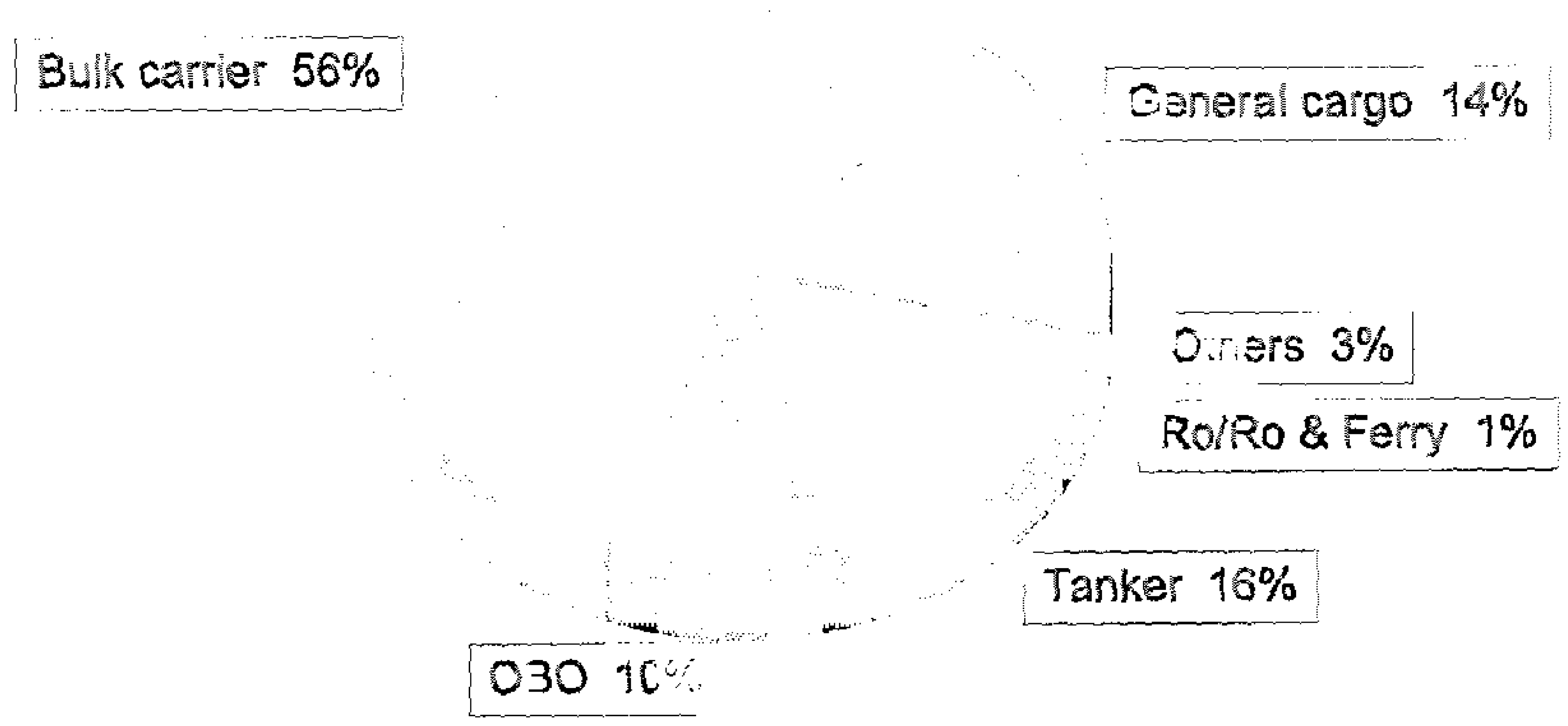
Vessel types	Tonnage (million dwt)			Number of vessels		
	[illegible]	[illegible]	Total	[illegible]	[illegible]	Total
General cargo	0.58	0.87	1.45	107	368	475
Bulk carrier	5.67	0.09	5.76	151	6	157
OBO	1.04	0	1.04	9	0	9
Tanker	1.58	0.12	1.79	35	64	99
Ro/Ro & Ferry	0.13	0.01	0.14	28	9	37
Others	0.13	0.09	0.13	121	244	365
TOTAL	**9.13**	**1.18**	**10.31**	**451**	**691**	**1142**

Source: Chamber of Shipping (1996c).

The total capacity of the fleet increased by 7% and reached 11 million dwt with 1153 vessels by 30 June 1996 (Lloyd's List, 1996f). The Turkish merchant fleet was placed 17th in the world merchant fleet with 1.4% in 1994 and was the 18th (1.5%) by the end of 1995 (Chamber of Shipping, 1996a). The size of the Turkish fleet is forecast to be 20 million dwt by 2000 with most of the expansion planned to be financed through foreign banks, as noted by Mr.Cerrahoglu, the former Chairman of the Assembly of the Chamber of Shipping

(Lloyd's Ship Manager, 1995b).

Figure 7: The percentages of the vessel types as the total dwt of the Turkish merchant fleet (31.12.1995)



Source: as Table 4.

The average age of the Turkish merchant fleet was approximately 18.4 years in 1995 and is more than the average age of the world fleet (Chamber of Shipping, 1996b). The distribution of the Turkish merchant fleet by age groups and tonnage by the end of 1995 is listed in Table 5. The percentages of the age groups for the tonnages are illustrated in Figure 8. There are 401 vessels between 0-14 years, 403 vessels between 15-24 and 338 vessels of 25 years and over (Chamber of Shipping, 1996a). The average age of the Turkish merchant fleet is 17 years at present (Lloyd's List, 1996f).

2.3.2. Turkish seaborne foreign trade

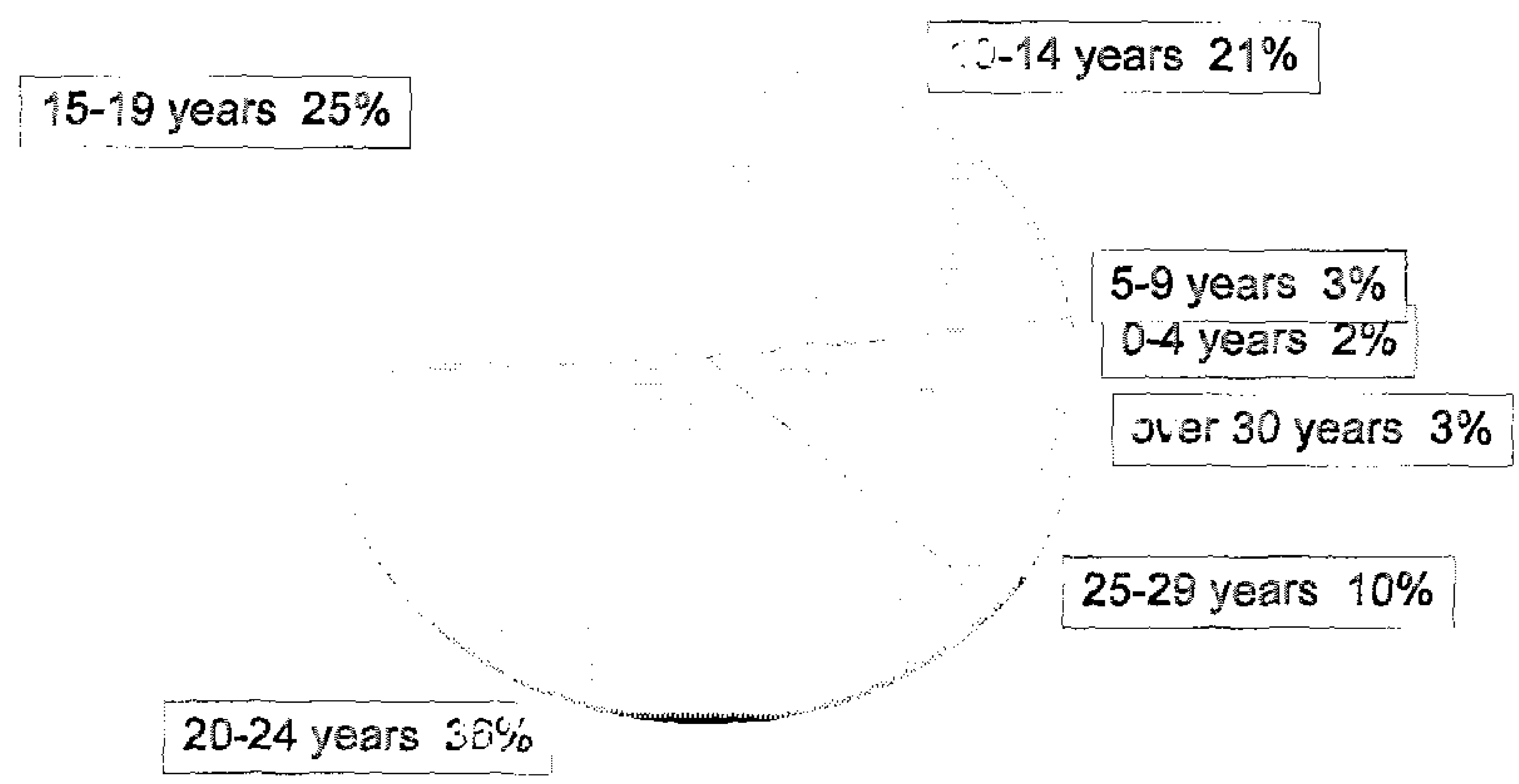
Turkish foreign trade increased from 47.1 million tons in 1985 to 85.5 million tons in 1994.

Table 5: The age groups of the Turkish merchant fleet (31.12.1995)

[illegible]	[illegible]	Tonnage [illegible]
0-4	81	0.18
5-9	127	0.33
10-14	193	2.19
15-19	199	2.61
20-24	204	3.72
25-29	146	1.03
over 30	192	0.25
TOTAL	**1142**	**10.31**

Source: Chamber of Shipping (1996).

Figure 8: The percentages of the age groups for the tonnages of the Turkish merchant fleet (31.12.1995)



Source: as Table 5.

The total value of Turkish foreign trade doubled from 21.3 billion US dollars in 1985 to 41.4 billion US dollars in 1994 (Union of Turkish Chambers, 1994). The annual growth of Turkish foreign trade, between 1985-1994, is listed in Table 6.

The total amount of goods carried by maritime transport for foreign trade in Turkey was 41.17 million tons in 1985 with 11.46 million tons of exports and 29.71 million tons of imports. The total amount of goods carried by maritime transport reached 82.98 million tons in 1993, but dropped to 74.74 million tons in 1994 (Chamber of Shipping, 1995a). This amount increased again to reach 84.18 million tons in 1995 (Chamber of Shipping, 1996d). The development of sea transport in Turkey between 1985-1995 is listed in Table 7 and is illustrated in Figure 9. The total amount of goods carried by vessels with Turkish and foreign flags is also listed in Table 7 and illustrated in Figure 10. It is clear from the same table and figure that approximately 95% of Turkish foreign trade is carried by sea transport to and from Turkey.

Total of exports in Turkish foreign trade carried by vessels with Turkish and foreign flags is listed in Table 8. The total amount of export goods carried by Turkish flag vessels was 2.45 million tons in 1985 and reached 7.96 million tons in 1995. In addition, total imports in Turkish foreign trade carried by the vessels with Turkish and foreign flags are listed in Table 9. The total amount of import goods carried by Turkish and foreign flag vessels was 15.83 million tons in 1985 and reached 27.20 million tons in 1995.

The total amount of freight income received from the carriage by Turkish flag vessels between 1985-1989 was approximately US$ 3.2 billion. However, the total amount of freight rates paid for the carriages by foreign flag vessels during the same period was approximately US$ 5 billion (Tez, 1992a).

Table 6: Annual growth of the Turkish foreign trade between 1985-1994

Year	Total amount (million tons)			Total value (billion US$)		
	Export	Import	Total	Export	Import	Total
1985	13.79	33.33	47.12	9.96	11.34	21.30
1986	13.22	35.59	48.81	7.46	11.10	18.56
1987	14.26	45.55	59.81	10.19	14.16	24.35
1988	21.89	46.30	68.19	11.66	14.34	26.00
1989	17.42	47.17	64.59	11.62	15.79	27.41
1990	18.65	50.89	69.54	12.96	22.30	35.26
1991	23.74	47.61	71.35	13.59	21.05	34.64
1992	26.05	50.57	76.62	14.72	22.87	37.59
1993	21.60	65.50	87.10	15.35	29.43	44.78
1994	28.58	56.89	85.47	18.11	23.27	41.38

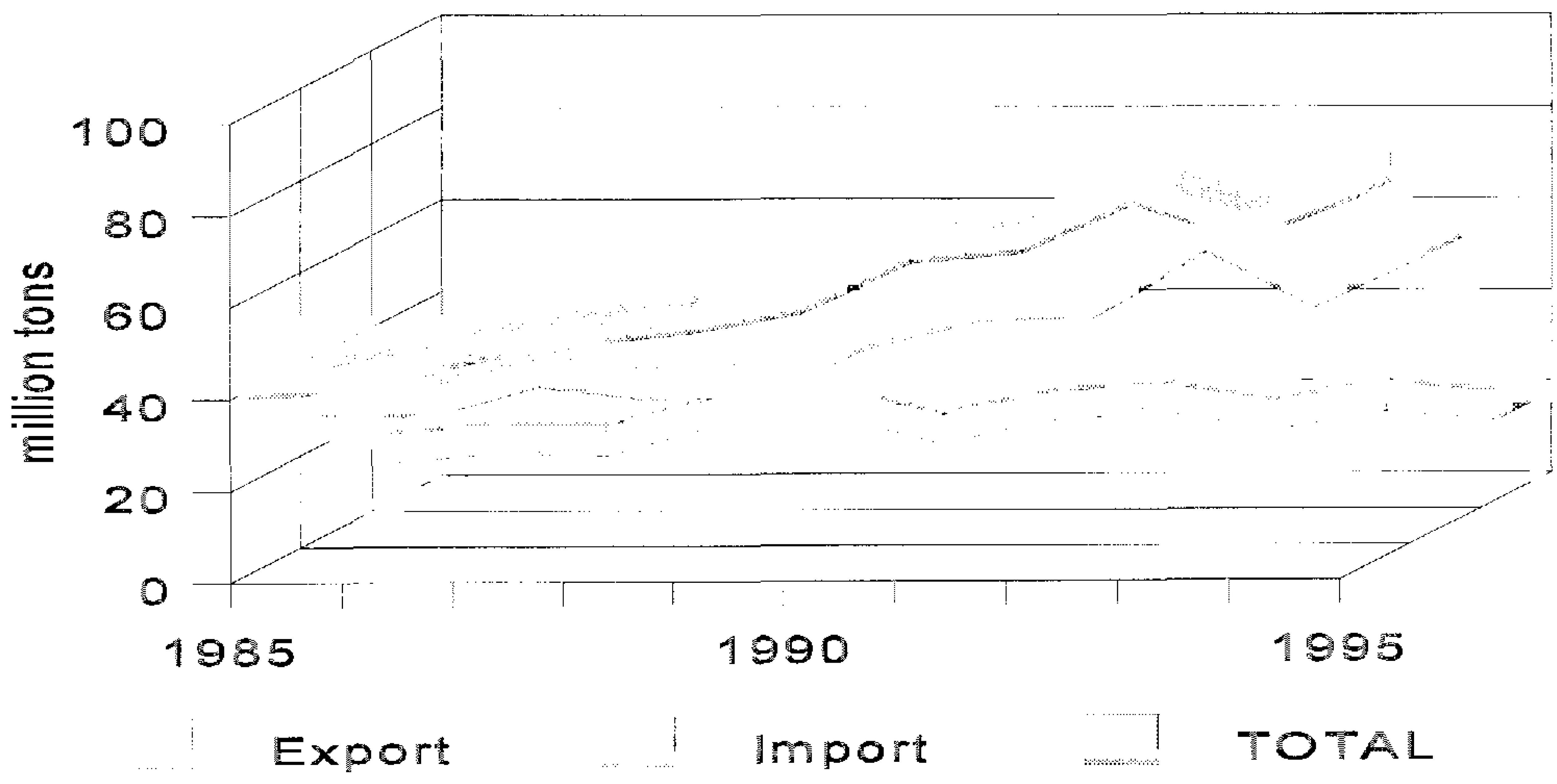
Source: Union of Turkish Chambers (1994).

Table 7: The development of the Turkish sea transport between 1985-1995 (million tons)

Year	Export	Import	Total	Carriage by Turkish flag vessels	Carriage by foreign flag vessels
1985	11.46	29.71	41.17	18.28	22.89
1986	13.39	29.03	42.42	17.65	24.77
1987	12.94	35.59	48.53	21.02	27.51
1988	19.71	32.81	52.52	19.70	32.82
1989	21.53	33.67	55.20	20.59	34.61
1990	15.24	43.88	59.12	22.31	36.81
1991	20.34	49.89	70.23	22.71	47.52
1992	21.92	50.50	72.42	29.54	42.88
1993	18.10	64.88	82.98	33.49	49.49
1994	22.11	52.63	74.74	36.99	37.75
1995	20.17	64.01	84.18	35.16	49.02

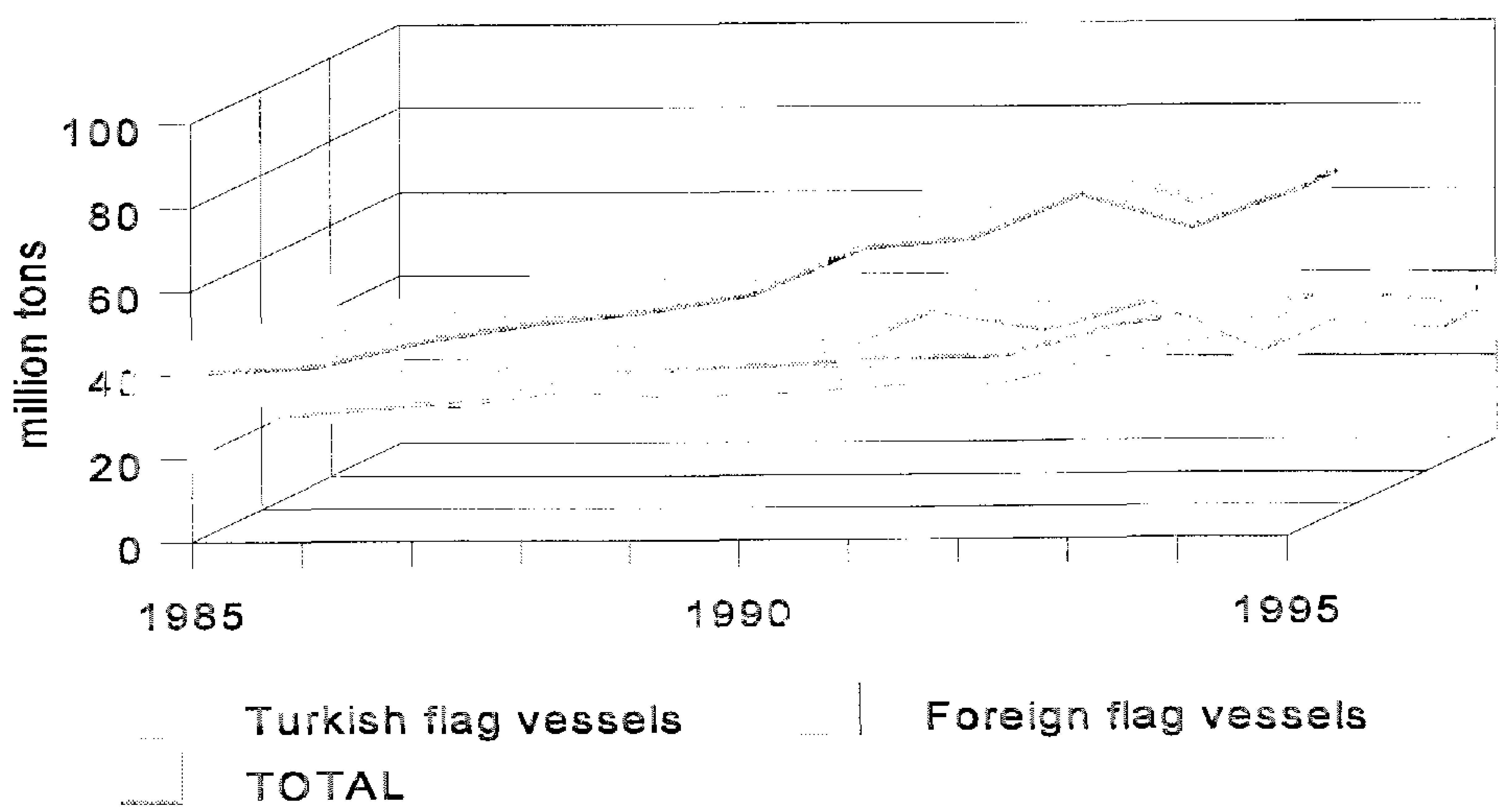
Sources: Tez (1992a);
Chamber of Shipping (1995a);
Chamber of Shipping (1995c);
Chamber of Shipping (1995d);
Chamber of Shipping (1996a);
Chamber of Shipping (1996b);
Chamber of Shipping (1996d).

Figure 9: Turkish foreign trade carried by sea transport between 1985-1995



Sources: as Table 7.

Figure 10: The distribution of Turkish foreign trade carried by Turkish and foreign flag vessels (1985-1995)



Sources: as Table 7.

Table 8: Total exports carried by the Turkish and foreign flag vessels between 1985-1995

(million tons)

Year	Export by Turkish flag vessels	Export by foreign flag vessels	Total export
1985	2.45	9.01	11.46
1986	4.66	8.73	13.39
1987	4.36	8.59	12.95
1988	5.02	14.69	19.71
1989	5.23	16.30	21.32
1990	4.72	10.52	15.24
1991	6.03	14.32	20.35
1992	8.29	13.63	21.92
1993	8.63	9.47	18.10
1994	10.50	11.61	22.11
1995	7.96	12.21	20.17

Sources: Chamber of Shipping (1995a);
Chamber of Shipping (1996d).

Table 9: Total imports carried by the Turkish and foreign flag vessels between 1985-1995

(million tons)

Year	Import by Turkish flag vessels	Import by foreign flag vessels	Total import
1985	15.83	13.88	29.71
1986	13.02	16.01	29.03
1987	16.66	18.93	35.59
1988	14.69	18.12	32.81
1989	15.36	18.31	33.67
1990	17.59	26.29	43.88
1991	16.68	33.21	49.89
1992	21.25	29.25	50.50
1993	24.86	40.02	64.88
1994	26.49	26.14	52.63
1995	27.20	36.81	64.01

Sources: Chamber of Shipping (1995a);
Chamber of Shipping (1996d).

2.3.3. Shipping in the Turkish economy

The Turkish maritime business is not limited to the borders of Turkey and has links with the world seas. Consequently, the maritime industry contributes highly to the Turkish economy through external relations and earning hard currency. Income was nearly US$ 3.5 billion in foreign exchange in 1994 (Chamber of Shipping, 1995a). As a point of comparison, US$ 4.2 billion was earned by the Turkish tourism industry in 1994. The income of the maritime industry reached US$ 5 billion in 1995 (Lloyd's List, 1996f) and was considered to be an important figure for the Turkish economy. It is targeted to be US$ 5 billion again for 1996 with a merchant fleet of 11 million dwt (Chamber of Shipping, 1996c).

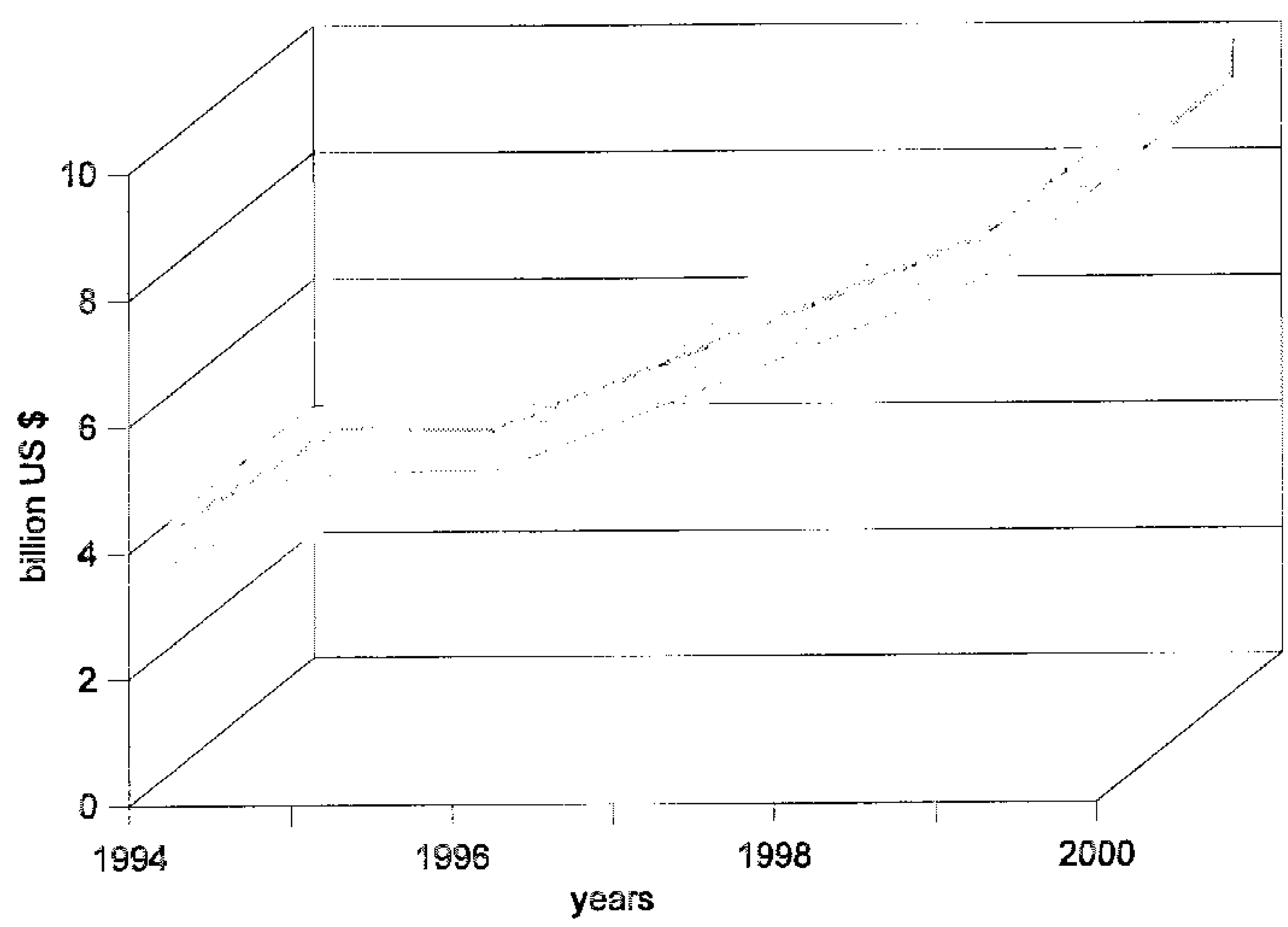
The Turkish GNP was US$ 175 billion in 1995 and the contribution of shipping to the GNP was 2.9% (Lloyd's List, 1996f). The GNP was forecast as US$ 181 billion for 1996 with the share of shipping as 2.8% (AIIB, 1996). It is forecast that the merchant fleet will reach a capacity of 15 million dwt at the end of the 1990s. The contribution of shipping to the Turkish economy is forecast to be US$ 10 billion with a merchant fleet of 20 million dwt by the beginning of 2000 (Chamber of Shipping, 1996c).

Although these indicators are of great value to Turkey as a developing country, they are insufficient in comparison with other maritime countries, such as Greece and Norway. For instance, the Greek fleet increased to 120 million dwt in 1993 bringing a total income of US$ 44 billion, which equals to 10% of the reserves of the 10 wealthiest countries in the world (Lloyd's Ship Manager, 1994b).

Many sectors were highly affected by the economic crisis in Turkey, in 1994. Various small shipping companies were also affected at the beginning of 1994 with some vessels waiting in Istanbul Bosphorus for two or three weeks looking for employment (Lloyd's List, 1994a). However, they recovered in the second half of 1994. On the other hand, none of the bigger shipowners and shipoperators were affected by the economic crisis because of operating their ships for transhipments between third countries and, thus, earning hard currency (Chamber of Shipping, 1996c).

As a consequence, a total of US$ 10 billion contribution of the shipping industry to the economy is also forecast by the Turkish Chamber of Shipping for the year 2000 as noted earlier (Chamber of Shipping, 1996f). Annual contributions of the shipping to the Turkish economy are illustrated in Figure 11.

Figure 11: Annual contributions of the shipping to the Turkish economy



Sources: Lloyd's Ship Manager (1994b);
AIIB (1996);
Chamber of Shipping (1996f);
Lloyd's List (1996f).

2.3.4. Technological structure

The total Turkish merchant fleet was 10.31 million dwt at the end of 1995 (Chamber of Shipping, 1996a) with an average age of 18.4 years (Chamber of Shipping, 1996b), which is considered an old age for a fleet.

The communication system in Turkey is a modern and an up-graded system. Although, telephone, fax and computer systems in industrialising cities have been improved, state owned shipping companies, ports and shipyards lack computerised systems. On the contrary, private shipping companies and maritime institutions are facilitated with modernised equipment.

The general condition of state owned maritime infrastructure in Turkey is fair and needs to be modernised in order to compete with the private sector on domestic and international platforms. The ports including the major ones, which are state owned ports, require more modernisation and most of them are not yet computerised as noted above (Chamber of Shipping, 1996c). For instance, the ports of Istanbul, Izmir and Mersin, which are amongst the major ports in Turkey, are also container ports. Although various container handling equipment, i.e. gantry cranes, etc. exist at these ports, this equipment is not efficiently used because of operator deficiencies (Containerisation International, 1995). The technical committee of the Undersecretariat of Shipping has been recently inspecting the small ports, harbours and quays, in order to assess them for modernisation (Chamber of Shipping, 1996f).

The infrastructure feeding the ports from hinterlands in Turkey, e.g.roads and railways, needs to be modernised and improved because of the increasing demands in bigger cities, Istanbul and Izmir, in particular.

The traffic at the Straits of Istanbul, connecting the Black Sea and the Sea of Marmara, has been very busy for many years and the traffic needs to be controlled closely in order to prevent collisions at sea (Chamber of Shipping, 1996c). Therefore, sea traffic in the straits of Istanbul will be controlled by electronic equipment installed along the straits. These proposed impovements are currently under tender action (Chamber of Shipping, 1996f).

The ferry ports, in Turkey, that provide services for ferry operations in the Italy-Greece-

Turkey corridor are the Ports of Izmir, Cesme, Marmaris and Antalya. All of these ferry ports are operated by Turkish State Railways. The rest of the ferry ports in Turkey are operated either by the Turkish Maritime Organisation or Turkish State Railways (TML, 1993). The positions of the ferry ports of Izmir and Antalya are similar to each other, while the ferry ports of Cesme and Marmaris are similar to each other. The ferry port of Izmir is situated at the centre of the city and exhibits a big volume of traffic.

The total area of the ferry quay and passenger terminal are considered to be too small for the potential ferry operations (Tez, 1992b). However, the port of Antalya has no connections with the railways. On the other hand, the ferry port of Cesme is situated in a better place compared to the ferry port of Izmir, with a lesser amount of traffic and wide aprons for cars and passenger. The passenger terminal of the ferry port of Cesme is also small for the potential passengers, however, it is new (Chamber of Shipping, 1988; Tez, 1992b). The Port of Antalya is also important for seaborne exports (TML, 1993).

As a consequence, it is necessary for the state owned Turkish shipping companies, ports and establishments to innovate and improve their technological facilities in order to compete in the free market conditions. In particular, the major ferry operator, Turkish Maritime Lines, needs to have more advanced and modernised computer systems and equipment. On the contrary, the private side of the industry has access to more advanced and modernised technological facilities and equipment.

2.3.5. Organisational and managerial structure

This section concerns the relationship between maritime companies such as shipowners, shipoperators, shipbuilders, maritime institutions, private and state owned maritime establishments and government departments.

Since there is no Ministry of Shipping in Turkey, the Turkish maritime industry was managed and controlled either by the Ministry of Transport or Undersecretariat of State Ministry for Shipping until 1996. After the establishment of the new coalition Government in 1996, the Turkish maritime industry has started to be controlled and managed by the Undersecretariat of Shipping directly under the Prime Ministry. Unfortunately, various shipping related state companies, such as Turkish Maritime Lines and Turkish Cargo Lines of the Turkish Maritime Organisation, Turkish State Railways, etc., are controlled by up to ten different ministries (Chamber of Shipping, 1996a; Tez, 1992a). Therefore, a lack of communication, decision making and information feedback are the main problems arising from this situation.

The majority of the Turkish shipping sector lies within the private sector, particularly, ship owners and ship operators and, consequently, most of Turkish ship owners, ship operators and shipyard owners have no direct political impact upon shipping organisations. Their indirect political impact tends to occur through the Chamber of Shipping (Chamber of Shipping, 1996c). The chairman and members of the Board of Chamber of Shipping are the ship owners and ship operators. Their main indirect impact upon shipping organisations in the political sphere is to support the establishment of the Ministry of Shipping (Observation, 1996).

Most of the ports are owned and operated by state organisations in Turkey. Some of them belong to the Turkish Maritime Organisation and the biggest eight ports are owned by Turkish State Railways (TML, 1993). However, shipoperating companies and maritime organisations in Turkey usually belong to the private sector. For instance, among 108 ship operators, only five of them are state owned companies, which are Turkish Maritime Organisation, Turkish Cargo Lines, Turkish Maritime Lines, Petrol Ofisi and Turkish-Libyan joint Maritime Transport Stock Co. (Fairplay, 1995; TML, 1993). The Turkish Maritime Organisation is the owner of Turkish Cargo Lines and Turkish Maritime Lines as noted earlier. Additionally, among 21 shipbuilding companies, only one of them is a state owned company, which is the Turkish Shipbuilding Industry Inc. operating four shipyards, and it is still under privatisation action (Fairplay, 1995).

There are 14 maritime organisations in Turkey and all of them are privately owned (Fairplay, 1995) e.g. Chamber of Shipping, Mersin Chamber of Shipping, Turkish Shipbuilders' Association, Turkish Shipowners' Association, Turkish Maritime Education Foundation, etc..

Since most of the shipping companies and organisations in Turkey are privately owned, management is based on a highly competitive market with the dynamism of a free market. Turkey is taking steps to progress privatisation since the beginning of the 1990s (Seatrade, 1994). However, the government is slow at taking further steps because of political and bureaucratic problems. It is accepted by the Turkish shipping community that the industry will benefit from privatisation of the state owned ship operator and ship owner company, Turkish Cargo Lines (LSM, 1994b) and some of the major ports and major shipyards located in Istanbul and Izmir (Tez, 1992a). Turkish Cargo Lines, as the of the major shipping companies, is much slimmer compared with its situation during the beginning of the 1990s after selling its older ships. However, the currently operated vessels need refurbishment and modernisation. This state owned company cannot contribute to the economy of the country given its current situation (LSM, 1994b).

The managerial organisation of the state owned maritime companies suffers from heavy bureaucracy and decision making rests with the top management and thus contrasts with the traditional private shipping family companies (Interview, 1996). In addition, decision making and responsibility are shared amongst top management, company staff and workers at recently established private shipping companies.

It is obvious that there is a great difference between the state owned and private maritime establishments in Turkey. The state owned departments and companies reflect the bureaucratic problems mainly caused by shared responsibility and decision making between different ministries. Therefore, the establishment of a Ministry of Shipping should reduce the organisational and managerial problems. On the contrary, organisational and managerial issues of private shipping companies matches the dynamic free market conditions where high levels of competition takes place.

As a consequence, the state owned shipping companies, which are on the government list for privatisation action, have various competition problems in the market that stem from organisational and managerial problems while the private shipping companies compete with each other in the dynamic free market; some of them even have foreign joint partners.

2.3.6. Legal issues

The first law related to shipping in Turkey was issued in 1864, as a translation from the shipping issues of French Trade Law. However, these were substituted by the shipping issues of German Trade Law in 1929. These issues from German Trade Law were adopted by the Turkish Trade Law for shipping (Kalpsuz, 1980). Additionally, issues related to ship registration and flags were adopted from German Trade Law dated 1899. The shipping issues of Turkish Trade Law were updated and revised, in 1957, by adopting the shipping issues of German Trade Law, that were updated and revised in 1956 (Kender and Cetingil, 1992).

Sources of Turkish Shipping Law are the Turkish Trade Law and various by-laws, regulations and international agreements. They are listed as follows (Ministry of Transport, 1992; Kender and Cetingil, 1992; Kalpsuz, 1980):

(1) Laws: The main source of Turkish Shipping Law is the "Shipping" section of Turkish Trade Law. Subsections of this law are related to vessels, operators, captains, passengers, shipping agreements and accidents at sea. These are listed as the laws of cabotage, labour at sea, protection of life and goods at sea, ports, vessels, coast guard and environment.

(2) By-laws: The ones related to shipping are the by-laws of ship registration issue, flagging, measuring the tonnages of commercial ships, seafarers, carrying dangerous goods by commercial ships and loading limits of commercial ships.

(3) Regulations: These are the regulations for selling a Turkish commercial ship for buying a new one, subsidies on Turkish shipping and shipbuilding, pilotage and trade on coasts and borders.

(4) International Agreement: The international agreements that Turkey signed are listed below:

- Brussels Agreement, dated 1910 and revised in 1967, related to life saving at sea.
- Brussels Agreement, dated 1924, related to bills of lading. This agreement was substituted by Hamburg Regulations, dated 1978.
- London Protocol, dated 1984, related to loss due to fuel pollution at sea.
- London Agreement for safety of life at sea (SOLAS), dated 1974. Turkey decided to adopt the agreement in 1980.
- Agreement of London International Loading Limits, dated 1966.
- International Agreement for Prevention of Marine Pollution (MARPOL), dated 1973. Turkey approved this agreement in 1990.
- Athens Agreement, dated 1974, related to carrying passengers and luggages by sea transport.
- International Agreement for training, certificating and standards of shifting

of seafarers (STCW), dated 1978. Turkey signed this agreement in 1989.

- Agreement for International Marine Communication via Satellites (INMARSAT), dated 1978. Turkey signed this agreement in 1989.

There have been a number of laws, by-laws, regulations and agreements in Turkish Maritime Law that can be considered to be directly and indirectly related to liner ferry operations. Regarding the above sources, Turkish Trade Law, law of protection of life and goods at sea and Athens Agreement for carrying passengers and luggage by sea transport are directly related to passengers and ferries. One of the subsections of Turkish Trade Law is related to the rights of passengers. Details of this subsection consist of rights of passengers, to cancel the tickets, the rights of carrying luggage, to be compensated due to various events, such as war, natural disasters, etc.

The laws and by-laws that have an indirect relationship, in general, with ferry operations are listed as follows: law of transport substructures, law of development of shipping fleet and subsidies for ship building facilities, law of subsidies for tourism, law of environment, law of general status of Turkish State Railways, that operate and control the main ports, law of general status of Turkish Maritime Organisation, by-law of the subsidy and development policy for Turkish shipping and ship building, by-law of the application of the law of development of shipping fleet and subsidies for ship building facilities, by-law of the Maritime Treatment between Turkey and Italy, by-law of the subsidy and development of the Turkish shipping fleet (Ministry of Transport, 1992).

A new regulation called "Line permit" was issued by the Undersecretariat of Shipping in 1996 adopting a policy to raise standards of ferry services in the international lines (Hurriyet, 1996a). This regulation was issued in particular to the ferry services in the Italy-Greece-

Turkey corridor in the Eastern Mediterranean market place because of various recent problems, i.e. operating out-dated ferries by taking the benefit of this growing ferry market.

It is obvious from the above that there are various laws and by-laws both directly and indirectly related to the Turkish maritime industry. However, it is widely considered that these are very general and not detailed. Therefore, new legislation needs to be issued for the shipping industry, specifically for the ferry sector (Undersecretariat of Shipping, 1996a) as a growing and a developing sector which has gained in importance after the 1990s.

As a consequence, the Turkish maritime industry continues to be a significant industry for the economy of the country. Turkish maritime companies plan to gain more recognition and competitive power all over the world whilst it is targeted for shipyards and certain ports to be privatised to achieve more productivity and efficiency. It is also a feature of the Turkish maritime industry to develop a ferry sector with greater market share, particularly in the Mediterranean to benefit from the dynamism of the market. The recent development of the ferry industry in the Eastern Mediterranean and accordingly, the Turkish passenger ferry industry in this market area will be reviewed in the following sections after analysing maritime policies.

2.4. TURKEY AND THE EUROPEAN UNION

Turkey has been an associate member of the European Union (EU) since the signing of the Ankara Agreement in 1963. Despite the passage of thirty four years, economic relations between Turkey and the EU are far from the intended level.

In 1980, Turkey presented a direct application for full membership of the Union. The application was considered in detail by the EU in 1987 (LSM, 1994b). However, it was decided by the EU that although Turkey was eligible for application, there were still major problems related to the Turkish economy and the political difficulties between Greece and Turkey caused because of the Cyprus situation and the proposed 12-mile continental shelf in the Aegean Sea (LSM, 1994b; Ozkan, 1995; Milliyet, 1996). Although Greece and Turkey are NATO allies (Lloyd's List, 1996d), tension between these countries has risen from time to time because of their claim over approximately 1000 rocky islets in the Aegean Sea (Lloyd's List, 1996a; Lloyd's List, 1996e). Thus, the application was suspended and shelved by the Community in 1989 until the unforeseeble future (Financial Times, 1994). Turkey is grouped with Cyprus and Malta for possible accession to the Union, as a group, in the early 2000s after the possible accession of Czech Republic, Hungary, Poland and Slovakia (Understanding Global Issues, 1993).

The associate membership experience of Turkey has proved to be unsatisfactory in comparison with full accession to the Union. Particularly, the restrictions on Turkey's textile exports and the cancelled prospects of free movement of workers in the EU were dissapointing experiences for Turkey in the 1980s. On the other hand, Turkey postponed the planned reductions of its customs duties on imports originating from the EU during the same period.

During 1989-1990, Turkey was one of the countries which conflicted with the Union over anti-dumping and anti-subsidy issues (Izmir Chamber of Trades, 1994). EU policy is that the export prices of the products imported into the Union should not be less than the price in the domestic market. The export commodities of Turkey under anti-dumping and anti-subsidy rules were textile products, iron and steel products, glass and some electronics. Furthermore, Turkey signed another agreement with the EU, in 1990, called the Multifibre Agreement, which concerns quotas on textiles. The Union placed quotas upon two thirds of its textile products' imports from third countries with whom this agreement was signed.

A Euro-Mediterranean partnership in the energy sector was adopted by a declaration at Barcelona Conference on 27-28 November 1995 (EC News, 1996a). Various political, economic and social principles were set out for relations between the EU and Mediterranean countries represented by Algeria, Cyprus, Egypt, Israel, Jordan, Lebanon, Malta, Morocco, Palestinian Authority, Syria, Tunisia and Turkey. The objectives of the Conference that were set for the partnership were as follows (Commission of the EC, 1996d):

- Accelerating sustainable socio-economic development,
- Improving the living conditions of people, increasing employment level and reducing the development gap in the Mediterranean region,
- Encouraging regional cooperation and integration.

As a consequence of these general objectives of the Conference, cooperation was strengthened and focused particularly in the field of energy sector (EC News, 1996a; EC News, 1996b).

Turkey's participation in Leonardo, Socrates and Youth for Europe programmes in the field of education, training and youth was adopted by the decision of the Commission of the European Communities on 13.05.1996. The decision comprises a cooperation and exchange programme between the academic staff, students and young people of Turkey and the EU countries (Commission of the EC, 1996e). The budget of the programme is ECU 375 million, which includes 100% grants for various projects in this field.

2.4.1. Economic relations

A major development in the EU affecting the Turkish economy has been the Union's southeastern enlargement in the Mediterranean during the beginning of the 1980s. The impact of this enlargement on the Turkish economy for exports reveals that Turkey has to compete with Greece and Portugal, particularly, in textiles. In addition, Spain seems to be a much more important competitor in agricultural products, such as vegetables and fresh fruit (Togan *et.al.*, 1987). Turkey has a comparative advantage vis a vis the EU in textiles, leather, vegetables, fresh fruit, prepared foodstuffs and glass (LSM, 1994b; Yalcintas, 1996).

The total foreign trade volume of Turkey was \$35.26 billion in 1990 and \$57.34 billion in 1995. The total volume of foreign trade with the EU was \$16.26 billion in 1990 and the same amount increased by 72% to \$27.94 billion in 1995 (SIS, 1996) as illustrated by Table 10 and Figure 12. Additionally, total foreign trade with the EU was 46.1% of total Turkish foreign trade in 1990. This percentage increased to 48.7% in 1995.

Table 10: Total volume of the Turkish foreign trade with the EU

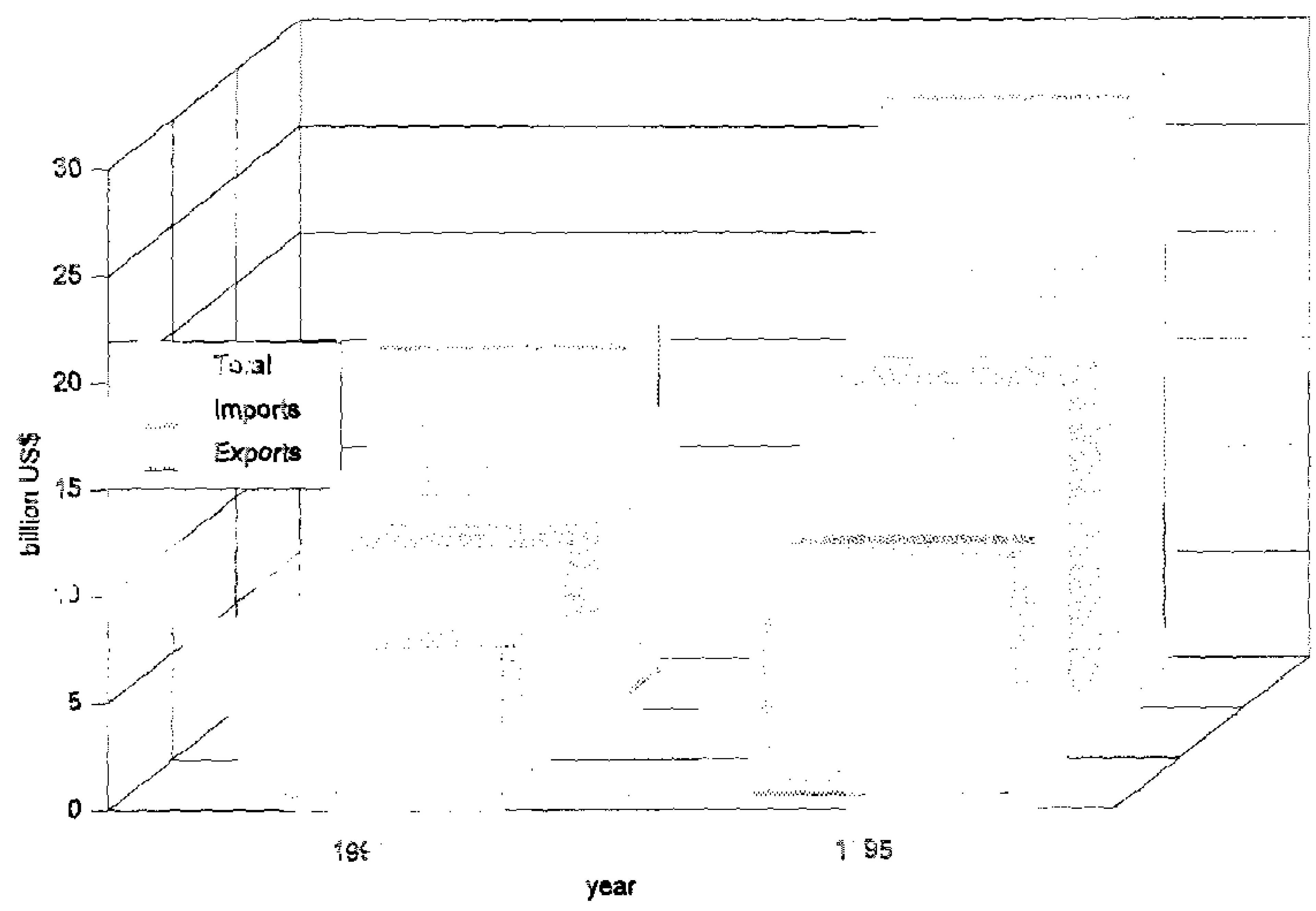
(billion US\$)

Year	Exports	Imports	Total	% of total Turkish foreign trade
1990	6.91	9.35	16.26	46.1%
1995	11.08	16.86	27.94	48.7%

Source: SIS (1996).

Total exports from Turkey to the EU countries was US\$ 11.08 billion (See Table 8) which was 51% of total exports - US\$ 21.7 billion - in 1995 to the other countries, i.e. OECD countries, Islamic countries, Middle Eastern countries, Gulf countries, North African countries, OPEC countries and other European countries (ATIB, 1996a). Similarly, total amount of imports from the EU countries was US\$ 16.86 billion which was 47% of total imports - US\$ 35.7 billion - in 1995 (ATIB, 1996a).

Figure 12: Total volume of Turkish foreign trade with the EU (billion US$)



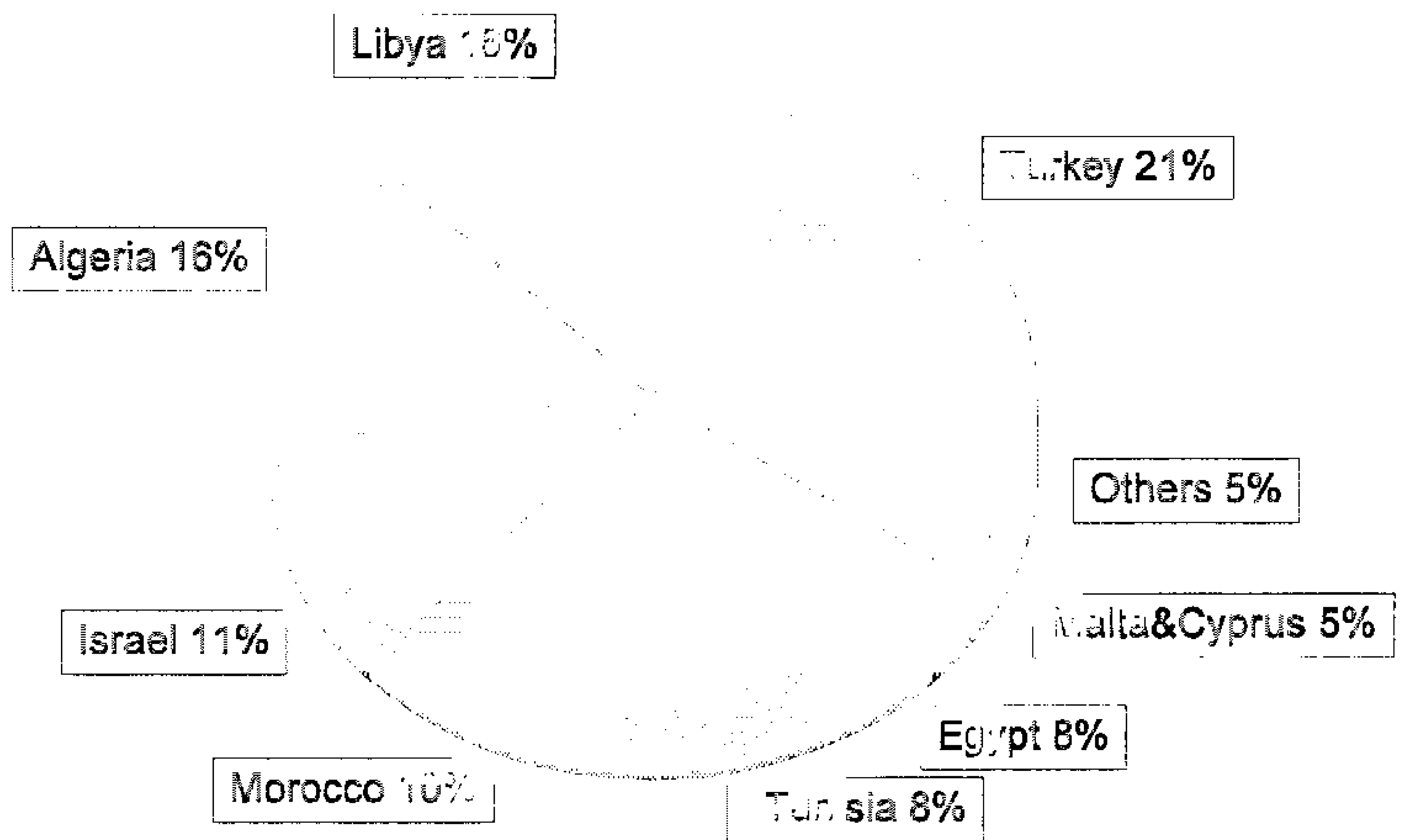
Source: as Table 10.

On the other hand, the foreign trade balance of the EU with the Middle and East European countries was a surplus of ECU 1 billion in 1990 and ECU 6.4 billion in 1994. The foreign trade balance of the EU with non-EU countries was a deficit of ECU 41 billion in 1990 and foreign trade was approximately balanced in 1993 and in 1994.

Similarly, the same balance with Mediterranean countries was a deficit of ECU 0.5 billion in 1990, a surplus of ECU 12.1 billion in 1993 and ECU 9.4 billion in 1994 (EC News, 1996c). 21% of the imports of the EU among Mediterranean countries was from Turkey and Turkey was the most prominent country that the EU imported goods from in that year as illustrated by Figure 13.

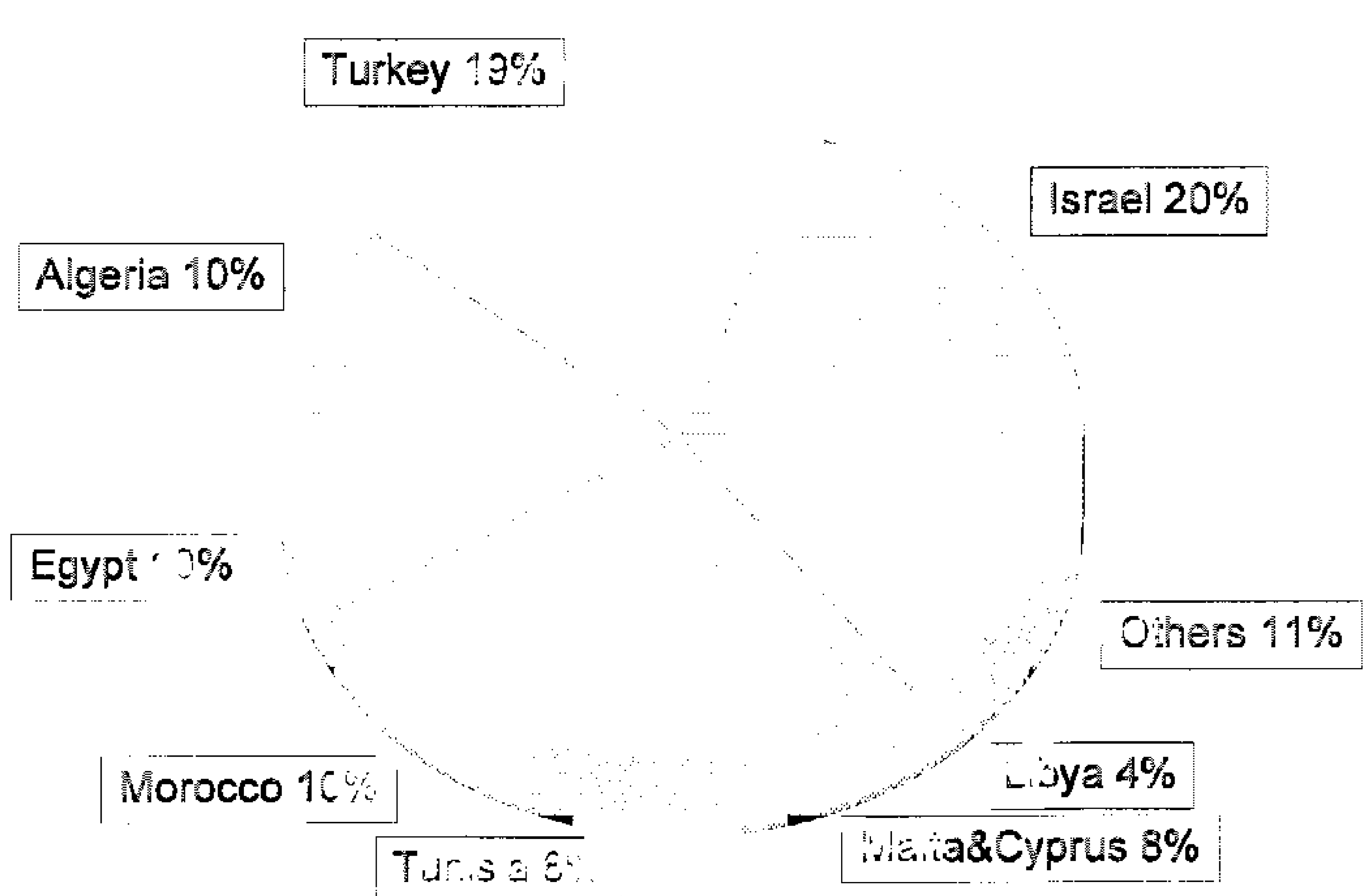
19% of exports of the EU were to Turkey among the Mediterranean countries in 1994 (EC News, 1996c). Turkey was the second country after Israel that the EU exported to in that year as illustrated by Figure 14.

Figure 13: Percentages of the total imports of the EU from the Mediterranean countries



Source: EC NEWS (1996c).

Figure 14: Percentages of the total exports of the EU to the Mediterranean countries



Source: EC NEWS (1996c).

2.4.2. Customs Union

A common foreign trade policy of the Union has a specific importance both for its Member Countries and for third countries. This policy was described in detail in Article 113 of Treaty of Rome, which was signed on 25 March 1957. Article 113 specifies, in general, that the above mentioned policy was to become the common policy within the Union for Common Customs Tariffs and common trade policy in exports and imports of the Union, trade agreements between the Union and third countries (Commission of the EC, 1996a). Common Customs Tariffs comprise the common customs tax rates for all commodities produced out of the Union and imported by the Member States of the Union from third countries.

Turkey signed an Association agreement with the Union, in 1963, which took full effect in 1964 (Evrensel-Brown, 1991) and is called the Ankara Agreement (Commission of the EC, 1996a). Through this agreement, a policy of integration between Turkey and the Union was adopted by giving Turkey potential full membership at the end of a three-phase process (Evrensel-Brown, 1991). A preparation period started as a first stage in 1965 with the introduction of some trade preferences, i.e. agricultural exports. In 1970, a supplementary protocol was signed to define the second stage of Turkey-EEC relations between 1973-1980. This transitional period covered the basic framework of a customs union. However, the military revolution that took place in Turkey in 1980 ceased Turkey-EEC relations. After the return to democracy in the early 1980s, Turkey started to follow a developmental strategy to liberalise the economy and industrialisation. Some principles of an open-market economy were introduced in the mid-1980s and these encouraged Turkey to become a full member of the Union. However, the final period of the three-phase process of the integration of Turkey and the EU has continued and Turkey is still not ready to become a full member of the Union because of the inadequate economic and political situation (Evrensel-Brown, 1991).

On the other hand, a new momentum towards customs union was given by Sir Leon Brittan, the EU External Affairs Commissioner, during his visit to Ankara in February 1994 (Financial Times, 1994). A meeting of the Foreign Affairs Ministers of the EU Member States was held during the beginning of November 1994 to discuss Customs Union with Turkey (EC News, 1995). The approval of the Customs Union Agreement between the EU and Turkey was delayed from 19 December 1994 to 6 March 1995. It was again delayed, on 6 March 1995, but it was decided to include Turkey in the Customs Union with the approval resulting from a vote of the European Parliament on 13 December 1995 (Lake, 1996). After this positive result, the agreement for Customs Union entered into force on 31 December 1995 (Commission of the EC, 1996e). As a result, Turkey has become one of the very few non-EU country having a Customs Union with the EU.

The following are considered to be the most important points resulting from the Customs Union between Turkey and the EU (Financial Times, 1994; Intermedia Economy, 1995; EC News, 1995):

- Trade barriers shall be lifted and free movement of goods shall progress between Turkey and the EU countries.
- Consumers shall be protected by competition and anti-cartel issues compatible with EU standards. Companies shall not have the right to adjust the prices of electronics, electrical households, food, etc..
- Manufacturers shall be environment friendly by building waste treatment plants.
- Customs duties and tax rates shall be cancelled for the imports of electronics, automobiles and many other commodities.
- Turkish citizens shall have the right to pass from one EU country to another with the visa of only one Member Country.

- Turkey will be a fully democratic country by allowing more freedom of self-expression.

A decision of the EC-Turkey Association Council was adopted on 24.01.1996, which is related to the position of the Union for the Customs Union. The proper functioning of the Customs Union and freedom of trade between the EU and Turkey were ensured by the following Articles 1 and 2:

> *Article 1:* Subject to Article 2, the position to be taken by the Community in the Customs Union Joint Committee shall be adopted by the Council, acting by a qualified majority on a proposal from the Commission (Commission of the EC, 1996a).
>
> *Article 2:* The position to be taken by the Community in the Customs Union Joint Committee shall be adopted by the Commission where the said position relates to the simple transposition into the Customs Union of acts of Community law, if necessary by means of technical adjustments, or to the assessment of anti-competitive behaviour (Commission of the EC, 1996a).

There are certain obligations that Turkey has to meet. These are solving problems about terrorism, Kurdish people living mainly in the regions of East and Southeast Anatolia, human rights concerning lack of self-expression and respect for the individual, deficits in state owned companies, social insurance, patent issues, privatisation, competition issues, reducing customs duties, tax reforms including reducing tax rates on imports originating from the EU to be compatible with the Common Customs Tariffs of the EU (YENI YUZYIL, 1994; European Commission, 1995).

It is planned that Turkey should receive 375 million ECUs from the EU budget, in the following five years, under the agreement of the Customs Union. It was stated by Mr.Lake - the representative of the European Commission in Turkey - that the success of the Customs Union is a necessity both for Turkey and the EU for improved economic and political relations (Lake, 1996; EC News, 1996d). In addition, he already noted that the total trade volume between the EU and Turkey increased 80% after a year for Customs Union and Turkey became the seventh trade partner of the EU in 1996, which was the tenth in 1993 (Yeni Asir, 1996).

As a consequence, trade relations of Turkey with the EU countries play an important role on the total trades and in the economic integration of Turkey with the world trades. Therefore, speeding up the trade relations with the EU has always been a priority for Turkey (Temel, 1996). The lifting of trade barriers following the Customs Union is important for the Turkish business environment and a further milestone towards full EU membership of Turkey in the future (Financial Times, 1994). In addition, it is widely believed that further economic relations with the EU, on top of Customs Union, will bring more development and stability to the economy of Turkey. Furthermore, total foreign trade of Turkey is forecast at US$ 100 billion in 2000 after expanded economic relations with the EU, which was US$ 45 billion in 1995 (Chamber of Shipping, 1996a; Observation, 1996). Thus, further economic relations and movements in trades will affect the transport industry, and accordingly, the shipping industry.

2.5. SOME CONCLUSIONS

Turkey, being situated to the southeast of Europe, to the south of the former Soviet Union and to the northwest of the Middle East, has been one of the prominent external countries for the EU based on its strategic and geopolitical situation. Therefore, Turkey has continued to have political relations with the EU. Furthermore, Turkey has close and increasing economic relations with the Union. In addition to economic relations, a Customs Union for free movement of goods between Turkey and the EU came into effect at the beginning of 1996 as noted earlier, enabling Turkey to become one of the very few non-EU countries having a customs union with the Union.

Consequently, the relationship between the EU and Turkey, at present, is mainly based on trade and political relationships and these relationships will continue as a result of the Customs Union. As a further and major consequence, the maritime industry is widely affected as a result of the increase in the movement of goods between Turkey and the EU, with inevitable impacts upon the shipping sector as a whole and the ferry sector in particular.

On the other hand, the free market reforms introduced by Mr.Ozal in the 1980s, have led a changing period and a new stage for Turkey as noted earlier. These had various social impacts and still continue to have these impacts in this young and developing country (Shield, 1995). The liberalisation policy in the free market also affected the Turkish shipping industry, as well as other industries, such as banking, manufacturing and automotive industries. The shipping companies have been reflecting this changing and transforming stage of Turkey since the mid 1980s. Turkish shipping has developed from a traditional maritime history of the Ottoman Empire to a dynamic, growing and developing shipping industry. The shipowners were affected from the social changes, as a result of the liberalisation policy, by becoming more active and by taking a collective approach to develop and improve the industry.

As a result of the above aggregate situation, the shipping industry is highly affected by the high competitive market conditions. Consequently, the outward growing and liberalisation policies in the Turkish economy and politics, and additionally, the Customs Union with the EU, have had and will continue to have social effects in the shipping industry, because in response the Turkish shipping industry has been mainly a dynamic, rapid changing, fast developing and growing industry based on competition and free market conditions.

Additional to increasing sea transport interaction, there has also been a rapid growth and an increase in the ferry industry in the Eastern Mediterranean mainly because of the changes in the former Yugoslavia which will be explained in detail in the following chapter. Therefore, competition in ferry services and operations, particularly, in the Italy-Greece-Turkey corridor in the Eastern Mediterranean has been considerable and has gained importance since the beginning of the 1990s.

Having indicated the context for the relations between European Union and Turkey, maritime policies of the Union and Turkey and ferry services and operations in the Eastern Mediterranean market will be analysed in the following sections.

CHAPTER 3: MARITIME POLICY AND THE EASTERN MEDITERRANEAN MARKET PLACE

3.1. INTRODUCTION

The first section of this chapter attempts to analyse the maritime policies of the EU and Turkey with the purpose of placing these policies in context and with respect to each other. The chapter then goes on to attempt to review the details of the ferry sector in the Eastern Mediterranean, where Turkish and the EU operators are most active in their competition.

Recent history and the current situation of the ferry services in this area are reviewed broadly in this section. The last subsection of this section concentrates on the specific nature of passenger ferry services in Italy-Greece-Turkey corridor giving the details of the ferry lines and the ferry operators in this market place which forms our case study area.

3.2. MARITIME POLICIES

The maritime policies of the EU and Turkey are outlined below and in addition, their relations and effects on the industry are analysed and explained in the final section before attempting to examine the Eastern Mediterranean market place in detail.

3.2.1. Maritime policy of the European Union

The main objective of the European Union (EU) is the economic and political unification of Europe. The Treaty of Rome, on which the European Union was founded in 1957 as the European Community, devotes a whole section to transport. The Commission issued a memorandum, in 1961, proposing measures to unify the European market based on major principles such as free competition, free choice of transport for the user and equal treatment for all forms of transport companies (Commission of the EC, 1990).

However, shipping was mentioned only once in the Treaty of Rome as follows:

> "The provisions of the Title shall apply to Transport by rail, road and inland waterway. The Council may act unanimously deciding whether to what extend and by what procedure appropriate provisions may be laid down for sea and air transport."

An urgent need arose to clarify the position of shipping in the EU from the beginning of the 1970s. The European Council accepted freedom of employment within the Union, which was applied to seafarers in 1973. Additional to this legislation, social issues on conditions of mobility of labour and seafarers were introduced. Safety and environment issues for the control of shipping activities were also introduced. Meanwhile, the Eastern European bloc started to be considered due to the enormous number of ships that were subsidised by the state in competition with EU operators (Bredimas and Tzoannos, 1981).

However, there was no specific shipping policy of the European Union until 1974 - there were only various interpretations of the general and Transport Articles of the Treaty of Rome that applied to shipping. In 1974, it was made clear by the European Court of Justice that shipping was not exempt from the Treaty and hence a policy had to be developed.

All of the EU countries were suffering from a decline in the number of ships registered under their flags in the beginning of the 1980s. The major causes for the decline were the recession in the world, the growth of protectionist practices of other countries and the conversion of European flags into flags of convenience in order to compete in the international market by avoiding taxes and social legislation (Commission of the EC, 1985).

Shipping, as an international activity, involves trade between the Member States of the Union and third countries or only between third countries. Therefore, the maritime policy of the EU also has links with the Union's international economic and political relations with third countries as well as those of the Member States. This concept was overtly incorporated into the maritime policy of the EU.

Nothing in policy terms specifically was incorporated in the shipping sector during the period 1973-1985. The most important action of the Community in shipping was adopting in 1979 - a regulation, the "Brussels Package" which was concerned with the ratification by the Member States to the United Nations Convention on the Code of Conduct for shipping (Official Journal of the EC, 1986). The Code, which this package focused upon, came into effect in 1983 (Bredimas-Savopoulou and Tzoannos, 1990).

However, the year 1985 is considered a turning point for policy making in the EU related to the maritime industry. The European Commission submitted a policy paper related to the maritime sector, in March 1985, entitled "Communication and Proposals by the Commission to the Council on Progress towards a Common Transport Policy - Maritime Transport" (Bredimas-Savopoulou and Tzoannos, 1990).

Furthermore, a comprehensive memorandum and a set of proposals were submitted for interlinked measures supporting the sector (Bredimas-Savopoulou and Tzoannos, 1990). The Council of the Community adopted the proposed package of four maritime Regulations, as Community law, on 22 December 1986.

The European Council stated, in December 1986, that the four Regulations constituted only the first stage of the Union's maritime policy. The following are the four Regulations of

"Stage 1" that entered into force on 1 July 1987 (Erdmenger and Stasinopoulos, 1988; Farthing, 1993; Hart *et.al.*, 1993):

- Council Regulation (EEC) No.4055/86 of 22 December 1986, applying the principle of freedom to provide services to maritime transport between Member States and between Member States and third countries.
- Council Regulation (EEC) No.4056/86 of 22 December 1986, laying down detailed rules for the application of Articles 85 and 86 of the Treaty to maritime transport.
- Council Regulation (EEC) No.4057/86 of 22 December 1986, on unfair pricing practices in maritime transport.
- Council Regulation (EEC) No.4058/86 of 22 December 1986, concerning coordinated action to safeguard free access to cargoes in ocean trades.

3.2.1.1. The four Regulations

(a) No.4055/86: Freedom to provide services

This Regulation introduces the principle of freedom to provide maritime services to maritime transport between the Member States and between the Member States and third countries. It applies to nationals and shipping companies of the Member States established in the Community (Farthing, 1993). A Member State is prevented from discriminating in favour of its own shipping companies to the disadvantage of the shipping companies in another Member State regarding this Regulation (Official Journal of the EC, 1986). This Regulation does not apply to domestic trade, in other words the cabotage, of a Member State; however, it applies both to intracommunity traffic and to traffic between Member States.

(b) No.4056/86: Competition rules

This Regulation aims at the effective application of the Treaty competition rules to shipping -

Articles 85 and 86 (Greaves, 1991). Restrictions or distortions of competition that affect trade between the Member States are regulated by these articles.

This Regulation, as the most important of the four, applies to all international shipping services to and from one or more Community ports, other than tramp services. It exempts liner cargo conferences from the Treaty's provisions on restrictive practices in international maritime transport. For instance, the users must be consulted on rates for the services, conditions and quality of services on a case-by-case basis in accordance with supply and demand conditions. A balance between the interests of conferences and those of shippers are provided by this Regulation. Thus, it differentiates between the conferences operating in international open trades and those operating in closed trades within the Member States (Official Journal of the EC, 1986).

(c) No.4057/86: Unfair pricing practices

This Regulation applies to liner trades and the Community is empowered by this Regulation to impose a compensatory duty on non-EEC shipowners if the following conditions are present: there have to be unfair pricing practices of shipping lines of third countries, the EC shipowners have to be affected by these unfair pricing practices in international liner shipping, they have to cause injuries and they have to damage Community shipping. Injury to the Community shipowners covers amongst other market shares, freight rates, profits, returns of capital, investments, employment and utilisation of capacity (Official Journal of the EC, 1986).

(d) No.4058/86: Coordinated action

This Regulation provides for coordinated Community action to safeguard free access to cargoes in ocean trades. In other words, coordinated action is provided by this Regulation where third countries restrict access of EC shipping companies to ocean trades. It covers liner and bulk cargoes, tramp services, passenger transport and movement of people or goods to or between offshore installations (Official Journal of the EC, 1986).

The four regulations focus in particular on the threat to Union shipping from the protectionist policies and practices of non-Member States (Greaves, 1991). The 1986 measures were only a start and further legislation was proposed after 1986.

3.2.1.2. Post 1986 developments

As a Second Stage, in support of the European Union Shipping Policy, the Council of Ministers concluded a debate on 4-5 December 1989, which was mainly about

> "the active and consistent implementation of the Regulations adopted in 1986 should also help considerably in strengthening the competitive position of Community fleets" (MAR/89/22 Rev.1 of 12 December 1989 as referred to by Brooks and Button, 1992).

It was perceived that a policy was needed to develop a competitive and efficient shipping industry in Europe. Therefore, the Commission of the European Union submitted to the Council in 1989 various proposals complementing the four Regulations of 1986. The objectives of these proposals were to improve the operating conditions of Union shipping and to reduce the disparities in operating conditions between the fleets from Member States and non-EU competitors. The proposed three major issues of "Stage 2" consisted of the following (Greaves, 1991; Brooks and Button, 1992):

(a) Proposed EU shipping register - EUROS: The European Commission made proposals to reduce the decline in the size of the Community fleet and the employment of Community seafarers in 1989 (Commission of the EC, 1989). A proposal for a

Community shipping register (EUROS) was included for ships to be formed in parallel to the national registers (Commission of the EC, 1991). Ships registered under EUROS would carry the Union's flag as well as the country of registration. Regarding EUROS, the following were suggested (Hart *et.al.*, 1993):

- The right of transfer of EUROS-registered vessels to the register of another Member State.
- The minimum standard for a EUROS-registered vessel to be at least 500 grt.
- The conforming of seafarers' qualifications and licences to minimum requirements for the purpose of employment on EUROS-registered vessels. The minimum requirement for crewing to be for all officers and half the crew from a European country.
- The obligation of EUROS-registered vessels to fly the EU flag in addition to their national flags.
- The rights of cabotage for EUROS-registered vessels to be accorded to nationals of Member States established outside the Union and shipping companies established outside the Union and controlled by nationals of a Member State.
- The preference of carriage of food aid to be given to EUROS-registered vessels.
- Financial advantages to be made available by Member States to achieve the objectives of EUROS.

(b) Cabotage: One of the objectives of the Single European Market was the formation of Community wide cabotage. Although, some modest progress had been made in the sectors of aviation and road haulage, little had been made in shipping. The aim of the

EU was to liberalise trade within the Union, stating the following (Brooks and Button, 1992):

> "... to prevent any Member State from discriminating in favour of its own shipping companies to the disadvantage of shipping companies in another Member State."

Although the principle of freedom to provide services to maritime transport to include cabotage was proposed in 1986, the Council was unable to adopt it; however, it was agreed that further consideration should be given to such a proposal. The second proposal of the Commission was related to maritime transport services. Regarding this proposal these services would include the following (Greaves, 1991):

- The carriage of passengers or goods by sea between ports in any one Member State, including overseas departments of the State and;
- The carriage of passengers or goods by sea between any port in a Member State and installations or structures on the continental shelf of that Member State, i.e. off-shore supply services.

However, regarding the above, the Member States would be allowed to require that the ships used for those services are manned with their own nationals of the Member States. There was considerable opposition to this proposal, particularly, from the southern Member States of the EU, such as Greece, Italy, France and Spain. These Member States wished to preserve their monopoly over transport to and from their islands. Additionally, the northern Member States also opposed the idea of making cabotage conditional upon membership of EUROS.

(c) Port State Control: It was proposed that Member States should perform their obligations and ratify various international conventions in the field of safety of life at sea, protection of marine environment and standards of living and working conditions on board ships.

3.2.1.3. Recent aspects of the EU maritime policy

The maritime industry reflects the growing importance of the service sector in the economic performance of the Union. It was considered by the EU that shipping services play a vital role throughout Europe (Commission of the EC, 1996c). The most recent stage of maritime policy of the EU since 1992 is referred to as "Stage 3". The most recent issues raised by the EU in maritime policy, which also includes the blueprint of Mr.Kinnock, the EU Transport Commissioner, (Commission of the EC, 1996b), are grouped as follows:

(a) The international character of the EU shipping sector: Shipping is closely linked with other maritime industries and maritime transport is an international industry. It has few entry barriers since any operator, regardless of nationality and the location of the company, can provide international shipping services. Therefore, shipping is considered as an international and a universal, rather than a unilateral transport mode (Commission of the EC, 1996b). This fact was also underlined with the document of the Commission of the EU, "Shaping Europe's Maritime Future - A Contribution to the Competitiveness of Europe's Maritime Industries" (Commission of the EC, 1996c).

In parallel to the developments, the Maritime Industries Forum was formed in 1992 to bring together parties from all segments of maritime industry and to discuss various common problems of the industry. This forum has undertaken valuable work for the integration of the maritime industries (Commission of the EC, 1996b).

A new approach to maritime strategy and new goals to establish a common maritime purpose were introduced and solutions to the problems of competitors to EU shipping were examined in "Towards a New Maritime Strategy", issued by the Commission (Commission of the EC, 1996b). The interdependence of the maritime industry sectors and the great contribution to local economies of the large number of enterprises dealing in various sectors such as shipping, port services, multimodal transport operations, marine sources of industry and fishing were mentioned in this document. Furthermore, various areas, where industrial competition takes place, were also identified.

The important role of small and medium enterprises in economic growth within the EU was also noted in the same document and was supported by preparing the Third Multiannual Programme for Enterprises for 1997-2000. The programme focuses on the improvement of the competition between the enterprises in the maritime sector in which a cooperation betweeen the EU and Mediterranean countries is mentioned seperately (Commission of the EC, 1996c). Partnerships between shipping enterprises of the EU and the Mediterranean countries, which also includes Turkey, are encouraged in this programme, in which they were also initiated with the Euro-Mediterranean Conference in 1995 in Barcelona (EC News, 1996a). A project under the policy for cooperation between the EU and the Mediterranean countries has already started between these countries to set up a Port Control System for non-EU Mediterranean countries (Commission of the EC, 1996c).

(b) Bulk and liner shipping: Bulk and liner shipping were considered to be the two main categories of the shipping sector. The majority of the Member States' shipping interests fall into these categories. Although there are important differences in the cost of these categories, bulk shipping tends to be more labour intensive and, therefore, is sensitive to labour costs, while liner shipping is more capital intensive and, therefore, is sensitive to high network costs (Commission of the EC, 1996b).

(c) EUROS, registers and open registry: Ships are traditionally grouped under a national jurisdiction by their registered flags. The national registers of EU ships have required the crew or an important part of it to be the EU nationals. As we have seen the European Commission concluded, in 1989, that the Community fleet needs an establishment of a Community register (EUROS) for the achievement of the necessary adjustments (Commission of the EC, 1989). However, the EU Member States have relaxed these requirements by the introduction of alternative registers or by supporting their registers with State aid (Commission of the EC, 1996b). Mr.Kinnock stated in his blueprint that EUROS was to be withdrawn (Lloyd's List, 1996b). Instead, the objective is to ensure that EU flags are as attractive as possible in achieving quality shipping and thus counteract open registers which apply low tax liabilities and few requirements compared to national registers. A growing number of countries offer open registries (Commission of the EC, 1996b).

(d) Flagging out: Overall cost savings, including crew costs, tax and fiscal costs, are the main reasons for flagging out. Mr.Kinnock stated that over half of the EU owned fleet is flagged out (Lloyd's List, 1996b). It was considered that flagging out results in job losses for seafarers and lessens the control of the EU over standards for the safety of ships (Commission of the EC, 1996b). Therefore, retaining ships under EU flags would ensure safety standards.

(e) External relations: Free access and fair competition throughout a global market, including further liberalisation, was put forward by the European Commission as an important external relations policy in maritime transport (Commission of the EC, 1996b).

(f) Relations with IMO and ILO: The necessity to assist the IMO and ILO by the Commission of the EC has gained importance regarding international standards for safety and labour rules. STCW and SOLAS rules were reviewed at the recent IMO conferences. The number of EU seafarers continues to fall (Commission of the EC, 1996b). Similarly, there is a shortage of qualified seafarers whilst the number of required will increase following the introduction of the new STCW rules.

(g) Liberalisation of domestic shipping: Following protracted negotiations domestic shipping was liberalised and a regulation (3577/92) was adopted in December 1992 to apply the principle of freedom to maritime services within Member States. In addition to this regulation, which came into effect on 01.01.1993, a report was issued by the Commission of the EC (1995b) implementing this regulation. Although Regulation 3577/92 applies the freedom to provide maritime services within the Member States from the beginning of 1993, there are various exceptions to liberalisation of the shipping sector. For instance, cruise services were liberalised on 01.01.1995, while regular passenger and ferry services will be liberalised by 01.01.1999 and all services of the Mediterranean countries - Spain, Portugal, France and Italy (excluding Greece) will be liberalised by 01.01.1999. On the other hand, the traffic to and from the Greek islands will not be liberalised until 01.01.2004 (Commission of the EC, 1995b).

(h) Safe seas: A common policy on safe seas was adopted by the European

Commission in February 1993. Several measures of implementation have been adopted by both the administrations of the Member States and the private sector (Commission of the EC, 1993). Following the Regulation adopted in January 1996, only organisations meeting high quality criteria will be recognised by the EU authorities in State ports to be allowed to carry out safety and environmental inspections (Commission of the EC, 1996b).

(i) Short sea shipping: A policy on short sea shipping was adopted by the European Commission in July 1995. An action programme and various recommendations related to regional and local authorities, ports and the maritime industries of the Member States were also included in the policy (Commission of the EC, 1995a).

(j) Competition rules: The European Commission adopted an active policy to encourage competition in the liner trades to and from the Union. A Regulation was adopted, in April 1995, related to the agreements, decisions and practices between the liner shipping companies (also referred as consortia) wihin the EU (Official Journal of the EC, 1995a). In addition, Mr.Kinnock recently stated that an international agreement on standards of competition to improve the existing competition rules is being sought (Lloyd's List, 1996b).

(k) State aid: Since competition from non-EU flags has grown rapidly, many Member States have offered various kinds of State aids to shipping differing between different States. For example, some Member States have supported investment in ships, while some have given aid to the employment of EU seafarers (Commission of the EC, 1996b).

(l) Port State Control: A policy on Port State Control was adopted in July 1995 providing a legal framework through harmonised rules and criteria for ports under the control of the Member States (Official Journal of the EC, 1995b). Additionally, the principles of prevention of pollution were also adopted by the Member States within the same document.

Various regulations are compulsory for non-EU flagged vessels as well as EU flagged ones operating to and from EU ports. Port State Control shall be strengthened through operational links with non-European countries (Lloyd's List, 1996b).

(m) ISM Code: A Regulation was adopted, in December 1995, regarding shipping companies operating ro-ro/passenger ferries to or from a port of a Member State to be subject to auditing with respect to ISM Code implementation. Additionally, a certification of quality and safety management system for shore based and on board activities are also required for these companies (Official Journal of the EC, 1995c). This Regulation came into force on 1 July 1996.

Some conclusions:

As a result, the most recent maritime policy of the EU has succeeded in opening up markets, particularly in Europe. The most recent maritime policy of the EU highlighted a strategy in determining a future in shipping policy, action to ensure safety and fair competition in internationally open markets and in the Union (Lloyd's List, 1996c). The issues in the shipping sector related, in particular, to the international relationships between the EU and other countries, short sea shipping, Port State Control and the ISM Code, have important effects upon the ferry sector, which is the central topic for this research. In particular, the dynamic ferry market in the Eastern Mediterranean will be affected by the attempts stated in the Commission documents (Commission of the EC, 1996b; Commission of the EC, 1996c), which also encourages relationships between the EU and Mediterranean countries including Turkey.

In addition to the maritime policy of the EU, it is necessary to review Turkish maritime policy in the following section before analysing their relative effects on the industry and the ferry market in the Eastern Mediterranean.

3.2.2. Turkish maritime policy

Turkish maritime policy consists of both international and national policies as follows:

3.2.2.1. International maritime policies

(a) Policy in relation to the EU maritime industry: As noted above a Customs Union between Turkey and the EU came into force on 1 January 1996. Meanwhile, it is known that Turkey will not be able to enter the Union in the near future. However, there has been a general policy of improving relations with the EU in the broad field of economics and politics. As a development of this, it is also recommended by the Turkish maritime authorities that Turkey should ensure that there are no ill effects for the industry from the competition generated by the Customs Union (Chamber of Shipping, 1995a).

Specifically, the import from the EU of machinery, engine and equipment of built or repaired vessels, depends on Article no.2581 of Turkish Trade Law, which simplifies the procedure and allows tax reductions (Chamber of Shipping, 1995b). In more general terms however, the main issue of Turkish/EU maritime industrial policy is to have its rights to be protected and undisturbed in the maritime sector, while maintaining relations with third countries and sharing world market(s) including that of the EU (Chamber of Shipping, 1995b).

(b) Policy for an international ship registry: Shipowners try to avoid high taxes and achieve low costs throughout the world and as a result, open registries have been widening in their use in the world.

The impact of this flight to flags of convenience is the same for Turkish shipowners as all others. One government maritime policy in Turkey is for an international ship registry (second registry), stimulated by the annual and increasing freight payment to foreign flag vessels of approximately US$ 1.5 billion. This policy has also been strongly supported by the Turkish Chamber of Shipping (Chamber of Shipping, 1995b). However, no action has yet been taken by the Government despite many promises (Chamber of Shipping, 1995a) because of bureaucratic problems stemming from the responsibilities distributed to a number of ministries, in particular.

(c) Policy for international conferences and agreements: Turkish representatives from the maritime sector and ship operators and ship owners in particular, want their voices to be heard in the world maritime sector. One way of achieving this is to participate in international maritime conferences and agreements.

Turkey is a member of the Organisation of Economic Cooperation and Development, OECD, as noted before. The Maritime Transport Committee of the OECD was established in 1961 and deals with relations and problems in the maritime industry, between the member countries and between the member countries and the third countries. Turkey is also a member of UNCTAD within the group of OECD members

(Chamber of Shipping, 1996a). In addition, Turkey agreed and signed the conventions of SOLAS 1974 and STCW 1978 of the International Maritime Organisation (IMO).

(d) Policy for 6-mile continental shelf in the Aegean Sea: Although Greece and Turkey are NATO allies (Lloyd's List, 1996d), there has been a cold war between them for many years. Greece has stated its intention to claim the full 12-mile maritime boundary from time to time, by supporting international maritime regulations for its islands and approximately 1000 rocky islets in the Aegean Sea (Lloyd's List, 1996a; Lloyd's List, 1996e). On the other hand, the policy of Turkey has been to support a special agreement for a 6-mile continental shelf in the Aegean Sea to protect Turkish cabotage trade (Fairplay, 1994; Chamber of Shipping, 1996b).

3.2.2.2. National maritime policies

(a) Establishment of a Ministry of Shipping: Maritime affairs are controlled by various ministries in Turkey. For example, the main ports are owned and operated by Turkish State Railways, which is under the responsibility of the Ministry of Transport. Additionally, the national cargo carrier, Turkish Cargo Lines, and ro-ro / passenger ferry operator, Turkish Maritime Lines, are under the responsibility of the Shipping Undersecretariat of the Prime Ministry. Various problems arise because of bureaucracy and the spread of responsibility between the ministries and lack of communication between various authorities (Tez, 1992b). Thus, there is a recognised need for the establishment of a Ministry of Shipping to control maritime affairs under one main authority.

The Turkish Government has promised the establishment of a Ministry of Shipping strongly supported by the Chamber of Shipping. Nevertheless, very little action has been taken since the beginning of the 1990s (Chamber of Shipping, 1996a). Despite all the efforts of the Chamber, the Law on the Organisation and the Duties of the Ministry of Shipping was still not issued by the Grand National Assembly of Turkey by mid 1996 (Chamber of Shipping, 1996f). Overall, little action has been taken by the Government by changing the position of the Undersecretariat of Shipping, previously under the Ministry of State but now directly under the Prime Ministry (Chamber of Shipping, 1996e).

(b) Policy for the improvement of the Turkish merchant fleet: This policy is mainly about the improvement and development of the Turkish merchant fleet to a total of 20 million dwt by the beginning of 2000 from 10.3 million dwt at the end of 1995. Additionally, a policy has also been adopted to reduce the average age of the fleet from 17 to 13 years by building new vessels (Chamber of Shipping, 1995b). Further details of the Turkish merchant fleet were reviewed in the previous section related to the Turkish maritime industry.

(c) Financial policy: Approximately, 60% of investment in the maritime sector in Turkey is covered through capital of the shipping companies. Government subsidy in the maritime sector is approximately 10%, in general terms. A variety of loans and credits are used by shipping companies, at their own risk, for the remaining amount (Chamber of Shipping, 1995a).

Additionally, it has been agreed to establish a specialised bank in the maritime sector to match the financial demand for new investment, new shipbuilding and improvement of the merchant fleet and to solve financial problems related to these areas (Chamber of Shipping, 1995b).

(d) Privatisation of various state owned institutions: During the Prime Ministry of Mrs.Ciller between 1993-1995 proposals were made for privatisation of various state owned institutions, including banks, communications, shipyards and ports.

The biggest four state owned shipyards and the main state owned ports have been under privatisation action since 1993. Additionally, suborganisations of the Turkish Maritime Organisation are also under privatisation action. This organisation includes the operation of various ports, the national carrier Turkish Cargo Lines, and the national ro-ro and passenger ferry operator Turkish Maritime Lines as noted earlier (Seatrade Review, 1993; Lloyd's Ship Manager, 1995b).

In particular, the Turkish national carrier Turkish Cargo Lines, was selected first for privatisation as a result of a US$ 8 million profit in 1993 after several years of loss (Seatrade, 1993). The state carrier, Turkish Cargo Lines, has a preference agreement for carrying Turkish military and other government cargoes that are mainly from western Europe and the U.S.A. - 50% of government cargoes must be carried by Turkish flag vessels (Lloyd's Ship Manager, 1994b).

Turkish Maritime Lines, which is the main ro-ro and passenger ferry operator, operates national passenger ferry services, city passenger services, international ro-ro services in the Black Sea and international passenger ferry services in the Eastern Mediterranean, in the corridor of Italy-Greece-Turkey.

Turkish Maritime Organisation regularly makes heavy losses of more than US$ 20 billion each year with an excess capacity and over employment of more than 3000 people, the majority working for city passenger services (Lloyd's Ship Manager, 1994b).

Turkish State Railways operates the seven major ports in Turkey and privatisation action is in progress including the biggest container terminals at the Ports of Istanbul, Izmir and Mersin. Additionally, privatisation of the twelve secondary ports owned and operated by Turkish Maritime Organisation is also in line. It is noted that privatisation of these ports would prevent monopolisation, while competition between the ports would reduce costs and improve service quality (Chamber of Shipping, 1996e; Lloyd's List, 1996f). Although the ports are not privatised yet, port tariffs of some ports are freer since 1995 (Seatrade, 1995).

The major four shipyards in Turkey are state owned and operated by Turkish Shipbuilding Industry (TSI) and are currently under privatisation action. The output of the Turkish shipyards was approximately 68000 grt in the mid 1980s, representing 2% of the total West European merchant ship building output (Drewry, 1995). The shipbuilding industry has been partially subsidised by state funds. New building orders were particularly from shipowners of Poland, Germany, Norway, the U.K. and the Netherlands (Lloyd's List, 1996f). Additionally, new buildings have also continued for Turkish shipowners.

The potential capacity of the shipyards is considered as a minimum of 1 million dwt per year. However, Turkish shipyards utilise only 10% of their capacity producing approximately 100,000 dwt per year (Lloyd's List, 1996f; State Planning Organisation, 1996b). Losses were US$73 in 1992 and US$31 in 1993 (Lloyd's List, 1994b) and it is widely considered that productivity and efficiency at shipyards could have been better (Chamber of Shipping, 1995b).

All these state owned institutions are looking forward to being privatised. However, so far, very few steps have been taken by the Government (Chamber of Shipping, 1995b). The plans for privatisation have hit many problems with company sales falling behind the privatisation timetable (Seatrade Review, 1995). Privatisation of the Turkish Maritime Organisation is being handled seperately by a special department of the Prime Ministry. A detailed financial analysis of the organisation has been undertaken by independent financial auditors. However, overall few tangible results have been achieved from the privatisation action since 1993 (Lloyd's Ship Manager, 1995b).

(e) Cabotage: Trading between Turkish ports is controlled by the law of cabotage, dated 13.04.1926, of Turkish Trade Law. Turkey has great potential for cabotage shipping because of its long coastline of approximately 8000 kilometres. However, cabotage shipping is continuously losing its economic place within Turkish shipping largely because of the inefficiencies of the monopoly held by the state owned cargo carrier (Chamber of Shipping, 1995b).

(f) The Sea of Marmara and the Straits of Bosphorus and Dardanelles: Dangerous tanker traffic has always caused problems as a result of collisions in the Sea of Marmara and the straits of Bosphorus and Dardanelles in the northwest of Turkey. Additional to the regulations brought by IMO in 1994, the Turkish Government needs to establish a physical and functional substructure to control shipping movements (Chamber of Shipping, 1995b). The Government has given approval to set up a radar traffic monitoring system covering the straits to ensure navigational safety (Lloyd's Ship Manager, 1994b).

(g) Maritime education and training: The main purpose of maritime education and training is to increase the safety, functioning and economics of maritime activities, thus reducing the cost of sea transportation and to improve the conditions of competition and cooperation with other transportation systems (Chamber of Shipping, 1996a). Therefore, maritime education and training have significance at Government level. The following factors are currently significant:

- Achieving the STCW standards and IMO and ILO recommendations,
- Basic Law of National Education and the regulations of the Ministry of National Education,
- The requirements of the Turkish Higher Education Authority.

The Turkish Maritime Education Foundation was established in 1993 and a considerable number of donations were collected from ship owners, ship operators and maritime companies. The main goal of the Foundation is to train seamen and people related to the maritime industry through sandwich courses and seminars and to provide certain facilities and laboratories to the maritime schools (Lloyd's Ship Manager, 1994b). There are seven maritime schools at the universities and four maritime high schools in Istanbul and Izmir, which is very few considering the high potential of the needs of maritime education. Despite the importance given by the Government to maritime education and training, the Government gives less attention to the newly established maritime schools at the universities through insufficient subsidies.

(h) Ferry services: This is a newly adopted policy to raise standards of ferry services and ferries operating on international lines, particularly in the corridor of Italy-Greece-

Turkey (Hurriyet, 1996a). Various regulations had to be adopted because of problems faced by passengers in this corridor, in previous years. The certificates required by a ferry to have an operation permit on an international line are certificates of registration, tonnage, seaworthines, international oil pollution prevention, load line, passenger ship safety, minimum safe manning, radio and telephone, apparatus manufacture and maintenance and hygenic conditions (Undersecretariat of Shipping, 1996b).

Regarding both international and national maritime policies, most continue to remain promises of the Government. Ship builders and ship operators complain about excessive bureaucracy in Turkey, even in terms of the flagship policy of privatisation (Lloyd's Ship Manager, 1995b). So far not a single state owned institution in the shipping sector has been privatised. Furthermore, very little action has been taken towards the establishment of the Ministry of Shipping.

3.2.3. Some conclusions

After reviewing the maritime policies of the EU and Turkey, it is necessary to note their relationship with each other and, in particular, their impact upon our specific interest in this research, the ferry industry in the Eastern Mediterranean.

Flagging out / off-shore registries: Both Turkish and EU shipowners clearly prefer to flag out using off-shore registries for the benefits of low taxation and crew costs. The EU policy plans to reduce flagging out and increase EU flagging to achieve safety standards (Commission of the EC, 1996b). This will affect the ferry market in the Eastern Mediterranean because the ferries operated either by the EU or the Turkish operators in this area are mostly under various flags, such as Cyprus, Malta or St.Vincent and the Grenadines rather than national flags.

Port State Control: This appears to be important for the international ferry services of Turkey and the EU. Various international conventions related to the safety of life at sea, protection of marine environment and standards of living and working conditions on board ships have to be recognised. Turkish ferry operators operating in this market need to meet their obligations in relation to the Member States and at their ports. Additionally, various principles of the prevention of the pollution were also adopted by the Member States regarding the EU policy of Port State Control, which was adopted in July 1995 (Official Journal of the EC, 1995b). Therefore, the Turkish ferry operators need to consider the criteria for the EU ports during their services to and from the EU and in the Eastern Mediterranean, in particular.

ISM Code: In addition to Port State Control, the ISM Code is also an important issue for Turkish ferry operators. Regarding the regulation, which came into force on 1 July 1996, companies operating ferries to or from the EU countries became subject to auditing (Official Journal of the EC, 1995c). In parallel to this regulation, the Undersecretariat of Shipping in Turkey also issued a regulation, in mid 1996, requiring a line permit for international ferry operations. The aim of this permit is to improve the quality of ferry services and the standards of the ferries and prepare the quality of the ferries for the ISM Code implementation and monitoring by the EU.

Inevitably, there are other specific policy interactions but those noted above are the most significant. Overall, it is enough to note that all ferry operators in the Eastern Mediterranean must meet the highest standards set by the EU if they are to enter EU waters and ports - and this in turn impacts upon the Turkish operations. In a similar vein, EU competition policy will also impact upon Turkish ferry operations prohibiting excessive state support and interference and encouraging increased independence and competition.

3.3. FERRY INDUSTRY IN THE EASTERN MEDITERRANEAN

The ferry industry consists of the transportation of passengers and cars, and additionally, roll on/roll off freight. It was noted earlier in the introduction that only the passenger side of ferry services has been analysed in this research in order to limit analysis to one specific and distinguishable market.

The ferry industry in the Eastern Mediterranean has been selected for further analysis because it is the only market place where Turkish ferry operators share the same market with EU competitors. In the following section the ferry operators and services in this area are outlined briefly to give an idea of the market.

3.3.1. Passenger ferry services and operators in the Eastern Mediterranean market

The Eastern Mediterranean market is one of the areas in the world with the longest ferry lines and the issue of market shares for the passenger ferry market and strong competition between the EU and nonmember country ferry operators have attracted attention to this area. The passenger ferry market in the Eastern Mediterranean consists of the international ferry lines between Italy, Croatia, Albania, Greece, Turkey, Cyprus and Israel together with the domestic ferry lines of these countries. The regular international lines in this area are grouped between Italy - Croatia, Italy - Albania, Italy - Greece, Italy - Turkey (See Figure 15), Greece - Croatia, Greece - Turkey (See Figure 15), Greece - Cyprus, Greece - Israel, Turkey - Cyprus and Turkey - Israel (See Table 11). Details of the international ferry lines in the Eastern Mediterranean are listed in Table 11 from port to port.

Table 11: International ferry lines in the Eastern Mediterranean

Country	Port destination
Italy - Croatia	- Ancona - Split - Ancona - Zadar - Bari - Dubrovnik - Trieste - Pula - Mali - Losinij - Split - Hvar - Korcula - Dubrovnik - Trieste - Pula - Split - Hvar - Korcula - Dubrovnik - Igoumenitsa
Italy - Albania	- Ancona - Durres - Bari - Durres - Brindisi - Vlore - Otranto - Sarante - Vlore - Trieste - Durres
Italy - Greece	- Ancona - Corfu Town - Igoumenitsa - Patras - Ancona - Corfu Town - Igoumenitsa - Paxos - Sami - Patras - Ancona - Igoumenitsa - Ancona - Igoumenitsa - Corfu Town - Patras - Ancona - Kefalonia - Patras - Heraklion - Ancona - Patras - Bari - Corfu Town - Igoumenitsa - Patras - Bari - Corfu Town - Igoumenitsa - Sami - Patras - Bari - Igoumenitsa - Bari - Igoumenitsa - Patras - Brindisi - Corfu Town - Igoumenitsa - Brindisi - Corfu Town - Igoumenitsa - Patras - Brindisi - Corfu Town - Ithaca - Argostoli - Zakynthos - Katakolon - Patras - Brindisi - Corfu Town - Paxos - Brindisi - Igoumenitsa - Brindisi - Igoumenitsa - Corfu Town - Brindisi - Igoumenitsa - Patras - Brindisi - Patras - Brindisi - Paxos - Corfu Town - Igoumenitsa - Kefalonia - Patras - Otranto - Igoumenitsa - Corfu Town - Trieste - Ancona - Corfu Town - Igoumenitsa - Patras - Trieste - Pula - Split - Hvar - Korcula - Dubrovnik - Igoumenitsa (Via Croatia) - Venice - Bari - Patras - Heraklion - Piraeus
Italy - Turkey (See Figure 15, 17 and 18)	<u>Direct lines:</u> (See Figure 17) - Ancona - Izmir - Bari - Cesme - Venice - Antalya - Venice - Cesme - Venice - Izmir - Venice - Marmaris <u>Indirect lines via Greece:</u> (See Figure 18) - Ancona - Kefalonia - Patras - Heraklion - Cesme - Ancona - Patras - Cesme - Bari - Igoumenitsa - Patras - Cesme - Bari - Patras - Cesme - Bari - Piraeus - Cesme - Brindisi - Igoumenitsa - Cesme - Brindisi - Patras - Cesme - Brindisi - Piraeus - Cesme
Greece - Croatia	(See Italy - Greece indirect line via Croatia)
Greece - Turkey	(See Italy - Turkey indirect lines via Greece) (See Figure 18)
Greece - Cyprus	(See Greece - Israel indirect lines via Cyprus)
Greece - Israel (Via Cyprus)	- Piraeus - Heraklion - Limassol - Haifa - Piraeus - Heraklion - Rhodes Town - Limassol - Haifa - Piraeus - Patmos - Rhodes Town - Limassol - Haifa - Piraeus - Rhodes Town - Limassol - Haifa
Turkey - Cyprus	- Alanya - Kyrenia - Mersin - Famagusta - Tasucu - Kyrenia
Turkey - Israel	- Antalya - Haifa

Sources: The Reed Travel Group (1994);
Various catalogues (1994).

3.3.2. Ferry services in the Italy-Greece-Turkey corridor in the Eastern Mediterranean

This research will focus upon an analysis of the passenger ferry services and operators only within the Italy-Greece-Turkey corridor of the Eastern Mediterranean area because Turkey and the EU ferry operators share the same market only in this area. More specifically, this ferry market comprises the area from the Adriatic coast of Italy, including the coasts and islands of Greece, and finally, ending at the west and the southwest coasts of Turkey. This specific market area has been defined by the researcher as "the Italy-Greece-Turkey corridor".

In the 1960s, some of the European countries, with Federal Germany as the leading country, needed foreign workers to match a high supply of work during the rapid growth of their industrialisation after World War II. Therefore, these countries demanded workers from various Mediterranean countries, such as Italy, Greece, Turkey and the former Yugoslavia. Thereafter, in the 1960s and 1970s, many Turkish workers together with their families moved to Federal Germany, France, Switzerland, the Netherlands, Austria, Belgium and Denmark for the purpose of working there. The current population of these Turkish people living in the European countries is approximately 2.5 million (Yeni Asir, 1995).

These Turkish people living and working in various European countries usually spend their summer holidays for 3-5 weeks in Turkey. Therefore, a dynamism in tourism, transport and domestic trades of Turkey takes place with the visit of these people during the period starting from the beginning of June until the beginning of October. Most of these people preferred to travel to Turkey by car following the roads of former Yugoslavia and Bulgaria in the past.

The first regular international ferry service of Turkey was on the Venice-Izmir line, between Italy and Turkey. This ferry operation started during the early 1970s, with the newly built ferry, "Truva", which was purchased from a French company in 1967 (TML, 1993). The first and only ferry operator was Turkish Maritime Lines, whose main market was to carry the Turkish people living and working in various European countries to travel to Turkey, and additionally to carry tourists from Europe to Turkey as an alternative transport mode to land and air transportation.

More importance and attention was given by the Turkish Government to the maritime sector in the 1980s and two ferries, "Ankara" and "Samsun", newly built in Polish shipyards, were added in the Turkish fleet, in 1983 and 1985, for operation by Turkish Maritime Lines. Additionally, a fourth ferry, "Iskenderun" and identical to "Samsun", was built in Turkish shipyards in 1991. "Samsun" and "Iskenderun" started to operate on the Venice-Izmir line (The Adriatic Line) in the Italy-Greece-Turkey corridor, while the other two ferries operate on domestic and Turkey-Cyprus lines (The Reed Travel Group, 1994).

However, in spite of this development in the market place the ferry lines in the Italy-Greece-Turkey corridor were not considered important until the war in Bosnia, in 1991. Land transport through the former Yugoslavia was impossible due to the war, and therefore, a tremendous increase in ferry traffic took place from 1991 (Cruise & Ferry Info, 1994; LSM, 1994b). Turkish people living and working in various European countries started to travel to Turkey either by an increasing number of charter flights or by the increasing number of ferry operations after 1991. For example, the total number of passengers carried by Turkish Maritime Lines, which was the only operator in this corridor before the 1990s, was 5810 in 1986. This number reached 8573 in 1990 and then, nearly doubled by reaching 15360 in 1991 (TMO, 1994). Therefore, these people have started to play a vital role in the development of the ferry market in the Italy-Greece-Turkey corridor, in the Eastern Mediterranean in the beginning of the 1990s.

Consequently, the limitations placed upon the definition of the passenger ferry market in the Eastern Mediterranean for the purposes of this research are as follows:

- The passenger ferry market in this area is analysed by focusing upon the Italy-Greece-Turkey corridor, from the Adriatic coast of Italy, including the mainland coasts and islands of Greece, and ending at the west and southwest coasts of Turkey. The reason for narrowing the market area to this sector, as noted above, is that Turkey and the EU ferry operators share a market only in this corridor.
- The passenger side of the ferry market alone is analysed separate from the freight sector.
- International regular lines are examined, while domestic and irregular lines are disregarded.
- Data for 1994 is used for the analysis of the ferry operators in the Eastern Mediterranean ferry market because this research started in late 1993 and data for 1994 was accessed, collected and analysed in 1995 and 1996.
- International ferry lines between the member countries of the EU in the Italy-Greece-Turkey corridor are not included in the analysis because Turkish operators are not involved in these operations.
- Passenger ferries smaller than 150 grt are excluded from the analysis because they are categorised under the class of motorboats or leisure boats.

International ferry lines in the Italy-Greece-Turkey corridor are grouped as follows:

(a) Italy - Turkey direct lines

(b) Italy - Turkey indirect lines via Greece

Details of these ferry lines were included earlier in Table 11 and were listed from port to port (The Reed Travel Group, 1994; Various catalogues, 1994) (See Figure 15, 17 and 18). In 1994, there were nine ferry operators in this market sector, among which six operators were Greek and three Turkish. Since there were no Italian operators, Greece will be deemed to represent the EU in this market, competing against Turkish operators. It should be noted that although Greece has been specified as representing the EU in this research, the Greek shipping, maritime policy and ferry services do not totally reflect the EU ones. For example, Greece receives various exeptions for its cabotage with a particular exeption in ferry services between the mainland and the islands, which will not be liberalised until 2004 (Commission of the EC, 1995b). Therefore, Greece appears to be representing the EU wherever the EU operators are mentioned in this research because it is an EU country and its presence in this market; however, it does not totally reflect the characteristics of the EU maritime policy.

The ferry operators and the direct lines between Italy and Turkey are listed in Table 12. Similarly, the ferry operators and the indirect lines via Greece are listed in Table 13 (Turkish Maritime Organisation, 1994). The ferry lines noted in Table 12 and 13 are illustrated on the map of Eastern Mediterranean ferry lines in Figure 15. The network of the ferry operations in this corridor is illustrated from port to port in Figure 16. The following figures illustrate details of various ferry lines in the Italy-Greece-Turkey corridor: The Turkish ferry lines in the Italy-Greece-Turkey corridor (Figure 17), the Greek ferry lines in the Italy-Greece-Turkey corridor (Figure 18), the ferry lines from Venice in the Italy-Greece-Turkey corridor (Figure 19), the ferry lines from Ancona in the Italy-Greece-Turkey corridor (Figure 20), the ferry lines from Bari in the Italy-Greece-Turkey corridor (Figure 21), the ferry lines from Brindisi in the Italy-Greece-Turkey corridor (Figure 22).

It is clear from Figure 17 that Turkish ferry operators prefer to operate direct lines from

Figure 15: Ferry lines in the Italy-Greece-Turkey corridor

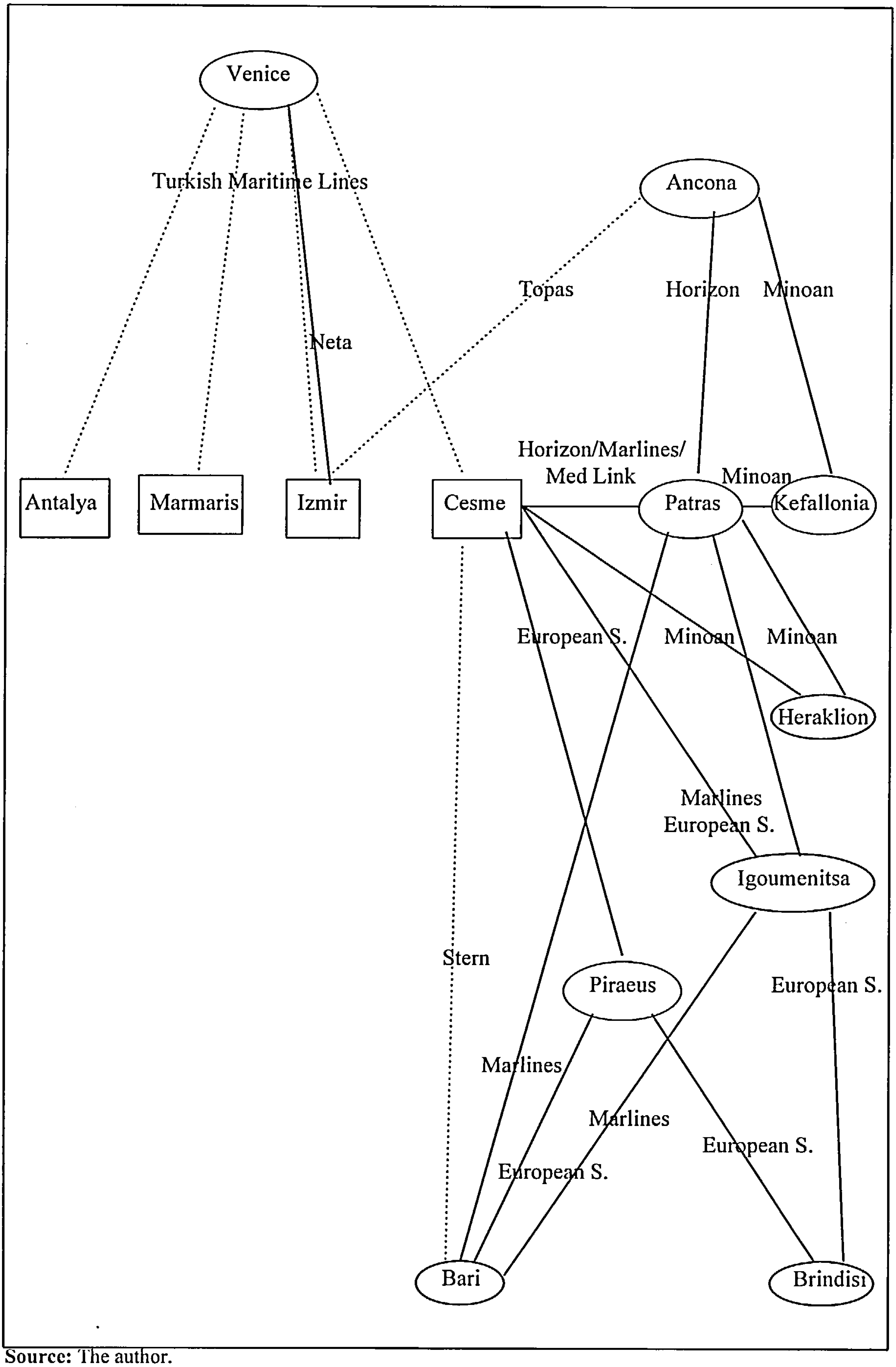
Red line : Turkish routes

Black line : European Union Routes

Source: The author.

Figure 16: Network of the ferry services in the Italy-Greece-Turkey corridor

(☐ : Turkish ports; ◯ : EU ports; ....: Turkish services; —— : EU services)



Source: The author.

Figure 17: The Turkish ferry lines in the Italy-Greece-Turkey corridor

Red line : Turkish routes

Source: The author.

Figure 18: The Greek (EU) ferry lines in the Italy-Greece-Turkey corridor

Black line : European Union Route:

Source: The author.

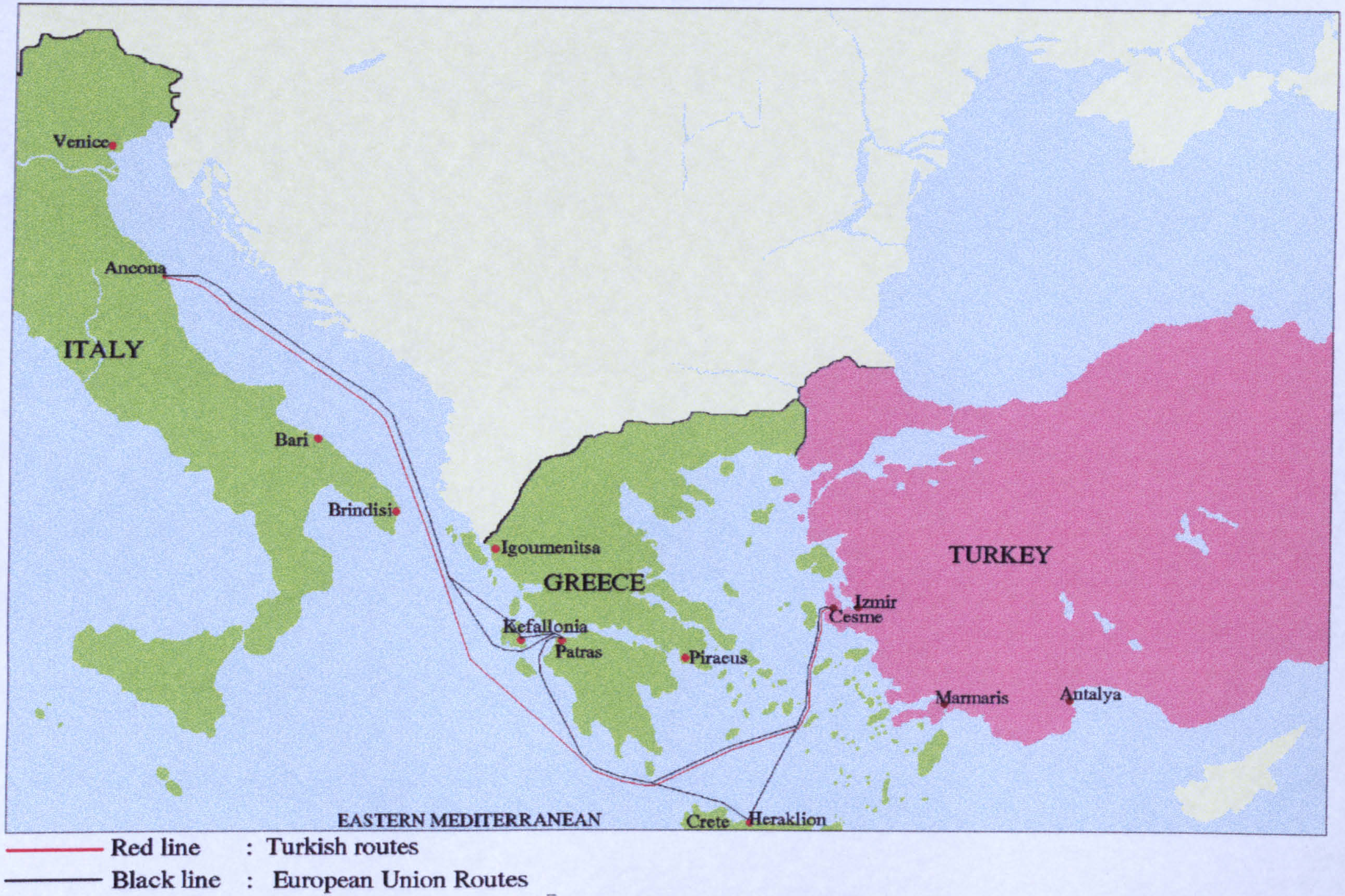
Figure 19: The ferry lines from Venice in the Italy-Greece-Turkey corridor

Red line : Turkish routes

Black line : European Union Routes

Source: The author.

Figure 20: The ferry lines from Ancona in the Italy-Greece-Turkey corridor



Source: The author.

Figure 21: The ferry lines from Bari in the Italy-Greece-Turkey corridor

Red line : **Turkish routes**

Black line : **European Union Routes**

Source: The author.

Figure 22: The ferry lines from Brindisi in the Italy-Greece-Turkey corridor

——— **Black line : European Union Route**

Source: The author.

Venice, Ancona and Bari, in Italy to Izmir, Cesme, Marmaris and Antalya, in Turkey. The majority of the Greek ferry operations take place between the Italian and Greek ports serving passengers between Italy and Greece, and additionally, these operations continue to operate to the Turkish ports as an end point to serve the growing Turkish market (See Figure 18).

Table 12: Passenger ferry operators and direct lines between Italy-Turkey

Operator	Nationality	Service line
Turkish Maritime Lines	Turkish	Venice (I) - Antalya (TR)
Turkish Maritime Lines	Turkish	Venice (I) - Cesme (TR)
Turkish Maritime Lines	Turkish	Venice (I) - Izmir (TR)
Turkish Maritime Lines	Turkish	Venice (I) - Marmaris (TR)
Topas Maritime Lines	Turkish	Ancona (I) - Izmir (TR)
Stern Maritime Lines	Turkish	Bari (I) - Cesme (TR)
Neta Lines	Greek	Venice (I) - Izmir (TR)

(I: Italy, TR: Turkey)
Source: TMO (1994).

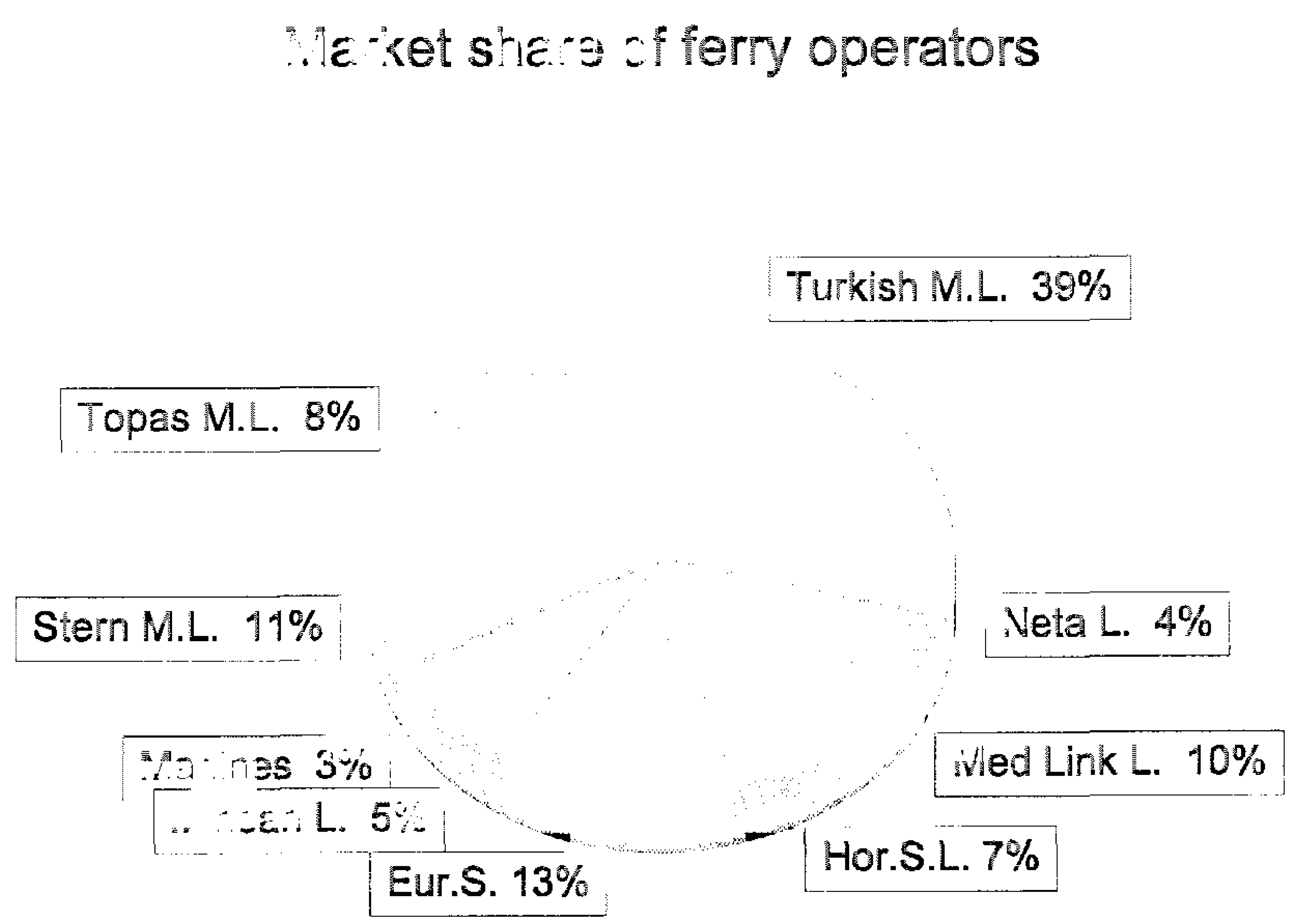
Table 13: Passenger ferry operators and indirect lines between Italy-Turkey via Greece

Operator	Nationality	Service line
Minoan Lines	Greek	Ancona (I) - Kefallonia (GR) - Patras (GR) - Heraklion (GR) - Cesme (TR)
Horizon Sea Lines	Greek	Ancona (I) - Patras (GR) - Cesme (TR)
Marlines	Greek	Bari (I) - Igoumenitsa (GR) - Patras (GR) - Cesme (TR)
Marlines	Greek	Bari (I) - Patras (GR) - Cesme (TR)
European Seaways	Greek	Bari (I) - Piraeus (GR) - Cesme (TR)
European Seaways	Greek	Brindisi (I) - Igoumenitsa (GR) - Cesme (TR)
Medlink Lines	Greek	Brindisi (I) - Patras (GR) - Cesme (TR)
European Seaways	Greek	Brindisi (I) - Piraeus (GR) - Cesme (TR)

(I: Italy, GR: Greece, TR: Turkey)
Source: TMO (1994).

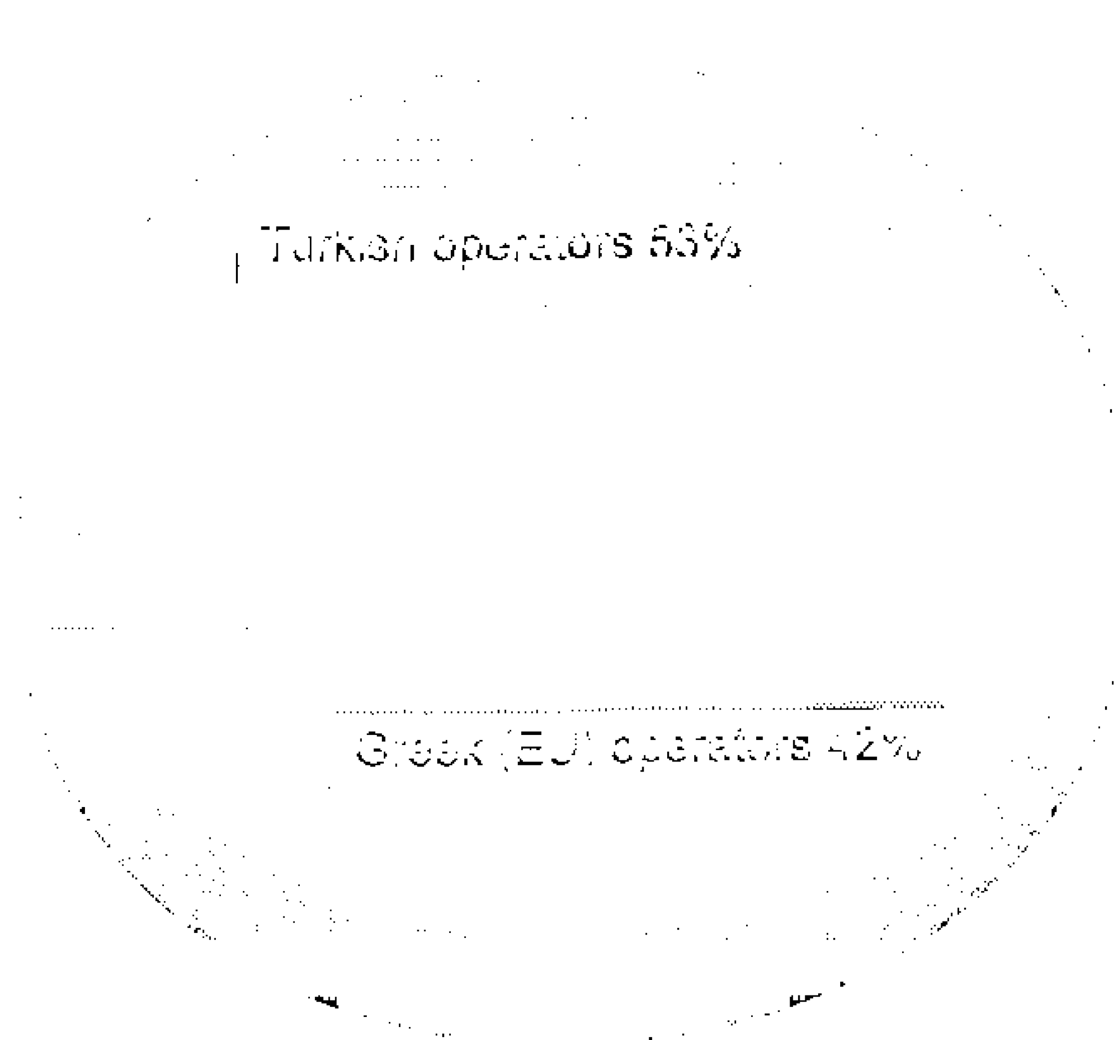
Various data of the ferry operators and ferries is illustrated in Tables 14-16 and Figures 23-33. General specifications of the ferry operators and ferries, such as the nationality of the operators, ports of departure and arrival, number of ferries, average age of the ferries and total number of passenger capacity of the ferries are given in Table 14. The percentages of the market share of the ferry operators are illustrated in Figure 23 and 24 regarding the total number of passengers they carried in the Italy-Greece-Turkey corridor in 1994.

Figure 23: Percentage of the market share of each Greek (EU) and Turkish ferry operator in the Eastern Mediterranean (1994)



Source: TMO (1994).

Figure 24: Percentages of the market shares of the Greek (EU) and Turkish ferry operators in the Eastern Mediterranean (1994)



Source: TMO (1994).

Table 14: Various specifications of the ferry services in the Italy-Greece-Turkey corridor (1994)

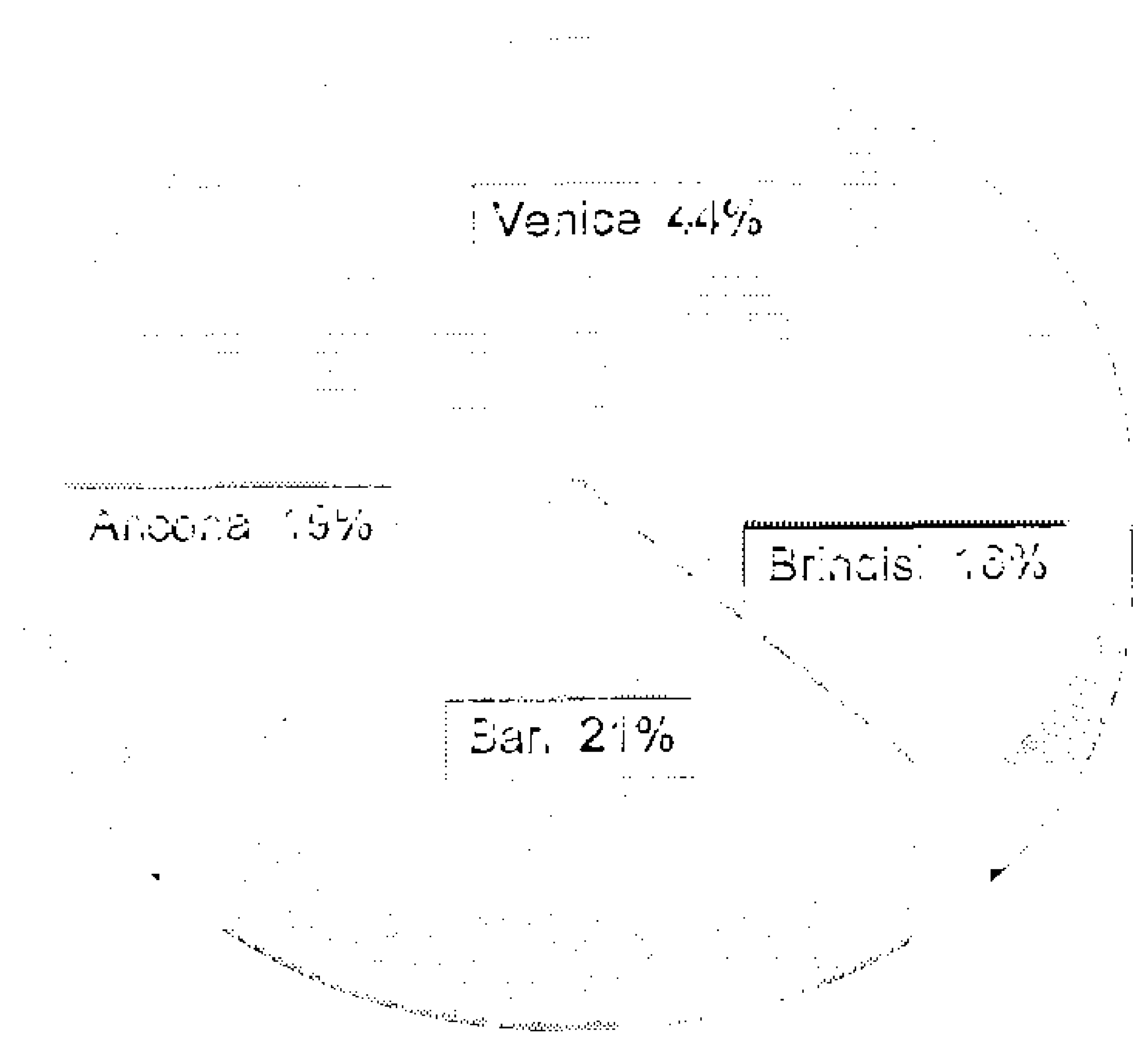
Ferry operator	Nationality	Port of departure	Port of arrival	Number of ferries	Average age of ferries	Passenger capacity	Total number of journeys	Total passengers carried	% of passengers carried per ferry
Turkish Maritime Lines	Turkish	Venice	Izmir/Cesme/ Marmaris/Antalya	4	12.75	3344	140	52410	45
Topas Maritime Lines	Turkish	Ancona	Izmir	1	27	1189*	40	10909	23
Stern Maritime Lines	Turkish	Bari	Cesme	2	24.5	2012	48	14150	29
Marlines	Greek	Bari	Cesme	1	27	1600	14	4264	19
Minoan Lines	Greek	Ancona	Cesme	1	28	1200	40	6089	13
European Seaways	Greek	Bari/Brindisi	Cesme	2	28.5	2036	118	17610	15
Horizon Sea Lines	Greek	Ancona	Cesme	1	22	1180	34	8787	22
Med Link Lines	Greek	Brindisi	Cesme	1	20	1480	24	13040	37
Neta Lines	Greek	Venice	Izmir	1	30	1189*	16	5482	29

*: Derived from the average based upon the regulations of the technique which will be explained later in detail.

Source: TMO (1994).

The Turkish ferry operators arrive at the Ports of Izmir, Cesme, Marmaris and Antalya in Turkey. All of the Greek ferry operators arrive at the Port of Cesme in Turkey, except one, which arrives at the Port of Izmir. Percentages of passengers carried by all of the ferry operators departuring from and arriving to the ports of Italy are illustrated in Figure 25.

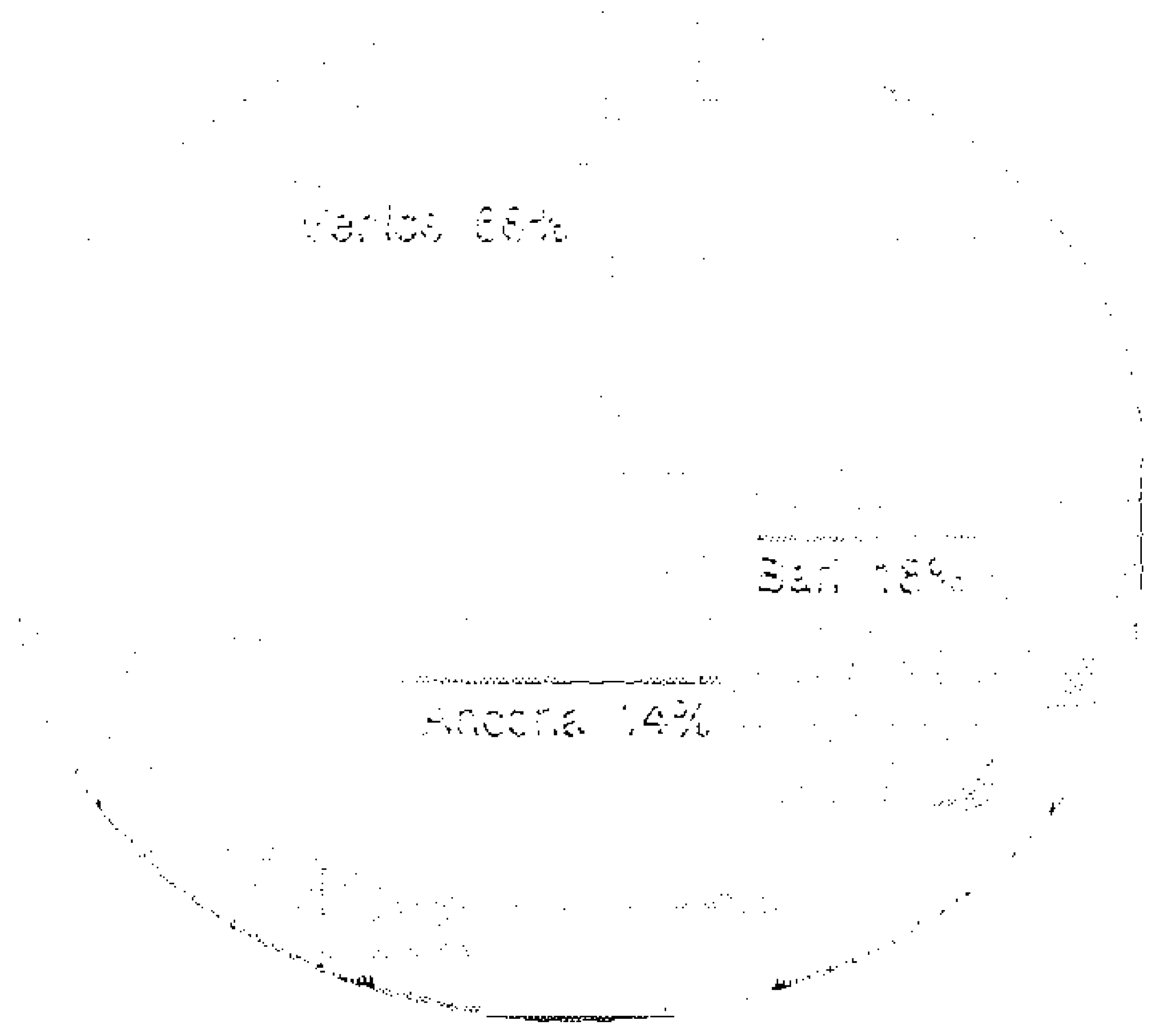
Figure 25: Percentages of passengers carried by all of the ferry operators departuring from and arriving to the ports of Italy (1994)



Source: TMO (1994).

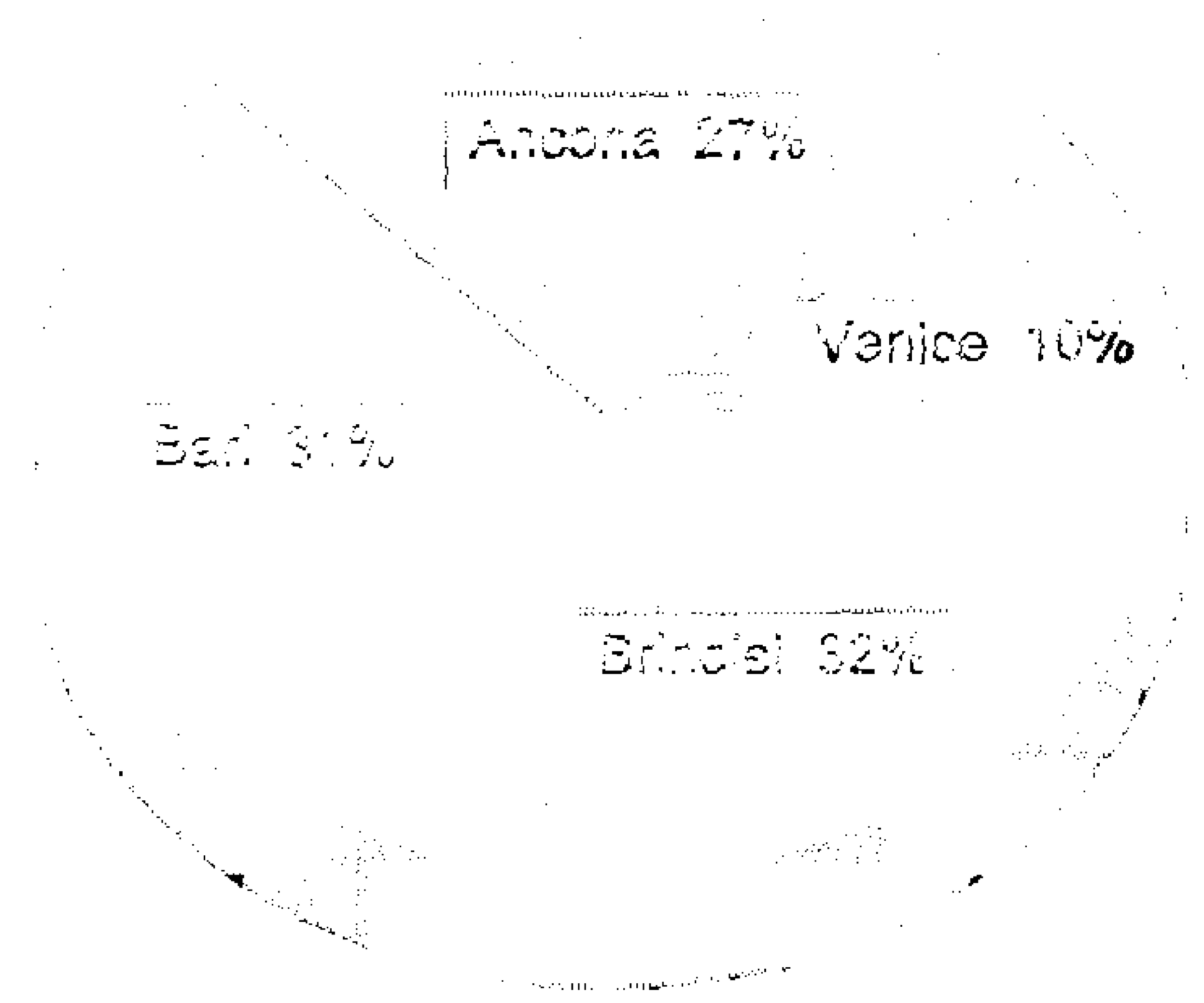
Percentages of passengers carried by the Turkish and the Greek ferry operators departuring from and arriving to the ports of Italy are illustrated by Figure 26 and 27, respectively. It should be noted that passengers collected from Greece by the Greek operators were very minor compared to the total number of passengers in this corridor in 1994. Therefore, they were included in the total number of passengers without being separated.

Figure 26: Percentages of passengers carried by the Turkish ferry operators departuring from and arriving to the ports of Italy (1994)



Source: TMO (1994).

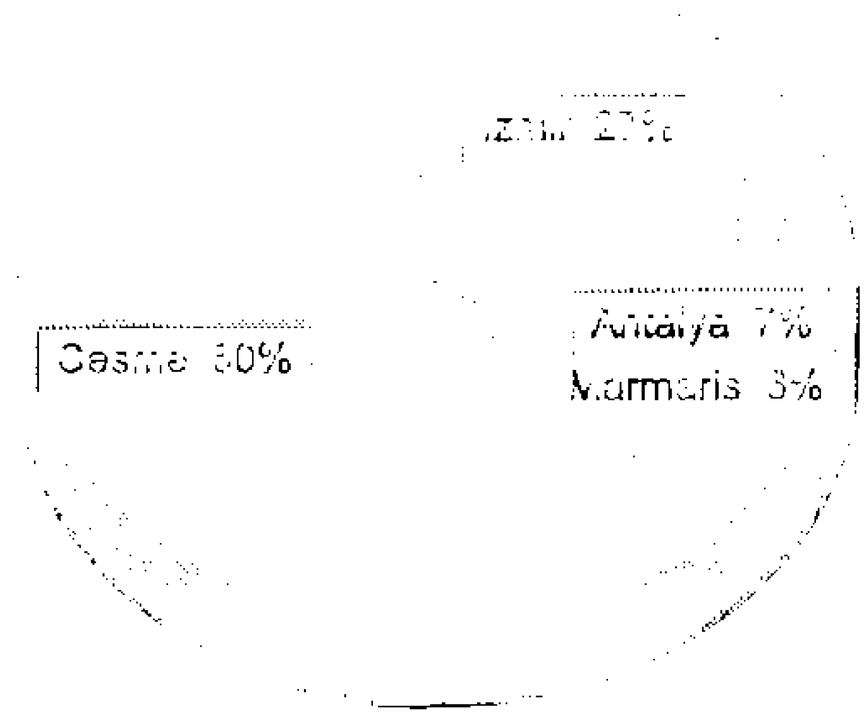
Figure 27: Percentages of passengers carried by the Greek ferry operators departuring from and arriving to the ports of Italy (1994)



Source: TMO (1994).

Figure 28 illustrates the percentages of passengers carried by the ferry operators departuring from and arriving to the ports of Turkey.

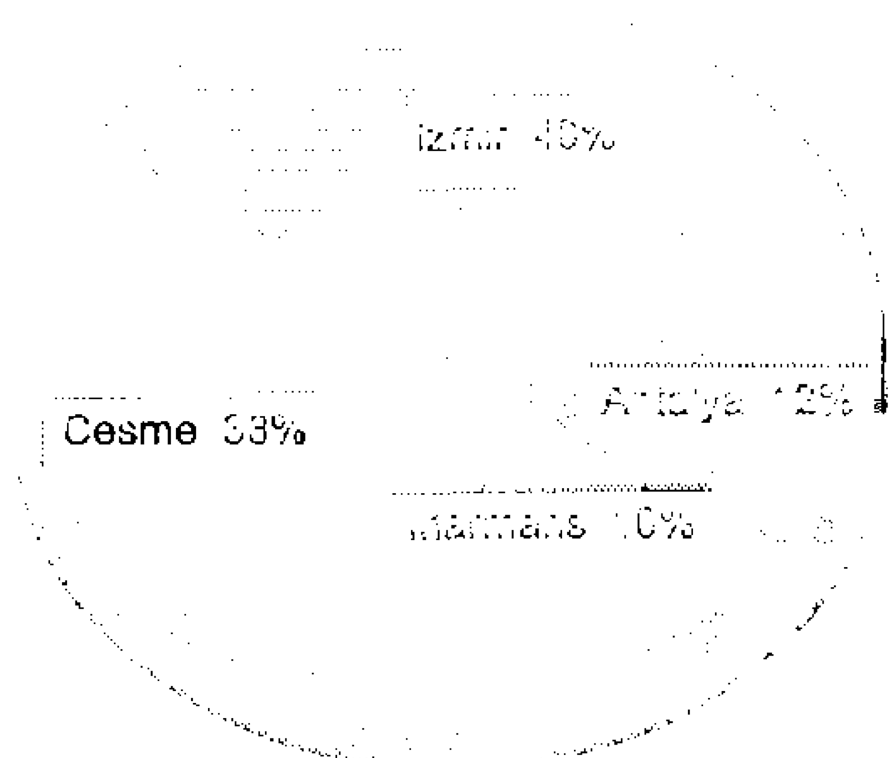
Figure 28: Percentages of passengers carried by the ferry operators departuring from and arriving to the ports of Turkey (1994)



Source: TMO (1994).

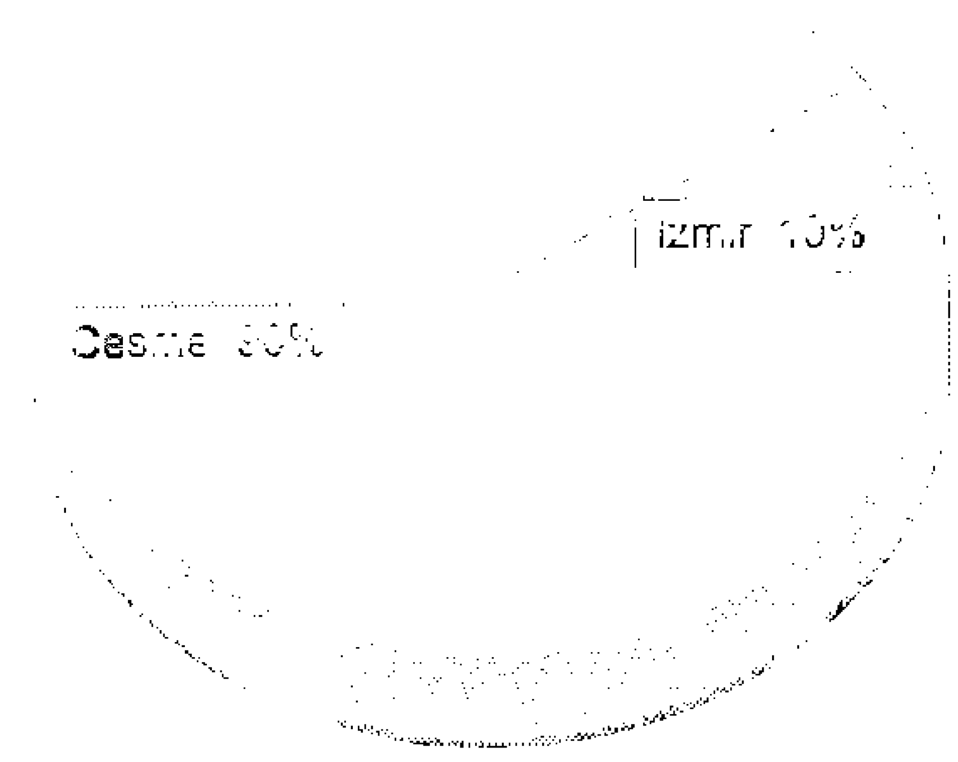
Percentages of passengers carried by the Turkish and the Greek ferry operators departuring from and arriving to the ports of Turkey are illustrated as follows by Figure 29 and Figure 30, respectively.

Figure 29: Percentages of passengers carried by the Turkish ferry operators departuring from and arriving to the ports of Turkey (1994)



Source: TMO (1994).

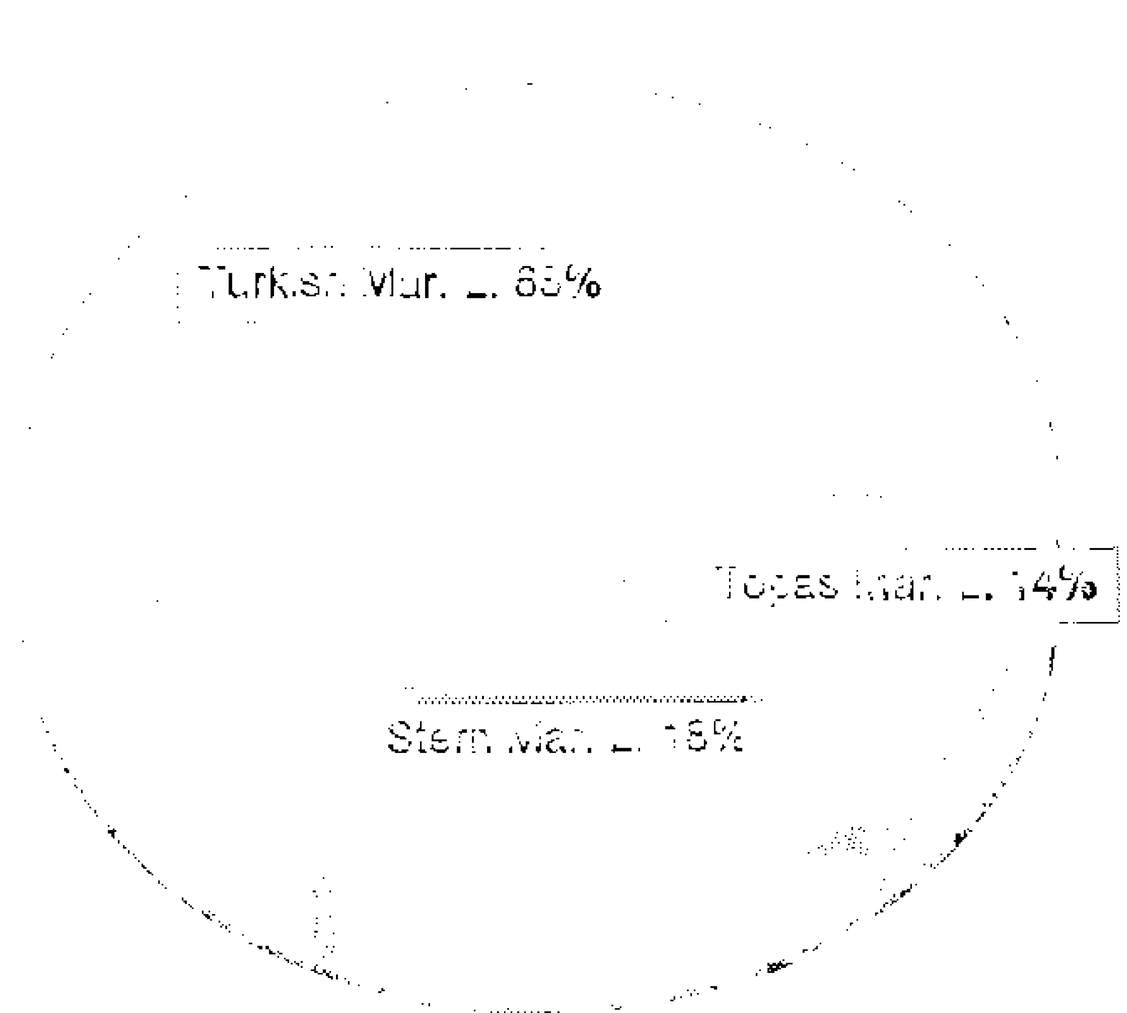
Figure 30: Percentages of passengers carried by the Greek ferry operators departuring from and arriving to the ports of Turkey (1994)



Source: TMO (1994).

The market shares of the Turkish ferry operators with a total of 77,469 passengers in 1994 in this area are illustrated in Figure 31. Turkish Maritime Lines dominates the market with 68% of annual passengers against Stern Maritime Lines with 18% and Topas Maritime Lines with 14%.

Figure 31: Market shares of the Turkish ferry operators in the Eastern Mediterranean (1994)



Source: TMO (1994).

Table 15 and Figure 32 illustrate the trend of the total number of passengers carried by Turkish Maritime Lines, the only ferry operator until 1991, since then, has shared the market with the EU operators. This company has been the major state owned ferry operator with the most total number of passengers, vessels and journeys in the Italy-Greece-Turkey corridor. Therefore, the trend of the total number of passengers carried by this operator is illustrated in Table 15 and Figure 32.

Percentages of the increase in the total number of passengers compared to the previous year are also given in the table. It is clear from the data that there is a 79% increase in the total number of passengers carried by this operator in 1991 largely because of the war in the former Yugoslavia. Additionally, the total number of passengers continues to increase each year since 1991, showing a 120% peak in 1994 compared to 1993.

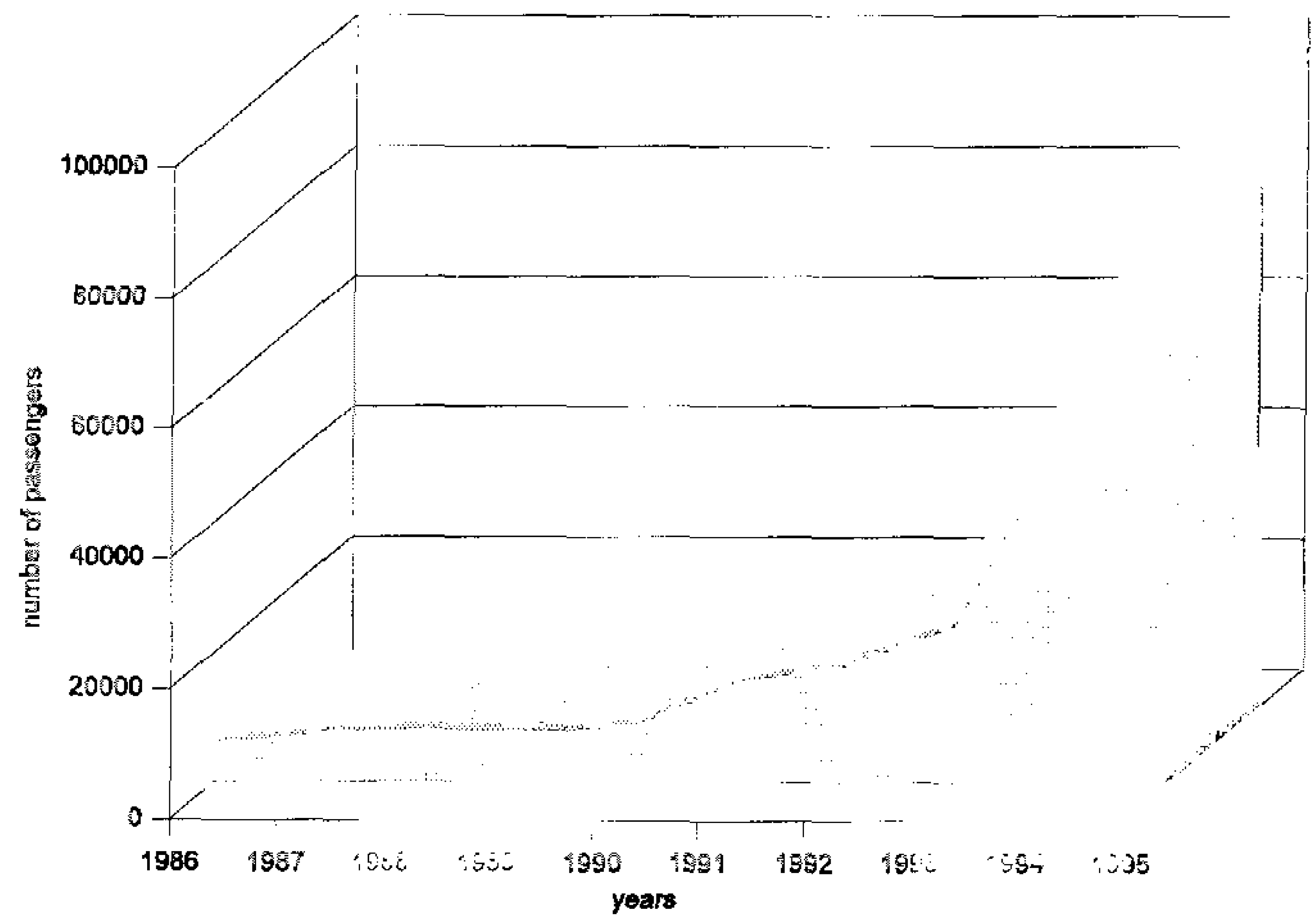
Table 15: Total number of passengers carried by Turkish Maritime Lines in the Italy-Greece-Turkey corridor (1986-1995)

Year	Number of passengers	Increase in the number of passengers
1986	5810	--
1987	7312	26%
1988	8197	12%
1989	7571	-8%
1990	8573	13%
1991	15360	79%
1992	17740	16%
1993	23865	35%
1994	52410	120%
1995	91374	74%

Sources: TMO (1994);
TMO (1995);
TMO (1996);
Undersecretariat of Shipping (1996).

Table 16 and Figure 33 illustrate the growth in the number of passengers carried by all Turkish ferry operators on the Italy-Turkey lines, in the Italy-Greece-Turkey corridor, between 1993 and 1995. It is clear from Table 16 and Figure 33 that there was a great increase in the total number of passengers during this period including, for example, an increase of 118% in 1994 and 70% in 1995 (TMO, 1994; TMO, 1995; TMO, 1996). In addition, the total number of passengers carried by the Greek operators between 1993-1995 are also illustrated in Table 16.

Figure 32: Total number of passengers carried by Turkish Maritime Lines in the Italy-Greece-Turkey corridor (1986-1995)



Sources: as Table 15.

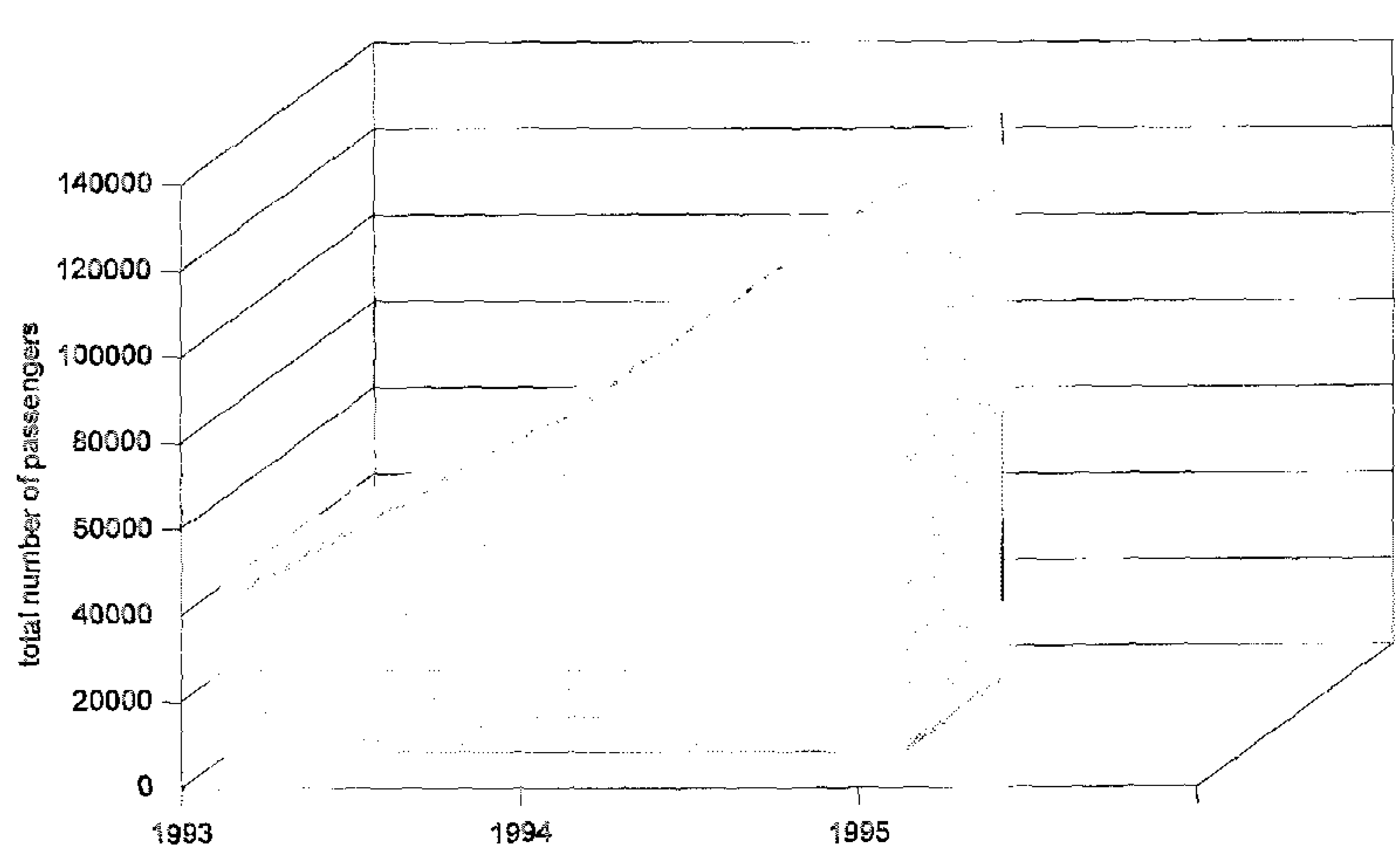
The number of Turkish ferry operators in this corridor was only one in 1990, the state owned company, Turkish Maritime Lines. The number increased to three in 1994 with Turkish Maritime Lines, Topas Maritime Lines and Stern Maritime Lines and to six in 1995 with the addition of three other private company operators, Maskot Tourism, Karavan Tourism and Akdeniz Shipping. Additionally, the total number of ferries operated by the Turkish operators increased from four in 1990 to six in 1994 and eleven in 1995 (TMO, 1995).

Table 16: The total number of passengers carried by the Turkish and the Greek ferry operators in the Italy-Greece-Turkey corridor (1993-1995)

Port	1993	1994	1995
Izmir	16577	30974	45962
Cesme	11647	29762	52410
Antalya	4934	9150	17562
Marmaris	2354	7583	15850
TOTAL (carried by Turkish operators)	**35512**	**77469**	**131784**
TOTAL (carried by Greek operators)	**25558**	**55272**	**92568**

Sources: State Institute of Statistics (1994);
TMO (1994);
TMO (1995);
TMO (1996).

Figure 33: The total number of passengers carried by Turkish ferry operators in the Italy-Greece-Turkey corridor (1993-1995)



Sources: as Table 16.

3.4. SOME CONCLUSIONS

Following this review of the maritime policies of Turkey and the EU and the ferry industry together with the passenger ferry market in the Eastern Mediterranean, the latter market will be analysed in the next chapter with the objective of developing a model to provide an analytical approach for positioning ferry operators in the market place. A positioning model using a quantitative approach will be developed to measure and to identify the positions of the Turkish and the EU ferry operators in the Eastern Mediterranean.

PART III:

APPROACH AND THE MODEL

CHAPTER 4: QUANTITATIVE APPROACH AND POSITIONING MODEL

4.1. INTRODUCTION

After reviewing the maritime policies of the EU and Turkey and the ferry services in the Eastern Mediterranean, this chapter attempts to develop a quantitative model to examine the positioning of ferry services in this market place. A comparison of qualitative and quantitative approaches is summarised in the first section. The second section of this chapter provides a literature review for services marketing, positioning of services and techniques to measure positioning. A conceptual model is presented in the third section for the development of a positioning model.

4.2. QUANTITATIVE APPROACH VERSUS QUALITATIVE APPROACH

A brief specification of the difference between a quantitative approach and a qualitative approach for a research is noted below.

A qualitative approach to research is characterised by small samples and nonconstructed data collection procedures. The techniques of qualitative research develop an initial understanding of something in an exploratory way (Parasuraman, 1991) by giving a general review of the research. The basic characteristics of a qualitative approach to research are summarised as: Open-ended, dynamic and flexible, broader and deeper database, richer source of ideas for marketing, dependent on research executive skills and results increase understanding (Gordon and Langmaid, 1988).

A qualitative approach to research is related to small samples - i.e. target consumers - and nonstructured data collection procedures as noted above while a quantitative approach to research involves large representative samples of a target population and structured data collection procedures. Furthermore, a quantitative approach in research is used to measure data and therefore, sample size of a target population for data collection and degree of statistical reliability are required (Palmer, 1994) to achieve a more reliable measurement of data. For this reason, information is obtained through various data sources, e.g. questionnaires, interviews, data files etc.. In addition, the methodology of this approach is related to the conclusiveness of the research (Parasuraman, 1991). Qualitative research develops an initial understanding of something in an exploratory way and incorporates a discussion outline for collecting information for a quantitative approach. However, on the other hand, a quantitative research is in the form of conclusive research projects (Parasuraman, 1991).

The goals of the qualitative approach are development of a theory, description, explanation and understanding, while that of a quantitative approach are testing of hypotheses analysing in an empirical way (Morse, 1994). The majority of techniques used in a qualitative approach are derived from social sciences (Palmer, 1994). Examples of qualitative and quantitative approaches in product planning and services marketing are given in Table 17.

The qualitative approach is best used in marketing research where the results of the problems and market conditions increase understanding, expand knowledge, clarify the real issues, explore and explain the market conditions, identify the behaviour of the supply and demand sides in the market area and provide input to a further stage of research (Gordon and Langmaid, 1988). The qualitative approach to research in this context is concerned with understanding the market rather than with measuring it. Therefore, measuring the market using a quantitative approach gives better results for reaching a conclusion. As a consequence, a qualitative approach deals with general understanding of research while a quantitative approach deals with the analytical side of research and brings it to a conclusion.

Table 17: Applications of a qualitative and quantitative approaches of the research

Area	**Qualitative approach**	**Quantitative approach**
Product planning	A marketing manager in the shipping industry wishes to develop an understanding of how, when, where and why passengers use a ferry service company to travel	A marketing manager wants to know whether a 1/3 off family discount for a ferry journey will significantly increase the ticket sales
Services marketing	The administrator of a ferry operator company wishes to develop a feel for the apprehension experienced by the passengers when they are on board of the ferry in a journey	The administrator wants to make certain the ratings of the passengers over specific attributes of the ferry, such as quality of facilities, food service, condition of cabins, additional facilities, personnel behaviour etc.

Source: Adopted from Parasuraman (1991).

As a consequence, a quantitative approach to positioning is used in this research because it enables accurate measurement of ferry operations in the market place and because it facilitates the development of results in conclusion after reviewing the general background to the Turkish maritime industry and the ferry market in the Eastern Mediterranean in Chapter 2 and 3, respectively.

4.3. SOME LITERATURE

4.3.1. Service marketing

The passenger ferry industry is part of the service sector and thus, is commonly considered as a service marketing issue. In this section service marketing theory will be discussed with respect to the passenger ferry sector before developing a positional model for further analysis with an attempt to identify the positioning of the ferry operators in the chosen market area.

The service sector generally is enormously large and varied. Governments are commonly the major providers of services, such as educational, health, military employment, communications, transportation and information systems. Many are provided on a non-profit basis, but others belonging to the private sector act on a commercial basis (Cowell, 1984). Business and professional services are mainly provided by airlines, sealines, banks, hotels, management consultants, insurance companies, advertising agencies, solicitors, marketing research companies, etc.

A contemporary definition of a service is given by Kotler and Armstrong (1993, p.200):

> "A service is an activity or benefit that one party can offer to another that is essentially intangible and does not result in the ownership of anything. Its production may or may not be tied to a physical product."

Services have a number of distinctive characteristics, which differentiate them from goods. The most common characteristics of services are intangibility, inseparability, variability, perishability and ownership (Cowell, 1984) as follows:

(a) Intangibility: Services are essentially intangible. It is often not possible to taste, feel, see, hear or smell services before they are purchased. The journey of a ferry service line is an example of intangibility because the product produced is the transfer of passengers or freight and not an "article" or possession.

(b) Inseparability: Services often cannot be separated from the person of the seller. Goods are produced, sold and consumed, but services are sold, produced and consumed. For instance, a food is first produced and sold, then consumed by a consumer who purchased it. On the contrary, a ticket for a ferry service between two destinations is first purchased in advance, then the journey is produced on the date that the ticket was issued for and the journey is consumed by the passenger on board together with the people representing the ferry company, i.e. the captain, service people, etc..

(c)Variability: It is often difficult to achieve standardisation of output in services. The variability of service output can cause problems. It is difficult to judge the quality in advance of purchase, such as the difficulty of judging the quality of the facilities on board of a ferry in advance of taking a journey.

(d)Perishability: Services are perishable and cannot be stored. For example, a maritime company that offers a journey at 0900 hours on one day a week between two destinations cannot sell any empty cabins for a journey once the vessel leaves the port.

(e) Ownership: The inability to own a service is related to its intangibility and perishability. In purchasing services, no ownership is transferred from the seller to the buyer. Payment is for the use of a service, but the sale of a tangible good, the buyer has the full use of the product itself. For instance, purchasing a ticket for a ferry service between two destinations does not mean that the ferry is purchased as a product. Only that the purchaser of the ticket may "hire" the use of the vessel for a limited time.

A service organisation designs its product and support services to meet the needs of target customers and to do this it formulates a marketing mix. A marketing mix is the set of controllable elements that an organisation can use to satisfy the needs and wants of a customer response (Palmer, 1994). These elements are product, price, place and promotion (Cowell, 1984; Palmer, 1994; Zeithaml and Bitner, 1996). In addition, they are expanded in the marketing mix for services by including the elements of people, physical evidence and process (Cowell, 1984; Palmer, 1994; Zeithaml and Bitner, 1996). This total of marketing mix elements for services are simply defined as "the 7Ps of service marketing".

In this research, the Turkish and the EU ferry operators are considered as the companies that are providing services for the passengers, who are the customers. The following examples can be given for the elements in the marketing mix for ferry services in general:

(a) Product: This element includes the ferry, its allocated terminals and the journey. The range of services provided and the quality of the services provided on board are also grouped under this element.

(b) Price: The levels of ferry ticket prices, commissions, terms of payment and discounts for families, children and students.

(c) Place: The location of the ferry ticket sales, the agencies and branch offices of the ferry companies together with the types of physical distribution channels used for the services.

(d) Promotion: This element includes various methods of communicating that may be through advertising, personal selling activities and sales of promotion activities, such as distributing various gifts to the customers for early booking or family discounts or group discounts on the ferry ticket prices.

(e) People: People perform a production or operational role in service organisations. Furthermore, the relationship between customers and personnel play an important role in the perceptions of the customers' towards a product of that company. The range of the customers, including the age, educational level, profession and target of travelling are important for the perceptions of the customers. Additionally, the educational and training level of personnel plays an important role in the reputation of the ferry company in the market.

(f) Physical evidence: Physical evidence includes elements of the physical environment and the location of agencies, branches, offices and head offices.

(g) Process: Process, which is the method of service delivery, is as critical and important as the behaviour of people in a ferry service organisation. The methods of selling ferry tickets and the ways of selling tickets through agencies, branches, offices or representatives are included here.

Total quality of the service as perceived by the customer is an eighth marketing mix element according to some authors, including Palmer (1994). However, we shall constrain ourselves here, to the traditional seven.

4.3.2. Positioning in service marketing

A model will be developed in order to identify and measure the positioning of the ferry operators as the service providers in the market place. Therefore, it is necessary to review the literature related to positioning in service marketing before attempting to develop a model.

Positioning originated in the late 1960s with the mapping of consumers' perceptions for products and this led to the approach of "Product Positioning". Ries and Trout (1986) mentioned the concept of positioning in the early 1970s in a series of three articles and described the origins of the idea (Congram and Friedman, 1991). Arnott (1993) defined positioning as

> "the deliberate, proactive, iterative process of defining, measuring, modifying and monitoring consumer perceptions of any marketable object."

By the 1980s, the marketers were urged by Ries and Trout (1986) to clearly focus their positioning strategies, but with greater competition (Congram and Friedman, 1991). Furthermore, companies began to look for the weak points of their competitors and then develop strategies in the context of those weak points. Therefore, positioning started to develop beyond its initial focus on the perceptions of consumers and to include additional considerations of the positions of the competitors in the market place. More specifically, the role and the principal uses of positioning in marketing management can be summarised as:

(a) Defining and understanding the relationships between the products and the markets

(i) How the product is compared with competitive offerings,

(ii) How well the product meets the consumer needs and expectations,

(iii) What the consumption level is for a product with a given set of characteristics offered at a given price (Lovelock, 1984).

(b) Identifying the market opportunities for introducing new products, repositioning the existing products within the same segment or a new segment of the market or eliminating products from the marketplace

(i) Introducing new products within the market considering competition,

(ii) Repositioning the existing products within the same segment or a new segment of the market by adding, dropping or changing certain attributes,

(iii) Eliminating products that do not satisfy the consumer needs (Lovelock, 1996).

(c) Making marketing mix decisions for competitive moves within distribution strategies, pricing strategies and communication strategies

(i) Distribution strategies of where to offer the product and when to make the product available,

(ii) Pricing strategies for how much charging and deciding the type of payment procedures,

(iii) Communication strategies for what target audiences, as consumers, are most easily convinced about the product and for what types of communication channels are chosen (Lovelock, 1984; Lovelock, 1996).

Failure to select a desired position in the marketplace and to develop a market plan for achieving a position may result in several undesirable possibilities, which can be as follows:

- The organisation is pushed into a position where it faces strong competitors,
- The organisation is pushed into a position where it faces little customer demand,
- The position of the organisation is so unknown that nobody knows what the real competence is,
- The organisation has no position in the marketplace because it is unknown to anybody (Lovelock, 1984).

Positioning is important for the service marketers because it addresses the issue of differentiation and the goal of removing a certain service from the ordinary market area, and additionally, it forces some decisions of the service company regarding the competition in the market (Congram and Friedman, 1991). Therefore, consumer behaviours are examples of research areas for strategic positioning of products and companies (The Economist, 1992).

Positioning has been used in various areas in the past and there are now a substantial number of examples of positioning studies (See Table 18) undertaken in marketing and in the service sector, but very few in shipping and none in the ferry sector.

Alternative quantitative methods that can be applied to positioning were contained within a checklist by McAllister as noted by Ledger and Roe (1995). Discussion of these approaches follows.

4.3.3. Measurement of positioning in service marketing

Measurements are necessary for the positioning of service companies and organisations in the

Table 18: Various positioning cases

Applicant(s)	Area	Subject
Shostack (1977)	Air transport	Market positioning of airline services based on tangible and intangible elements
Polzella and Reid (1989)	Aviation	Measurement and positioning of aircraft system variables
Anooshian *et.al.* (1984)	Child development	Evaluation of children's perceptions for certain objects
Cousins (1983)	Child development	Perceptual mapping for psychological development of children
Moeser (1988)	Civil engineering	Positioning maps for a complex building
Savolainen *et.al.* (1995)	Computer industry	Positioning of modelling approaches and methods
Groenen and Heiser (1996)	Education	Positioning of journals in the psychometric literature according to their citations
Reap and Popovics (1989)	Education	Positioning of an educational department
Kurian *et.al.* (1989)	Human sciences	Left-arm dominance of a person
Ho *et.al.* (1982)	Medicine	Linear positioning performance on a human body nerve system
Lau (1988)	Politics	Positioning of power
Zins (1994)	Tourism	Positioning of various leisure places regarding their facilities
Various newspaper owners as noted by Rosario (1994)	Marketing	Positioning strategies for newspapers in 1997
Davies and Brooks (1989)	Marketing	Positioning of department stores in Manchester, in the U.K., by using multidimensional scaling
Schori and Meadow (1985)	Marketing	Optimal positioning of a brand
Wind (1982)	Marketing	Positioning of various automobile brands by using multidimensional scaling
Wind and Robinson (1972) as noted by Wind (1982)	Marketing	Product positioning for the similarity of a group of food by using multidimensional scaling
Lovelock (1996)	Service marketing	Positioning of high service hotels
Palmer (1994)	Service marketing	Positioning strategy of a group of supermarkets in the U.K.
Palmer (1994)	Service marketing	Service positioning strategies of a set of organisations
Hooley and Saunders (1993)	Service marketing	Positioning of leisure facilities in the East Midlands of the U.K.
Eckardt (1992)	Service marketing	Positioning of hospitals regarding their services
Congram and Friedman (1991)	Service marketing	Positioning of various credit cards, e.g. Visa, MasterCard and American Express

Sources: as noted in the table.

market place to differentiate between them and to identify them. Some examples of the use of different scales of measurement in positioning are various statistical formula, ranking of preferences and categorisation of objects (Green *et.al.*, 1988). Additionally, according to service management principles, satisfaction of consumers and the effectiveness in customer services are measured through metric or nonmetric variables within the current situation of the service organisation (Gronroos, 1990). Similarly, measurements are used for the purpose of modelling in marketing (Lillien *et.al.*,1992).

Measurement can be defined as a way of obtaining symbols to represent the properties of people, objects, events or states, when symbols have the same relevant relationship to each other as do the things represented (Green *et.al.*, 1988). In other words, if a characteristic, a property or a behaviour is represented by numbers, there must be a one to one correspondence between the number system used and the relations between various measured quantities. Measurement can proceed only after defining the variables, as what must be measured and how it is to be measured. In measurement, numbers reflect the relations between the objects with respect to the characteristics that are involved. A scale of measurement shows the comparisons of amounts and changes in the property being measured.

Defining and measuring customer service in marketing could be done in such a way that it becomes essential to understand the customer service in terms of differing requirements of different market segments. Various elements can define customer services, such as order cycle time, availability, reliability, after sales support, etc. (Christopher, 1986). It is obvious that in some market situations, some of these elements are more important than others, related to customer perceptions towards services. Thus, company services are measured within that market place. There are many ways to segment a market. Market segments have the characteristics of accessibility, substantiality, actionability and measurability for being useful and effective. Accessibility is the degree to which a market segment can be reached and served. Substantiality is the degree to which a market segment is sufficiently large or profitable. The degree to which effective programmes can be designed for attracting and serving the segments is the actionability. Finally, measurability becomes the degree to which the size and purchasing power of a market segment can be measured (Kotler and Armstrong, 1993).

Measurements can be used for the purpose of modelling in marketing. For instance, demand for a product as a function of various independent variables can be measured within the models. Another measuring model can be the measuring of competitive influences in the market while working in that marketplace and having the responses from consumers of that market (Lillien *et.al.*, 1992).

According to service management principles, for service oriented approaches, satisfaction of consumers with service quality, within the current situation of the service organisation, has to be measured (Gronroos, 1990). The key element in measuring services marketing effectiveness is "how to do things, not what to do" (Congram and Friedman, 1991). Similarly, in a service business, the effectiveness in customer services is measured through objective or subjective methods, which consist of metric or nonmetric variables. Measuring the current situation of a service organisation can be made within the position of that organisation in the marketplace. This is done through various types of analysis, such as multivariate analysis, which will be mentioned later in this chapter.

Positioning strategies identify the importance of the services within a specific market segment. There the importance of perceptions of consumers are paramount. Perceptions of different individuals may have different priorities, particularly, in positioning of organisations and companies for the purpose of using the service, timing of use, using the service alone or if using the service with a group, then the composition of that group. Therefore, if a positioning or repositioning of a service comes to action, the starting point becomes research of the consumer and then comes the development of perceptual maps. Perceptions of consumers are usually measured by perceptual maps and their role in positioning appear to be important. As it is specified by Congram and Friedman (1991) in the Handbook of Marketing for the Service Industries, positioning starts with perceptual mapping. A perceptual map is similar to a geographical map. For example, a geographical map positions cities according to their distances from one another on the dimensions of north-south and east-west. With perceptual maps, the psychological distances between services are measured and reflected on the graphs by the help of human perceptions. The psychological distances between services are reflected on whatever dimensions that consumers deem relevant while evaluating the service that is being studied, i.e. quality, friendliness, convenience, reliability, attractiveness, cleanliness, etc..

As a consequence, in this research the positioning of the ferry operators in the Eastern Mediterranean ferry service market that takes place, particularly, in the Italy-Greece-Turkey corridor, is measured by developing and operationalising a positioning model using a quantitative approach. Little research into, or application of, positional models has previously taken place in transport and almost none in the maritime sector (See Table 18). Various positioning cases are available in a study of aircraft system variables in aviation (Polzella and Reid, 1989), marketing research for automobile brands (Wind, 1982) and leisure services in tourism (Zins, 1994; Sinclair and Stalling, 1990) as noted earlier, which are considered adjacent fields to maritime transport. In addition, there has been a study of airline services (Shostack, 1977) which is a similar area to maritime services. Hence, applications from elsewhere were difficult to find and related studies to this exercise in the ferry market had to be used. Quantitative techniques to measure the positioning models are reviewed in the next section.

Supply and demand side applications in positioning:

Data based on customer expectations, perception and preferences - representing the demand side of the market - is used in marketing research more than data based on the supply side of the market as product or service producers or providers (Zeithaml and Bitner, 1996). This data is valuable to build up company perceptions of customer expectations and therefore, the company identifies its strategy for customer-driven service and product standards (Lovelock, 1996).

However, company-defined service and product standards are also vital elements for companies. They are related to internal characteristics of companies e.g. total number of personnel, training programmes, promotion strategies, methods of selling products, places of outlets, level of decision-making etc. to maintain a considerable level of productivity, efficiency, cost and technical quality (Zeithaml and Bitner, 1996). Therefore, market research can also be achieved by applying surveys to the supply side of the market - product and service producers and providers.

Service providers can build up their company strategies to improve or continue their positions in the market place after a marketing research is applied to them, which leads to discover and be aware of the facts related to their companies. In addition, they can also measure and identify their positioning against their competitors by applying surveys to customers. However, these surveys will give an idea of only the perceptions, expectations and preferences of their customers as noted above. Therefore, various company characteristics can also be evaluated instead of only measuring these customer characteristics.

There are a number of positioning cases related to the supply side of the market. For example, a market research was conducted for the positioning of coffee-makers by applying the questionnaires to them who represent the supply side of the service market (Vriens, 1994). Another survey was applied to a number of shopping centre owners to discover their management strategies (Baron and Phillips, 1994). A range of marketing problems related to a number of issues in strategies, segmentations, products, pricing, distribution and promotion (Vriens, 1994).

Positioning cases, which are based upon the supply side of the market, were analysed by Ledger (1995) and Ledger and Roe (1996), particularly in shipping cases. Eastern Europe shipping was examined by data of various of shipping companies.

4.3.4. Techniques to measure positioning

This section is related to the alternative methods of measuring positioning. Various alternative techniques are specified briefly and the optimum technique for this research is selected and discussed in detail. Alternative types of analysis for measuring positioning using quantitative data in marketing research depend on the number of variables. These types of analysis are as below:

(a) Univariate analysis,

(b) Bivariate analysis,

(c) Multivariate analysis (Kent, 1993).

(a) Univariate analysis: Univariate analysis forms a basis for making precise quantitative statements about one type of variable and takes place if variables are being taken one at a time (Kent, 1993). Furthermore, it takes no account of the relationship between the variables

(Aaker *et.al.*, 1995). The following is an example of raw metric data, representing the ages of ferries, that can be used for univariate analysis: - 16, 18, 12, 20 and 10 years. The listed univariate data is one type of variable. The analysis of this type of data is usually made by calculating the range, median value, mean, standard deviation and frequency (Tull and Hawkins, 1987).

The variables in the research proposed here are of more than one type and more than one variable needs to be taken at a time for calculation and analysis. Therefore, univariate analysis is not suitable for this research.

(b) Bivariate analysis:

Bivariate analysis examines the relationship between the values of two variable (Tull and Hawkins, 1987). Additionally, it measures the values of the two variables that vary together in a kind of pattern. If a pattern, in other words, a relationship exists between the variables, then it becomes possible to predict the value of one variable from the knowledge of the values of the other variables. Thus, a measure of association between the values of the variables are provided by this analysis (Kent, 1993; Aaker *et.al.*, 1995). Various statistical techniques such as simple regression, analysis of variance and chi-square are used by bivariate analysis (Kent, 1993).

In bivariate analysis, two types of variables are used: predictor (independent) variables and criterion (dependent) variables. Predictor variables are used to help predict or explain the level of criterion variables. Marketing managers are often interested in the degree of association between two variables. Depending upon the purposes for which the data was obtained, they may be interested in examining the degree of association of variables such as income, price, perceived quality, life-cycle stage, social class, amount of advertising and education, etc. With variables such as sales, attitudes toward brands, brand preference, market share, purchaser of brand and nonpurchaser of brand, etc. (Tull and Hawkins, 1987) For instance, market share is an example of a criterion variable, while predictor variables may be relative price, amount of advertising, and number of outlets.

Bivariate analysis is limited to looking at the relationships between variables two at a time and is not appropriate for more than two variables involved in the analysis. Since more than two variables are required at the same time in identifying the positioning of ferry operators in the market area for this research, bivariate analysis appears to be inappropriate for this research.

(c) Multivariate Analysis:

Multivariate analysis can be defined as the application of methods that deal with large numbers of measurements made on each object in one or more samples, simultaneously (Dillon and Goldstein, 1984). The important characteristic of this type of analysis is that multivariate analysis deals with the simultaneaous relationships among variables and concentrates on more complex relationships among several variables in a set of data (Chisnall, 1992). In other words, multivariate analysis techniques differ from analysis of the mean, standard deviation or variance of a single variable in univariate analysis or from pairwise relationship between two variables in bivariate analysis.

This type of analysis has various advantages over procedures of univariate and bivariate analysis (Kent, 1993) such as forming a group of variables that are interrelated and similar, enabling the prediction of dependent variables from independent variables and driving a conclusion from the relationships between variables (Kent, 1993). Furthermore, this analysis deals with correlations among three or more variables reflecting the relationships amongst them. For instance, the effects of price, package, brand name and manufacturer of a product (independent variables) on the sales of the product or the preferences of the customers (dependent variables) can be examined by multivariate analysis techniques.

Most marketing research studies, including the positioning of products, brands and companies in the market area, and data analysis are concerned with association among three or more variables. Since a research problem can seldomly be solved by a single variable (Wind, 1982), multivariate data analysis (Multivariate Analysis) has been widely accepted over the last decade and the techniques of multivariate analysis have been used in almost all fields of science (Dillon and Goldstein, 1984). Examples of various applications of multivariate analysis are listed in Table 19.

4.3.5. Multivariate analysis techniques

A wide variety of multivariate techniques are available for marketing studies. Most of the methods appropriate for positioning depend on the type of data, the type of problem and the objectives that are being analysed. One fundamental distinction between many techniques stems from the association between the two sets of variables, specified as the methods of dependence and interdependence (Dillon and Goldstein, 1984).

4.3.5.1. Dependence Methods

If the association between the two sets of variables, representing the positioning of a product, brand or a company in the market area, is in such a way that one set is a dependent or criterion measure, then the appropriate class of techniques is that of dependence methods (Aaker *et.al.*, 1995). The data matrix of a dependence method is partitioned in a way which the data can be divided into seperate parts. For instance, the dependent and the independent variables take place on different sides of the formula (Wind, 1982). The following are the several techniques

Table 19: Various applications of multivariate analysis

Applicant(s)	Area	Subject
Manly (1994)	Economy	Employment distribution in different types of industries in various European countries
Hubert (1994)	Education	Various studies in various fields of education
Bojorquez-Tapia *et.al.* (1991)	Environment	Environmental problems in Mexico
Manly (1994)	Human science	Examining various Egyptian skulls from ancient times
Krzanowski (1988)	Industry	Relationship between the costs of production and materials
Green *et.al.* (1989)	Marketing	Product planning, development of product perceptions, product pricing and identifying the positioning of products, brands and services
Bhuiya *et.al.* (1987)	Medicine	Fatality of measles desease among children in Bangladesh
McGraw *et.al.* (1994)	Psychology	A psychology case for the estimation of multivariate probabilities
Brooner *et.al.* (1990)	Psychology	Study of alcoholism
Morse et.al. (1991)	Sociology	Classifying homeless people
Sufian (1993)	Urban studies	Determination of urban quality of life in metropolitan areas
Eaglstein and Weisberg (1990)	Urban studies	Study of intra-urban migration
Bumpus (1898) as noted by Manly (1994)	Zoology	Effects of natural selection on sparrows after a storm

Sources: as noted in the table.

that can analyse dependence structures depending on the nature and the number of the variables (Dillon and Goldstein, 1984; Chatfield and Collins, 1980):

(1) Multiple Regression:

This technique is one of the most commonly known and used multivariate methods. Multiple regression is mainly concerned with the effects of a set of independent variables, which are the predictor variables, on a variable, which is the dependent variable (Dillon and Goldstein, 1984). Multiple regression analysis is frequently used in marketing for the measurement of the determinants of demand, e.g. market share and positioning of products, for forecasting sales and for determining the relationship between the dependent variable and independent variables, estimating the reliance of a product price when the product brand is held constant (Tull and Hawkins, 1987).

This type of multivariate analysis technique is inappropriate for this research because the type of data matrix is partitioned. In other words, the data needs to be calculated and analysed together at one time.

(2) Discriminant Analysis:

This technique is one of the more popular and frequently utilised techniques in the analysis of multiple measurements (Dillon and Goldstein, 1984). It classifies individuals or objects into two or more categories by using a set of intervally scaled independent variables. The mathematical logic of discriminant analysis is similar to regression analysis. As a result of the discriminant equation, the most important variables are demonstrated for illustrating what distinguishes the classes (Tull and Hawkins, 1987). Examples of the use of this technique in marketing are given as the classification of buyers versus non-buyers of a brand, selection of store sites and finding out the perceived price level of a company as a major discriminating factor between shoppers and nonshoppers. Thus, the position of that company in the market area is identified by customers through this technique.

This technique is not appropriate for this research because of its similarity to regression analysis, where dependent and independent variables are partitioned and take place on different sides of the formula.

(3) Logit Analysis:

This technique is appropriate when a single dependent variable is a discrete measurement and not a continuous measurement, then all the independent variables are also discrete (Dillon and Goldstein, 1984). Logit analysis is inappropriate for this research because the data matrix is partitioned and the variables are divided as dependent and independent on different sides of the formula for calculation.

(4) Path Analysis:

This type of analysis consists of a series of regression analyses that are managed simultaneously to determine if a proposed set of relationships exists in a set of sample data. It is generally used to test a sequence of relationship (Tull and Hawkins, 1987). An example of a path analysis technique is testing advertising leading to favourable attitudes toward a brand and leading to brand use. Thus, positioning of a brand can be identified by this technique.

Path analysis is used for one dependent variable at a time, i.e. the positioning of a brand in the market. Therefore, this technique is not appropriate for this research because the positioning of various companies needs to be identified at the same time.

(5) Multivariate Analysis of Variance (MANOVA):

This technique is the appropriate data analysis technique to assess the impact of various levels of one or more experimental variables on the dependent measures when multiple dependent measures are available. Thus, the major focus of this type of analysis is the testing of significant differences on a set of variables due to the changes in one or more experimental variables (Dillon and Goldstein, 1984). For instance, MANOVA may be used for the analysis of the relationship between the dependent variables representing the position of a product in the market and the purchasing level of a product by the customers. Independent variables representing the price, brand, package and store area can be used for that analysis.

MANOVA is not appropriate for this research because the data matrix of this technique is partitioned. Data from this research requires to be analysed in a nonpartitioned data matrix.

(6) Canonical Correlation Analysis:

This type of analysis determines the linear association between a set of independent variables and a set of dependent measures. There are two linear combinations, which are one for the independent set of variables and one for the dependent set of variables for the determination of a maximum correlation (Dillon and Goldstein, 1984). The number of dependent and independent variables are both two or more. Since the data matrix of the canonical correlation analysis technique is partitioned, this technique is inappropriate for the analysis of the data of this research.

4.3.5.2. Interdependence Methods

If the mutual association across all variables is in such a way that there is no distinction made among variables, then the techniques to be used are interdependence methods. The variables may be completely independent while there may be a correlation among each other (Chatfield and Collins, 1980; Aaker *et.al.*, 1995). For instance, the positioning of various companies, with many variables with each of them representing different characteristics, may be identified by using multivariate interdependence methods. This type of technique provides insights into the underlying structure of the data by simplifying the complexities, primarily through data reduction. The following multivariate interdependence techniques are appropriate for positioning (Dillon and Goldstein, 1984):

(1) Principal Components Analysis:

This type of analysis is a data reduction technique to construct linear combinations of the original variables that account for the total variation as much as possible. The linear combinations are calculated in such a way that they are uncorrelated with each other, however, they account for smaller amounts of total variation (Dillon and Goldstein, 1984). This technique is not suitable for this research because a correlation among the variables is required to identify the comparative positioning of the ferry companies in the market place.

(2) Factor Analysis:

Factor analysis is also a data reduction technique through which a large number of original variables are summarised into a small number of variables, called factors (Tull and Hawkins, 1993). However, in contrast to principal components analysis, only a part of the total variation, that a particular variable shares with the other variables, constitutes a set for the factor analysis and the rest of the data is reduced (Dillon and Goldstein, 1984). It was similarly noted by Tull and Hawkins (1993) in an example of a study of consumer involvement for product categories. 19 items of data were simplified and condensed into 4 factors representing different product categories in that study in which data reduction was approximately 80%. Therefore, this technique is not appropriate for this research because it would reduce and omit many variables from the analysis.

(3) Cluster Analysis:

This is also another type of data reduction technique. The cluster analysis technique identifies a smaller number of groups such that elements in a particular group are, in some sense, more similar to each other than to elements belonging to other groups. The homogeneous subgroups are constructed and based on the similarities / dissimilarities of respondents' attribute ratings (Dillon and Goldstein, 1984).

This technique may be used for this research because of the grouping of similar characteristics and the formation of homogeneous subgroups of the characteristics of the companies. However, it is not totally suitable for analysing the positioning of the companies for this research because too much data is reduced and, thus, lost in the analysis.

(4) Conjoint Analysis:

Conjoint analysis is concerned with the measurement of psychological judgments. Input data for conjoint analysis is the preferences for each combination of characteristics depending on the respondents. The rank order of the respondents' preferences constitutes a set to be conducted for one case at a time (Green *et.al.*, 1988).

This technique may be used for this research for rank ordering of the preferences, which are represented by variables one case at a time (Aaker *et.al.*, 1995). Unfortunately, it is not totally suitable for the analysis of positioning of companies in the market area because this technique is only related to the measurement of the preferences that depend on psychological judgments and not related to the measurement of metric data.

(5) Multidimensional Scaling:

Multidimensional scaling allows a researcher to explore and infer the underlying criteria or dimensions of people's perceptions about similarities or dissimilarities between objects and preferences among various objects. Simply, multidimensional scaling looks for the dimensions from a series of similarities / dissimilarities or judgments about the objects within a given set of multivariate data (Green and Wind, 1973). An important feature and the main objective of multidimensional scaling is a map of objects that can be products, brands, companies or others in a reduced space. The position of an object in that space reflects its degree of perceived similarity / dissimilarity compared to other objects (Chatfield and Collins, 1980).

Two types of this technique exist - metric multidimensional scaling and non-metric multidimensional scaling. The similarity or dissimilarity data are assumed to have metric properties with metric multidimensional scaling while the similarity or dissimilarity between two objects decreases or increases linearly with distance (Dillon and Goldstein, 1984). Additionally, rank order of data and score rating of data are also used by metric multidimensional scaling techniques (Coxon, 1980a). On the other side, the non-metric approach only uses the rank-order of distances (Chatfield and Collins, 1980; Dillon and Goldstein, 1984).

Unlike other techniques that may require respondents to evaluate objects, products or brands on numerous attributes through a set of attributes that were prepared by a researcher in advance, MDS is usually used for both attribute and nonattribute based techniques. In MDS, respondents do not only evaluate objects, products, brands or companies, instead they can also rate them in terms of similarity / dissimilarity or preference (Tull and Hawkins, 1993).

Some conclusions

Multidimensional scaling is a widely used multivariate analysis technique, particularly, in marketing to identify the relative positioning of competing products, brands and companies as perceived by customers (Tull and Hawkins, 1993; Wind, 1982). In addition, MDS is commonly used in marketing in various other areas (See Table 18) to identify, measure and illustrate the positioning based on perceptions or similarity judgments of respondents - customers or service providers. Regarding the above specifications, it was decided to use the multidimensional scaling technique of the multivariate analysis methods, as the most appropriate technique for the analysis of data in this research.

This technique appears to be the appropriate technique for this research because the positioning of competing companies in the market area can be identified, measured and illustrated most satisfactorily by using this technique. The non-partitioned multivariate data of more than two companies, each representing different characteristics of the companies, can be used at the same time. Additionally, both metric data and non-metric data - the preference data - can be used at the same time within this technique. Moreover, preference data of respondents for various characteristics of companies in this research are used for ratings which are then evaluated within the technique to identify and illustrate the positioning of these companies.

Consequently, it is ideal for this research in identifying positioning of the passenger ferry operator companies - the service providers in the Eastern Mediterranean ferry market, through an n-dimensional map - illustrated by specific computer software programmes - by using the score ratings of the data of the operators.

4.3.6. Multidimensional Scaling in more detail

Multidimensional scaling is used to identify the positioning of objects, products or companies in dimensions by which they are perceived or evaluated by the marketing researcher (Aaker, et.al., 1995). Input data of this technique is an attribute based quantitative data which involves the rank orders or score ratings of the similarities or the perceptions for objects, products or companies. Output data is involves with the illustrations of ideal points and vectors in a graph, which is produced by specific computer programmes.

Multidimensional scaling (MDS) was developed in behavioral and social sciences for studying the structure of objects or people. MDS is defined by Davison (1983, p.95), as

> "... a set of multivariate, statistical methods for estimating the parameters in and assessing the fit of various spatial distance models for proximity data."

Carroll and Arabie give two definitions of MDS as mentioned by Davison (1983). According to these definitions, MDS is a family of geometric models for multidimensional representation of data and a corresponding set of methods for fitting such models to actual data. According to Davison, most multivariate statistics, including factor analysis and cluster analysis, would fit this definition. However, MDS refers to a set of multivariate statistical methods for estimating the parameters in and assessing the fit of various spatial distance models for proximity data (Davison, 1983).

Additionally, Bartolucci notes it (1986, p.747) that Carroll summarises MDS as

> "... a family of methods for developing multidimensional spatial representations from the data. The motivation naturally is to gain great insight into the data... The techniques and the models used provide a fairly good first approximation to reality."

Coxon describes MDS in a similar way, in his book "The User's Guide to Multidimensional Scaling" (1982, p.1) as

> "... a family of models by means of which information contained in a set of data is represented by a set of points in a space. These points are arranged in such a way that geometrical relationships, such as distance between the points reflect the empirical relationships in the data."

Coxon, furthermore, describes MDS by giving an example of representing the complex associations between a set of variables, which is contained in a matrix of correlations, by portraying each variable as a point and placing them in such a way that the distances between the points reproduce the numerical values of the correlation coefficients. Thus, a picture of the data is produced which is much easier to assimilate visually than a large matrix of numbers (Coxon, 1982).

Davies and Coxon (1982, p.147) view MDS as below:

> "The field of MDS lies within the area of scaling, which in turn forms part of the region of measurement... The problem of measurement lies in contracting the marriage between objects and numbers... social scientists on the one hand and mathematicians on the other."

Similar to the above definitions, another narrow definition of MDS is given by Cox and Cox (1994, p.1) as follows:

> "MDS is the search for a low dimensional space, ... in which points in the space represent the objects, ..., one point representing one object, and such that the distances between the points in the space, match as well as possible the original dissimilarities."

Additional to the above definition, the techniques used for the search for the space and the associated configuration of points form metric and nonmetric multidimensional scaling (Cox and Cox, 1994).

The purpose of the MDS technique, within the analysis of data collected in the social, behavioural sciences and various other sciences, is (Shepard *et.al.*, 1972):

> **(a)** Somehow getting hold of whatever pattern or structure may lie hidden in a matrix of empirical data,
>
> **(b)** Representing that structure in such a form that it is much more accessible to the human eye as a geometrical model or a picture.

The objects studied may be stimuli, persons, marketing products, etc., and they are represented by points in a spatial model. The significant features of the data about the objects are revealed in geometrical relations among the points.

The methodology of MDS, as mentioned by Green *et.al.* (1989), could be used to predict the effect of product or brand positions in a perceived space, an ideal point or stimulus positions in an evaluative space, and a share of object, product or brand choices. After they distinguish between objective and perceived attribute spaces, the stimuli are compared. The choices are made by means of portraying geometrical and preferred combinations of scores on the evaluative dimensions.

It was mentioned by Davison (1985) that Schiffman, Reynolds and Young emphasized the experimental, mathematical and interpretative advantages of MDS, in 1981. Additionally, Davison mentioned, in his same article, that other authors, i.e. Kruskal and Wish (1978) suggested using MDS to analyse correlations between measures.

MDS techniques, which are applied in order to reveal a perceptual map of objects varying upon the orientation of the study, have the following main advantages over other techniques

(Luck *et.al.*, 1982; Frankel *et.al.*, 1984):

(a) The availability of a number of statistical techniques through the use of metric and/or nonmetric input data.

(b) MDS techniques can be applied to various situations and subjects.

(c) MDS techniques can describe complex relationships, while reducing the complexity of data and information.

(d) MDS can examine a variety of hypotheses.

(e) MDS techniques are used for the new strategies in marketing for the development or improvement of new brands or products.

(f) Analysis of positions of objects, products and etc. within an industry or a sector can be carried out extremely well.

(g) Positioning or repositioning of objects, products, brands, companies or characteristics are identified and measured by MDS techniques and are illustrated by figures in a multidimensional space.

(h) MDS techniques are used for identification and understanding of market segmentation and product differentiation in marketing (Tull and Hawkins, 1993).

(i) MDS techniques permit researchers to describe and examine the perceptions of respondents within dimensions by perceptual mapping.

(j) Within MDS techniques, preference statements, proximity judgments and attribute rankings are scaled.

(k) MDS allows the use of certain computer software programmes and technical features (Tull and Hawkins, 1993).

The development of MDS consists of two major phases (Shepard *et.al.*, 1972):

(a) Development of "Classical Scaling", which forms metric MDS, and, in contrast,

(b) Development of "Ordinal Scaling", which forms the nonmetric side of MDS.

Classical scaling originated in the 1930s when Young and Householder (1938) showed how to start with a matrix of distances between points in a Euclidean space coordinates for points that can be found in such a way that distances are preserved (Cox and Cox, 1994). Some details of Euclidean space and distance will be explained later in this chapter.

Metric MDS is also known as the "Princeton" or the "Tongerson" approach. The first full development was made by Gulliksen's psychometric group at Princeton University, in the U.S.A., in 1952. Tongerson (1952) brought the subject into popularity by using the technique for scaling in 1952 and completed (1960) a textbook, which has been regarded among psychologists as the classical treatment of the theory and methods of scaling in general, including the results of the first phase of the developments in MDS.

The second phase consisted of three basic developments of MDS. The first one began about ten years later at the Bell Telephone Laboratories, in the U.S.A. The initial development of nonmetric MDS was introduced by Shepard in 1962, and furthermore, conceptual and computational improvements were added by his mathematical colleague, Kruskal, in 1964. Additionally, many others, including Chang, Johnson, Klemmer, Nakatani, Wish, and particularly, Carroll, at Bell Laboratories, worked on numerous methods derived from this new approach, MDS (Shepard *et.al.*, 1972) They made significant extensions. The models are quite similar, but differ considerably in terms of various options involving starting configurations, distance metrics, flexibility of input data options etc. (Green and Wind, 1973). Carroll and Chang developed and applied a new type of individual differences model by which the dissimilarities data of various judges can be meaningfully interrelated. The model that they developed is called INDSCAL.

A second, independent development of the second phase was made by Coombs and his students at the University of Michigan, in 1964. The specific methods devised by Coombs have not been widely used for multidimensional analysis of actual data, because of a number of reasons noted by Shepard et.al. (1972). One of them was the lack of methods for sufficient formalisation to be converted into computer programmes whilst another was the failure of methods to provide picturable representations of nonmetric data. However, the methods of Coombs served as a basis for the newer methods derived by Lingoes, Guttman, and others (Shepard *et.al.*, 1972).

Guttman (1968) took a different approach to Kruskal's approach in 1964, in setting up nonmetric MDS. Kendall worked on a dissimilarity matrix of ordinal scaling in 1971 (Chatfield and Collins, 1980; Cox and Cox, 1994). Young introduced an interactive classical scaling method in 1972, in the U.S.A. (Cox and Cox, 1994).

MDS(X), which is the computer programme for MDS, was developed in 1972, being separate from but having some relationship with the previous ones developed at Bell Laboratories and the University of Michigan. Lingoes, from the University of Michigan, Guttman from Israel, and Roskam from the Netherlands developed Guttman-Lingoes-Roskam method for MDS, in 1973, - also known as "GLR". Guttman and Lingoes produced a series of computer programs for nonmetric MDS based on the Guttman approach. The programs are included in SSA-I (Smallest Space Analysis) of programs (Interview, 1995a).

Hayashi and Takane introduced another method for nonmetric MDS, in 1978, in Japan (Cox and Cox, 1994). The basis of the new, nonmetric variety of MDS mostly depends on the approach proposed by Kruskal (1964), as mentioned by Chatfield and Collins (1980). Similarly, it is also specified by Bartolucci that much of the early work and methodological technique of MDS used today is attributed to Kruskal (Bartolucci, 1986).

The third development, as mentioned by Cox and Cox (1994), was made by Coxon and Davies in 1983. They have taken further steps for MDS by redeveloping a computer software programme called "MDS(X)" (See Appendix 1). This is a series of 15 independent MDS programmes as a software package for computers (Coxon and MDS(X) Project Team, 1980b).

All of the methods developed at different places and times have links between them and are associated with each other as Coxon dicussed at private interviews in 1995 (Interview, 1995a; Interview, 1995b).

4.3.6.1. Input data of MDS

The scales of input data are nominal, ordinal, interval, and ratio. Measurement results of these types of scales are explained in Table 20.

Table 20: Types of measurement data in MDS

Scale	Basic Empirical Operations	Permissable Statistics
Nominal	Determination of equality	Number of cases Mode Contingency correlations (Chi-Square test)
Ordinal	Determination of greater or less	Median Percentiles Rank-order and rating correlations
Interval	Determination of equality of intervals or differences	Arithmetic mean Standard deviation Average deviation Correlation ratio t-test; F-test
Ratio	Determination of equality of ratios	Coefficient of variation Geometric mean Harmonic mean

Source: Dillon and Goldstein (1984).

For instance, nominal-scaled data is described in terms of classes, in other words, the numbers assigned simply represent the objects with no ordering. Ordinal-scaled data is ranked data, which means that one object has more or less or the same amount of an attribute or some other objects. On the other hand, interval-scale data represents one object by illustrating how much more that object has of an attribute than another object. Finally, ratio-scaled data has no origin (a zero amount of attribute) and ratios of scale values are considered to be meaningful for performing mathematical operations. Data that is interval or ratio scaled are metric, while data measured at the nominal or ordinal scale level are nonmetric (Green *et.al.*, 1988). The corresponding scaling methods are metric scaling and nonmetric scaling, respectively. An example of an ordinal scaling method is nonmetric MDS.

Data for a MDS can be collected in several ways and the input data consist of either objective or perceived attribute scores for various objects. The input data for MDS can be preference based or similarity based. Preference data is generated by the ranking of a set of objects from the most preferred to the least preferred or from the least preferred to the most preferred. Similarity based input data is generated by selecting pairwise comparisons (Coxon, 1982).

4.3.6.2. Measures of proximities

MDS is a technique for inferring the number and nature of dimensions underlying respondent evaluations / perceptions on the basis of similarity and/or preference judgments provided by respondents about elements, e.g. objects, products, brands and companies (Parasuraman, 1991). The important points of the technique are the number of dimensions and configuration, in other words, pattern of points in that dimensionality.

Data perceived from similarities or preferences can be in the form of metric ratings as well as nonmetric ranks. In other words, MDS approaches are available for analysing both metric and nonmetric input data. The results of the analysis may be expressed graphically or numerically indicating, for instance, the market segments and their sizes.

Proximity is defined by Cox and Cox (1994) as the nearness of proximity, in other words, the nearness of objects, individuals or stimuli in two ways: similarity or dissimilarity. The similarity or dissimilarity of measuring pairs of objects show how similar a measure quantifies the degree to which the two objects are alike (Davison, 1983). Correlation coefficients and joint probabilities are some examples of proximity measures. The proximity measure depends upon the problem in hand. Sometimes the similarity between two objects is not based on any underlying recorded data of objects. Therefore, the similarity / dissimilarity measurement is totally subjective (Cox and Cox, 1994). In some situations, similarities / dissimilarities are constructed from a data matrix for the objects,in the form of (n*n), which are called similarity / dissimilarity coefficients, by Cox and Cox (1994). Unless otherwise stated, a measure of proximity is used for the measure of dissimilarity in most of the literature.

Coxon (1982) and Davies and Coxon (1982) can be referred to for further details of multidimensional scaling techniques.

4.3.6.3. Major types of MDS

There are different types of MDS procedures that measure attributes or variables, represent the relationships between a set of objects on a graph and identify the judgments of similarity between the objects (Coxon, A.P.M. and MDS(X) Project Team, 1980a). The major types and models used for MDS are as follows (Dillon and Goldstein, 1984; Cox and Cox, 1994):

(a) Metric and nonmetric MDS: This type of MDS comprises two sections, metric and nonmetric MDS as specified below:

(1) Metric Scaling: Metric MDS assumes that the data is quantitative, having either interval or ratio scale properties. The level of measurement is at the interval or ratio scale, and therefore, an exact functional form relating the proximity values to the distances can be specified. Metric MDS procedures directly relate the distance and proximity measures in a linear fashion (Coxon, 1982).

(i) Classical metric scaling: The first MDS models that were designed to use metric information and assumed to calculate similarities or dissimilarities in empirical ways, were classical metric scaling models (Coxon, A.P.M. and MDS(X) Project Team, 1980a). Programmes for this model use linear regression for statistical calculations.

(ii) Euclidean distance model: The starting matrix of distances between points in a Euclidean space coordinates with the points while the distances are preserved. This model uses the data as the estimates of distances in terms of dissimilarity, in most cases, or in terms of similarity, in some cases. The solution derived from this model consists of an arrangement of points in a small number of dimensions being located in such a way that the distance between the points matches the dissimilarities between the objects as closely as possible. The distances of configuration of points reflect the rank order of the data (Coxon, 1982).

(iii) Least squares scaling: This type of model is another example of a metric MDS. Least squares scaling allows a continuous monotonic transformation of dissimilarity before a configuration is found using least squares. The distances do not have to be Euclidean. Different types of least squares MDS are ALSCAL, an alternating least squares method, and SMACOF, a minimisation method using a majorising function (Coxon, 1982).

(2) Nonmetric Scaling: If the metric nature of the transformation of dissimilarities is abandoned, then the nonmetric MDS comes into work. The data is qualitative, having nominal or ordinal scale properties. It is quite common for the proximity values to have ordinal properties. In that case, the computation criterion is to relate the rank order of distances to the rank order of the proximity measures (Coxon, A.P.M. and MDS(X) Project Team, 1980a). Thus, in contrast to metric MDS, nonmetric MDS procedures yield solutions such that the distances in the derived space are merely in the same rank order as the original data. The theory of nonmetric MDS is given for two-way, one-mode data, especially for dissimilarity data collected for one set of objects. An important secondary purpose in nonmetric scaling is to "metrise" the nonmetric data. Nonmetric MDS programs apply monotone transformations to the original data so that the arithmetical operations can be performed on the rank orders of the proximities (Coxon, A.P.M. and MDS(X) Project Team, 1980a).

(b) Joint space analysis: This type of analysis is an alternating class of MDS procedures. They can handle a rectangular matrix in which the data form a simple rectangular matrix while the row items differ from column items. For instance, the rows can pertain to subjects and the columns to stimuli.

(1) Individual Differences Analysis: This model produces an overall configuration of points representing all of the pairs of types of objects, in a group of stimulus space, together with a configuration of points representing the judgments in a different subject space.

(2) Correspondence Analysis: This type of analysis represents the rows and columns of a data matrix as points in a space of low dimension, which is generally a Euclidean space of dimensions. Data can be analysed in the form of a two-way contingency table.

(3) Unfolding: This model attempts to produce a configuration of points in a space with each point representing one of the n judges together with another configuration of points, representing the m types of objects, in the same space. This is also known as classical multidimensional unfolding.

(c) Weighted MDS: These types of MDS separate the information that is common to all of the subjects, which is the group stimulus space, from the information that is unique to each subject. The stimulus space represents the group of information, while the weight space represents the variation between the individual subject proximity matrices.

(1) Individual Difference Scaling: This type of MDS can be used to account for differences other than those due to individuals, for instance, between occasions or experimental conditions. The first successful computer program for implementing this type of MDS is INDSCAL.

4.3.6.4. Applications of MDS

MDS, being a technique developed in the behavioral and social sciences for studying the structure of objects or people, has been proven as useful to research in many fields. Articles and books using MDS have appeared at an ever-increasing rate and in a growing number of disciplines as specified by Coxon (1982) and as also mentioned by Cox and Cox (1994). Various areas, in which MDS was used, are listed in Table 21.

Table 21: Various applications into MDS

Applicant(s)	Areas of MDS cases
Soli and Arabie (1979)	Acoustics
Hayashi (1974)	Agriculture
Corradino (1990) and Backhaus *et.al.* (1987)	Animal behaviour
Swann (1978)	Anthropology
Polzella and Reid (1989) and Kelly *et.al.* (1979)	Aviation
Lawson and Ogg (1989)	Biometrics
Tong (1989)	Ecology
Tittle *et.al.* (1996); Oltman *et.al.* (1987); Weeks and Bentler (1978); Subkoviak (1975); Wainer and Berg (1972) and Johnson (1970)	Education
Coury (1987)	Ergonomics
Smith and Iles (1988)	Forestry
Hanham (1976)	Geography
Dunfield (1996)	Health care
Kendall (1971)	History
Jacobowitz (1975)	Human body
Groenen and Heiser (1996); Manrai and Manrai (1993); Eliashberg and Manrai (1993); de Sarbo *et.al.* (1994); Buyukkurt and Buyukkurt (1990); Manrai and Sinha (1989); Cooper (1983); Wind (1982) and Green and Carmone (1970)	Marketing
Davison and Jones (1976)	Military
Davison and Jones (1976); Funk *et.al.* (1974) and Rummelhart and Abrahamson (1973)	Psychology
Forgas (1977) and Mauser (1972)	Politics
Coxon and Jones (1974)	Sociology
Zins (1994); Sinclair and Stalling (1990) and Gartner (1989)	Tourism

Sources: as listed in the table.

Multidimensional scaling technique was used in marketing, in particular, by a number of academic and researchers, e.g. market structures (Wind, 1982; de Sarbo *et.al.*, 1994), market segmentation (Cooper, 1983), product design (Eliasberg and Manrai, 1993) consumer perceptions (Manrai and Sinha, 1989) and positioning (Manrai and Manrai, 1993).

4.3.6.5. Application to MDS in marketing and service marketing

The main focus of this research is the analysis of the passenger ferry market within the shipping industry and thus a service marketing issue. Therefore, the application of the MDS technique in marketing is reviewed in more detail than the other areas.

The metric and nonmetric types of MDS have been applied to a wide range of marketing problems. Significant applications in marketing research were generally related to theoretical and methodological developments. Most research in marketing using MDS techniques, was concerned with attitude and perceptual changes, as specified by Moinpour *et.al.* (1976). There is a general attitude that MDS is a common technique to be used in positioning in marketing as an alternative to other multivariate analysis methods. However, if further statistical analysis is needed then it is not appropriate to use this technique. In that case, other techniques in multivariate analysis methods are considered more appropriate (Molinero, 1991).

Additionally, McIntyre and Ryans (1977) specified that the rank order method in marketing practice, in other words, ranking all possible pairs of stimuli in an order of decreasing or increasing similarity, was used by some researchers. However, many marketing researchers have used a modified version, which is the rating scale method involving the rating of all possible pairs of stimuli on a rating scale calibrated with some phrases such as "highly similar-not at all similar" or "almost identical-completely different". Determining the perceptions of consumers is one of the primary concerns in marketing research and MDS becomes an effective way to measure and represent the perceptions. The MDS applications that were made in the past include product planning, product and/or company positioning decisions concerning branding and pricing, study of channels of distribution, personal selling, effect of advertising as specified by Green *et.al.* (1989).

Product planning concentrates on market structure analysis, the development of product perceptions and analysing differences in product perceptions. MDS may be used to determine relevant product markets, to identify the determinant attributes, to form product perceptual spaces, to model an individual or market segment decision making, and to determine the impact of pricing on brand perception (Green *et.al.*, 1989). The selection of trademarks for branding and the effect of these brands on consumer perceptions may be evaluated by using MDS techniques. MDS may also be used to analyse the effect of advertising on consumers about their perceptions for brands. Overall, the position of a product, brand, company and service can be measured by MDS techniques. Various MDS applications of positioning cases in marketing are listed in Table 22.

Since MDS has been widely used in various cases of marketing and service marketing, this technique seems to be applicable for positioning the ferry operator companies in the Italy-Greece-Turkey corridor, in the Eastern Mediterranean. The application of data of the ferry market using an MDS technique will be the first application in this field. In other words, as noted by Coxon (Interview, 1995a), developing a positioning model and operationalising the model by using the MDS technique in this research will be the first application to MDS in shipping.

4.3.6.6. Various software programmes for MDS

One of the two requisites for an MDS analysis is a computer based algorithm to implement the analysis, with the other being a set of numbers that are called proximities. Therefore, the

Table 22: Various MDS applications of positioning cases in marketing

Applicant(s)	Subject
Best (1976)	Rank ordering of various brands of soft drinks by 77 individuals
Cooper (1983)	Market segmentation
Cooper and Nakanishi (1983)	Sensitivity of price variations with perceptual positions
Day *et.al.* (1976)	Brand perceptions of beer market
de Sarbo, Manrai and Manrai(1994)	Study of market structures
Doyle and McGee (1973)	Market structure of convenience foods
Eliasberg and Manrai (1993); de Sarbo and Manrai (1992)	Product design and positioning
Fenton and Pearce (1988)	Study of various tourism attractions by applying data into MDS
Green and Carmone (1968)	Structure of computer market
Green and McMennamin (1973)	Branding in advertising problems
Green *et.al.* (1969)	Differentiation of various cars from a list with similarities and preferences
Groenen and Heiser (1996)	Similarity judgments of students for different cola brands
Huber (1975)	Five models for preferences of different levels of sugar in tea
Manrai and Manrai (1993); Manrai and Sinha (1989)	Study of relationships between consumer perceptions and choices
Moinpour *et.al.* (1976)	Perceptual changes of a group of students for various brands of toothpastes
Moore *et.al.* (1979)	Study of household cleaners
Percy (1975)	Study of potato dishes
Polzella and Reid (1989)	Measuring aircraft system variables
Poste and Patterson (1988)	Study of twelve different brands of yoghurts
Smith and Lusch (1976)	Effects of advertising on positioning a brand
Turner (1971)	Study of the number and kinds of criteria that salesmen use in evaluating customers
Wind and Robinson (1988)	Positioning of one of the medical journals among other medical journals
Young *et.al.* (1978)	Differentiation of segmentation of style, appearance and image for products as criteria of marketing success
Zins (1994)	Study of people's attitudes toward different leisure places

Sources: as listed in the table.

computer programmes for MDS play an important role and the aims of using computer programmes for an MDS analysis are:

(a) Beginning with a simple set of data that describes similarities and differences between objects as reported by respondents,

(b) Generating a multidimensional configuration related with input data,

(c) Identifying the meaning of the dimensions that the respondents differentiate between objects.

Various computer software programmes are developed by various specialists for data applications into MDS. The important characteristics of the computer programmes for MDS are number of stimuli, number of data matrices, data-set size, dimensionality, optimisation strategy, convergent property, starting configuration control, control over iteration process, measurement level-type of MDS performed, measurement process, symmetry, similarities, missing data capability, rectangular data matrices permitted and three-way data matrices permitted (Dillon and Goldstein, 1984).

The set of descriptors by which the methodology of MDS that can be described are as the following (Green *et.al.*, 1988):

(a) Mode, which is a class of identities, such as brands, respondents, etc.

(b) Data array, which is a number of ways that modes are arranged. For example, brand-brand relationships with respondents' ratings from 1 to 9.

(c) Type of geometric model in which a distance model is issued versus a vector or a projection model.

(d) Number of different sets of plotted points as being one, two, or more than two.

(e) Scale type, such as nominal, ordinal, interval, or ratio scaled input data.

The major models and computer algorithm programmes used for MDS together with their developers are listed and described below (Green and Wind, 1973; Cox and Cox, 1994):

(a) MDSCAL 5: Kruskal (1964) is the developer of this type of MDS program. It constructs a configuration of points in space from information about the distances between points (Green *et.al.*, 1989). Input data are the similarities of stimuli. Nonmetric and metric scaling can be performed.

(b) TORSCA 8: This programme was developed by Young and Tongerson (1967) and performs three types of scaling. The first being a metric solution based on Tongerson's classical MDS method, the second a quasi-nonmetric solution, and the third a nonmetric solution based on ranks or similarities (Tull and Hawkins, 1993).

(c) KYST: This programme represents a mixture of MDSCAL 5 and TORSCA 9 (Tull and Hawkins, 1993). It includes the initial configuration procedure from TORSCA and has the capability of rotating solutions to principal components. The program handles both metric and nonmetric scaling and unfolding, and uses proximity input data (Green *et.al.*, 1989).

(d) PARAMAP: Carroll and Chang (1966) developed this programme with an abbreviation of PARAmetric MAPping. It performs multidimensional scaling of a rectangular data matrix of objects by variables or a symmetric matrix of dissimilarities.

(e) MDPREF: This programme was developed by Carroll and Chang (1969), and stands for MultiDimensional PREFerences scaling. It is a metric model based on a principal components analysis. It performs an internal analysis of m subjects' preference data. Input data is usually stimuli evaluation data, and paired comparisons can also be used in older versions of the model. This programme utilizes a vector model for preferences and develops the vector directions for the subjects in a common space. The programme was used by Green, Wind and Jain in 1972 and by Green and Devita in 1975 for the analysis of preferences in product planning.

(f) PREFMAP: This programme for PREFerence MAPping was developed by Carroll and Chang (1972). It produces preference mapping analysis based on a generalisation of the Coombsian unfolding model preference. It relates preference data to a multidimensional solution. After a given stimulus configuration and a set of preference scales, the procedure finds an ideal point in the given stimulus space for each individual.

(g) INDSCAL: This approach, standing for INDividual SCALing, was developed by Carroll and Chang (1969). It performs a canonical decomposition of N-way tables and analysis of individual differences in MDS. Proximity, in other words, similarity data is input and the program procedures up to a 7-way solution for 10 dimensions. INDSCAL solves for the group stimulus space and a set of judges' saliences for each dimension of the group stimulus space.

(h) PROFIT: Is a technique for fitting outside measuring vectors into stimulus spaces. Input data are the coordinates of stimulus points in k-dimensional space and derived from sets of independently determined physical measures.

(i) MINISSA: The later development of Smallest Space Analysis, SSA, by Guttman, Lingoes and Roskam is MINISSA, which stands for Michigan-Israel-Nijmegen

Integrated Smallest Space Analysis. This programme uses the rank order of differences in similarities rather than their absolute value. Thus, the greatest dissimilarity in a model is represented by the longest distance between two points on the resulting map, and for similarity, the smallest by the shortest distance as specified by Davies and Brooks (1989).

(j) **MDS(X):** This is a series of MDS programmes developed by Coxon and includes the following 15 programmes as specified by the Pocket Guide of MDS(X): CANDECOMP, HICLUS, INDSCAL-S, MDPREF, MINICPA, MINIRSA, MINISSA-N, MRSCAL, MVNDS, PARAMAP, PINDIS, PREFMAP, PROFIT, TRISOSCAL and UNICON.

In addition to the above software programmes, there are also various others including SINDSCAL, SSA, MULTISCALE, POLYCON, SMACOF, C-MATCH, CANCOR and MONANOVA (Green *et.al.*, 1973; Cox and Cox, 1994).

The requirement from the software in this research is the ability of it to illustrate, on a graph, the positioning of the ferry operators in comparison with each other in the market place. MDPREF programme of MDS matches the requirements of the research and it is exactly appropriate to use and evaluate the valid data from the ferry operators. However, separate MDPREF software does not exist. Therefore, the MDPREF sub-programme of MDS(X) software has been used for this purpose.

4.3.6.7. The MDPREF programme of the MDS(X) series of computer programmes

The MDS(X) Series of Multidimensional Scaling Programmes were developed by a team based at the University of Edinburgh and University College, Cardiff, both in the U.K. The

MDS(X) Project group consists of Professor A.P.M.Coxon (University of Essex, Colchester - previously University College, Cardiff), Mr.P.M.Davies (University College, Cardiff), Professor C.L.Jones (University of Toronto), Professor P.Arabie (University of Illinois), Dr.S.K.Tagg (Strathclyde University), Mr.D.T.Muxworthy (University of Edinburgh), Dr.F.C.Critchley (University of Glasgow). The distribution of the programmes together with the accompanying documentation is managed from the addresses in Appendix 1. Further information can also be taken from the same addresses.

MDPREF is becoming increasingly popular for analysing preference data for similarity rankings and score ratings. Since the solution is analytic, it is calculated and graphed by computer software to obtain a quantitative representation of a set of data by illustrating the preference ranking or similarity / dissimilarity. In the MDPREF programme, stimuli are represented as points in a multidimensional space, while a subject's preferences are represented in this space as a vector or a line. Vectors or lines are oriented in such a way that the order of projections of stimuli points on these lines represent the subject's order of preference (Coxon and MDS(X) Project Team, 1980a). "Manual for MDS(X) Series of Multidimensional Scaling Programmes" of Coxon and MDS(X) Project Team (1980a) can be referred to further information. The following are two applications of the MDPREF of the MDS technique (Table 23):

Table 23: Various MDPREF applications of the MDS programmes

Area	Subject
Politics	Investigation of factors underlying a decision in factories in terms of various characteristics of a number of companies
Sociology	Analysis of preferences of a group of people for family compositions of different number of daughters and sons

Sources: Coxon and MDS(X) Project Team (1980a);
Davies and Coxon (1982).

It should be noted that no recent applications into this programme of the MDS are available - possibly as a consequence of changing within social science research. However, the specification of the data of this research is technically very suitable for an application into the MDPREF programme to calculate and illustrate the positions of the operator companies in the ferry market using multivariate data. Additionally, a map is produced by the programme to illustrate the aggregate positioning of companies in relation to each other in the market place and, consequently, it is considered that the MDPREF programme of MDS is the most suitable programme for this research.

4.4. DEVELOPMENT OF THE MODEL

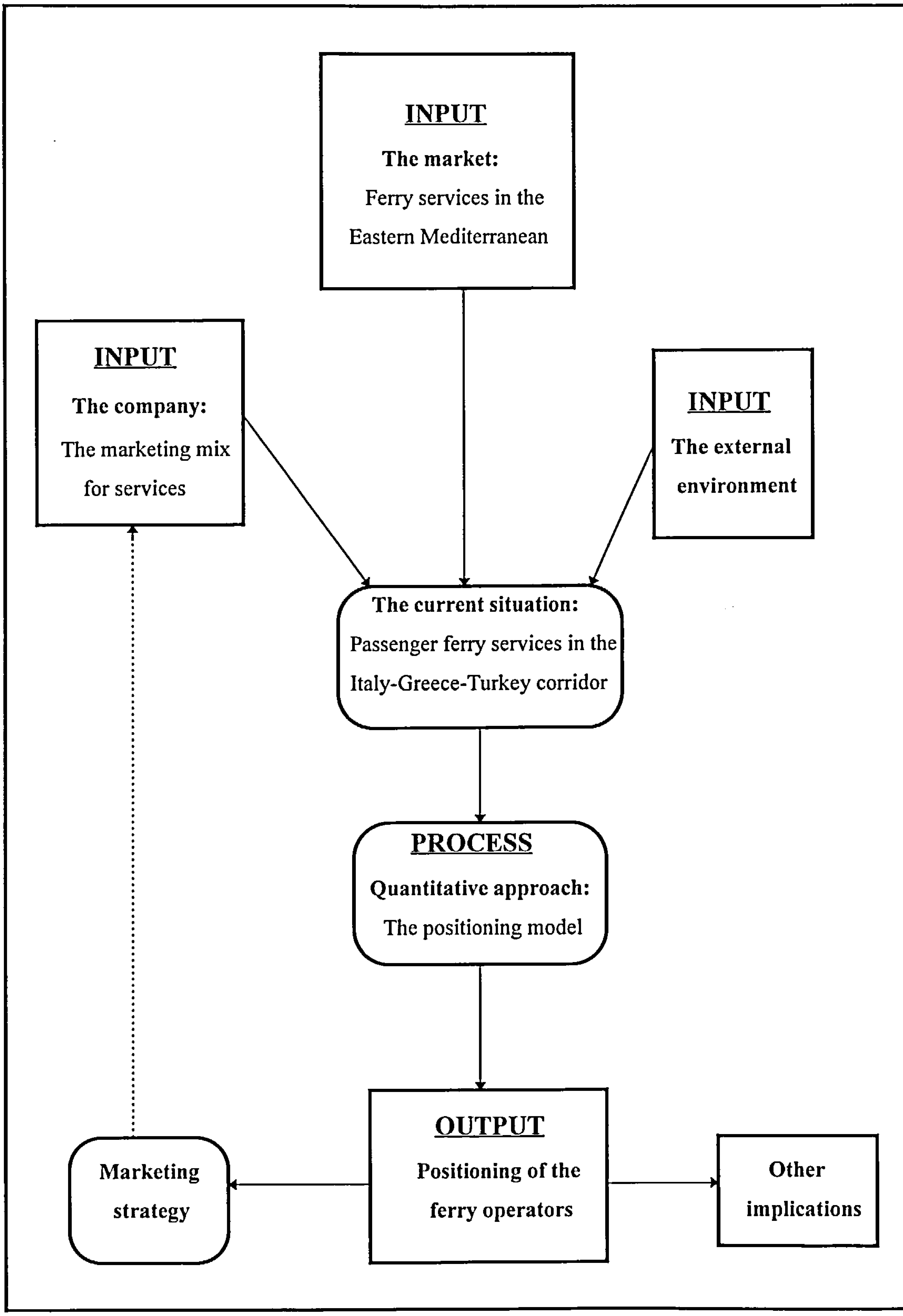
A review of a quantitative approach and some literature forms the basis of the theoretical model developed in this chapter. The positioning model will be developed in the final section after presenting the conceptual model and hypotheses development.

4.4.1. The conceptual model

A conceptual model for identifying a positioning model is developed in this section to illustrate and explain the key elements and their relationship affecting the positioning model. These key elements are converted into measurable variables for testing various hypotheses both in this chapter and in the operationalisation of the positioning model in the next chapter.

Conceptual modelling of the positioning model for the Turkish ferry operators in comparison with their EU competitors in the Eastern Mediterranean market is illustrated in Figure 34. The conceptual model is derived from a similar study in passenger ferry services using another multivariate approach (Matear, 1991).

Figure 34: The conceptual model



Source: The author.

Input elements:

The market: The passenger ferry market in the Eastern Mediterranean was explained in Chapter 3. In other words, this represents a general background to the ferry market before developing the model.

The company: The 7Ps of the marketing mix elements for services were explained earlier in this chapter. The behaviour of the ferry operator companies are based on these 7Ps in analysing their services in the market place.

The external environment: This element comprises all of the factors that may directly or indirectly have effects upon the ferry services in this market other than the ferry operator companies and the market in general.

Process elements:

The current situation: The current situation in the passenger ferry market with particular reference to the Italy-Greece-Turkey corridor was explained in detail in Chapter 3. The ferry services and operations in this corridor are directly affected by the other services in the Eastern Mediterranean, the ferry operator companies and the external environment.

Quantitative approach - The positioning model: The input elements are brought together in this process - the modelling of positioning - to identify the positioning of the ferry operator companies in the market place - as an output of the system.

Output elements:

Positioning of the ferry operators: The positioning of the ferry operators in the market place is identified as an output of the system after the operationalisation of the model.

Marketing strategy: The marketing strategy of a ferry company is basically determined by the market conditions and is shaped by the output - the positioning of the ferry operators, received through the process - the positioning model. In addition, the ferry companies evaluate the output through feed-back to the service marketing mix elements of the company to receive better results for the output.

Other implications: This model can be used for identifying and measuring the positioning for other markets in a similar approach.

4.4.2. The positioning model

The positioning model is developed for the Turkish passenger ferry services and operations providing a framework for comparison with the European Union ferry services and operations in the Eastern Mediterranean market place. Various hypotheses are developed below in the following section for the positioning model.

Furthermore, the positioning model is operationalised in the next chapter, through multivariate analysis by using a multidimensional scaling technique - both metric and nonmetric MDS for variables and score ratings. The data of the ferry operators in the market will be applied through the MDPREF software programme of the MDS(X) Series of Computer Programmes, in the following chapter, which will lead into the graphical illustration of the positioning of the ferry operators in the Italy-Greece-Turkey corridor, in the Eastern Mediterranean.

4.4.3. Hypotheses development

The passenger ferry services in the Italy-Greece-Turkey corridor are examined and they can be analysed during the operationalisation of the positioning model, through the questionnaire survey, which is based on the 7Ps of the service marketing mix elements. The following main hypothesis and sub-hypotheses are developed and are derived from the conceptual modelling of the positioning model:

H_0: The Turkish and the EU ferry operators are positioned differently in the Eastern Mediterranean market.

The positioning of the ferry operators can individually be identified and their comparative market positioning can be measured accordingly. It is assumed that a differentiation between these ferry operators exists in the market place based upon the 7Ps of the service marketing mix elements - product, price, place, promotion, people, physical evidence and process. These are the sub-hypotheses related to the main hypothesis:

H_{01}: There is a differentiation between the Turkish and the EU ferry operators in the market place for product characteristics.

H_{02}: There is a differentiation between the Turkish and the EU ferry operators in the market place for price characteristics.

H_{03}: There is a differentiation between the Turkish and the EU ferry operators in the market place for place characteristics.

H_{04}: There is a differentiation between the Turkish and the EU ferry operators in the market place for promotion characteristics.

H_{05}: There is a differentiation between the Turkish and the EU ferry operators in the

market place for people characteristics.

H_{06}: There is a differentiation between the Turkish and the EU ferry operators in the market place for physical evidence characteristics.

H_{07}: There is a differentiation between the Turkish and the EU ferry operators in the market place for process characteristics.

These hypotheses will be examined in detail during the operationalisation of the positioning model in the next chapter.

CHAPTER 5: OPERATIONALISATION OF THE POSITIONING MODEL

5.1. INTRODUCTION

This section of the research concentrates upon operationalisation of the model to identify the positions of the Turkish ferry operators in comparison with European Union competitors in the Eastern Mediterranean market. This model was developed in the previous section to provide an analytical examination of the data following the picture painted by the conceptual model. Multidimensional Scaling was used during the development of the positioning model. The quantitative data from the ferry operators was applied into the MDPREF programme of the MDS(X) series of computer programmes. Data of the ferry operators - representing the supply side - was used for analyses in this research to bring an originality to most of the applications of positioning cases in service marketing because consumer data - representing the demand side - is used for most other analyses. Although positioning cases are mostly based upon the demand side of marketing, there are a number of examples of positioning cases for the supply side particularly in shipping (Ledger, 1995; Ledger and Roe, 1996). The next section examines the methodology used for the operationalisation of the model (Aeker *et.al.*, 1995) for services marketing within the quantitative approach.

5.2. METHODOLOGY

The stages of the MDS approach consist of the selection of criteria, required data, method of data collection, selection of questions, data collection from the operators including raw data, response rate, measurement, analysis of data and finally, analysis of data application (Zins, 1994; Tongzon, 1995). The results of data application into the MDS will be analysed in the next chapter.

5.2.1. Selection of criteria

As explained earlier, ferry operations are widely considered a service. The marketing mix for service marketing is used as a basic structure for the selection of criteria for the MDS positioning model and consequently, the selection of criteria is based upon the "7P"s of the service marketing mix, - product, price, place, promotion, people, physical evidence and process (Zeithaml and Bitner, 1996).

5.2.2. Required data

As explained earlier, the multidimensional scaling technique is used for the application of data of ferry operators into the MDPREF programme. Data required for this application includes both metric and nonmetric characteristics of the ferry operator companies, which are grouped under the "7P"s, in general.

Requirements of data for this application are based upon the eight hypotheses developed earlier in the Chapter 4. These requirements are derived from the 7Ps of marketing mix for elements for services which were explained through similar examples by Zeithaml and Bitner (1996). Requirements of data for the first section - product, includes information with particular reference to various physical specifications of the ferries, journey and the service. Data required for the second section -price, is related to the price levels and characteristics of the ferry tickets. The required data for the third section - place, stems from the channel type and location of the ferry company head office and branches and also is related to the ferry services, in other words, the routes for the journeys. Data required for the fourth section - promotion, includes sales promotion and advertising, e.g. types of goods for promotion, media used for advertisement and marketing statistics. Requirements of data for the fifth section - people, is related to various information about the company personnel and employee research. Data required for the sixth section - physical evidence, is related to various physical characteristics of the company and its facilities, i.e. total branches, agencies and locations and its organisation. Requirements of data for the seventh and the final section - process, include flow of activities and methods of selling tickets. Data about the ferry operators was collected through a questionnaire approach as explained below in detail.

5.2.3. Method of data collection

In order to collect data from the market place, primary and secondary sources for data were determined. Questionnaires were used to collect primary data from the ferry operators as a common method of gathering information besides field observations, interviews, laboratory measurements etc. (Howard and Sharp, 1983). In addition to the collection of primary data, various secondary data sources were used as a common method of gathering additional information e.g. journals, technical publications, official publications, trade associations, private data services, computer databases etc. (Howard and Sharp, 1983). Various gaps in the questionnaires were filled in by the researcher using private data files of the Turkish Maritime Organisation (1994) and various ferry operator catalogues and brochures (1994) similar to additional data collected from secondary data sources for ferry services in other research studies (Heijveld and Gray, 1993).

5.2.4. Selection of questions

Questions that were forwarded to the ferry operators through questionnaires were derived by considering the theory of the "7P"s of the service marketing mix. The questionnaire was divided into 7 sections, each representing a different "P" of the service marketing mix (See Appendix 2). These questions were based upon studies of various academics (Zeithaml and Bitner, 1996) and similar research and analyses of recent positioning cases in shipping (Heijveld and Gray, 1993; Ledger, 1995; Ledger and Roe, 1995; Ledger and Roe, 1996). For example, Polish liner shipping in the East European shipping was examined by Ledger and

Roe (1995) through the 7Ps of the service marketing mix elements. Therefore, the questionnaires of various studies in shipping, which were based upon these 7Ps, were considered by the researcher for the selection of questions in the questionnaire.

The questions in the questionnaire matched the specifications of the required data for the software programme of the MDS technique. The total number of questions was 62 and the number of questions for each section varied from 2 to 26. Some questions were repeated due to their relevance to more than one section; however this has no effect upon the calculations of the method statistically nor the results (Interview, 1995a). In addition, although some questions were related to more than one group, they were grouped only under one "P" chosen as having more relevance to that group.

The total number of the questions could have been increased or the variety of the questions made different; however, the current total number of the questions was sufficient, suitable and appropriate for the analysis in this research as discussed with Coxon at an interview (1995a). The questionnaire was also in Turkish for the Turkish ferry operators (See Appendix 3). The contents of the questions are explained below in detail.

(a) Product:

A total of 26 questions was asked in this section making this section the largest because "product" covers the greatest variety of physical and numerical specifications of the total "7P"s of the marketing mix elements. Questions in this section included various specifications of ferries, passengers and journeys.

1. Total number of ferries in general: This question applied to the total number of ferries of the operator including the ferries operating in market places other than the Italy-Greece-Turkey corridor. Answers to this question will give an idea of the experience of the operators in the ferry business. (*)

2. Number of ferries operating in the Italy-Greece-Turkey corridor: Answers to this question gave an idea of the experience of the operators in this specific area in the market - the Italy-Greece-Turkey corridor. (*)

3. Maximum speed of ferries: Answers to this question gave an idea of the maximum speed of the ferries as one of the characteristics for measuring the frequency of the services in this specific market area.

4. Flags of ferries: This question was asked to find out the contribution of the operator to his national shipping by operating under his national flag. These were categorised under Turkish, Greek, Cypriot and Maltese flags because ferries were operating usually under these flags in this market.

5. Operators of the ferries: This question was asked to find out the contribution of the operator to his national shipping by representing that country's citizenship and by establishing the company in that country. Operators were categorised under Turkish, Greek and Italian nationalities because of operating in this specific area in the Italy-Greece-Turkey corridor, in the Eastern Mediterranean ferry market.

6. Total tonnages of ferries: Total tonnages of the ferries operating in this specific corridor

(*): In addition, this question was also asked to find more about the experience, establishment, services, traditional circumstances and knowledge of the operator in the market place.

was added together to give a broad idea of the total fleet and capacity of the operator. (*)

7. Average tonnages of ferries: Total tonnage of ferries (question 6) was divided by total number of ferries operating in this corridor (question 2) in order to calculate the average tonnage of ferries operating in this corridor. (*)

8. Average ages of ferries: Total age of ferries was divided by total number of ferries operating in this corridor for the calculation of the average age. This gave a distinct idea of one of the physical characteristics of the ferries. (*)

9. Refurbishment of ferries: Refurbishment of the facilities on board of ferries gave an idea of the renewal of facilities in general. Answers to this question covered any refurbishment of facilities which amended the registration of classification, e.g. Lloyd's Register of ships, etc. in order to make a differentiation between ferries with or without any renewals , e.g. renewal of cabins etc..

10. Any improvement plans for ferries: This question was asked to find about whether there were any improvement plans for the facilities on board ferries as forthcoming refurbishments.

11. Passenger capacity per ferry: This question was asked to have an idea of the carrying capacity of the ferries. (*)

12. Car capacity per ferry: Similar to the previous question - number 11, this question was asked to have an idea of the carrying capacities of the ferries, in general. (*)

(*): In addition, this question was also asked to find more about the experience, establishment, services, traditional circumstances and knowledge of the operator in the market place.

13. Seasons of journey in a year: Seasons of journeys of the ferry services gave an idea of operation times as they have direct effects upon the total number of passengers in a year. Seasons of journey were categorised under all seasons, spring-summer-autumn and high season to cover all of the alternative ferry service configurations in this market. The category for spring-summer-autumn covered the period from the beginning of April until the end of September. High season category covered the period from the beginning of July until the end of August. (*)

14. Total number of one-way-journeys in 1994: This question was asked to establish the total number of journeys in 1994. A return journey was calculated as two one-way-journeys. Journeys either start from Turkey or Italy; however, they all ended in Turkey. (*)

15. Number of return journeys per week: Answers to this question were categorised under once a week, twice a week and more than twice a week in order to find out the weekly frequencies of the ferry services of the operators in this market. (*)

16. Total number of passengers in 1994: Answers to this specific question were representing important specifications of the operators for identifying and measuring their positions and their market shares in the Eastern Mediterranean. (*)

17. Total number of passengers per ferry in 1994: Answers to this question were calculated by dividing the total number of passengers in 1994 by the total number of ferries operating in the corridor. (*)

(*): In addition, this question was also asked to find more about the experience, establishment, services, traditional circumstances and knowledge of the operator in the market place.

18. Average number of passengers per journey: Answers to this question were calculated by dividing the total number of passengers in 1994 (question 16) by total number of one-way-journeys in the same year (question 14). These answers provided data for the following question - number 19. (*)

19. Percentage of average full capacity of ferries (one-way): Answers to this question were calculated by dividing the average number of passengers per one-way-journey (question 18) by the total passenger capacity of the ferries (question 11) in order to assess the total full capacity of ferries and the efficiency of the services. (*)

20. General characteristics of passengers: This question was asked to find out classification of passengers, in general. Answers to this question gave an idea of the general type of the passengers travelling in this corridor by ferry services. (*)

21. General level of passengers: In addition to the previous question - number 20, general levels of passengers, i.e. living standards, occupation and educational levels, were asked of the operators. Answers to this question reflected the perceptions of the operators; however, they could be more reliable if a customer based questionnaire was applied by the operator earlier (Turkish Maritime Organisation, 1994). (*)

22. General satisfaction of passengers: Similar to the previous questions - numbers 20 and 21, this question also covered direct customer expectations and perceptions. Answers to this question could have reflected the perceptions of the passengers if a questionnaire was applied to the customers by the operator earlier (see question 23).

(*): In addition, this question was also asked to find more about the experience, establishment, services, traditional circumstances and knowledge of the operator in the market place.

23. Customer expectations for service improvement: Passengers play an important role as customers for services. Therefore, this question was asked of operators to establish whether they consulted their customers over expectations for the future.

24. Questionnaires applied to passengers: This question was asked to find out any earlier survey applied to the passengers by the operators which could have had direct effects upon answers of the operators to questions 20, 21 and 22.

25. Services on board: All facilities provided on board ferries operating in the Italy-Greece-Turkey corridor were assessed. Services were grouped in accordance with the AA Guide to Ferries (1994) because it is a well reputed source of data in this industry. In addition, these groups covered a set of core and additional attributes of the services provided by the ferry operators in this corridor - derived from research in the U.K. ferry services to the main continent (Heijveld and Gray, 1993). These services are as follows: Group 1 services are grouped as good in general, by considering both their quality and amount of services that includes both core attributes i.e. pullman seats, cabins, lounge, TV/video, bar and cafeteria, together with many additional attributes i.e. restaurant, children's play area, baby room, medical service, exchange bureau, duty/tax free shopping and swimming pool; group 2 services are considered as a sufficient amount of services including both core attributes i.e. pullman seats, cabins, lounge, TV/video, bar and cafeteria together with additional attributes i.e. children's play area and duty/tax free shopping; group 3 services are perceived as reduced services compared to the previous groups; however, these are provided by all of the ferry operators in this market as core attributes i.e. pullman seats, cabins, lounge, TV/video, bar and cafeteria. Answers to this question could have also reflected the perceptions of the passengers if a questionnaire was applied to the customers by the operator earlier (see question 23).

26. Quality of ferries: Answers to this question were in accordance with the previous question - number 25, giving a broad idea of the product quality considering both the ferries in general and services on board ferries in this corridor. Similar to the previous questions, answers to this question could have reflected the perceptions of the passengers if a questionnaire was applied to the customers by the operator earlier (see question 23). However, since this research is not based on the customer side of the market and is concerned only with ferry operators as the service providers, the answers of the operators to this question were accepted as the indicators of perceptions.

(b) Price:

This section of the questionnaire included ticket prices of the ferry services and also whether they were members of various shipping groups, Conferences or Consortia, which also determine ticket prices.

1. Ticket price variations in a year: This question was asked to find out whether there were financial constraints for a journey in this corridor, i.e. seasonal prices, or whether there is timing flexibility for the price of a journey.

2. High season pullman seat one-way fares for adults: This was asked to find out the ticket price differentiations of operators for an adult. High season - July and August, ticket prices are compared because of the peak times for the frequency of the journey and availability of all ferry services and operators in this corridor. Pullman seat prices were compared to have an idea of the basic travelling way on board of ferries. Therefore, these prices did not include various additional prices e.g. prices for breakfast and meals, port tax etc. thus, simplifying the analysis.

3. Minimum high season fares for children: Similar to the previous question - number 2, ticket prices for children were also compared for each ferry operator company to give an idea of other ticket prices additional to adult prices for families travelling by ferry in this corridor. Similar to the previous question -number 2, prices for this question only included pullman seat prices.

4. Minimum high season fares for cars: Similar to the previous questions - numbers 2 and 3, this question was asked to give an idea of ticket prices for cars. These additional ticket prices for family budgets are normally considered important by families travelling by car and using a ferry in this corridor.

5. Subsidies from government: This was asked to find out the effects of subsidies upon ferry operator companies in comparing their positioning in the market area. The amount of subsidy for a company is not as important; as the availability of a subsidy - in differentiating between the companies - receiving or not receiving a subsidy as an external aid to the company reveals governmental attitude towards those companies.

6. Membership of a shipping group, conferences or consortia: Membership of such groups protect the companies operating in the same market from unfair competition in that same market area. Therefore, this was asked to differentiate between the operator companies who are members and the ones who are not members of shipping groups, conferences or consortia. (*)

7. Fixed pricing as a shipping group, conferences or consortia: Ticket prices are fixed within

(*): In addition, this question was also asked to find more about the experience, establishment, services, traditional circumstances and knowledge of the operator in the market place.

these groups operating in the same market in order to protect themselves from unfair pricing and unfair competition. Therefore, this was asked to find out whether there is fixed pricing between the operator companies that are members of a shipping group, conferences or consortia. (*)

(c) Place:

This section of the questionnaire constituted questions related to locations and places where ferry services were in progress.

1. International routing: This was asked to find out the routes and ports that the operators use in the Italy-Greece-Turkey corridor. (*)

2. Operating line: In addition to the previous question - number 1, this was asked to find out whether the operators have ferry services directly from Italy to Turkey or they have indirect services via Greece. (*)

3. Place of head office: Main locations of the operators were asked to find out about the base for their establishment.

4. Location of branches: Answers to this question gave an idea of the distribution channels of service providers in this corridor.

5. Location of agencies: Similar to the previous question - number 4, answers to this question gave an idea of additional distribution channels of the ferry operators as the main service

(*): In addition, this question was also asked to find more about the experience, establishment, services, traditional circumstances and knowledge of the operator in the market place.

providers in this corridor.

(d) Promotion:

This section of the questionnaire was for collecting information about the promotional side of services that the operators provide in this corridor.

1. Goods for promotion: This was asked to find out whether the operators have any aims to reach customers through various goods i.e. calenders, stationery, accessories etc..

2. Budget for promotion: In addition to the previous question - number 1, answers to this question gave an idea about how much of the budget the operators spend upon promotion in this field.

3. Media used for advertising: Communication tools are used for advertisement because they are easy and common ways of reaching potential and expected customers. Therefore, answers to this question gave an idea of types of communication tools used by the operators in this corridor.

4. Budget for advertising: In addition to the previous question - number 3, this gave an idea of how much of the budget the operators spend upon advertisements.

5. Corporate image: This question was asked to find out how the operators see themselves and their positioning in the market in the context of their competitors. The answers to this question were expected to be more reliable if the ferry operators already had market research based on passenger perceptions about ferry operators including their satisfaction for services they receive, their expectations for services and for operators, etc..

6. Marketing statistics: This was asked to find out whether the operators in this corridor were aware of the market situation in this specific area by having various statistics about the current market. These statistics also help the operators in forecasting for this specific market.

7. Customer statistics: This was asked to find out whether the operators in this corridor, as the service providers for passengers, were aware of various specifications about these customers i.e. annual total number of passengers they carry, annual total number of passengers travel in this market, customer profile etc..

8. Catalogue distribution to customers: This gave an idea about how much the operators were promoting and were reaching other expected customers through their potential passengers by distributing their catalogues to these passengers.

9. Sales promotion activities: This was asked to find out whether the operator company has various sales promotion activities while providing services in this corridor such as offering off-seasonal discounts; in other words, offering discounts for ferry ticket prices to attract customers in the winter time when demand for the ferry services falls.

10. Additional promotional achieves while competing on the same route: In addition to the previous question - number 9, this gave an idea about whether the operators have additional promotional services while in competition with other operators on the same service line, e.g. offering family discounts to the passengers also in the high season of the ferry services.

11. Budget for marketing: In addition to the earlier question about marketing statistics - number 6, this gave an idea of how much of the budget the operators spend on marketing in this field.

12. Number of people working in marketing: Answers to this question gave an idea about the importance given by the operator companies for marketing both their company and services in the ferry business.

13. Contributing to exhibitions: This gave an idea about the policies of the operator companies for outward growth and improvement in this corridor.

(e) People:

Although this element of service marketing mix is related to both the customers and personnel of the service providers, this section of the questionnaire was involved only with the people in the supply side of the market because this research is concerned with the ferry operators in the Eastern Mediterranean.

1. Number of personnel: This gave an idea of the employment capacity of the operator companies in the market.

2. Training programmes: This question was asked to the operators to find about any training programmes that they apply for upgrading the level of their personnel.

3. Budget for training: In addition to the previous question - number 2, this gave an idea of how much of the budget the operators spend training their personnel.

4. Participating in decision making: Answers to this question gave an idea of the participation of personnel in the decision making through unions etc.. In addition, it gave an idea of the level of decision making in the company i.e. workers level, management level or director level.

5. Qualifications of personnel: This was asked to find out what qualifications, in general, the operators look for in their personnel to achieve more success in this field.

6. Shipping backgrounds: This gave an idea of whether the operator company was looking for a maritime background in their personnel to achieve more success and in competing with other operators in this specific market.

(f) Physical evidence:

This section was related to the physical characteristics of the ferry services in the Italy-Greece-Turkey corridor. Although various questions related to the physical characteristics of ferries and ports could be grouped under this section, they were grouped within previous sections because of their closer relevance as explained earlier.

1. Total number of branches, agencies and outlets: This question gave an idea about the total number of physical outlets and distribution channels of the ferry operator companies providing their services in this corridor.

2. Location of offices, branches and agencies: Similar to earlier questions in "Place" section - numbers 4 and 5, physical places for distribution channels of the ferry operators as the main service providers in this corridor were established.

3. Organisation chart: This gave an idea of the positioning and responsibilities of employees throughout the operator company. This question was asked in the physical evidence element of the service marketing mix elements because it is more appropriate here to reflect the physical reputation and tangible representation of the service company (Zeithaml and Bitner, 1996).

(g) Process:

This section of the questionnaire was related to the way of providing the service in the market place.

1. Method of selling tickets: This question was asked to find out the methods of selling ferry tickets for ferry services in the Italy-Greece-Turkey corridor whether by keeping stocks of tickets and selling them through various outlets e.g. agencies, branches etc. or by having an on-line computer network system and selling tickets through this system.

2. Selling tickets via which outlets: This gave an idea of which of the outlets i.e. branches, agencies and offices were used for selling ferry tickets of ferry services in this corridor.

After the review of the reasons for the selection of questions, data from the ferry operators was collected through the questionnaires as explained below in detail.

5.2.5. Data collection

The names of ferry operators that operate between the ports of Turkey and the EU were taken from the ABC Cruise and Ferry Guide (1994), various ferry agencies in Turkey or the Turkish Maritime Organisation (1994) - of which some details were noted in Chapter 3. These data sources were selected because they provide basic reliable and sufficient data for the ferry services concerned and operators. It was noted by the ABC Cruise and Ferry Guide (1994) that Turkey has ferry services to and from the ports of Italy and Greece, both representing the EU. The addresses of the ferry operators were taken from the Maritime Directory (1994), World Shipping Directory (1994) and catalogues received from various ferry agencies. The questionnaires were sent to all ferry operator companies together with a large number of travel and ferry agencies in Italy, Greece and Turkey.

Questionnaires were sent to ferry operators whose addresses were extracted from the ABC Cruise and Ferry Guide of the Reed Travel Group (1994), the Turkish Maritime Organisation (1994) and various ferry agencies in Turkey. Some of the operators answered the questionnaires almost completely, while some answered some of the questions. In addition, a number of letters were received from various ferry agencies without answering the questionnaire and with most of them noting that they are only agents and have no direct relationship with the mentioned ferry operations.

Furthermore, various gaps in the questionnaires were filled in by the researcher using a reliable source for data - data files of a state owned company, Turkish Maritime Organisation - as a common method of completing the collected data generally in statistics and more specifically in MDS (Interview, 1995a). This data was received by analysing the ferry record files for all of Turkish ferry ports from the Izmir branch of the Turkish Maritime Organisation. All of the files for each ferry journey to and from the Turkish ferry ports were reviewed. The files consisted of much information which was of value in the analysis, i.e. lists of passengers, various specifications of ferries, details of routes and destinations of ferry ports and various specifications of the operators. Further calculations were made, i.e. calculating the total number of journeys, average number of passengers per journey, etc.. Thus, most of the data gaps in the questionnaires were filled in by the researcher through these data files. As a consequence, data already received from the companies through questionnaires was either double checked or various gaps in the questionnaires were filled in by the data from the files of the Turkish Maritime Organisation (1994).

This aggregate data was reasonably comprehensive but there were various other data gaps, particularly related to company information. The missing data were filled in by the researcher either by calculating the average of similar data of other companies or by removing the question from the questionnaire in the case when at least half of data was missing for that question (Interview, 1995a).

The data collected for the international ferry services between Turkey and the EU were restricted to the Italy-Greece-Turkey corridor for 1994. The ferry ports that were used as destinations for these ferry services in this corridor were Venice, Ancona, Bari and Brindisi in Italy; Igoumenitsa, Kefallonia, Patras, Piraeus and Heraklion in Greece; Izmir, Cesme, Marmaris and Antalya in Turkey as noted in Chapter 3. Details of these routes from port to port were noted earlier during the explanation of the passenger ferry market in the Eastern Mediterranean.

5.2.6. Raw data

The ferry operators in the Eastern Mediterranean were analysed for the year 1994 as noted earlier. Data of the 9 ferry operators are illustrated in Tables 24-30 within the 7 sections of the questionnaire based on the "7P"s of the service marketing mix elements. These tables consist of the actual raw data from the ferry operators received from the questionnaires and was either double checked or gaps completed by the researcher from data files of the Turkish Maritime Organisation (1994).

5.2.7. Response rate

A total of 9 ferry companies - 3 Turkish and 6 Greek (EU) companies - operate in the Italy-Greece-Turkey corridor as noted earlier in Chapter 3. The questionnaire was responded to by all of the ferry operator companies. However, various questions in the questionnaire were not responded to by various operators during the survey and some of these gaps on the questionnaire were filled in by the researcher through secondary data, which is a common method applied in data application in MDS, as also noted earlier in the data collection.

Table 24: Raw data of Product

	Characteristics	C1	C2	C3	C4	C5	C6	C7	C8	C9
1	Total number of ferries in general	3	9	4	1	3	2	4	2	1
2	Number of ferries operating in the Italy-Greece-Turkey corridor	1	1	2	1	1	2	4	1	1
3	Maximum speed of ferries[Knots]	19	18	17.5	20	19	20.25	19.19	16.5	18
4	Flags of ferries Turkish=1, Greek=2, Cypriot=3, Maltese=4, Others=5	3	2	4	4	4	5	1	4	2
5	Operators of ferries: Turkish=1, Greek, Italian=2,Others=3	2	2	2	2	2	1	1	1	2
6	Total tonnages of ferries operating in this corridor [Grt]	6013	7356	8374	5824	15237	10088	35140	9934	6222
7	Average tonnages of ferries [Grt]	6013	7356	4187	5824	15237	5044	8785	9934	6222
8	Average ages of ferries	27	28	28.5	22	20	24.5	12.75	27	30
9	Refurbishment of ferries:Yes=1, no=2 (if age<15, then choose 1)	1	2	2	2	1	2	1	2	2
10 *	Any improvement plans for ferries: Available=1,not available=2	1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
11	Passenger capacity per ferry	1600	1200	1018	1180	1480	1006	836	1189 **	1189 **
12	Car capacity per ferry	350	340	230	280	350	220	186	135	261 **
13	Seasons of journey: All seasons:1, spring-summer-autumn:2, high season:3	3	2	1	2	2	2	1	2	2
14	Total number of one-way journeys in 1994	7	20	59	17	12	24	70	20	8
15	Number of return journeys per week: Once a week=1, twice a week=2,more than twice a week=3	2	1	2	1	2	2	2	1	1
16	Total number of passengers in 1994	4264	6089	17610	8787	13040	14150	52410	10909	5482

(continued)

(Table 24: continued)

	Characteristics	C1	C2	C3	C4	C5	C6	C7	C8	C9
17	Total number of passengers per ferry in 1994	4264	6089	8805	8787	13040	7075	13103	10909	5482
18	Average number of passengers per journey	610	305	299	517	1087	590	749	546	686
19	Percentage of average full capacity of ferries (one way) [%]	38	25	29	44	73	59	90	46	58
20 +	General characteristic of passengers: Businessman=1, Foreign tourist=2, Native tourist=3, Turkish workers=4, others=5	4	4	4	4	4	4	4	4	4
21 ^	General level of passengers (Standard, occupation, educational level): Good=1, average=2, poor=3	2	2	2	2	2	2	1	2	2
22 *	General satisfaction of passengers: Good=1, satisfactory=2, poor=3	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
23 +	Customer expectations for service improvement: Customers agree=1, Disagree=2, No comment=3, not asked=4	4	4	4	4	4**	4**	4	4	4
24 +	Questionnaires applied to passengers: Yes=1, No=2	2	2	2	2	2	2	2	2	2**
25	Services on board: Good=1, satisfactory=2, poor=3	2	1	2	2	2	3	1	2	2
26	Quality of ferries: Good=1, satisfactory=2, poor=3	2	1	2	2	2	3	1	2	3

C1=MARLINES, C2=MINOAN LINES, C3=EUROPEAN SEAWAYS, C4=HORIZON SEA LINES, C5=MED LINK LINES, C6=STERN MARITIME LINES, C7=TURKISH MARITIME LINES, C8=TOPAS MARITIME LINES, C9=NETA LINES

n.a.: Not available
* : This question will be removed due to insufficient data
**: No available data; number is derived from average
+: This question will be removed due to data undifferentiation
^: This question will be removed due to only one different data

Table 25: Raw data of Price

	Characteristics	C1	C2	C3	C4	C5	C6	C7	C8	C9
1 +	Ticket price variation in a year : Yes,seasonal=1, No=2	1	1	1	1	1	1	1	1	1
2	High season pullman seat one way fares for adults from (a) Venice to Turkey [DM] (b) Ancona to Turkey [DM] (c) Bari to Turkey [DM] (d) Brindisi to Turkey [DM]	294	301	240 ^	247	240	208	235	235	220
3	Minimum high season fares for children from (a) Venice to Turkey [DM] (b) Ancona to Turkey [DM] (c) Bari to Turkey [DM] (d) Brindisi to Turkey [DM]	147	151	120 ^	124	120	104	141	118	110
4	Minimum high season fares for cars from (a) Venice to Turkey [DM] (b) Ancona to Turkey [DM] (c) Bari to Turkey [DM] (d) Brindisi to Turkey [DM]	345	448	325 ^	377	310	265	350	350	340
5 ^^	Subsidies from government: Yes=1, No=2	2	2	2	2	2	2	1	2	2
6	Membership of a shipping group=1, Conferences=2, Consortia=3, none=4	1	1	4	4	1	4	4	1	4
7	Fixed pricing as a shipping group=1, Conferences=2, Consortia=3, none=4	1	1	4	4	1	4	4	1	4

C1=MARLINES, C2=MINOAN LINES, C3=EUROPEAN SEAWAYS, C4=HORIZON SEA LINES, C5=MED LINK LINES, C6=STERN MARITIME LINES, C7=TURKISH MARITIME LINES, C8=TOPAS MARITIME LINES, C9=NETA LINES

+: This question will be removed due to same data and undifferentiation of data
^: Average price is taken for Bari and Brindisi
^^: This question will be removed due to only one different data

Table 26: Raw data of Place

	Characteristics	C1	C2	C3	C4	C5	C6	C7	C8	C9
1	International routing: Italy-Turkey=1, Italy-Greece-Turkey=2, Greece-Turkey=3	2	2	2	2	2	1	1	1	1
2	Operating line from Venice/Ancona/Bari/Brindisi to Cesme/Izmir/Marmaris/Antalya direct=1, via Greece=2	2	2	2	2	2	1	1	1	1
3	Place of head office: Italy=1, Greece=2, Turkey=3, Germany=4	2	2	2	2	2	4	3	3	2
4	Location of branches in Italy+Greece+Turkey+others=1, Italy+Greece, Greece+Turkey, Italy+Turkey=2, Italy, Greece, Turkey=3, None=4	3	1	1	3	3	3	3	2	3
5	Location of agencies in Italy+Greece+Turkey+others=1, Italy+Greece, Greece+Turkey, Italy+Turkey=2, Italy, Greece, Turkey=3, None=4	2	1	1	1	3	1	1	1	3

C1=MARLINES, C2=MINOAN LINES, C3=EUROPEAN SEAWAYS, C4=HORIZON SEA LINES, C5=MED LINK LINES, C6=STERN MARITIME LINES, C7=TURKISH MARITIME LINES, C8=TOPAS MARITIME LINES, C9=NETA LINES

Table 27: Raw data of Promotion

	Characteristics	C1	C2	C3	C4	C5	C6	C7	C8	C9
1^	Types of goods for Promotion: Yes (Calender / Stationery / Accessories etc.)=1, No=2	1	1	1	1	1	1**	1	1	1**
2*	Budget for promotion: Yes, up to 5% of total budget=1, More than 5% of total budget=2, No=3	1	1	n.a.	n.a.	n.a.	n.a.	n.a.	1	n.a.
3^	Media used for advertising: Yes, Newspaper/Journal=1, Radio/TV/other=2,No=3	1	1	1	1	1	1	1	1	1**
4*	Budget for advertising: Yes, up to 5% of total budget=1 More than 5 % of total budget=2, No=3	1	1	n.a.	n.a.	n.a.	n.a.	n.a.	1	n.a.
5	Corporate image: Excellent=1, Good=2, Satisfactory=3, Poor=4, Very poor=5	2	2	3	2	2	2	1	2	3
6^	Marketing statistics: Yes, available=1, No, not available=2	2	2	2	2	2	2	2	2	2**
7^	Customer statistics: Yes, available=1, No, not available=2	2	2	2	2	2	2	2	2	2**
8	Catologue distribution to customers: Yes, usually=1, sometimes=2, rarely=3	1	1	2	2	2	3	1	2	3
9	Sales promotion activities: Yes, occasionally=1, none=2	1	1	2	1	2	2	1	2	2
10	Additional promotional achieves while competing on the same route: Yes, available=1, No, not available=2	2	2	2	1	2	1	2	1	2
11*	Budget for marketing: Yes, up to 5% of total budget=1, More than 5 % of total budget=2, No, there isn't any=3	3	3	n.a.	n.a.	n.a.	n.a.	3	3	n.a.
12*	Number of people working in marketing: Up to 10=1, More than 10=2	1	1	n.a.	n.a.	n.a.	n.a.	n.a.	1	n.a.
13	Contributing to exhibitions: Yes (Regularly / irregularly)=1, No= 2	1	1	2	2	2	2**	1	2	2**

C1=MARLINES, C2=MINOANLINES, C3=EUROPEAN SEAWAYS, C4=HORIZON SEA LINES, C5=MED LINK LINES, C6=STERN MARI TIMES LINES, C7=TURKISH MARI TIME LINES, C8=TOPAS MARITIME LINES, C9=NETA LINES

n.a.: Not available
* : This question will be removed due to insufficient data
** : no available data; number is derived from average
^: This question will be removed due to same data and undifferentiation of data

Table 28: Raw data of People

	Characteristics	C1	C2	C3	C4	C5	C6	C7	C8	C9
1	Number of personnel (Head office & Branch): Up to 10=1, 11-20=2, 21-30=3, 31-40=4, More than 41=5	3	5	2	1	1	1	5	1	1
2	Training programmes: Yes, inside/outside of company =1, None=2	2	1	2	2	2*	2	1	2	2
3	Budget for training: Yes, there is certain percentage=1, No budget=2	2	1	2	2	2*	2	1	2	2
4	Participating in decision-making: Unions,workers=1, Management=2, Director=3	3	2	3	3	3	3	2	3	3
5 **	Qualifications of personnel: Excellent=1, Good=2, Satisfactory=3, Poor=4, Very poor=5	2	2	2	2	2	2	2	2	3
6 +	Shipping backgrounds: Yes=1, no = 2	2	2	n.a.	n.a.	n.a.	n.a.	2	2	n.a.

C1=MARLINES, C2=MINOAN LINES, C3=EUROPEAN SEAWAYS, C4=HORIZON SEA LINES, C5=MED LINK LINES, C6=STERN MARITIME LINES, C7=TURKISH MARITIME LINES, C8=TOPAS MARITIME LINES, C9=NETA LINES

n.a.: Not available
* : No available data; number is derived from average
**: This question will be removed due to only one different data
+: This question will be removed due to insufficient data

Table 29: Raw data of Physical evidence

	Characteristics	C1	C2	C3	C4	C5	C6	C7	C8	C9
1	Total number of branches, agencies and outlets Up to 10 = 1, More than 10 = 2	2	2	1	1	1	1	2	1	1
2	Location of offices, branches and agencies in Italy, Greece, Turkey=1, Italy,Greece,Turkey and other European countries=2	1	1	1	1	1	2	2	2	1
3	Organisation chart: Available = 1, not available= 2	2	1	2	2	2	2	1	2	2

C1=MARLINES, C2=MINOAN LINES, C3=EUROPEAN SEAWAYS, C4=HORIZON SEA LINES, C5=MED LINK LINES, C6=STERN MARITIME LINES, C7=TURKISH MARITIME LINES, C8=TOPAS MARITIME LINES, C9=NETA LINES

Table 30: Raw data of Process

	Characteristics	C1	C2	C3	C4	C5	C6	C7	C8	C9
1	Method of selling tickets Keeping stock of tickets = 1, On - Line reservation system = 2	2	2	1	1	1	1	1	1	1**
2 ^	Selling tickets via Agents, branches = 1 Offices, representatives= 2, Others = 3	1	1	1	1	1	1	1	1	1

C1=MARLINES, C2=MINOAN LINES, C3=EUROPEAN SEAWAYS, C4=HORIZON SEA LINES, C5=MED LINK LINES, C6=STERN MARITIME LINES, C7=TURKISH MARITIME LINES, C8=TOPAS MARITIME LINES, C9=NETA LINES

** : not available data; number derived from average
^ : This question will be removed due to data undifferentiation

Therefore, 469 data sources of the 9 ferry operators from a total of 558 were responded with a rate of 84%. As a consequence, 513 data sources from a total of 558 - including some data from secondary sources - were used for further data analysis.

5.2.8. Measurement

Various units were used for the measurement of each question on the questionnaire. The units that were used are listed in Table 31.

5.2.9. Score ratings

Data analysis of the ferry operators is based upon earlier hypotheses, which were developed in the previous chapter. However, before analysing this data and applying it for ferry operatorsin MDS, there are a number of requirements to meet (Interview, 1995a):

(a) Removing questions from the questionnaire due to insufficient data. In other words, if data for the operators for a question is less than half that should have been been received, then that question has to be removed (Interview, 1995a).

(b) Removing the questions from the questionnaire due to undifferentiation of the data. In other words, if each piece of data of ferry operators for a question is the same or only one of them is different, then the related question is also removed (Interview, 1995a).

(c) Recoding and internal transformation of data has to take place. The choices for the answers of some questions need to be grouped together. Therefore, a further coding and transformation of the choices for the answers takes place (Coxon and MDS(X) Project Team, 1980a).

Table 31: Units of measurement for the data

Section	Question number	Unit
Product	1 and 2	each
	3	knots
	4 and 5	(multiple choice)
	6 and 7	grosstonnage
	8	years
	9-10	(multiple choice)
	11 and 12	each
	13	(multiple choice)
	14	each
	15	(multiple choice)
	16-18	each
	19	percentage
	20-26	(multiple choice)
Price	1	(multiple choice)
	2-4	DM
	5-7	(multiple choice)
Place	1-5	(multiple choice)
Promotion	1-13	(multiple choice)
People	1-6	(multiple choice)
Physical evidence	1-3	(multiple choice)
Process	1 and 2	(multiple choice)

Source: The author.

Considering these requirements, a total of 19 questions (See Table 32) were removed. 12 of these 19 questions were disregarded because of reason (b) above (Interview, 1995a). Therefore, a total of 7 questions remained unqualified for the application because of reason (a) based upon insufficient data and therefore, they were removed. As a result of this reduction, the total number of questions decreased by 69% from 62 to 43 - with 387 data sources from a total of 558 - after the removal of questions as illustrated in Table 33.

It should be noted that the questions that were removed because of the above reasons have no effects upon the application of the MDS technique. In other words, 12 questions were removed because of either undifferentiated data - all operators with same data - or with an exeption of one different data. Some of these questions required valuable data for the analysis. For example, only one operator - Turkish Maritime Lines - receiving a subsidy from government would have differentiated its position against others. In addition, data of budget for promotion, advertising and marketing would be valuable data for evaluating details of characteristics of companies. However, loss of this data required by a total of 19 questions - approximately 30% of loss data - would not make much difference (Interview, 1995a; Interview, 1995b) in identifying and measuring the positioning of ferry operators in general. It should also be noted that the units of data within measurement do not affect the analysis of data because the recoding of data, producing score ratings for each question, takes place without considering units (Coxon and MDS(X) Project Team, 1980a).

After covering the above requirements, the data of the ferry operators (See Table 24-30) was required to be converted from raw data into score ratings to be applied into the MDPREF programme of the MDS(X) Series of Multidimensional Scaling programmes. Rating methods are commonly used in marketing research and behavioural sciences and they represent popular and easily applied data collection methods (Green *et.al.*, 1988). Rating allows a respondent

Table 32: Disregarded questions from the questionnaire

Section	Question number	Question	Reason for removal
Product	10	Any improvement plans for ferries: Available=1, not available=2	Insufficient data
	20	General characteristics of passengers: Businessman=1, foreign tourist=2, native tourist=3, Turkish workers=4, others=5	Data undifferentiation
	21	General level of passengers (standard, occupation, educational level): Good=1, average=2, poor=3	One different data
	22	General satisfaction of passengers: Good=1, satisfactory=2, poor=3	Insufficient data
	23	Customer expectations for service improvement: Customers agree=1, disagree=2, no comment=3, not asked=4	Data undifferentiation
	24	Questionnaires applied to passengers: Yes=1, no=2	Data undifferentiation
Price	1	Ticket price variation in a year: Yes, seasonal=1, no=2	Data undifferentiation
	5	Subsidies from government: Yes=1, no=2	One different data
Promotion	1	Types of goods for promotion: Yes(calender/stationery/accessories etc.)=1, no=2	Data undifferentiation
	2	Budget for promotion: Yes, up to 5% of total budget=1, more than 5% of total budget=2, no=3	Insufficient data
	3	Media used for advertising: Yes, newspaper/journal=1, radio/TV/other=2, no=3	Data undifferentiation
	4	Budget for advertising: Yes, up to 5% total budget=1, more than 5% of total budget=2, no=3	Insufficient data
	6	Marketing statistics: Yes, available=1, no, not available=2	Data undifferentiation
	7	*Customer statistics:* Yes, available=1, no, not available=2	Data undifferentiation
	11	Budget for marketing: Yes, up to 5% of total budget=1, more than 5% of total budget=2, no, there isn't any=3	Insufficient data
	12	Number of people working in marketing: Up to 10=1, more than 10=2	Insufficient data
People	5	Qualifications of personnel: Excellent=1, good=2, satisfactory=3, poor=4, very poor=5	One different data
	6	Shipping backgrounds: Yes=1, no=2	Insufficient data
Process	2	Selling tickets via: Agencies, branches=1, offices, representatives=2, others=3	Data undifferentiation

Source: The author.

Table 33: Total applicable data of the ferry operators into MDS

Sections of 7Ps	Previous number of questions	Total number of questions after reductions
Product	26	20
Price	7	5
Place	5	5
Promotion	13	5
People	5	4
Physical evidence	4	3
Process	2	1
Total	62	43

Source: The author.

to choose a degree of a characteristics or an attribute directly on a scale, e.g. Likert scale with five scales ranging from a greatest to a least degree for perception. In addition, rating scales are used that may be based upon the assumptions of a researcher for evaluating the perceptions of respondents (Green *et.al.*, 1988).

Therefore, all of the qualified and applicable data of the ferry operators in this research was ranked question by question using the preferences of the researcher which is a common method for evaluating score ratings in MDS (Interview, 1995a; Hair *et.al.*, 1995). The preferences in the score ratings are based upon the requirements derived from the main hypotheses developed earlier. The score ratings were given for each qualified and applicable data and for each question in the questionnaire, and therefore, the operators were ranked for each question according to their answers to the questions. Each question was ranked from 1 to 9, with the smallest number representing the most preferred data (Coxon and MDS(X) Project Team, 1980a). For instance, the maximum number of ferries owned by a ferry operator was considered the most preferable total number of ferries because of the experience in the market place this suggests. Hence, the score rating for that operator became 1. Furthermore, the score rating for a ferry operator with the least number of ferries was 9 because he was preferred the least due to his limited experience in the market place. The score ratings for the rest of the ferry operators were allocated accordingly. In the case of two or more ferry operators having the same data, the score rating was repeated.

Details in converting the raw data of the ferry operators into score ratings are explained below and with Table 34, which illustrates the score ratings of the characteristics of each ferry operator with ferry services in the Italy-Greece-Turkey corridor. It should be noted that this table does not include the questions that were removed after the recoding and transformation of the data. In addition, the 7 sections of the questionnaire were merged together to become ready for application into the MDPREF programme. The rows on the tables, as indicated by the questions on the questionnaire, represent the independent variables of the operators. Furthermore, the columns were randomly allocated and the number did not reflect dominance of any ferry operators.

(a) Product:

A total of 26 questions decreased to 20 in this section through the removal of questions for various reasons explained earlier in this chapter (See Table 32). In addition, Table 24 and 34 can be referred for raw data of the ferry operators and for score ratings of data, respectively.

1. Total number of ferries in general: Ferry operators with greater number of vessels are preferred because of their experience in the ferry business. Consequently, ferry operators were

Table 34: Score ratings of data based on the "7P"s

Section	no.	Characteristic	C1	C2	C3	C4	C5	C6	C7	C8	C9
Product	1	Total number of ferries in general	3	1	2	5	3	4	2	4	5
	2	Number of ferries operating in the Italy-Greece-Turkey corridor	3	3	2	3	3	2	1	3	3
	3	Maximum speed of ferries	4	5	6	2	4	1	3	7	5
	4	Flags of ferries Turkish=1, Others=2	2	2	2	2	2	2	1	2	2
	5	Operators of ferries: Turkish=1, Others=2	2	2	2	2	2	1	1	1	2
	6	Total tonnages of ferries operating in this corridor	8	6	5	9	2	3	1	4	7
	7	Average tonnages of ferries	6	4	9	7	1	8	3	2	5
	8	Average ages of ferries	5	6	7	3	2	4	1	5	5
	9	Refurbishment of ferries:Yes=1, no=2	1	2	2	2	1	2	1	2	2
	10	Passenger capacity per ferry	1	3	6	5	2	7	8	4	4
	11	Car capacity per ferry	1	2	5	3	1	6	7	8	4
	12	Seasons of journey: All seasons:1, spring-summer-autumn,high season :2	2	2	1	2	2	2	1	2	2
	13	Total number of one-way-journeys in 1994	8	4	2	5	6	3	1	4	7
	14	Number of return journeys per week: Twice=1, once=2	1	2	1	2	1	1	1	2	2
	15	Total number of passengers in 1994	9	7	2	6	4	3	1	5	8
	16	Total number of passengers per ferry in 1994	9	7	4	5	2	6	1	3	8
	17	Average number of passengers per journey	4	8	9	7	1	5	2	6	3
	18	Percentage of average full capacity of ferries	7	9	8	6	2	3	1	5	4
	19	Services on board: Good=1, satisfactory=2, poor=3	2	1	2	2	2	3	1	2	2
	20	Quality of ferries: Good=1, satisfactory=2, poor=3	2	1	2	2	2	3	1	2	3

(continued)

(Table 34: continued)

Section	no.	Characteristic	C1	C2	C3	C4	C5	C6	C7	C8	C9
Price	21	High Season pullman seat one way fares for adults from (a) Venice to Turkey (b) Ancona to Turkey (c) Bari to Turkey (d) Brindisi to Turkey	6	7	4	5	4	1	3	3	2
	22	Minimum high season fares for children from (a) Venice to Turkey (b) Ancona to Turkey (c) Bari to Turkey (d) Brindisi to Turkey	7	8	4	5	4	1	6	3	2
	23	Minimum high season fares for cars from (a) Venice to Turkey (b) Ancona to Turkey (c) Bari to Turkey (d) Brindisi to Turkey	5	8	3	7	2	1	6	6	4
	24	Membership of a shipping group, Conferences, Consortia: Yes=1, no=2	1	1	2	2	1	2	2	1	2
	25	Fixed pricing as a shipping group, Conferences, Consortia: Yes=1, no=2	1	1	2	2	1	2	2	1	2
Place	26	International routing: Italy-Turkey=1, Italy-Greece-Turkey, Greece-Turkey=2	2	2	2	2	2	1	1	1	1
	27	Operating line from Italy to Turkey: direct=1, via Greece=2	2	2	2	2	2	1	1	1	1
	28	Place of head office: Turkey=1, others=2	2	2	2	2	2	2	1	1	2
	29	Location of branches: Italy+Greece+Turkey + others=1, Italy+Greece,Greece+ Turkey, Italy+Turkey=2, Italy, Greece, Turkey, None=3	3	1	1	3	3	3	3	2	3
	30	Location of agencies: Italy+Greece+Turkey + others=1, Italy+Greece,Greece+ Turkey, Italy+Turkey=2, Italy, Greece, Turkey, None=3	2	1	1	1	3	1	1	1	3

(continued)

(Table 34: continued)

Section	no	Characteristic	C1	C2	C3	C4	C5	C6	C7	C8	C9
Promotion	31	Corporate image: Excellent=1,good=2, satisfactory=3,poor=4, very poor=5	2	2	3	2	2	2	1	2	3
	32	Catalogue distribution to customers: Yes, usually=1, sometimes=2, rarely=3	1	1	2	2	2	3	1	2	3
	33	Sales promotion activities: Yes, occasionally=1, none=2	1	1	2	1	2	2	1	2	2
	34	Additional promotional achieves while competing on the same route:Yes=1, no=2	2	2	2	1	2	1	2	1	2
	35	Contributing to exhibitions:Yes=1,No=2	1	1	2	2	2	2	1	2	2
People	36	Number of personnel: More than 41=1, 31-40=2, 21-30=3, 11-20=4, 1-10=5	3	1	4	5	5	5	1	5	5
	37	Training programs: Yes =1, no=2	2	1	2	2	2	2	1	2	2
	38	Budget for training: Yes=1, no=2	2	1	2	2	2	2	1	2	2
	39	Participating in decision-making: Unions/Workers=1, Management=2, Director=3	3	2	3	3	3	3	2	3	3
Physical evidence	40	Total number of branches, agencies and outlets: More than 10 = 1, up to 10 = 2	1	1	2	2	2	2	1	2	2
	41	Location of offices, branches and agencies Italy,Greece,Turkey and other European countries=1;Italy, Greece, Turkey=2	2	2	2	2	2	1	1	1	2
	42	Organisation chart: Available = 1, not Available= 2	2	1	2	2	2	2	1	2	2
Process	43	Method of selling tickets On-Line system = 1, stock of tickets = 2	1	1	2	2	2	2	2	2	2

C1=MARLINES, C2=MINOAN LINES, C3=EUROPEAN SEAWAYS, C4=HORIZON SEA LINES, C5=MED LINK LINES, C6=STERN MARITIME LINES, C7=TURKISH MARITIME LINES, C8=TOPAS MARITIME LINES, C9=NETA LINES

ranked in accordance with the total number of ferries they own. (*)

2. *Number of ferries operating in the Italy-Greece-Turkey corridor:* Similar to the previous question, ferry operators were ranked according to the total number of ferries that were in service in this specific market area assuming that ferry operators with greater number of ferries operating in this specific market have more experience in this business. (*)

3. *Maximum speed of ferries:* Faster ferries are preferred because of the importance of time for both the operators and passengers in an approximate duration of 65 hours of journey in this corridor. The journey time is important for operators as it enables them to provide more frequent services. It is important for passengers because of completing the transportation between two destinations within less time.

4. *Flags of ferries:* Vessels with Turkish flags were preferred because of the basic aim of this research in identifying the positioning of Turkish ferry operators in comparison with their EU competitors. (+)

5. *Operators of ferries:* Turkish operators were preferred in ranking because of the reason noted in the previous question - number 4. (+)

6. *Total tonnages of ferries:* Companies operating ferries with greater grosstonnages were

(*): In addition, the score ratings given to answer to this question reflected the experience, profession, establishment, services, traditional circumstances and knowledge of the operator in the market place. Therefore, the operators were ranked accordingly from the greatest to the least by reflecting these qualifications in this positional study.

(+): One of the objectives of this research is to identify the positioning of the Turkish operators in comparison with their EU competitors. Therefore, the preference ranking within the positional analysis is based upon the Turkish operators.

preferred because of their assumed experience and ability to carry more passengers. (*)

7. Average tonnages of ferries: Preference was given for a greater average tonnage of ferries and the averages were ranked from the greatest to the least because of their ability to carry more passengers. (*)

8. Average ages of ferries: The ranking of preference was made for the ages from the youngest to the oldest because of the physical reliability of construction, for safety reasons and for the quality of facilities on board of ferries which provide better services for passengers.

9. Refurbishment of ferries: Refurbished ferries were preferred in score ratings because they provided better services for passengers compared to aging ferries operating in this corridor (See question 8). If the age of the ferry was smaller than 15, then it was considered that these ferries do not need serious refurbishment because vessels under this age are considered in general young enough to operate in accordance with most classification societies.

10. Passenger capacity per ferry: The preference was given to ferries with greater capacity because of their capability of carrying more passengers in a journey. (*)

11. Car capacity per ferry: Similar to the previous question - number 10, preference was given to ferries with greater capacity because of their capability of carrying more cars in a journey. (*)

(*): In addition, the score ratings given to answer to this question reflected the experience, profession, establishment, services, traditional circumstances and knowledge of the operator in the market place. Therefore, the operators were ranked accordingly from the greatest to the least by reflecting these qualifications in this positional study.

12. Seasons of journey in a year: Operators having ferry service in all of the seasons in a year were preferred because they provided services continuously in comparison with other operators. (*)

13. Total number of one-way-journeys in 1994: Ferry operators with greater number of journeys were preferred because they provided more services in this corridor. (*)

14. Number of return journeys per week: Similar to the previous question - number 13, operators with greater number of total journeys provided in a week was preferred because of the frequency of their ferry services in this market. (*)

15. Total number of passengers in 1994: Operators carrying more passengers were preferred because this figure represents their market shares in terms of carrying passengers.(*)

16. Total number of passengers per ferry in 1994: Ferries with greater average of passengers were preferred in ranking because of their greater share in the market. (*)

17. Average number of passengers per journey: Averages were ranked from the greatest to the least because of the operators' market shares in this corridor. (*)

18. Percentage of average full capacity of ferries (one-way): Similar to the previous question - number 17, percentages were ranked from the greatest to the least in order to put the operators in a sequence. (*)

(*): In addition, the score ratings given to answers to this question reflected the experience, profession, establishment, services, traditional circumstances and knowledge of the operator in the market place. Therefore, the operators were ranked accordingly from the greatest to the least by reflecting these qualifications in this positional study.

19. Services on board: Ferries having more facilities on board were preferred in ranking because they provided more service to the passengers. (*)

20. Quality of ferries: The preference in score rating was given to better quality ferries based upon their construction, engine, facilities and services on board. Therefore, answers and score ratings to this question have links with the ones to the previous questions. (*)

(b) Price:

This section of the questionnaire includes five questions which were seven before the removal of two which are unqualified (See Table 32). In addition, Table 25 can be referred for raw data and Table 34 for score ratings.

1. High season pullman seat one-way fares for adults: Preference in this question was given to ranking them from the cheapest to the most expensive ticket prices because of the general preference of customers to receive a better service with a cheaper price as also proposed by the operators. In addition, preference ranking was given because of meeting at an optimum point for better service and better price at the same time in a similar way to the break-even point in supply and demand curves in economics.

2. Minimum high season fares for children: Similar to the previous question - number 1, ticket prices of children were also ranked from the cheapest to the most expensive.

3. Minimum high season fares for cars: Similar to the previous questions - numbers 1 and 2, this question was also ranked from the cheapest price to the most expensive.

(*): In addition, the score ratings given to answers to this question reflected the experience, profession, establishment, services, traditional circumstances and knowledge of the operator in the market place. Therefore, the operators were ranked accordingly from the greatest to the least by reflecting these qualifications in this positional study.

4. Membership of a shipping group, conferences or consortia: The preference in this question was made to operators who are members of these groups because of their cooperation in providing ferry services in the market place. (*)

5. Fixed pricing as a shipping group, conferences or consortia: Similar to the previous question - number 4, preference was given to the operators who are adopting a fixed price policy in the market place because of their good attitude towards unfair competition. (*)

(c) Place:

This section of the questionnaire constituted the same number of questions as the raw data because none of the questions were removed. In addition, Table 26 and 34 can be referred to for raw data and score ratings, respectively.

1. International routing: The preference in ranking was given to the operators who were operating direct services between Italy and Turkey as more time was saved by not having indirect services to and from Greece representing a positional benefit for the Turkish operators. (+)

2. Operating line: Similar to the previous question - number 1, preference in ranking was given to the operator companies who were operating direct services between Italy and Turkey representing a positional benefit for the Turkish operators. (+)

(*): In addition, the score ratings given to answers to this question reflected the experience, profession, establishment, services, traditional circumstances and knowledge of the operator in the market place. Therefore, the operators were ranked accordingly from the greatest to the least by reflecting these qualifications in this positional study.

(+): One of the objectives of this research is to identify the positioning of the Turkish operators in comparison with their EU competitors. Therefore, the preference ranking within the positional analysis is based upon the Turkish operators.

3. Place of head office: The operators who were based in Turkey are preferred in ranking because one of the objectives of this research is to identify the positioning of the Turkish operators in comparison with their EU competitors. Therefore, the preference ranking within the positional analysis is directed towards the Turkish operators.

4. Location of branches: Preference was given to operators who had more branches because of the availability of a distribution channel in more places, and therefore, their provision of services to the customer in more places. (*)

5. Location of agencies: Similar to the previous question - number 4, operators with more agencies were preferred. (*)

(d) Promotion:

The total number of questions was reduced from 13 to 5 in this section of the questionnaire (See Table 32). In addition, Table 27 and 34 can be referred to for raw data and score ratings, respectively.

1. Corporate image: Preference was given to better images (as clarified by the operators) in the market because of the generally perceived position of the ferry company and, in addition, because of the perceptions of customers. (*)

2. Catalogue distribution to customers: Preference was given to operators who were frequently promoting their services to customers.

(*): In addition, the score ratings given to answers to this question reflected the experience, profession, establishment, services, traditional circumstances and knowledge of the operator in the market place. Therefore, the operators were ranked accordingly from the greatest to the least by reflecting these qualifications in this positional study.

3. Sales promotion activities: Preference in ranking was given to operators having more promotional activities in the market representing their attitude towards customers in general.(*)

4. Additional promotional achieves while competing on the same route: In addition to the previous question - number 3, preference in ranking was also given to operators having additional services in the market. (*)

5. Contibuting to exhibitions: Operators who were contributing to exhibitions were preferred because it revealed their intentions to improve themselves in this corridor. (*)

(e) People:

The total number of questions in this section of the questionnaire was reduced from 6 to 4 (See Table 32). In addition, Table 28 can be referred to for raw data and Table 34 for score ratings.

1. Number of personnel: This was ranked from the greatest to the least because of prefering operator companies with greater employment capacity in the market. (*)

2. Training programmes: Preference was given to operators having these programmes because of their intention to improve themselves in this specific corridor.

3. Budget for training: In addition to the previous question - number 2, preference was given to operators with a higher budget for personnel training. (*)

(*): In addition, the score ratings given to answers to this question reflected the experience, profession, establishment, services, traditional circumstances and knowledge of the operator in the market place. Therefore, the operators were ranked accordingly from the greatest to the least by reflecting these qualifications in this positional study.

4. Participating in decision making: Traditional approaches that rely on hierarchically determined decisions are considered insufficient by many companies in today's dynamic and demanding world (Mohrman *et.al.*, 1995). It is noted by the Institute of Personnel Development (1996) that it is people in an organisation that provide the opportunity to achieve comparative advantage. Therefore many organisations are now looking to ensure more effective integration with their personnel. As a consequence, preference for the level decision making in the ferry companies was ranked from the level of unions and workers towards the level of top management because of ranking the operators in accordance with their attitutude towards their employees and their integration with their personnel.

(f) Physical evidence:

None of the questions in this section of the questionnaire were removed because of unqualified data. In addition, Table 29 and 34 can be referred to for raw data and score ratings, respectively.

1. Total number of branches, agencies and outlets: The ranking for this question was made from the greatest number of outlets to the least number because of the intentions of the operators to reach their customers through distribution channels. (*)

2. Location of offices, branches and agengies: Similar to the previous question and earlier questions in the "Place" section - numbers 4 and 5, operators having more places for distribution channels are preferred in ranking. (*)

3. Organisation chart: Ferry operator companies with organisation charts were preferred

(*): In addition, the score ratings given to answers to this question reflected the experience, profession, establishment, services, traditional circumstances and knowledge of the operator in the market place. Therefore, the operators were ranked accordingly from the greatest to the least by reflecting these qualifications in this positional study.

because of their clear intentions towards personnel planning and management. (*)

(g) Process:

One question was removed in this section of the questionnaire.

1. Method of selling tickets: Operator companies with more advanced and up-dated selling methods, i.e. on-line computer system, were preferred in ranking because of their dedication towards up-dated technology and communication systems.

As a consequence, data from 43 questions for 9 operators were applied into the MDPREF programme of the MDS(X) series of programmes.

5.2.10. Application of data into MDS

The MDPREF programme of the MDS(X) series of programmes was used with the permission of Professor A.P.M.Coxon, the leader and the Principal Investigator of the MDS(X) Project, in the U.K. (Coxon and MDS(X) Project Team, 1980a; Interview, 1995a). The reasons for using the MDPREF programme, which was originated by Carroll and Chang (1969), were explained in the previous chapter. The following sections concern themselves with the application of the data of the ferry operators operating in the Italy-Greece-Turkey corridor into the MDPREF programme. Appendix 4 can be referred to for the input and output programmes together with the calculations within the application.

It should be noted that the data of the 7 sections were applied together once into the

(*): In addition, the score ratings given to answers to this question reflected the experience, profession, establishment, services, traditional circumstances and knowledge of the operator in the market place. Therefore, the operators were ranked accordingly from the greatest to the least by reflecting these qualifications in this positional study.

programme to illustrate the overall positioning of the ferry operators in the market. In addition, data for each section of the "7P"s were also applied into the programme separately to reveal different positions of the operators within each "P" of the service marketing mix elements. It should also be noted that each application of the "P" does not necessarily reflect the total market individually because of the reliability of the application of the data into the programme. However, these seven different applications of the "7P"s do give an additional idea of the situation for each "P" (Interview, 1995a).

5.2.11. Analysis of data application

The data application, with a run name of "FERRY SERVICES RUN 1", consists of the input data, in which rows are considered as subjects representing 43 variables - in other words, characteristics of the ferry companies, and columns are considered as stimuli representing 9 different ferry operators. There are 43 subjects and 9 stimuli in total, forming a 43x9 data matrix. The input programme of the application is followed by the calculations, which are illustrated by the output programme of this application. The groups of calculations produced by the output programme are explained below.

The first score matrix is a set of N subjects asked to give a preference rating to a set of p stimuli. Each row of the matrix represents the preference score rating given by that subject to the stimuli. The first score matrix of FERRY SERVICES RUN 1 application consists of 43 rows, in other words, variables, representing subjects, and 9 columns representing the stimuli, in other words, ferry operators. The data of this matrix is the set of score rating data, which is the actual input data for the MDPREF, forming a 43x9 rectangular data matrix.

The cross product matrix of subjects is an NxN matrix. It is a 43x43 data matrix for this application as part of the calculations within the MDPREF programme (Coxon and MDS(X)

Project Team, 1980a). The correlation matrix of subjects is an NxN matrix, where N is 43 for this application. The inter-subject correlations are calculated within this matrix. The cross product matrix of stimuli is a pxp matrix, where p is 9 in this application, and is a part of the calculations of the MDPREF programme. The correlation matrix of stimuli is a pxp matrix of inter-stimuli correlation values, where p is 9 as seen in the output programme. The second score matrix is an Nxp matrix, where N is 43 and p is 9 for this application, and is a part of the calculations of this programme. The residuals matrix is an Nxp matrix illustrating the difference between the first and the second score matrices.

It is clear from the correlation matrix of subjects that the measure of goodness-of-fit of the MDPREF model to the data is high. The reason for that can be established by considering a subject vector passing through a configuration of stimulus points with the values meeting that vector by being maximally correlated with those subjects' data according to Eckart Young calculations (Coxon and MDS(X) Project Group, 1980a). It is indicated from the correlation matrix that the subjects are highly correlated because the correlation values are very close to 1, with the smallest value being 0.6216, and additionally, with 5 values exactly 1.0000 (Davies and Coxon, 1982).

Before analysing the results, it is necessary to develop various hypotheses for testing the relationship between the characteristics of the companies and between the operators. Therefore, the following hypotheses can be developed for these correlation coefficients of subjects - characteristics of ferry companies - as follows:

H_0: The relationship between the subjects is not important.

H_1: The relationship between the subjects is important.

If the rank correlation coefficient table with 1% error limit and 99% confidence limit is referred to (See Appendix 5) for n=30, then the coefficient becomes 0.478. Since n=43 for this application, it is clear that the table value for the correlation coefficient will be even less than 0.478 because they are listed in a decreasing order in the table. However, the calculated minimum correlation coefficient of this application is 0.6216. Thus, H_0 hypothesis is rejected and H_1 hypothesis is accepted within the limits of 1% of error and 99% of confidence. Thus, although the characteristics of the ferry operator companies are independent of each other, there is a close relationship between these characteristics, and therefore, this relationship is important and the values are not random.

Similar to the above, the following hypotheses for the correlation coefficients of stimuli - ferry operators - can be developed as follows:

H_0: The relationship between the stimuli is not important.

H_1: The relationship between the stimuli is important.

For this application, n for the stimuli is 9 and the calculated minimum correlation coefficient value for the stimuli is 0.6090. However, the table value for the correlation coefficient is 0.833 for 1% of error and 99% of confidence limits. Therefore, the H_0 hypothesis is accepted for these limits noting that the relationship of the stimuli, representing the operators, is not important. In other words, there is no distinct relationship between the ferry operators and they are not closely related to each other in the market having different characteristics and positioning on different sides of the market place.

As a consequence of the above hypotheses, the following are developed only for Turkish ferry operators justified as the positional analysis in this research is based upon the altitude of Turkish operators in the market place as explained earlier.

H_0: There is no similarity between the Turkish ferry operators in the Italy-Greece-Turkey corridor.

H_1: There is a similarity between the Turkish ferry operators in the Italy-Greece-Turkey corridor.

Error limits can be widened from 1% to 5% in this case because of the unavailability of data. On the contrary, the error limits are tightened for greater data for reliability reasons. Therefore, limits of 5% of error and 95% of confidence are used for these hypotheses.

The table value of correlation coefficients is 0.683 for 5% of error and 95% confidence limits (See Appendix 5). Since the minimum calculated correlation coefficient of the Turkish ferry operators (companies with numbers 6, 7 and 8) is 0.7426, which is greater than the table value (See Appendix 5), H_0 is rejected and H_1 is accepted. As a consequence, a similarity between the Turkish ferry operators in the market exists. In accordance with this consequence, their close positioning in the market is illustrated in Figure 35 and 36 in the following chapter.

The values of the subject and stimuli matrices are calculated within the MDPREF programme and the first column of the matrix indicates the variables for the axis of "Dimension 1", while the second for the axis of "Dimension 2", similar to data applications in various other statistical techniques (Moinpour *et.al.*, 1976; Zins, 1994, Tongzon, 1995).

5.2.12. Additional data applications

Similar to above application, data of each "P" of the "7P"s of the service marketing mix elements, data of each ferry service line and data of direct and indirect ferry lines were applied separately into the MDPREF programme and were operationalised to give further idea for the positioning of the ferry operators in the market place. However, they do not reflect the market positioning individually because of the limited data within each of these applications. Brief explanations of these applications and their results are given in the following section.

5.3. SOME CONCLUSIONS

Data of the ferry operators were applied into the MDPREF programme of the MDS(X) Series of Multidimensional Scaling computer programmes for the analysis of the positioning of the Turkish ferry operators in comparison with their European Union competitors in the Eastern Mediterranean, in this chapter of the research. Their results will be examined through various figures in the following chapter.

CHAPTER 6: RESULTS

6.1. INTRODUCTION

This chapter concentrates upon the results of the analysis outlined in the previous chapter. These results are based on the calculations derived from the output programme of the analysis (See Appendix 4).

Positioning of the Turkish ferry operators in comparison with their EU competitors in the market are illustrated in this chapter through various figures as the results of the analysis. These figures were also produced by the output programme of the MDPREF programme.

6.2. FIGURE REPRESENTATIONS

The figures illustrated in this chapter are two dimensional graphs mainly representing the correlations between the ferry operator companies in terms of their characteristics.

Axes of dimensions:

Variables on the axes of the dimensions were derived from the subject matrix calculated within the output programme of the MDPREF programme as noted in the previous chapter. The absolute values of closer numbers within these matrices group together by representing various characteristics of the ferry operators. Therefore, as a consequence of this, similar variables group as a common characteristic in general.

"Dimension 1" - y axis - represents a general characteristic that appears the most significant characteristic for the ferry operators based on the results of the calculations. This axis illustrates the correlation coefficients between the characteristics of the ferry operator companies in general between a range of +1.20 and -1.20 on the left side of the graph as a result of the calculations, which recalculates it to a range between +100 and -100 on the right side of the graph. Similarly, "dimension 2" - x axis - represents a group of characteristics that appears as the second significant characteristic of the ferry operator companies for that illustration. The range of the correlation coefficients for this axis differs between +1.20 and -1.20 underneath the graph as a part of the calculations, which was recalculated to a range between +100 and -100 as indicated above the graph.

Configuration of the ferry operators:

The stimuli are represented as points - where points are representing ferry operator companies in this research - in a multidimensional space as noted earlier in Chapter 4 and as also noted by de Soete and Carroll (1983) in a similar way for the representation of brands in marketing. The configuration of the 9 ferry operators are illustrated in the figure by points represented by numbers from 1 to 9. It should be noted that these numbers do not represent any dominance of the operators; however, the sequence of the ferry operators is based on the sequence of the companies on the raw data tables as noted earlier.

The configuration of the ferry operators in the figure is based on the correlations calculated by the MDPREF programme as illustrated by the output programme in the previous chapter. Ferry operators having similarity with each other and illustrating similar characteristics with each other group together in the figure representing their close positioning in the market place. This is also specified by Chatfield and Collins (1980) and Moinpour *et.al.* (1976) that two vectors passing through two points and originating from the origin - where (x,y)=(0,0) - in an n-dimensional space with an angle between these vectors gets smaller and, therefore, its cosine becomes close to 1. As a consequence, this indicates a high correlation, in other words, a close similarity between these ferry operators.

Configuration of the characteristics:

Variables are represented by vectors - where vectors are representing characteristics of the ferry operator companies in this research - in the same space originating from the origin similar to each segment represented by a vector (de Soete and Carroll, 1983; de Sarbo *et.al.*, 1994). The configuration of the characteristics of the ferry operators are illustrated in the figure by vectors represented by numbers from 10 to 52, totalling 43 characteristics. Similar to an earlier explanation, it should be noted that these numbers do not dominate each other; however, the sequence of the characteristics is based on the questions of the questionnaire. These characteristics are illustrated by vectors originating from the origin of the graph - (x,y)=(0,0) - as a part of the calculations of the output programme.

These company characteristics are illustrated according to their correlation coefficients derived from the subject matrix of the output programme of the MDPREF programme as a part of the calculations. Various points overlay each other by having very close relationship among themselves. In addition, they group together according to their similarity and close relationship in a similar way to the stimuli as previously noted.

6.3. RESULTS OF THE ANALYSIS

Data of the ferry operators for 43 questions out of 62 were applied into the MDS technique during the operationalisation of the positioning model. Reasons for data reduction were also explained earlier. Therefore, the results of the analysis introduced in this chapter do not reflect any data which was omitted from the analysis. Furthermore, it should be noted that most of reduced data included undifferentiated data, which would have neutral effect upon the result.

Figure 35 illustrates the correlations for each of the 43 characteristics between the 9 ferry operator companies and their data. This is the final configuration, in two dimensions, with

N=43 subjects representing the correlations between 43 characteristics and with p=9 stimuli representing that for the ferry companies. The MDPREF programme positions these 43 characteristics as vectors together with the 9 companies as points in a two dimensional space. As a consequence of the axis representations as noted earlier, "dimension 1" is "service quality" by representing product quality, service quality and company specifications. Similarly, "dimension 2" is "total passengers" by representing various passenger specifications and total number of passengers. As a result, dimension 1 represents the supply side of the market reflecting the ferry operators while dimension 2 represents the demand side reflecting the passengers, in general.

The interpretation of the solution consists of the stimulus points being positioned to secure maximum agreement with the subjects' vectors. The interpretation of the position of stimulus points is made regarding the spread of the subject vector ends. In Figure 35, points from 1 to 9 are the stimuli points representing the 9 ferry operators and points from 10 to 52 are the subject vectors representing the 43 characteristics of these ferry companies. In addition to Figure 35, positioning of the operators and their characteristics in the market are illustrated by vectors more clearly in Figure 36 noting their significant representations based on the "7P"s. The following points are the results derived from Figure 35 and 36:

-- The ferry operators are represented by numbers from 1 to 9 with the same sequence they were applied into the MDPREF programme from the table of score ratings (See Table 34).

-- The characteristics of the ferry operators are represented by vector end points from 10 to 52 totalling 43 characteristics. The sequence of these characteristics reflects their sequence of application into the technique from the score ratings' table (See Table 34). These numbers represent the sequence of the characteristics derived from the questions in the questionnaire.

Figure 35: Configuration of subjects and stimuli in two dimensional space (Subjects(=variables) are represented by vectors and stimuli(= operators) are represented by points)

```
             FERRY SERVICES RUN 1                                              FULL SET

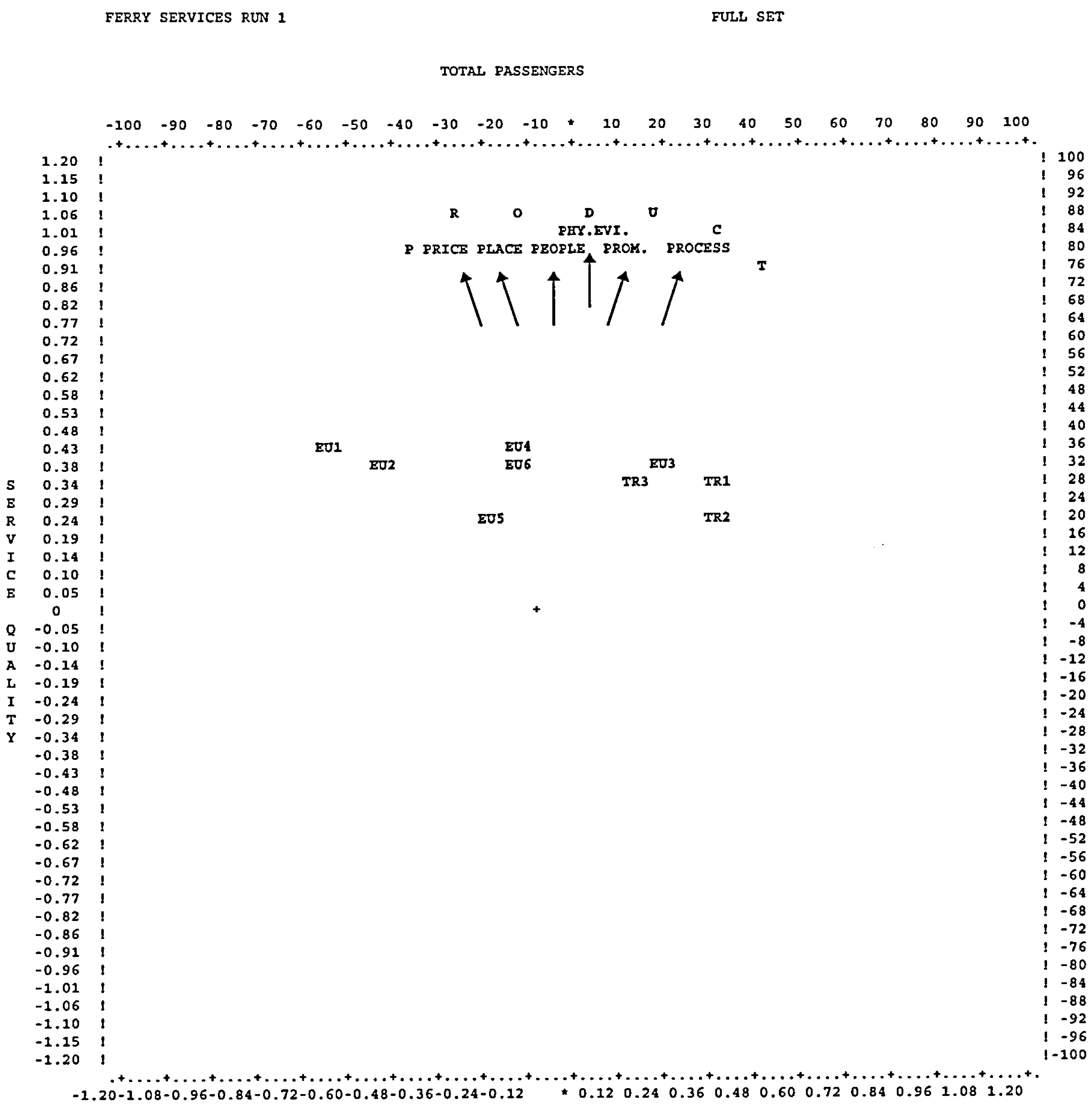
CONFIGURATION OF SUBJECTS AND STIMULI
DIMENSION  2 PLOTTED AGAINST DIMENSION  1                   DIMENSION
                                                                2
             -100  -90  -80  -70  -60  -50  -40  -30  -20  -10  *   10   20   30   40   50   60   70   80   90  100
             .+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+.
      1.20  !                                                                                                       ! 100
      1.15  !                                                                                                       !  96
      1.10  !                                                                                                       !  92
      1.06  !                                                                                                       !  88
      1.01  !                                    30 36 50 21 43 51  45 49                                           !  84
      0.96  !                                 24                          52                                        !  80
      0.91  !                                                                   19                                  !  76
      0.86  !                                                                      20                               !  72
      0.82  !                                                                                                       !  68
      0.77  !                                                                                                       !  64
      0.72  !                                                                                                       !  60
      0.67  !                                                                                                       !  56
      0.62  !                                                                                                       !  52
      0.58  !                                                                                                       !  48
      0.53  !                                                                                                       !  44
      0.48  !                                                                                                       !  40
      0.43  !                         1                    4                                                        !  36
      0.38  !                               2              9               3                                        !  32
      0.34  !                                                           8        6                                  !  28
      0.29  !                                                                                                       !  24
      0.24  !                                           5                        7                                  !  20
      0.19  !                                                                                                       !  16
      0.14  !                                                                                                       !  12
      0.10  !                                                                                                       !   8
      0.05  !                                                                                                       !   4
DIMENSION  1                                                      +                                                 !   0
     -0.05  !                                                                                                       !  -4
     -0.10  !                                                                                                       !  -8
     -0.14  !                                                                                                       ! -12
     -0.19  !                                                                                                       ! -16
     -0.24  !                                                                                                       ! -20
     -0.29  !                                                                                                       ! -24
     -0.34  !                                                                                                       ! -28
     -0.38  !                                                                                                       ! -32
     -0.43  !                                                                                                       ! -36
     -0.48  !                                                                                                       ! -40
     -0.53  !                                                                                                       ! -44
     -0.58  !                                                                                                       ! -48
     -0.62  !                                                                                                       ! -52
     -0.67  !                                                                                                       ! -56
     -0.72  !                                                                                                       ! -60
     -0.77  !                                                                                                       ! -64
     -0.82  !                                                                                                       ! -68
     -0.86  !                                                                                                       ! -72
     -0.91  !                                                                                                       ! -76
     -0.96  !                                                                                                       ! -80
     -1.01  !                                                                                                       ! -84
     -1.06  !                                                                                                       ! -88
     -1.10  !                                                                                                       ! -92
     -1.15  !                                                                                                       ! -96
     -1.20  !                                                                                                       !-100
             .+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+.
         -1.20-1.08-0.96-0.84-0.72-0.60-0.48-0.36-0.24-0.12    * 0.12 0.24 0.36 0.48 0.60 0.72 0.84 0.96 1.08 1.20
POINT  52 OVERLAYS POINT(S)   34  33
POINT  51 OVERLAYS POINT(S)   48  47  46  40  38  26
POINT  50 OVERLAYS POINT(S)   39  35  32  14  11
POINT  49 OVERLAYS POINT(S)   44  42  41
POINT  45 OVERLAYS POINT(S)   29  28  18  16  10
POINT  43 OVERLAYS POINT(S)   37  23  13  12
POINT  36 OVERLAYS POINT(S)   31  27  25  15
POINT  30 OVERLAYS POINT(S)   22
POINT  21 OVERLAYS POINT(S)   17

POINTS 1 TO  9 ARE STIMULI - POINTS  10 TO  52 ARE SUBJECTS.


DIMENSION 1: Service quality
DIMENSION 2: Total passengers

POINTS 6, 7, 8: TURKISH FERRY OPERATORS
POINTS 1, 2, 3, 4, 5, 9: GREEK FERRY OPERATORS REPRESENTING THE EU
```

Figure 36: Configuration of correlations between the ferry operators and their characteristics in the Eastern Mediterranean market



TR1: STERN MARITIME LINES (TURKISH OPERATOR)
TR2: TURKISH MARITIME LINES (TURKISH OPERATOR)
TR3: TOPAS MARITIME LINES (TURKISH OPERATOR)

EU1: MARLINES (EU OPERATOR)
EU2: MINOAN LINES (EU OPERATOR)
EU3: EUROPEAN SEAWAYS (EU OPERATOR)
EU4: HORIZON SEA LINES (EU OPERATOR)
EU5: MED LINK LINES (EU OPERATOR)
EU6: NETA LINES (EU OPERATOR)

-- Companies grouping together in the graph represent a close positioning in the market place because they have similar characteristics. This depends on the explanation provided by Chatfield and Collins (1980) and Moinpour *et.al.* (1976), which results in a higher correlation between the points, in other words, greater similarity between the companies in the market place.

-- Turkish companies - Stern Maritime Lines, Turkish Maritime Lines and Topas Maritime Lines, are represented by the points with the numbers 6, 7 and 8, respectively in Figure 35. They are represented by symbols - TR1, TR2 and TR3, respectively, in Figure 36. These companies are positioned close together and illustrate similarity in various fields, e.g. ferry and journey specifications, ticket prices, service lines, promotion types, company personnel, locations of branches and agencies, etc.. Particularly, Stern Maritime Lines and Turkish Maritime Lines illustrate very similar characteristics by positioning very close to each other.

-- Greek companies are also represented by points in Figure 35 with Marlines - number 1, Minoan Lines - number 2, European Seaways - number 3, Horizon Sea Lines - number 4, Med Link Lines - number 5 and Neta Lines - number 6. They are illustrated by symbols EU1, EU2, EU3, EU4, EU5 and EU6, respectively, in Figure 36. As illustrated in these figures, most of them are grouped together, except European Seaways which is the company represented by number 3. This operator shows similarity with the Turkish companies - Stern Maritime Lines and Turkish Maritime Lines, because it is positioned close by having similar characteristics with these operators in various fields, e.g. season of journey, ticket prices, characteristics of ferries etc..

-- The operators, which are closer to any "P" of the 7Ps, reflect that they have a similarity for the characteristics grouped under that "P", in particular. For example, Horizon Sea Lines -

EU4 and Neta Lines - EU6 are positioned closely in the market by illustrating similar characteristics of place and people. In other words, these operators are similar to each other by having similarity in the location of head offices, branches and agencies. In addition, they are also similar to each other in the total number of personnel, training programmes, budget for training and participating of personnel in decision-making.

-- Horizon Sea Lines, Med Link Lines and Neta Lines illustrate greater similarity between them in ferry ticket prices, places of branches and agencies, company personnel and various product specifications, e.g. ferry characteristics, seasons of journey etc.. In addition, Marlines and Minoan Lines also illustrate similarity with other EU operators in various product specifications, in particular.

-- Company characteristics grouping together are similar to each other compared to the ones that are apart from each other in a way matching the explanations provided by Chatfield and Collins (1980) and Moinpour *et.al.* (1976).

-- The variables that overlay each other illustrate very similar characteristics, e.g. company specifications, price variations, personnel specifications, places of branches, types of promotion, ferry specifications, total number of journeys, etc..

-- All of the ferry operator companies have at least some similarity in some characteristics of product i.e. ferry and journey. Therefore, "Product" is widely distributed over the operators. For example, Stern Maritime Lines - represented by number 6 and Turkish Maritime Lines - represented by number 7 in Figure 35 have some similarity in the total number of passenger and car capacities of their ferries. These characteristics are represented by numbers 19 and 20 in Figure 35 and they were derived from questions 10 and 11 from the table of score ratings

(See Table 34).

Consequently, the ferry operators illustrating a close positioning in Figure 35 and 36 reflect the close positioning in the market place by having similar characteristics with each other in the ferry services in the Eastern Mediterranean. In addition, the similarity in the characteristics is also illustrated in the same figures by these company characteristics positioning close together as vector ends produced by the programme. Furthermore, ferry operators positioning in different places for various characteristics means that they do not reflect any similarity with each other for those characteristics.

6.4. ADDITIONAL DATA APPLICATIONS AND RESULTS

Additionally, data for each "P" of the "7P"s of the service marketing mix, data for each service line and data for direct and indirect ferry lines are applied separately into the MDPREF programme and operationalised to give a further idea of the positioning of the ferry operators in the market. However, they do not fully reflect the market positioning individually because of the unreliability of these limited data applications for these specific situations.

Thus, they only give further indication of each of these specific situations. Figures are illustrated in this section with the characteristics of axes of dimensions and configurations of the ferry operators and their characteristics, as noted earlier in this chapter. It should be stressed that significant characteristics among each "P" of the "7P"s are noted in the figure representing those characteristics that appear more definite according to the calculations of the programme. In addition, it should also be noted that axes of dimensions are represented by characteristics of the operators for each application in this section based on their significance that were calculated by the programme. Therefore, characteristics representing the dimensions are noted individually for each application in this section.

6.4.1. Applications of each "P" of the 7Ps

In addition to the previous data application based on the total 7Ps of service marketing mix elements, the following are various data applications into the MDPREF programme to widen the view of the previous main application. It should be noted that the following applications are operationalised for each "P" of the 7Ps to give a further idea of the positioning of the ferry operators in the market only for that "P". The input programmes of these applications are given in Appendix 6. The final output graphs are illustrated in Figure 37-48 for "product", "price", "place", "promotion", "people" and "physical evidence". It should be noted that a separate configuration for "process" cannot be calculated by the computer programme because it constitutes only one score rating representing one characteristic of each company. Therefore, no correlations between variables are calculated by the programme.

Product and its market implications

Figure 37 illustrates the positioning of the ferry operators in the market with particular reference to their score ratings for the "Product" section of the service marketing mix. Similarly, Figure 38 illustrates the positioning more clearly. The companies are positioned in the market according to the specifications of the ferries that they operate in that area as illustrated in the figure. For example, age, flag and speed of the ferries and seasons of the journey forms the first dimension which can be referred as "product quality". Total number of passengers carried by each of the ferry operator forms the second dimension, - "total number of passengers". The positioning of the ferry operators for "product" configuration is similar to the positioning for the configuration of the total 7Ps (Figure 35 and 36) because the score ratings of product, representing the specifications of the product, contributes considerably to the total score ratings. Therefore, the Turkish ferry operators are positioned close to each other indicating similar characteristics in the market. Similarly, the Greek ferry operators indicate the same by positioning close to each other, except for European Seaways

Figure 37: Positioning of the ferry operators for "Product"

```
             PRODUCT RUN 1                                                      FULL SET

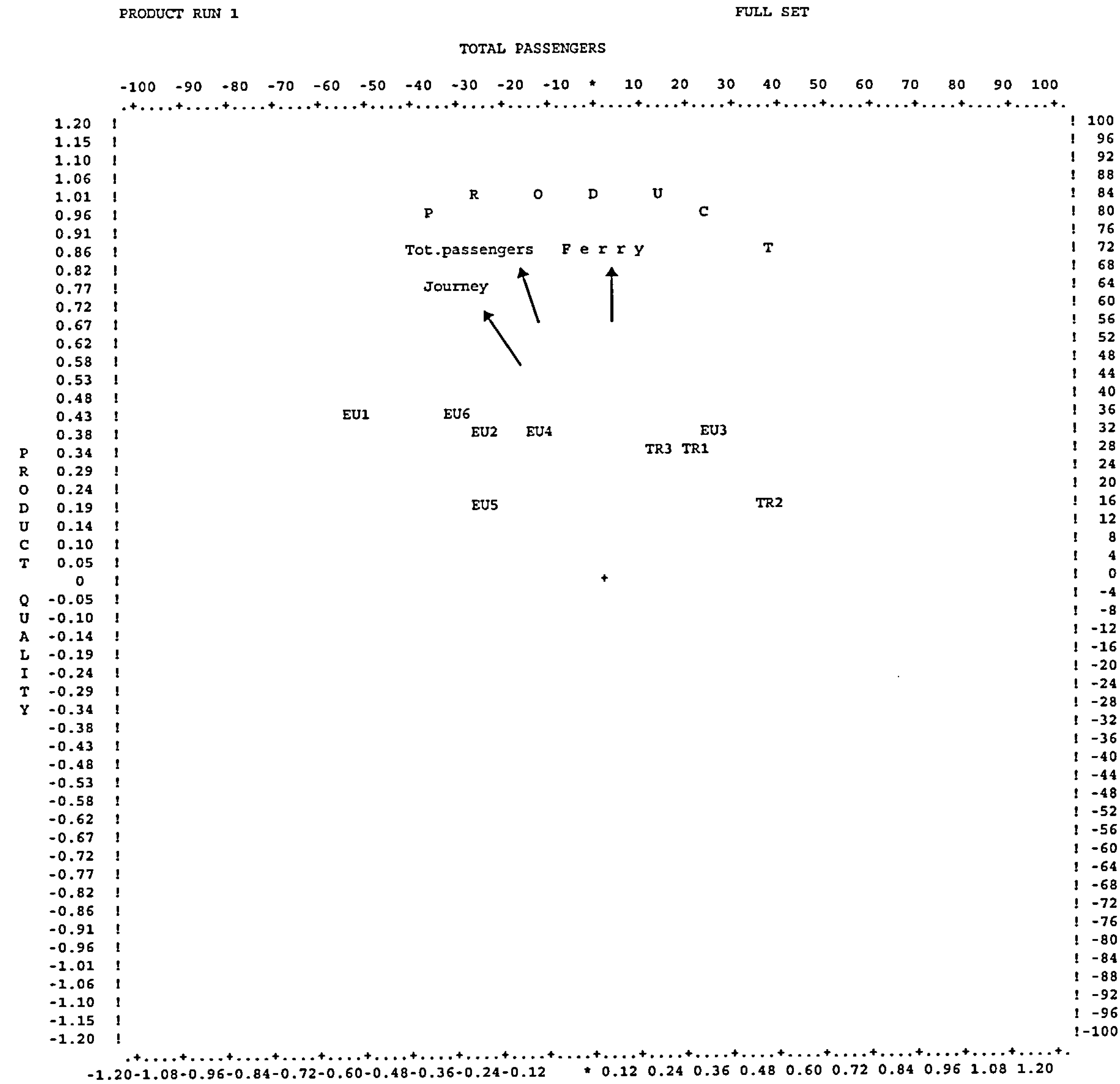
CONFIGURATION OF SUBJECTS AND STIMULI
DIMENSION  2 PLOTTED AGAINST DIMENSION  1                   DIMENSION
                                                                2
             -100  -90  -80  -70  -60  -50  -40  -30  -20  -10   *   10   20   30   40   50   60   70   80   90  100
             .+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+.
      1.20  !                                                                                                       ! 100
      1.15  !                                                                                                       !  96
      1.10  !                                                                                                       !  92
      1.06  !                                                                                                       !  88
      1.01  !                                    25 15 27 21 23 29  26                                              !  84
      0.96  !                                 24                                                                    !  80
      0.91  !                                                                                                       !  76
      0.86  !                                                                      20                               !  72
      0.82  !                                                                                                       !  68
      0.77  !                                                                                                       !  64
      0.72  !                                                                                                       !  60
      0.67  !                                                                                                       !  56
      0.62  !                                                                                                       !  52
      0.58  !                                                                                                       !  48
      0.53  !                                                                                                       !  44
      0.48  !                                                                                                       !  40
      0.43  !                         1           9                                                                 !  36
      0.38  !                                        2     4                  3                                     !  32
      0.34  !                                                           8  6                                        !  28
      0.29  !                                                                                                       !  24
      0.24  !                                                                                                       !  20
      0.19  !                                        5                              7                               !  16
      0.14  !                                                                                                       !  12
      0.10  !                                                                                                       !   8
      0.05  !                                                                                                       !   4
DIMENSION  1                                                     +                                                  !   0
     -0.05  !                                                                                                       !  -4
     -0.10  !                                                                                                       !  -8
     -0.14  !                                                                                                       ! -12
     -0.19  !                                                                                                       ! -16
     -0.24  !                                                                                                       ! -20
     -0.29  !                                                                                                       ! -24
     -0.34  !                                                                                                       ! -28
     -0.38  !                                                                                                       ! -32
     -0.43  !                                                                                                       ! -36
     -0.48  !                                                                                                       ! -40
     -0.53  !                                                                                                       ! -44
     -0.58  !                                                                                                       ! -48
     -0.62  !                                                                                                       ! -52
     -0.67  !                                                                                                       ! -56
     -0.72  !                                                                                                       ! -60
     -0.77  !                                                                                                       ! -64
     -0.82  !                                                                                                       ! -68
     -0.86  !                                                                                                       ! -72
     -0.91  !                                                                                                       ! -76
     -0.96  !                                                                                                       ! -80
     -1.01  !                                                                                                       ! -84
     -1.06  !                                                                                                       ! -88
     -1.10  !                                                                                                       ! -92
     -1.15  !                                                                                                       ! -96
     -1.20  !                                                                                                       !-100
             .+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+.
         -1.20-1.08-0.96-0.84-0.72-0.60-0.48-0.36-0.24-0.12    * 0.12 0.24 0.36 0.48 0.60 0.72 0.84 0.96 1.08 1.20
POINT  29 OVERLAYS POINT(S)   28
POINT  27 OVERLAYS POINT(S)   14  11
POINT  26 OVERLAYS POINT(S)   18  16
POINT  24 OVERLAYS POINT(S)   22
POINT  23 OVERLAYS POINT(S)   17  13  12  10
POINT  20 OVERLAYS POINT(S)   19

POINTS 1 TO  9 ARE STIMULI - POINTS  10 TO  29 ARE SUBJECTS.


POINTS 6, 7, 8: TURKISH FERRY OPERATORS
POINTS 1, 2, 3, 4, 5, 9: GREEK FERRY OPERATORS REPRESENTING THE EU

DIMENSION 1: Product quality
DIMENSION 2: Total number of passengers
```

Figure 38: Details of the positioning of the ferry operators for "Product"



TR1: STERN MARITIME LINES (TURKISH OPERATOR)
TR2: TURKISH MARITIME LINES (TURKISH OPERATOR)
TR3: TOPAS MARITIME LINES (TURKISH OPERATOR)

EU1: MARLINES (EU OPERATOR)
EU2: MINOAN LINES (EU OPERATOR)
EU3: EUROPEAN SEAWAYS (EU OPERATOR)
EU4: HORIZON SEA LINES (EU OPERATOR)
EU5: MED LINK LINES (EU OPERATOR)
EU6: NETA LINES (EU OPERATOR)

which is positioned close to the Turkish operators.

As it can be discovered from the figures that Minoan Lines, Horizon Sea Lines and Neta Lines position together close to the journey vector end while Marlines and Med Link Lines also position close to them. Marlines positions a little further from the group because of having ferry services only during the high season - summer season and because of that having a less total of passengers in 1994.

Although Neta Lines is similar to Marlines in the characteristics of product in general, it positions a little further because of having services for more period of time - in the spring-summer-autumn and, therefore, having a more total number of passengers. Thus, Neta Lines positions closer to Minoan Lines and Horizon Sea Lines because of having similarity in the journey season and total number of passengers.

Although journey season of Med Link Lines is the same with those of Minoan Lines, Horizon Sea Lines and Neta Lines, it positions a little further from them because of having more passenger capacity and, therefore, having a more total number of passengers in a year.

Passenger and car capacities of the ferries of European Seaways and the Turkish operators - Stern Maritime Lines, Turkish Maritime Lines and Topas Maritime Lines, are similar to each other. In addition, tonnages, ages and average speeds of their ferries are also similar. Therefore, they position closer to each other. However, Turkish Maritime Lines can be differentiated within the group by positioning a little further from them because of operating in all seasons of the year with younger ferries, and therefore, having more journeys and a more total number of passengers. Thus, these characteristics position this large and experienced company different from others.

European Seaways illustrates a different characteristic compared to the other EU operators by positioning close to the Turkish operators, in general. This operator is similar to the Turkish ones in the passenger and car capacities and total tonnages of ferries. It is very similar to Stern Maritime Lines, in particular, in the total number, total tonnage, average tonnage and passenger and car capacities of ferries and, therefore, total number of passengers per ferry. These operators indicate these similar characteristics because of having similar company size and experience in the market place.

European Seaways also has some similarity with Turkish Maritime Lines by operating all of the seasons in a year, which means that it is trying to have more experience in the market place and to have more share in the total number of passengers by having more journeys in the year. This characteristic is one of the distinct characteristics that positions it further from the other EU operators and closer to the Turkish operators in the market place.

Price and its market implications

Figure 39 and 40 illustrate the positioning of the ferry operators by considering only the "price" side of the market. Ferry ticket prices are represented by dimension 1 while membership of a shipping group or a Consortia is represented by dimension 2. The figure illustrates the positioning of the ferry operators with the price changes according to the membership of a shipping group or a Consortia. The companies that are members of shipping groups (Marlines, Minoan Lines and Med Link Lines) position together in the market and vice verse. In addition, the companies offering higher ticket prices, which are Marlines, Minoan Lines, Horizon Sea Lines and Med Link Lines, also position together in the market. Similarly, others with cheaper prices also position together.

Horizon Sea Lines, Neta Lines, Stern Maritime Lines and Turkish Maritime Lines group

Figure 39: Positioning of the ferry operators for "Price"

```
             PRICE RUN 1                                                    FULL SET

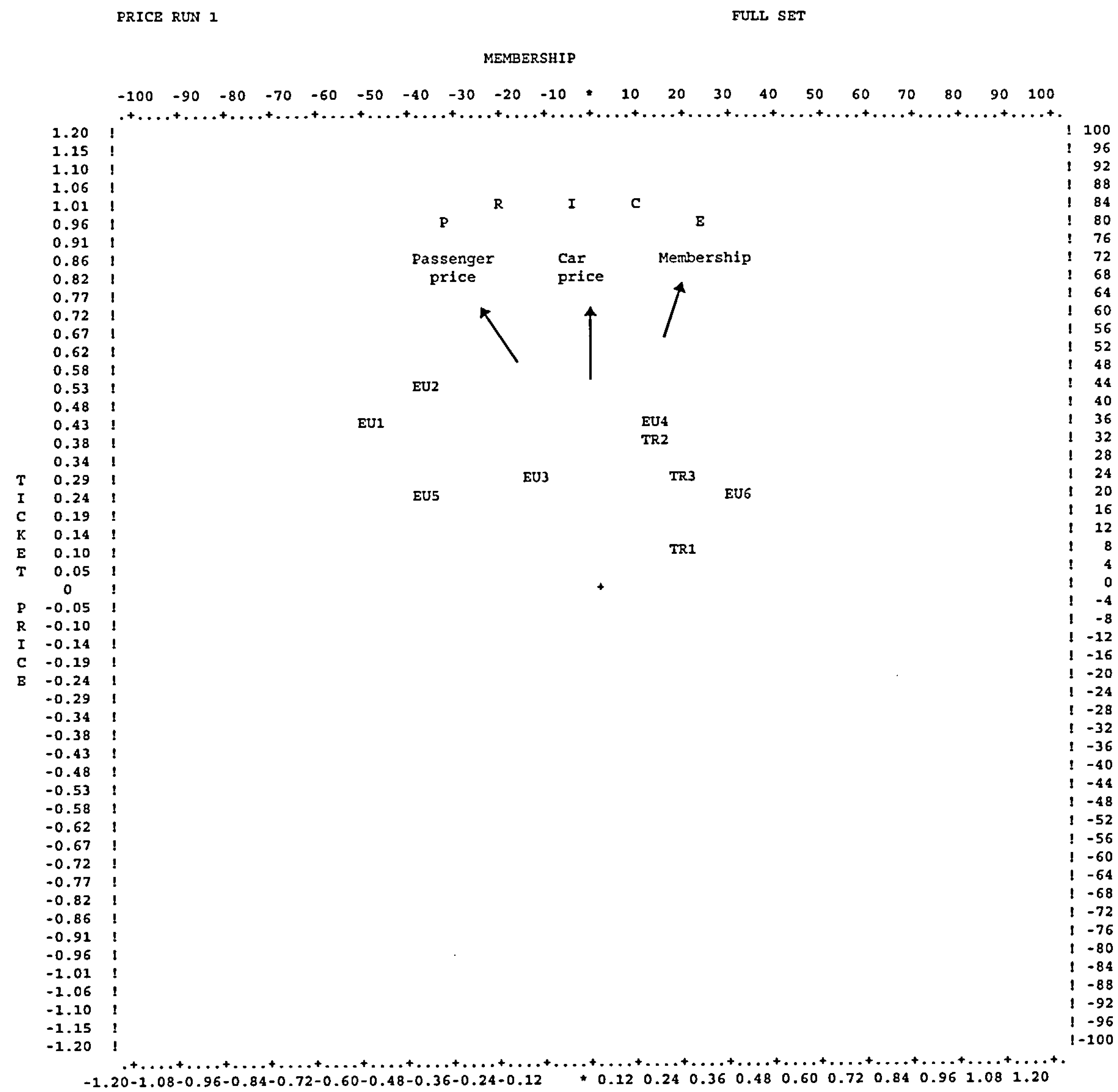
CONFIGURATION OF SUBJECTS AND STIMULI
DIMENSION  2 PLOTTED AGAINST DIMENSION  1                   DIMENSION
                                                                2
             -100  -90  -80  -70  -60  -50  -40  -30  -20  -10   *   10   20   30   40   50   60   70   80   90  100
             .+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+.
      1.20  !                                                                                                       ! 100
      1.15  !                                                                                                       !  96
      1.10  !                                                                                                       !  92
      1.06  !                                                                                                       !  88
      1.01  !                                       10 11           12                                              !  84
      0.96  !                                                                14                                     !  80
      0.91  !                                                                                                       !  76
      0.86  !                                                                                                       !  72
      0.82  !                                                                                                       !  68
      0.77  !                                                                                                       !  64
      0.72  !                                                                                                       !  60
      0.67  !                                                                                                       !  56
      0.62  !                                                                                                       !  52
      0.58  !                                                                                                       !  48
      0.53  !                                  2                                                                    !  44
      0.48  !                                                                                                       !  40
      0.43  !                            1                              4                                           !  36
      0.38  !                                                           7                                           !  32
      0.34  !                                                                                                       !  28
      0.29  !                                              3               8                                        !  24
      0.24  !                                  5                                 9                                  !  20
      0.19  !                                                                                                       !  16
      0.14  !                                                                                                       !  12
      0.10  !                                                              6                                        !   8
      0.05  !                                                                                                       !   4
DIMENSION  1                                                     +                                                  !   0
     -0.05  !                                                                                                       !  -4
     -0.10  !                                                                                                       !  -8
     -0.14  !                                                                                                       ! -12
     -0.19  !                                                                                                       ! -16
     -0.24  !                                                                                                       ! -20
     -0.29  !                                                                                                       ! -24
     -0.34  !                                                                                                       ! -28
     -0.38  !                                                                                                       ! -32
     -0.43  !                                                                                                       ! -36
     -0.48  !                                                                                                       ! -40
     -0.53  !                                                                                                       ! -44
     -0.58  !                                                                                                       ! -48
     -0.62  !                                                                                                       ! -52
     -0.67  !                                                                                                       ! -56
     -0.72  !                                                                                                       ! -60
     -0.77  !                                                                                                       ! -64
     -0.82  !                                                                                                       ! -68
     -0.86  !                                                                                                       ! -72
     -0.91  !                                                                                                       ! -76
     -0.96  !                                                                                                       ! -80
     -1.01  !                                                                                                       ! -84
     -1.06  !                                                                                                       ! -88
     -1.10  !                                                                                                       ! -92
     -1.15  !                                                                                                       ! -96
     -1.20  !                                                                                                       !-100
             .+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+.
         -1.20-1.08-0.96-0.84-0.72-0.60-0.48-0.36-0.24-0.12     * 0.12 0.24 0.36 0.48 0.60 0.72 0.84 0.96 1.08 1.20
POINT  14 OVERLAYS POINT(S)    13

POINTS 1 TO  9 ARE STIMULI - POINTS  10 TO  14 ARE SUBJECTS.


POINTS 6, 7, 8: TURKISH FERRY OPERATORS
POINTS 1, 2, 3, 4, 5, 9: GREEK FERRY OPERATORS REPRESENTING THE EU

DIMENSION 1: Price
DIMENSION 2: Membership of a group
```

Figure 40: Details of the positioning of the ferry operators for "Price"



TR1: STERN MARITIME LINES (TURKISH OPERATOR)
TR2: TURKISH MARITIME LINES (TURKISH OPERATOR)
TR3: TOPAS MARITIME LINES (TURKISH OPERATOR)

EU1: MARLINES (EU OPERATOR)
EU2: MINOAN LINES (EU OPERATOR)
EU3: EUROPEAN SEAWAYS (EU OPERATOR)
EU4: HORIZON SEA LINES (EU OPERATOR)
EU5: MED LINK LINES (EU OPERATOR)
EU6: NETA LINES (EU OPERATOR)

together under the membership vector end because they share a similarity in this characteristic with none of them having any membership in either shipping groups nor Conferences. In addition to Turkish Maritime Lines and Horizon Sea Lines having similarity in the membership of a shipping group - none of the two is a member of a shipping group, their ticket prices for children and car are also similar to each other. This can also be discovered from the score ratings' table (See Table 34) by one of the two following the other in the ticket prices. However, the ticket price of Turkish Maritime Lines for adults is different from the other, which positions it on a different point but very close to Horizon Sea Lines.

Although Topas Maritime Lines and Turkish Maritime Lines are similar in the ticket prices for adults and children, their difference in the membership of a shipping group and, therefore, Topas Maritime Lines having fixed ticket prices because of the membership, positions them alittle differently.

Marlines, Minoan Lines, European Seaways and Med Link Lines position close together under the vector end for passenger price because of them having similar ticket prices. However, Marlines and Minoan Lines position alittle far from the group by having more expensive ticket prices because of being larger companies with more expenses and different strategies compared to the others.

Turkish Maritime Lines is the only operator in this market receiving a subsidy because of being a large state owned company as noted earlier. However, data of subsidy question was omitted because of undifferentiated data and, therefore, this data was not applied into the technique. It should be noted that Turkish Maritime Lines could position differently because of this data, which makes it distinct from others. However, it was also noted earlier that data of only one disregarded question makes not much difference in the total positioning of the operators in the market place although data seems to be very distinctive data.

Place and its market implications

Figure 41 and 42 illustrate the positioning of the ferry operators according to "place" with company outlets, i.e. places of head office, branches and agencies, represented by dimension 1 and service lines, i.e. routes, represented by dimension 2. The service lines of the companies have direct effects on having many outlets in various countries. Therefore, the companies operating on the same routes, i.e. Stern Maritime Lines, Turkish Maritime Lines, Topas Maritime Lines and Neta Lines operating on direct lines between Italy and Turkey, position together with similar places of outlets in the same countries.

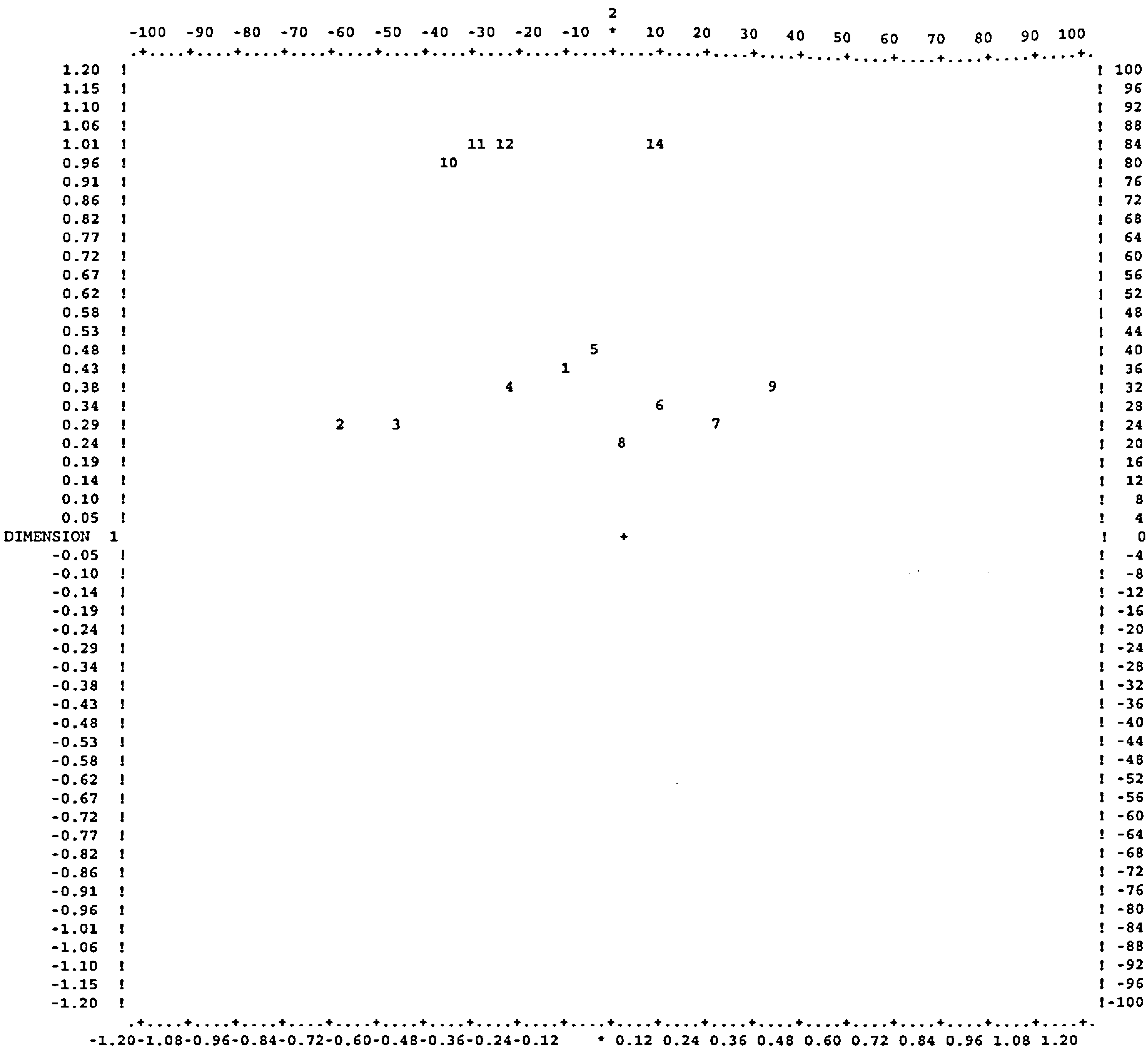
Marlines, Horizon Sea Lines and Med Link Lines have similarity in the international routing, places of ferry service lines and places of head office. However, their places of agencies differentiate them between each other, because of Horizon Sea Lines having agencies in one country, Marlines in two countries and Med Link Lines in more than two countries. This characteristic depends on the size and experience of the company in general, i.e. Horizon Sea Lines is a small company and Med Link Lines is a medium company with a membership of a shipping group, which makes it to have more outlets. However, Marlines is a larger company, but location of its outlets is not distributed widely and this makes it position far from the group.

Minoan Lines and European Seaways have similarity in the international routing and their operation service lines. They also have similarity in these characteristics with Marlines, Horizon Sea Lines and Med Link Lines. Minoan Lines and European Seaways are more organised and experienced companies in the ferry services because Minoan Lines is one of the major operators in the ferry services between Italy and Greece, in particular, and European

Figure 41: Positioning of the ferry operators for "Place"

PLACE RUN 1 FULL SET

CONFIGURATION OF SUBJECTS AND STIMULI
DIMENSION 2 PLOTTED AGAINST DIMENSION 1



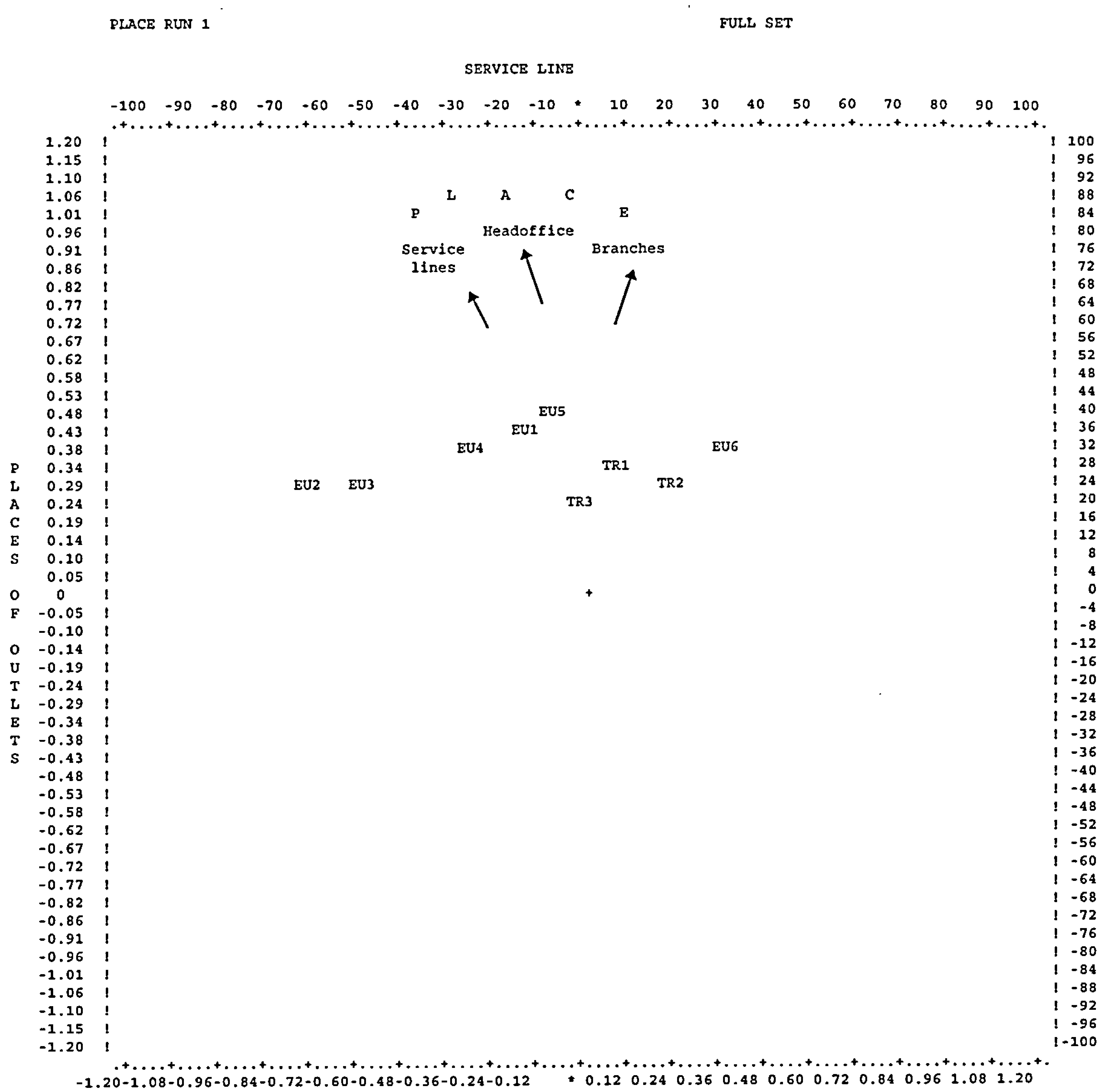
POINT 14 OVERLAYS POINT(S) 13

POINTS 1 TO 9 ARE STIMULI - POINTS 10 TO 14 ARE SUBJECTS.

POINTS 6, 7, 8: TURKISH FERRY OPERATORS
POINTS 1, 2, 3, 4, 5, 9: GREEK FERRY OPERATORS REPRESENTING THE EU

DIMENSION 1: Place of outlets
DIMENSION 2: Service line

Figure 42: Details of the positioning of the ferry operators for "Place"



TR1: STERN MARITIME LINES (TURKISH OPERATOR)
TR2: TURKISH MARITIME LINES (TURKISH OPERATOR)
TR3: TOPAS MARITIME LINES (TURKISH OPERATOR)

EU1: MARLINES (EU OPERATOR)
EU2: MINOAN LINES (EU OPERATOR)
EU3: EUROPEAN SEAWAYS (EU OPERATOR)
EU4: HORIZON SEA LINES (EU OPERATOR)
EU5: MED LINK LINES (EU OPERATOR)
EU6: NETA LINES (EU OPERATOR)

Seaways operates continuously during the year. Therefore, they have outlets in many places to serve for and to reach their customers, which differentiates their positioning compared to the others in the group.

The Turkish operators - Stern Maritime Lines, Turkish Maritime Lines and Topas Maritime Lines, position closer in a different place in the market by having agencies and branches in more places compared to most of the EU companies because they organise to match the requirements of the demand side - with a majority of the Turkish people, by operating direct lines from Italy to Turkey.

Promotion and its market implications

Figure 43 and 44 illustrate the positioning of the ferry operators according to the "promotion" side of the market with company quality representing dimension 1 and additional services representing dimension 2. The companies (- Marlines, Minoan Lines and Turkish Maritime Lines) with additional promotions, e.g. off-seasonal discounts, position together while competing with others. Similarly, Horizon Sea Lines, Topas Maritime Lines and Stern Maritime Lines position closely in the market by having various sales activities, e.g. family discounts.

Marlines and Minoan Lines position together under the vector end of additional services because they can offer additional services to their customers based on their company sizes and experiences in the market place. Therefore, they have got enough budget for advertising through media and distributing promotion items. However, data related to these characteristics was omitted because of insufficient data for other operators and therefore, was not applied into the technique as noted earlier, which could have some minor effects in the total positioning. These companies regularly attend the exhibitions and also have some personnel

Figure 43: Positioning of the ferry operators for "Promotion"

```
             PROMOTION RUN 1                                                   FULL SET

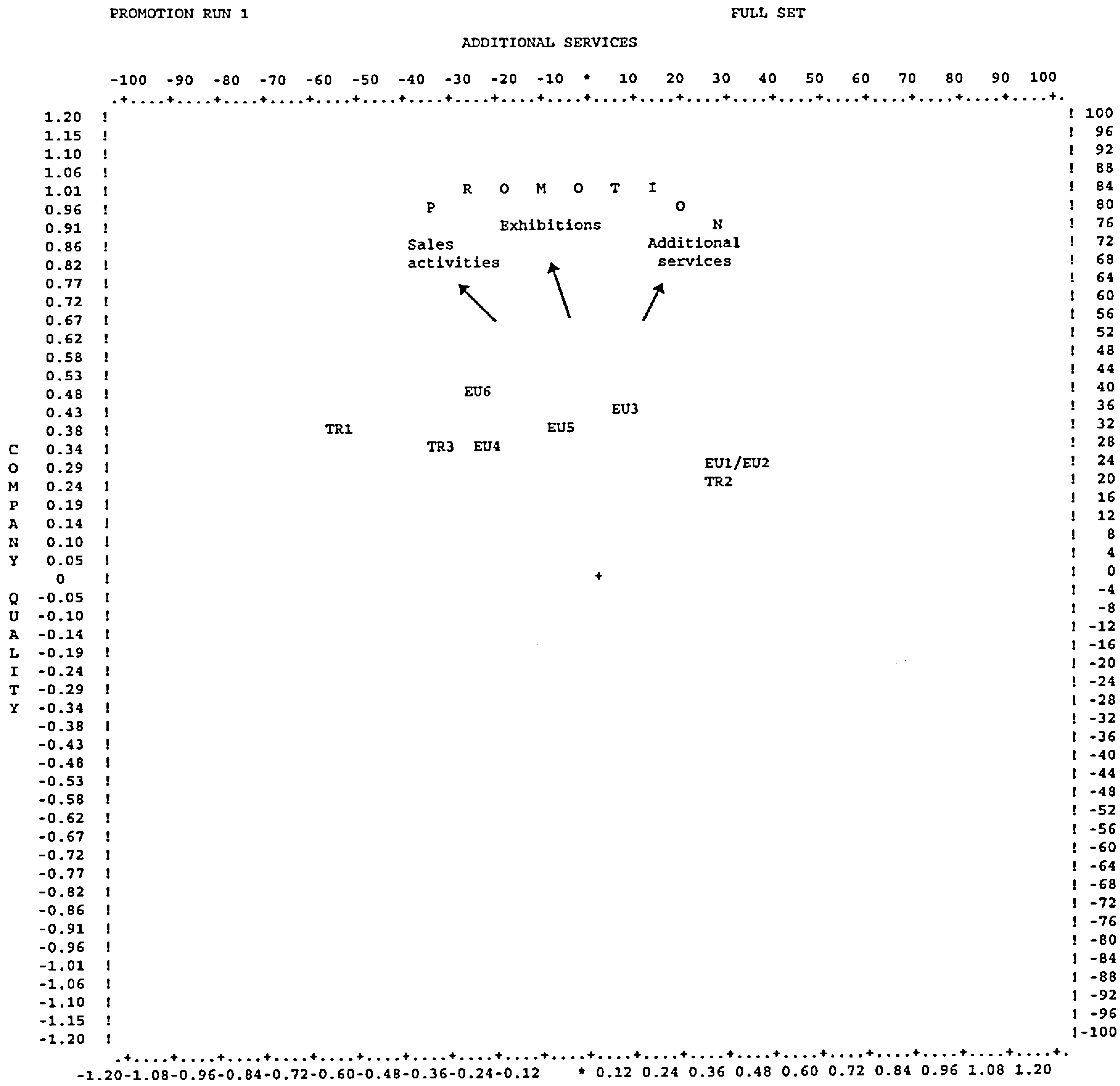
CONFIGURATION OF SUBJECTS AND STIMULI
DIMENSION  2 PLOTTED AGAINST DIMENSION  1                   DIMENSION
                                                                2
             -100  -90  -80  -70  -60  -50  -40  -30  -20  -10  *   10   20   30   40   50   60   70   80   90  100
             .+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+.
      1.20  !                                                                                                        ! 100
      1.15  !                                                                                                        !  96
      1.10  !                                                                                                        !  92
      1.06  !                                                                                                        !  88
      1.01  !                                        11 14    10                                                     !  84
      0.96  !                                                             13                                         !  80
      0.91  !                                                                                                        !  76
      0.86  !                                                                                                        !  72
      0.82  !                                                                                                        !  68
      0.77  !                                                                                                        !  64
      0.72  !                                                                                                        !  60
      0.67  !                                                                                                        !  56
      0.62  !                                                                                                        !  52
      0.58  !                                                                                                        !  48
      0.53  !                                                                                                        !  44
      0.48  !                                         9                                                              !  40
      0.43  !                                                         3                                              !  36
      0.38  !                          6                       5                                                     !  32
      0.34  !                                      8  4                                                              !  28
      0.29  !                                                                     2                                  !  24
      0.24  !                                                                  7                                     !  20
      0.19  !                                                                                                        !  16
      0.14  !                                                                                                        !  12
      0.10  !                                                                                                        !   8
      0.05  !                                                                                                        !   4
DIMENSION  1                                                       +                                                 !   0
     -0.05  !                                                                                                        !  -4
     -0.10  !                                                                                                        !  -8
     -0.14  !                                                                                                        ! -12
     -0.19  !                                                                                                        ! -16
     -0.24  !                                                                                                        ! -20
     -0.29  !                                                                                                        ! -24
     -0.34  !                                                                                                        ! -28
     -0.38  !                                                                                                        ! -32
     -0.43  !                                                                                                        ! -36
     -0.48  !                                                                                                        ! -40
     -0.53  !                                                                                                        ! -44
     -0.58  !                                                                                                        ! -48
     -0.62  !                                                                                                        ! -52
     -0.67  !                                                                                                        ! -56
     -0.72  !                                                                                                        ! -60
     -0.77  !                                                                                                        ! -64
     -0.82  !                                                                                                        ! -68
     -0.86  !                                                                                                        ! -72
     -0.91  !                                                                                                        ! -76
     -0.96  !                                                                                                        ! -80
     -1.01  !                                                                                                        ! -84
     -1.06  !                                                                                                        ! -88
     -1.10  !                                                                                                        ! -92
     -1.15  !                                                                                                        ! -96
     -1.20  !                                                                                                        !-100
             .+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+.
         -1.20-1.08-0.96-0.84-0.72-0.60-0.48-0.36-0.24-0.12     * 0.12 0.24 0.36 0.48 0.60 0.72 0.84 0.96 1.08 1.20
POINT  14 OVERLAYS POINT(S)    12
POINT   2 OVERLAYS POINT(S)    1

POINTS 1 TO  9 ARE STIMULI - POINTS  10 TO  14 ARE SUBJECTS.


POINTS 6, 7, 8: TURKISH FERRY OPERATORS
POINTS 1, 2, 3, 4, 5, 9: GREEK FERRY OPERATORS REPRESENTING THE EU

DIMENSION 1: Company quality
DIMENSION 2: Additional services
```

Figure 44: Details of the positioning of the ferry operators for "Promotion"



TR1: STERN MARITIME LINES (TURKISH OPERATOR)
TR2: TURKISH MARITIME LINES (TURKISH OPERATOR)
TR3: TOPAS MARITIME LINES (TURKISH OPERATOR)

EU1: MARLINES (EU OPERATOR)
EU2: MINOAN LINES (EU OPERATOR)
EU3: EUROPEAN SEAWAYS (EU OPERATOR)
EU4: HORIZON SEA LINES (EU OPERATOR)
EU5: MED LINK LINES (EU OPERATOR)
EU6: NETA LINES (EU OPERATOR)

for marketing, in particular because they are large companies with more experience compared to the other EU companies.

In addition to them, Turkish Maritime Lines is one of the major companies in this market with a considerable experience in the ferry services. Therefore, it is also positioned very close to Marlines and Minoan Sea Lines with having much similarity in the company characteristics. However, it is different from them because of some characteristics i.e. not attending exhibitions, not distributing catalogues nor not having sales promotion activities.

Horizon Sea Lines, Neta Lines and Topas Maritime Lines are smaller companies compared to Turkish Maritime Lines, Minoan Lines and Marlines, therefore, they do not give sufficient importance for catalogue distribution, promotional sales activities and additional services by positioning under the vector end of sales activities far from the group of larger companies.

People and its market implications

Figure 45 and 46 illustrate the "people" side of market positioning of the ferry operators. Training of the company personnel is represented by dimension 1 and quality of personnel is represented by dimension 2. Therefore, there is a correlation between the companies with similar characteristics of personnel and total number of passengers, i.e. they position together in the market, e.g. Marlines positioning with Neta Lines and Horizon Sea Lines positioning with Stern Maritime Lines and Topas Maritime Lines.

Minoan Lines, Marlines and Turkish Maritime Lines reflect their characteristics as larger companies in the market place similar to their behaviour in the market implications for promotion characteristics. Their company characteristics of total number of personnel, training programmes, budget for training and decision-making are similar to each other.

Figure 45: Positioning of the ferry operators for "People"

```
             PEOPLE RUN 1                                                              FULL SET

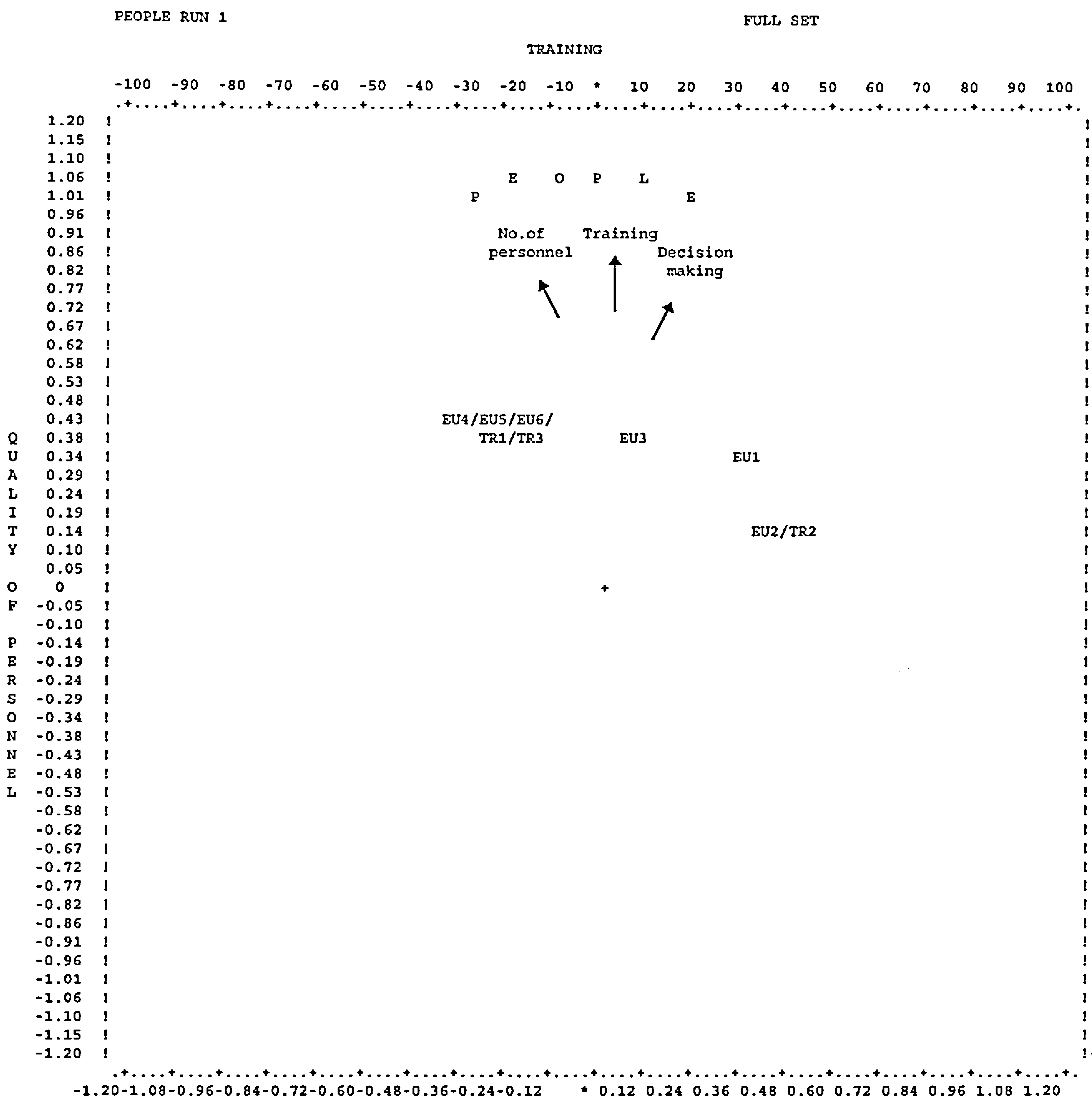
CONFIGURATION OF SUBJECTS AND STIMULI
DIMENSION  2 PLOTTED AGAINST DIMENSION  1                                  DIMENSION
                                                                               2
            -100  -90  -80  -70  -60  -50  -40  -30  -20  -10   *   10   20   30   40   50   60   70   80   90  100
             .+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+.
      1.20  !                                                                                                     ! 100
      1.15  !                                                                                                     !  96
      1.10  !                                                                                                     !  92
      1.06  !                                                                                                     !  88
      1.01  !                                         10       12  13                                             !  84
      0.96  !                                                                                                     !  80
      0.91  !                                                                                                     !  76
      0.86  !                                                                                                     !  72
      0.82  !                                                                                                     !  68
      0.77  !                                                                                                     !  64
      0.72  !                                                                                                     !  60
      0.67  !                                                                                                     !  56
      0.62  !                                                                                                     !  52
      0.58  !                                                                                                     !  48
      0.53  !                                                                                                     !  44
      0.48  !                                                                                                     !  40
      0.43  !                                       9                                                             !  36
      0.38  !                                                       3                                             !  32
      0.34  !                                                                   1                                 !  28
      0.29  !                                                                                                     !  24
      0.24  !                                                                                                     !  20
      0.19  !                                                                                                     !  16
      0.14  !                                                                      7                              !  12
      0.10  !                                                                                                     !   8
      0.05  !                                                                                                     !   4
DIMENSION  1                                                   +                                                  !   0
     -0.05  !                                                                                                     !  -4
     -0.10  !                                                                                                     !  -8
     -0.14  !                                                                                                     ! -12
     -0.19  !                                                                                                     ! -16
     -0.24  !                                                                                                     ! -20
     -0.29  !                                                                                                     ! -24
     -0.34  !                                                                                                     ! -28
     -0.38  !                                                                                                     ! -32
     -0.43  !                                                                                                     ! -36
     -0.48  !                                                                                                     ! -40
     -0.53  !                                                                                                     ! -44
     -0.58  !                                                                                                     ! -48
     -0.62  !                                                                                                     ! -52
     -0.67  !                                                                                                     ! -56
     -0.72  !                                                                                                     ! -60
     -0.77  !                                                                                                     ! -64
     -0.82  !                                                                                                     ! -68
     -0.86  !                                                                                                     ! -72
     -0.91  !                                                                                                     ! -76
     -0.96  !                                                                                                     ! -80
     -1.01  !                                                                                                     ! -84
     -1.06  !                                                                                                     ! -88
     -1.10  !                                                                                                     ! -92
     -1.15  !                                                                                                     ! -96
     -1.20  !                                                                                                     !-100
             .+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+.
         -1.20-1.08-0.96-0.84-0.72-0.60-0.48-0.36-0.24-0.12     * 0.12 0.24 0.36 0.48 0.60 0.72 0.84 0.96 1.08 1.20
POINT  12 OVERLAYS POINT(S)    11
POINT   9 OVERLAYS POINT(S)     8    6    5    4
POINT   7 OVERLAYS POINT(S)     2

POINTS 1 TO  9 ARE STIMULI - POINTS  10 TO  13 ARE SUBJECTS.


POINTS 6, 7, 8: TURKISH FERRY OPERATORS
POINTS 1, 2, 3, 4, 5, 9: GREEK FERRY OPERATORS REPRESENTING THE EU

DIMENSION 1: Quality of personnel
DIMENSION 2: Training
```

Figure 46: Details of the positioning of the ferry operators for "People"



TR1: STERN MARITIME LINES (TURKISH OPERATOR)
TR2: TURKISH MARITIME LINES (TURKISH OPERATOR)
TR3: TOPAS MARITIME LINES (TURKISH OPERATOR)

EU1: MARLINES (EU OPERATOR)
EU2: MINOAN LINES (EU OPERATOR)
EU3: EUROPEAN SEAWAYS (EU OPERATOR)
EU4: HORIZON SEA LINES (EU OPERATOR)
EU5: MED LINK LINES (EU OPERATOR)
EU6: NETA LINES (EU OPERATOR)

Marlines is positioned a little different from Minoan Lines and Turkish Maritime Lines because of having less number of personnel and having decision-making in the director. This was also reflected in the membership of a shipping group by having a different type of organisation and decision-making systems which make it different from most of them.

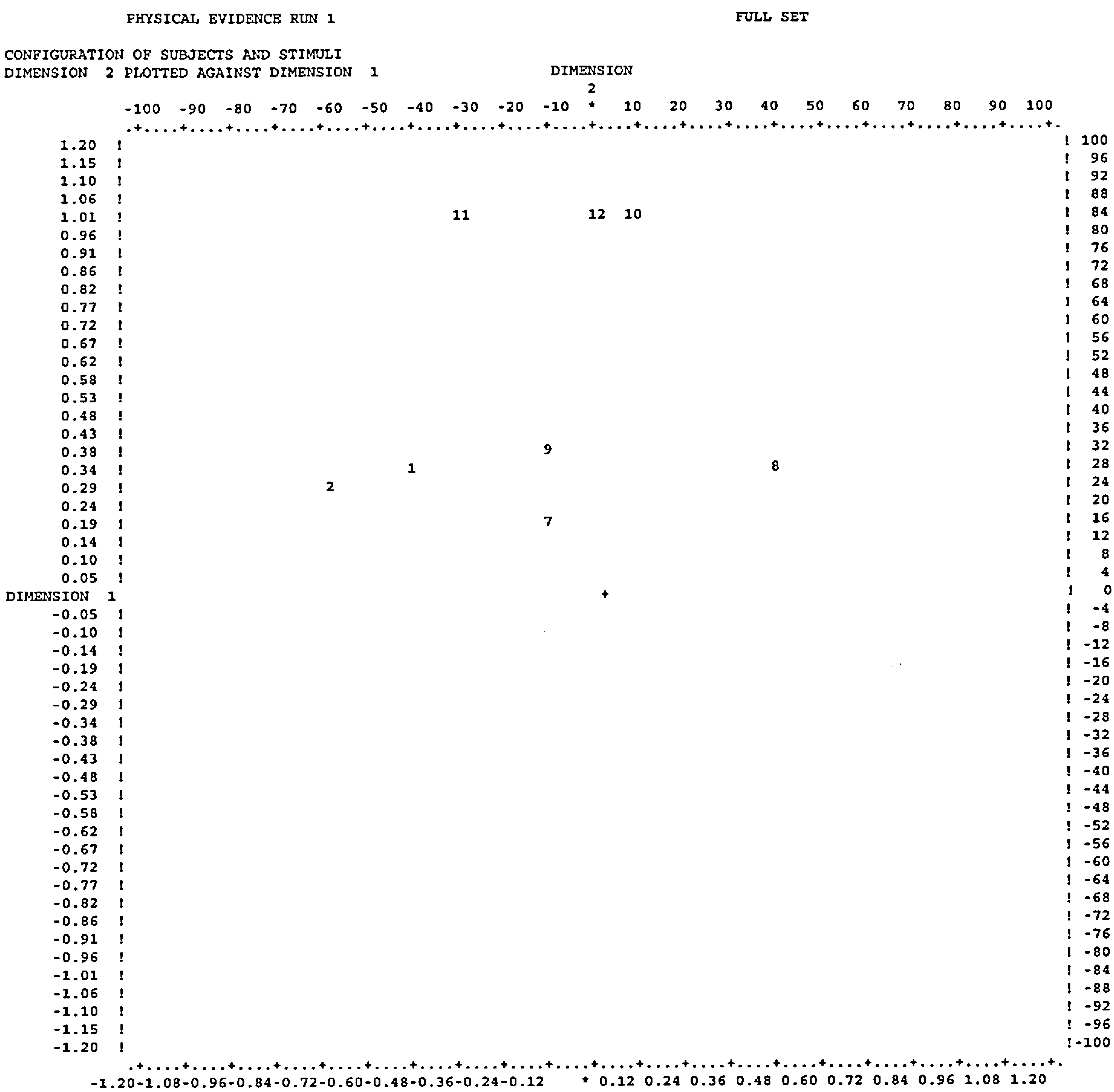
European Seaways is similar to Marlines in the decision-making process, however, it is positioned with smaller companies by having less number of personnel. Horizon Sea Lines, Neta Lines, Stern Maritime Lines and Topas Maritime Lines position very closely representing small and medium companies with less number of personnel and poor management system.

Physical evidence and its market implications

Figure 47 and 48 illustrate market positioning according to "physical evidence" with number of company outlets representing dimension 1 and location of these outlets representing dimension 2. Therefore, companies (- European Seaways, Horizon Sea Lines, Med Link Lines and Neta Lines) with similar specifications, i.e. organisation chart and location of outlets, position together in the market.

Stern Maritime Lines and Topas Maritime Lines have similarity in physical evidence characteristics because both of them have less than ten branches and agencies placed in Turkey, Greece, Italy and other countries in the EU. Turkish Maritime Lines also has some similarity with them in these characteristics. In addition, its agencies and branches are more than the others and has an organisation chart describing its management system because of its experience and company size reflecting its position as one of the major operators in this market. Therefore, it is positioned under the vector end of organisation chart characteristic.

Figure 47: Positioning of the ferry operators for "Physical evidence"



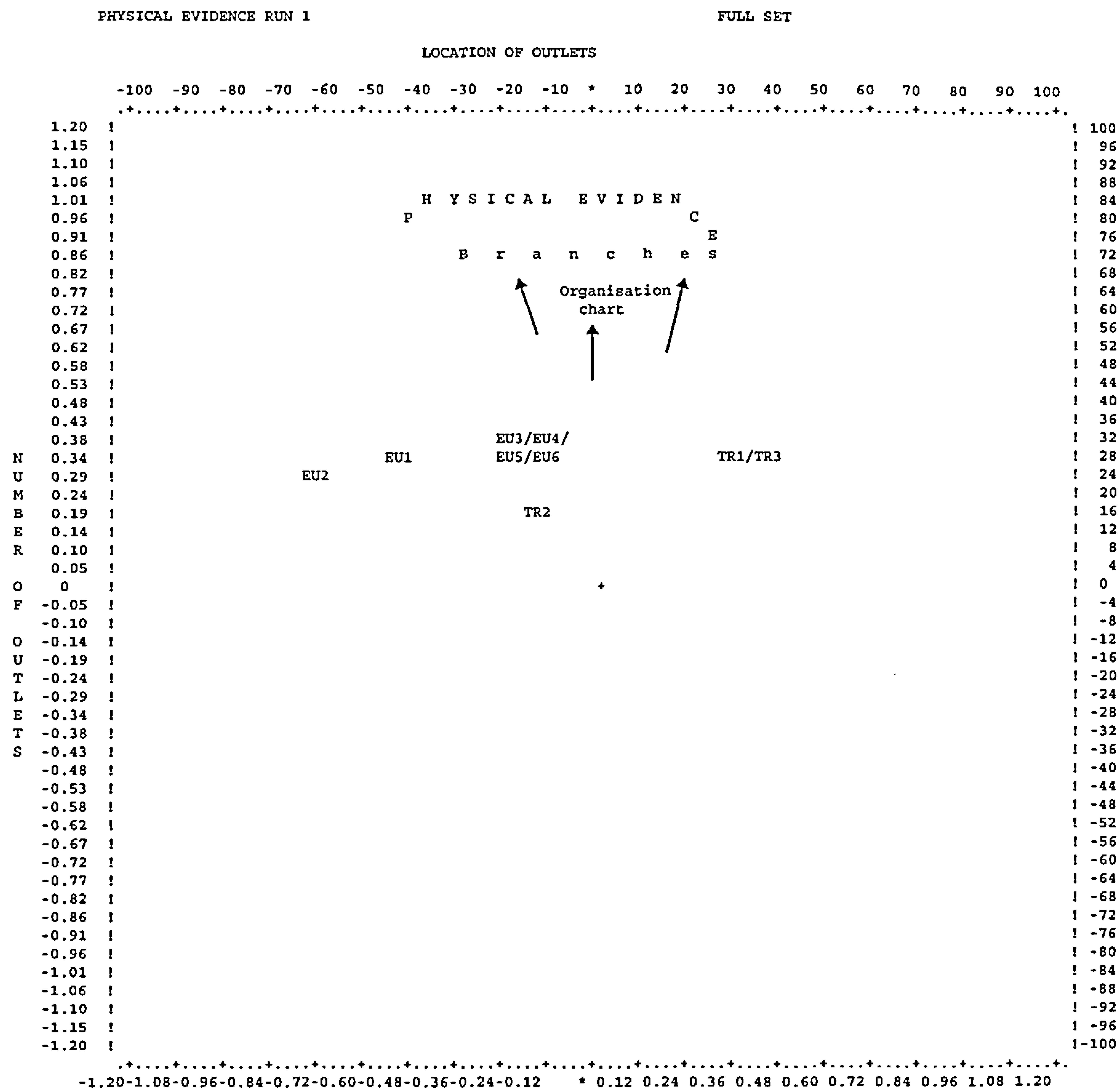
POINT 9 OVERLAYS POINT(S) 5 4 3
POINT 8 OVERLAYS POINT(S) 6

POINTS 1 TO 9 ARE STIMULI - POINTS 10 TO 12 ARE SUBJECTS.

POINTS 6, 7, 8: TURKISH FERRY OPERATORS
POINTS 1, 2, 3, 4, 5, 9: GREEK FERRY OPERATORS REPRESENTING THE EU

DIMENSION 1: Number of outlets
DIMENSION 2: Location of outlets

Figure 48: Details of the positioning of the ferry operators for "Physical evidence"



TR1: STERN MARITIME LINES (TURKISH OPERATOR)
TR2: TURKISH MARITIME LINES (TURKISH OPERATOR)
TR3: TOPAS MARITIME LINES (TURKISH OPERATOR)

EU1: MARLINES (EU OPERATOR)
EU2: MINOAN LINES (EU OPERATOR)
EU3: EUROPEAN SEAWAYS (EU OPERATOR)
EU4: HORIZON SEA LINES (EU OPERATOR)
EU5: MED LINK LINES (EU OPERATOR)
EU6: NETA LINES (EU OPERATOR)

European Seaways, Horizon Sea Lines, Med Link Lines and Neta Lines position very closely because of having very similar and some identical physical evidence characteristics based on their organisation structures and company sizes. Therefore, they - Horizon Sea Lines and Neta Lines, in particular - have limited number of outlets with limited number of personnel. Marlines and Minoan Sea Lines position far from this group as more organised operators with larger company sizes in the market place.

6.4.2. Applications for each service line

Similar to the above applications, data of the operator companies operating on the same service line, are applied separately into the MDPREF programme to have a further idea of the positioning on each service line. Each application does not individually reflect the total positioning in the market place as explained earlier. The starting destinations of the ferry services in the EU are the ports of Venice, Ancona, Bari and Brindisi in Italy which end in the ports of Izmir, Cesme, Marmaris or Antalya in Turkey. Therefore, ferry services were also analysed for each of the ferry lines starting from these destinations and the results are explained in this section.

Axes of dimensions and configurations of the ferry operators and their characteristics are based on the explanations noted earlier in this chapter. In addition, it should be noted that various data of these input programmes were reduced because of data undifferentiation as also explained earlier. The computer input programmes of these data applications are listed in Appendix 6.

(a) Venice - Izmir/Cesme/Marmaris/Antalya line and its marketing implications

Figure 49 and 50 illustrate the positioning of the ferry operators serving on the lines from Venice in Italy to the destinations in Turkey. The two dimensions of the graph are product and

Figure 49: Positioning of the ferry operators on Venice line

```
              VENICE LINE RUN 1                                                           FULL SET

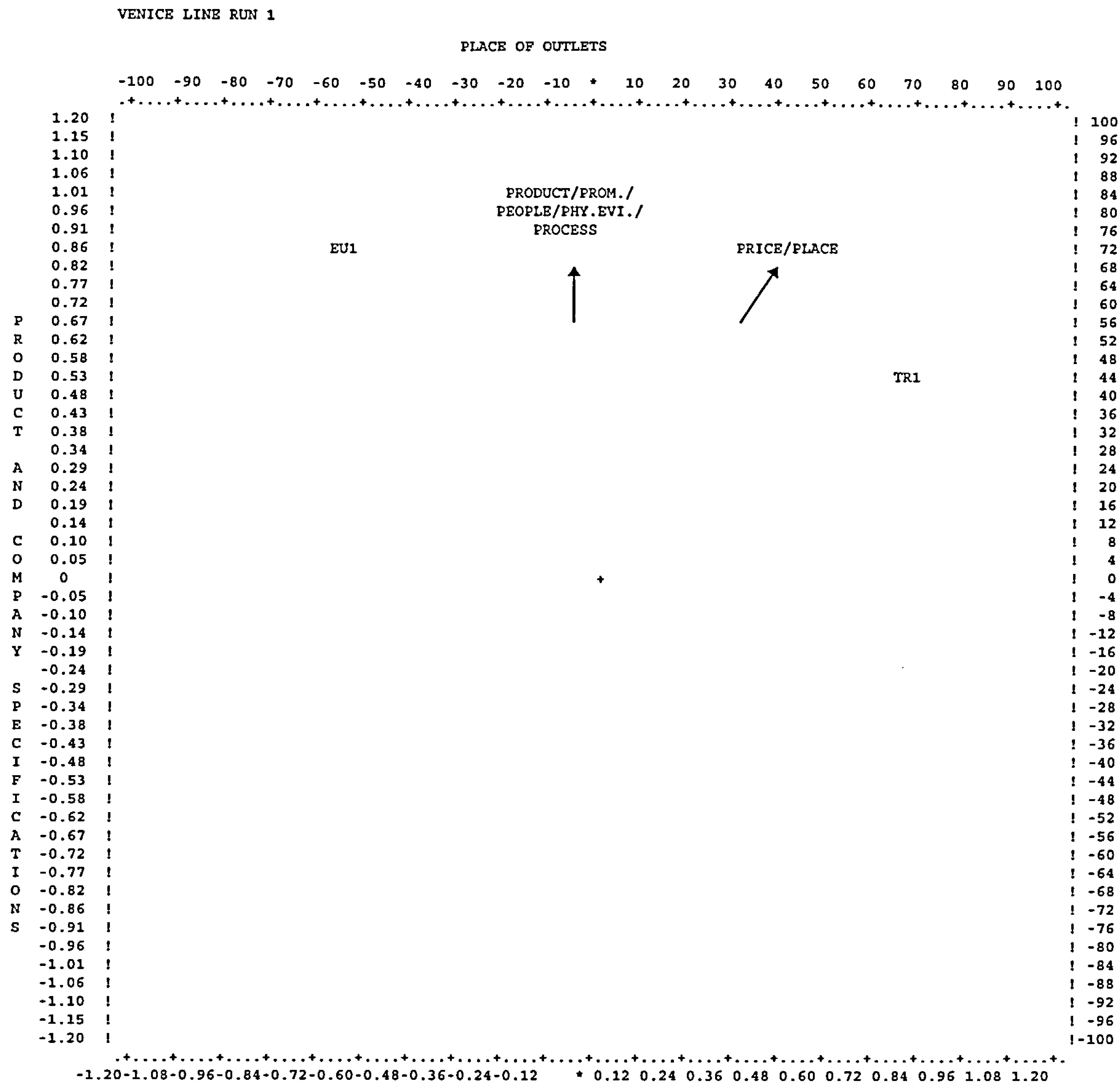
CONFIGURATION OF SUBJECTS AND STIMULI
DIMENSION  2 PLOTTED AGAINST DIMENSION  1                        DIMENSION
                                                                     2
             -100  -90  -80  -70  -60  -50  -40  -30  -20  -10   *   10   20   30   40   50   60   70   80   90  100
             .+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+.
       1.20  !                                                                                                     ! 100
       1.15  !                                                                                                     !  96
       1.10  !                                                                                                     !  92
       1.06  !                                                                                                     !  88
       1.01  !                                         38                                                          !  84
       0.96  !                                                                                                     !  80
       0.91  !                                                                                                     !  76
       0.86  !                        2                                            25                              !  72
       0.82  !                                                                                                     !  68
       0.77  !                                                                                                     !  64
       0.72  !                                                                                                     !  60
       0.67  !                                                                                                     !  56
       0.62  !                                                                                                     !  52
       0.58  !                                                                                                     !  48
       0.53  !                                                                                        1            !  44
       0.48  !                                                                                                     !  40
       0.43  !                                                                                                     !  36
       0.38  !                                                                                                     !  32
       0.34  !                                                                                                     !  28
       0.29  !                                                                                                     !  24
       0.24  !                                                                                                     !  20
       0.19  !                                                                                                     !  16
       0.14  !                                                                                                     !  12
       0.10  !                                                                                                     !   8
       0.05  !                                                                                                     !   4
DIMENSION  1                                                      +                                                !   0
      -0.05  !                                                                                                     !  -4
      -0.10  !                                                                                                     !  -8
      -0.14  !                                                                                                     ! -12
      -0.19  !                                                                                                     ! -16
      -0.24  !                                                                                                     ! -20
      -0.29  !                                                                                                     ! -24
      -0.34  !                                                                                                     ! -28
      -0.38  !                                                                                                     ! -32
      -0.43  !                                                                                                     ! -36
      -0.48  !                                                                                                     ! -40
      -0.53  !                                                                                                     ! -44
      -0.58  !                                                                                                     ! -48
      -0.62  !                                                                                                     ! -52
      -0.67  !                                                                                                     ! -56
      -0.72  !                                                                                                     ! -60
      -0.77  !                                                                                                     ! -64
      -0.82  !                                                                                                     ! -68
      -0.86  !                                                                                                     ! -72
      -0.91  !                                                                                                     ! -76
      -0.96  !                                                                                                     ! -80
      -1.01  !                                                                                                     ! -84
      -1.06  !                                                                                                     ! -88
      -1.10  !                                                                                                     ! -92
      -1.15  !                                                                                                     ! -96
      -1.20  !                                                                                                     !-100
             .+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+.
         -1.20-1.08-0.96-0.84-0.72-0.60-0.48-0.36-0.24-0.12    * 0.12 0.24 0.36 0.48 0.60 0.72 0.84 0.96 1.08 1.20
POINT  38 OVERLAYS POINT(S)   37  36  35  34  33  32  31  30  29  28  27  26  22  21  20  19  18  17  16  15  14  11  10
9   8
  7   6   5   4   3
POINT  25 OVERLAYS POINT(S)   24  23  13  12

POINTS 1 TO  2 ARE STIMULI - POINTS   3 TO  38 ARE SUBJECTS


POINT 1: TURKISH FERRY OPERATOR
POINT 2: GREEK FERRY OPERATOR REPRESENTING THE EU


DIMENSION 1: Product and company specifications
DIMENSION 2: Places of oulets
```

Figure 50: Details of the positioning of the ferry operators on Venice line



TR1: TURKISH MARITIME ORGANISATION (TURKISH OPERATOR)

EU1: NETA LINES (EU OPERATOR)

company specifications and places of outlets. Turkish Maritime Lines and Neta Lines are the only operators on this line. They position on opposite sides of the market indicating no similarity with each other. The total quality of the product, which includes the ferry, its facilities, the journey, and the company appear to be important on this Venice line.

Characteristics of price and place play an important role for identifying the positions of Turkish Maritime Lines and Neta Lines in this market place. Neta Lines is positioned close to the vector end of product, promotion, people, physical evidence and process characteristics, which also means that these two operators are very different from each other for these characteristics. The main reasons for positioning apart arises from different company sizes, organisation structures and services and therefore, as a result of these different characteristics, market shares of these operators differ very much from each other in this specific market place. In addition, the difference between these operators are also for the characteristics of promotion, personnel, ages of ferries, passenger and car capacities of ferries, total number journey and therefore, total number of passengers in a year.

Furthermore, Turkish Maritime Lines has more number of agencies and branches because of its company size and its more experience in the market place. Its ticket prices are also more expensive because of offering more quality service.

(b) Ancona - Izmir/Cesme line and its marketing implications

Figure 51 and 52 illustrate positioning in the market place with company specifications representing dimension 1 and ticket pricing representing dimension 2. Minoan Lines, Horizon Sea Lines and Topas Maritime Lines do not indicate any similarity with each other by positioning away from each other in the market. As a result, quality of company specifications appear as an important issue on this ferry line.

Figure 51: Positioning of the ferry operators on Ancona line

```
             ANCONA LINE RUN 1                                                      FULL SET

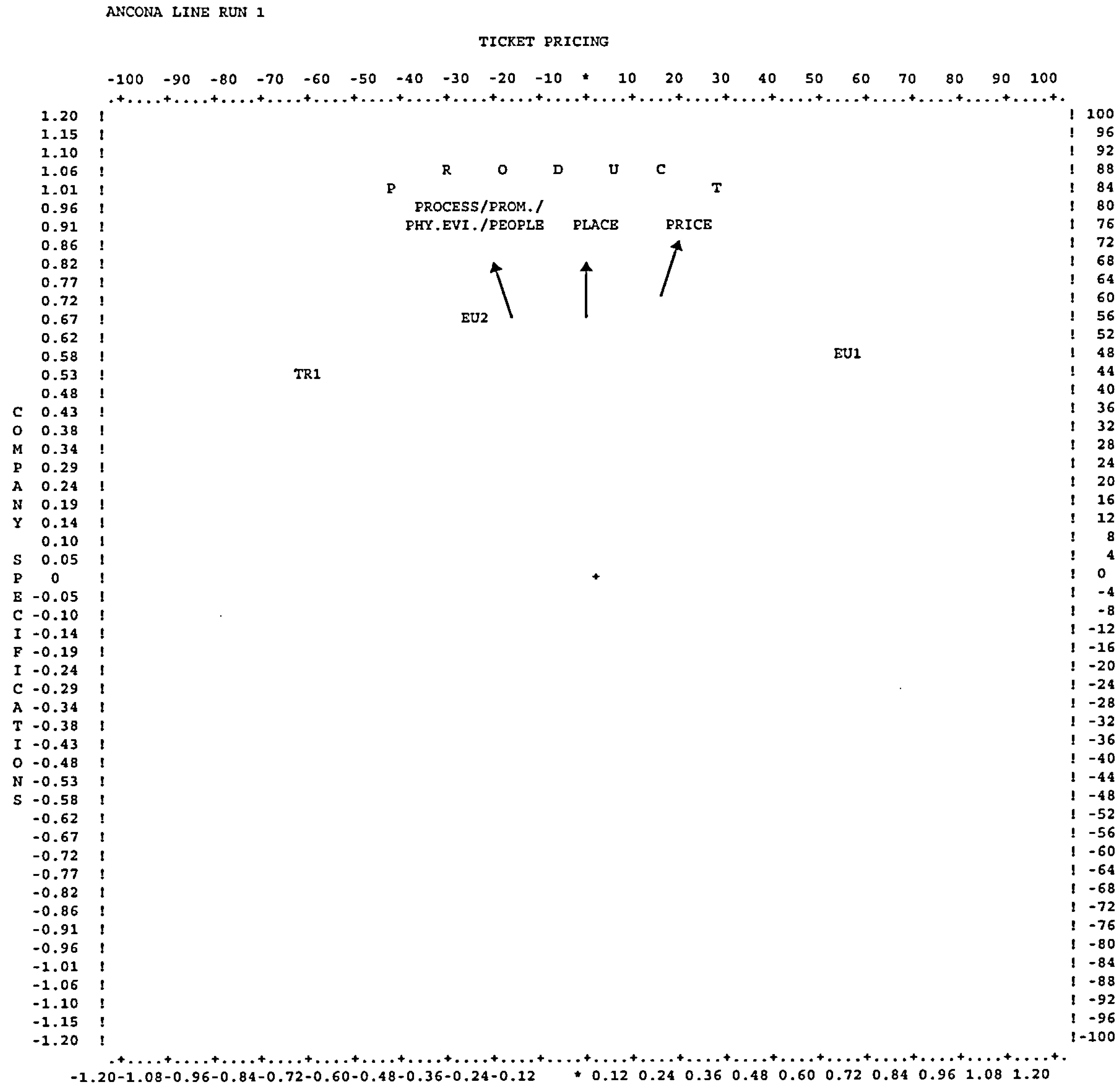
CONFIGURATION OF SUBJECTS AND STIMULI
DIMENSION  2 PLOTTED AGAINST DIMENSION  1                     DIMENSION
                                                                  2
             -100  -90  -80  -70  -60  -50  -40  -30  -20  -10  *   10   20   30   40   50   60   70   80   90  100
             .+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+.
      1.20  !                                                                                                      ! 100
      1.15  !                                                                                                      !  96
      1.10  !                                                                                                      !  92
      1.06  !                                                                                                      !  88
      1.01  !                                   39    23        8  37  9                                           !  84
      0.96  !                             11 27                          30                                        !  80
      0.91  !                                                                                                      !  76
      0.86  !                                                                                                      !  72
      0.82  !                                                                                                      !  68
      0.77  !                                                                                                      !  64
      0.72  !                                                                                                      !  60
      0.67  !                                       2                                                              !  56
      0.62  !                                                                                                      !  52
      0.58  !                                                                              1                       !  48
      0.53  !                     3                                                                                !  44
      0.48  !                                                                                                      !  40
      0.43  !                                                                                                      !  36
      0.38  !                                                                                                      !  32
      0.34  !                                                                                                      !  28
      0.29  !                                                                                                      !  24
      0.24  !                                                                                                      !  20
      0.19  !                                                                                                      !  16
      0.14  !                                                                                                      !  12
      0.10  !                                                                                                      !   8
      0.05  !                                                                                                      !   4
DIMENSION  1                                                   +                                                   !   0
     -0.05  !                                                                                                      !  -4
     -0.10  !                                                                                                      !  -8
     -0.14  !                                                                                                      ! -12
     -0.19  !                                                                                                      ! -16
     -0.24  !                                                                                                      ! -20
     -0.29  !                                                                                                      ! -24
     -0.34  !                                                                                                      ! -28
     -0.38  !                                                                                                      ! -32
     -0.43  !                                                                                                      ! -36
     -0.48  !                                                                                                      ! -40
     -0.53  !                                                                                                      ! -44
     -0.58  !                                                                                                      ! -48
     -0.62  !                                                                                                      ! -52
     -0.67  !                                                                                                      ! -56
     -0.72  !                                                                                                      ! -60
     -0.77  !                                                                                                      ! -64
     -0.82  !                                                                                                      ! -68
     -0.86  !                                                                                                      ! -72
     -0.91  !                                                                                                      ! -76
     -0.96  !                                                                                                      ! -80
     -1.01  !                                                                                                      ! -84
     -1.06  !                                                                                                      ! -88
     -1.10  !                                                                                                      ! -92
     -1.15  !                                                                                                      ! -96
     -1.20  !                                                                                                      !-100
             .+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+.
        -1.20-1.08-0.96-0.84-0.72-0.60-0.48-0.36-0.24-0.12    * 0.12 0.24 0.36 0.48 0.60 0.72 0.84 0.96 1.08 1.20
POINT  39 OVERLAYS POINT(S)   38  36  35  34  33  32  31  29  28  18  17
POINT  37 OVERLAYS POINT(S)   26  25  24   6
POINT  30 OVERLAYS POINT(S)   21  20  19  16  15  14  13
POINT  27 OVERLAYS POINT(S)   10   4
POINT  23 OVERLAYS POINT(S)   22  12   5
POINT   8 OVERLAYS POINT(S)    7

POINTS 1 TO  3 ARE STIMULI - POINTS   4 TO  39 ARE SUBJECTS.


POINT  3: TURKISH FERRY OPERATORS
POINTS 1, 2: GREEK FERRY OPERATORS REPRESENTING THE EU


DIMENSION 1: Company specifications
DIMENSION 2: Ticket pricing
```

Figure 52: Details of the positioning of the ferry operators on Ancona line



TR1: TOPAS MARITIME LINES (TURKISH OPERATOR)

EU1: MINOAN LINES (EU OPERATOR)

EU2: HORIZON SEA LINES (EU OPERATOR)

Minoan Lines is positioned in a different place compared to Horizon Sea Lines and Topas Maritime Lines for the characteristics of total number of journey, total number of passengers, percentage of average full capacity of ferries, services on board, location of agencies because of its more experience as one of the major operators in the ferry market.

Horizon Sea Lines and Topas Maritime Lines, which are medium size companies, have similarity in their difference in the characteristics for promotion, less number of personnel with no training programmes, less number of branches and agencies and method of selling tickets reflecting their medium size company specifications and limited experience in the market place. Therefore, these operators are limited in reaching the customers through these outlets.

(c) Bari - Cesme line and its market implications

Figure 53 and 54 illustrate the market positioning according to product and company specifications, dimension 1, and ticket pricing, dimension 2. Companies with similar specifications and ferry quality position together in the market place by also indicating similarity in the pricing of the ferry tickets. These companies are European Seaways and Stern Maritime Lines while Marlines indicate a different characteristic for the pricing of tickets by positioning away from these companies. Pricing of the tickets is affected by the quality of the company and the ferries on this line.

Similar to the positioning of the ferry operators in the previous applications for different service lines, European Seaways and Stern Maritime Lines are medium size companies where Marlines is a larger company on this line. For example, Marlines is a larger and more organised company in the total number of ferries, total passenger and car capacities, In addition, the location of its branches and agencies are more distributed because of its

Figure 53: Positioning of the ferry operators on Bari line

```
           BARI LINE RUN 1                                                        FULL SET

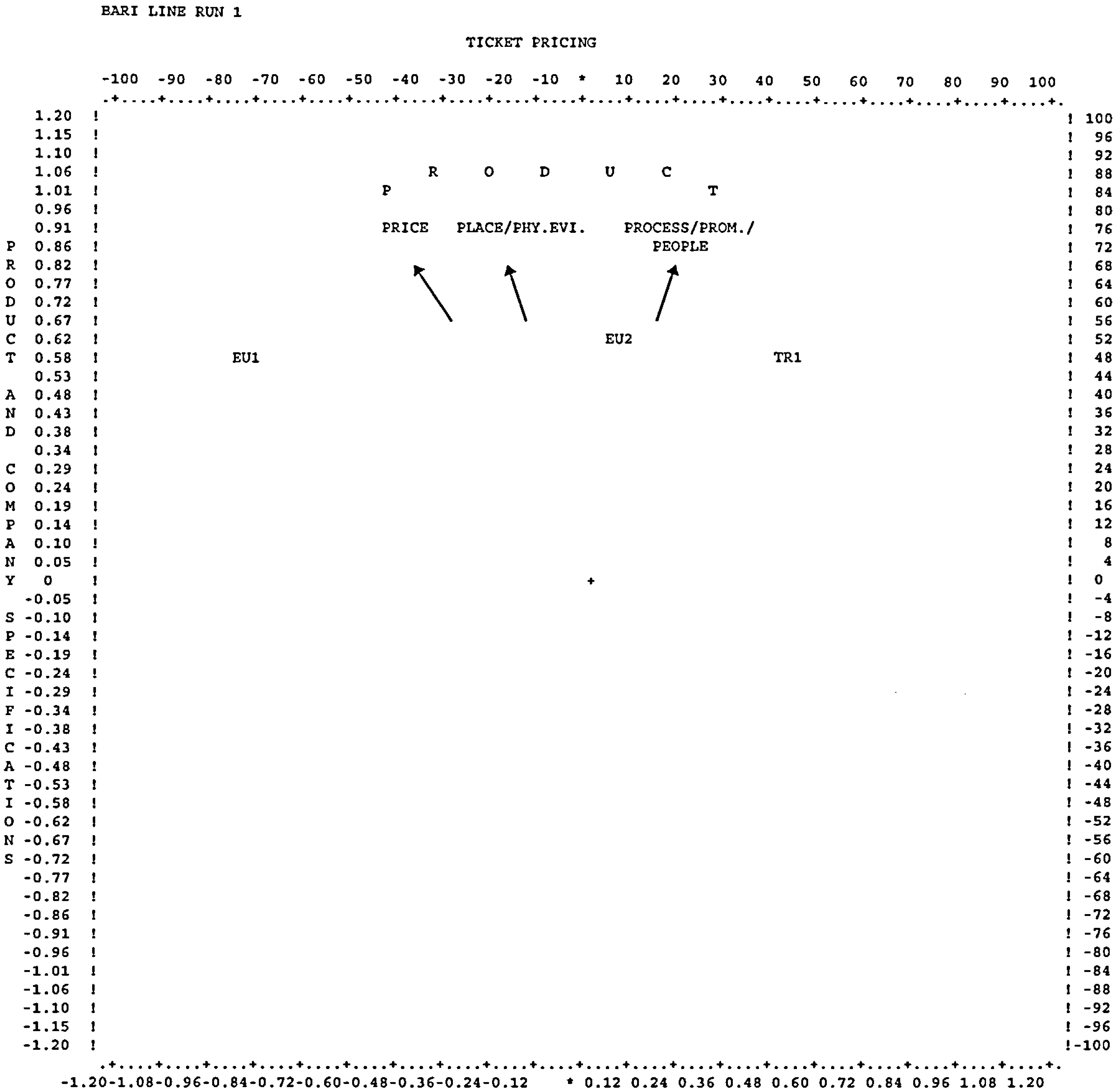
CONFIGURATION OF SUBJECTS AND STIMULI
DIMENSION  2 PLOTTED AGAINST DIMENSION  1                           DIMENSION
                                                                        2
            -100  -90  -80  -70  -60  -50  -40  -30  -20  -10   *   10   20   30   40   50   60   70   80   90  100
            .+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+.
      1.20  !                                                                                                     ! 100
      1.15  !                                                                                                     !  96
      1.10  !                                                                                                     !  92
      1.06  !                                                                                                     !  88
      1.01  !                                  17 38 19 29 31  4      39                                          !  84
      0.96  !                             24 30                             36                                    !  80
      0.91  !                                                                                                     !  76
      0.86  !                                                                                                     !  72
      0.82  !                                                                                                     !  68
      0.77  !                                                                                                     !  64
      0.72  !                                                                                                     !  60
      0.67  !                                                                                                     !  56
      0.62  !                                                       2                                             !  52
      0.58  !               1                                                        3                            !  48
      0.53  !                                                                                                     !  44
      0.48  !                                                                                                     !  40
      0.43  !                                                                                                     !  36
      0.38  !                                                                                                     !  32
      0.34  !                                                                                                     !  28
      0.29  !                                                                                                     !  24
      0.24  !                                                                                                     !  20
      0.19  !                                                                                                     !  16
      0.14  !                                                                                                     !  12
      0.10  !                                                                                                     !   8
      0.05  !                                                                                                     !   4
DIMENSION  1                                                  +                                                   !   0
     -0.05  !                                                                                                     !  -4
     -0.10  !                                                                                                     !  -8
     -0.14  !                                                                                                     ! -12
     -0.19  !                                                                                                     ! -16
     -0.24  !                                                                                                     ! -20
     -0.29  !                                                                                                     ! -24
     -0.34  !                                                                                                     ! -28
     -0.38  !                                                                                                     ! -32
     -0.43  !                                                                                                     ! -36
     -0.48  !                                                                                                     ! -40
     -0.53  !                                                                                                     ! -44
     -0.58  !                                                                                                     ! -48
     -0.62  !                                                                                                     ! -52
     -0.67  !                                                                                                     ! -56
     -0.72  !                                                                                                     ! -60
     -0.77  !                                                                                                     ! -64
     -0.82  !                                                                                                     ! -68
     -0.86  !                                                                                                     ! -72
     -0.91  !                                                                                                     ! -76
     -0.96  !                                                                                                     ! -80
     -1.01  !                                                                                                     ! -84
     -1.06  !                                                                                                     ! -88
     -1.10  !                                                                                                     ! -92
     -1.15  !                                                                                                     ! -96
     -1.20  !                                                                                                     !-100
            .+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+.
        -1.20-1.08-0.96-0.84-0.72-0.60-0.48-0.36-0.24-0.12    * 0.12 0.24 0.36 0.48 0.60 0.72 0.84 0.96 1.08 1.20
POINT  39 OVERLAYS POINT(S)    37  35  33  26  25  21  20  18  11   9
POINT  38 OVERLAYS POINT(S)    34  27   7
POINT  36 OVERLAYS POINT(S)    32  13  12
POINT  30 OVERLAYS POINT(S)    28   5
POINT  29 OVERLAYS POINT(S)    14
POINT  24 OVERLAYS POINT(S)    23  22   8
POINT  19 OVERLAYS POINT(S)    10   6
POINT  17 OVERLAYS POINT(S)    16  15

POINTS 1 TO  3 ARE STIMULI - POINTS   4 TO  39 ARE SUBJECTS.


POINT  3: TURKISH FERRY OPERATOR
POINTS 1, 2: GREEK FERRY OPERATORS REPRESENTING THE EU


DIMENSION 1: Product and company specifications
DIMENSION 2: Ticket pricing
```

Figure 54: Details of the positioning of the ferry operators on Bari line



TR1: STERN MARITIME LINES (TURKISH OPERATOR)

EU1: MARLINES (EU OPERATOR)

EU2: EUROPEAN SEAWAYS (EU OPERATOR)

membership to a shipping company. Therefore, it has more experience for providing services to its consumers through these outlets.

Stern Maritime Lines and European Seaways, which are medium size companies, are similar to each other in the method of selling tickets, less number of personnel with no training programmes and therefore, with no budget for training. They are grouped together; however, Marlines is positioned alittle different because of its larger company size with more experience in the ferry services and therefore, it has more expensive ticket prices compared to the others.

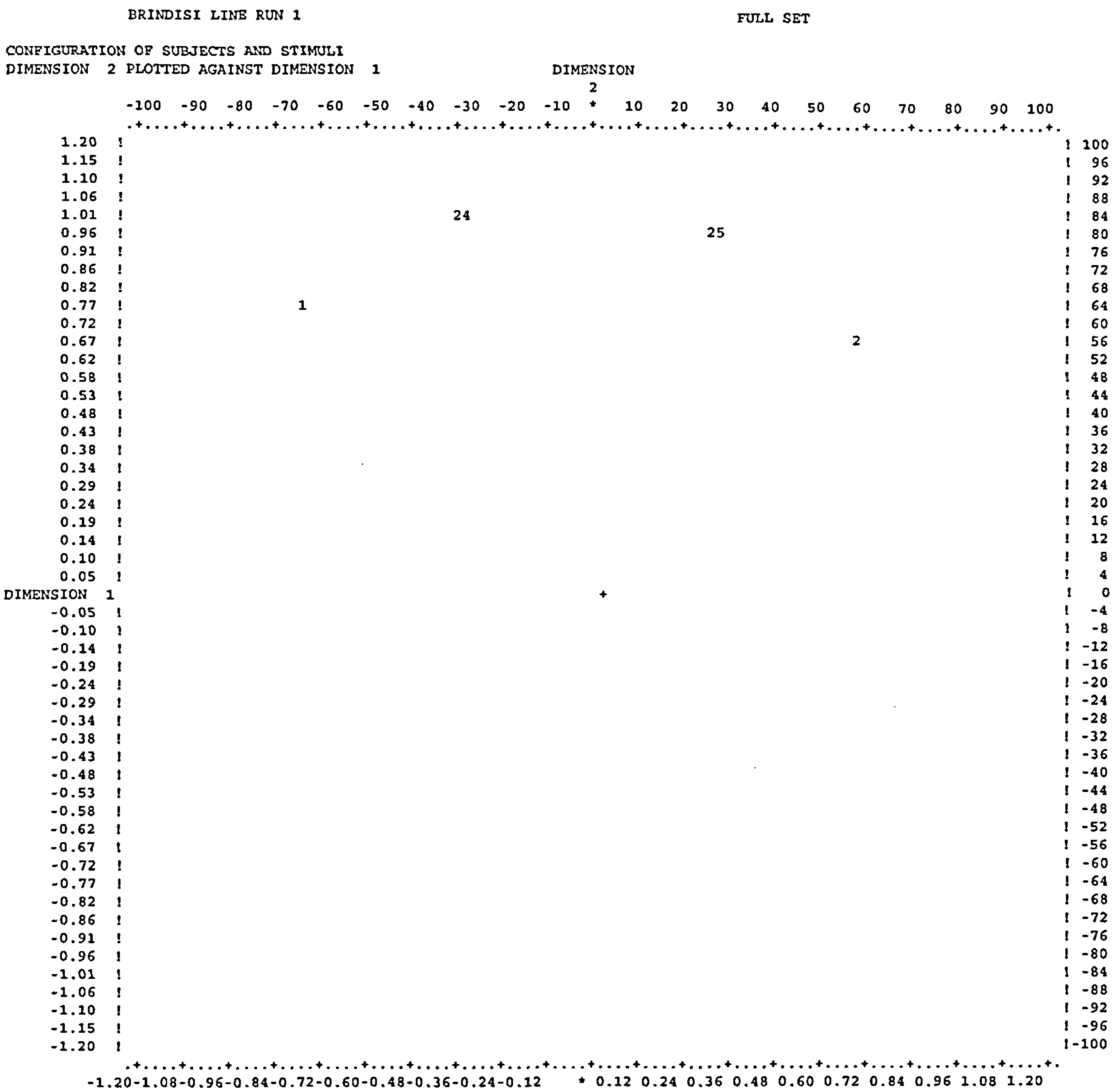
(d) Brindisi - Cesme line and its market implications

Figure 55 and 56 illustrate the positioning of the operators in the market place in accordance with ticket pricing as represented by dimension 1 and place of service line as represented by dimension 2. European Seaways and Med Link Lines are the only operators on this line. Although they indicate similarity on the pricing of the tickets, they position on opposite sides of the market depending on the company quality.

European Seaways is positioned differently compared to Med Link Lines because of having more journeys and therefore, more total number of passengers in a year. Although total tonnage and passenger and car capacities of the ferries of Med Link Lines are greater than those of European Seaways, its total number of passengers is less than that of European Seaways because of not operating continiously during the year and therefore, having less number of journeys in a year.

In addition, they have similarity in the ticket prices; however, Med Link Lines positions differently because of having a membership in a shipping group. European Seaways has more

Figure 55: Positioning of the ferry operators on Brindisi line



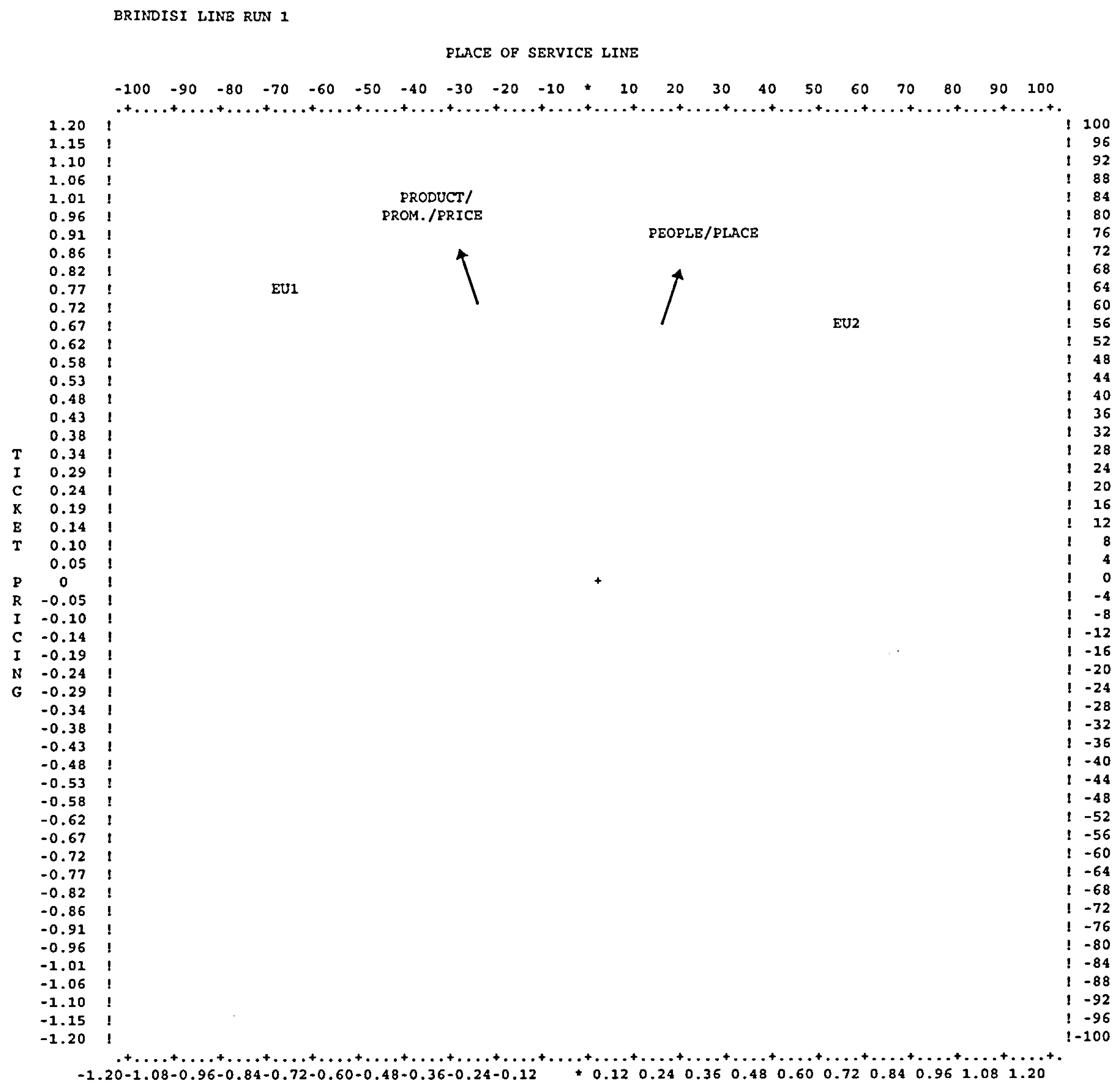

```
POINT  25 OVERLAYS POINT(S)   23  22  21  14  13  12   4   3
POINT  24 OVERLAYS POINT(S)   20  19  18  17  16  15  11  10   9   8   7   6   5

POINTS 1 TO  2 ARE STIMULI - POINTS   3 TO  25 ARE SUBJECTS.


POINTS 1, 2: GREEK FERRY OPERATORS REPRESENTING THE EU


DIMENSION 1: Ticket pricing
DIMENSION 2: Place of service line
```

Figure 56: Details of the positioning of the ferry operators on Brindisi line



EU1: EUROPEAN SEAWAYS (EU OPERATOR)

EU2: MED LINK LINES (EU OPERATOR)

number of personnel, outlets and journeys and therefore, has more experience in providing services for more number of passengers in all seasons of the year.

6.4.3. Applications for direct and indirect service lines

Similar to the previous applications, data of the ferry operator companies is applied into the MDPREF programme to have a further idea of the positioning in the market place for direct lines between Italy and Turkey and indirect lines via Greece, which are the main groups of ferry services in the Italy-Greece-Turkey corridor. These applications again do not individually reflect total market positioning because of unreliability of limited data; however, they give a further understanding of their individual effect in the market place.

In addition, total number of ferry operators differs for each line and, therefore, some data is reduced further because of data undifferentiation which does not have any effects over the previous main data application. Input programmes of these applications are listed in Appendix 6.

(a) Direct lines between Italy and Turkey and their market implications

Figure 57 and 58 illustrate the positioning of the ferry companies operating on direct lines between destinations of Venice, Ancona and Bari in Italy and Izmir, Cesme, Marmaris and Antalya in Turkey with ferry and company specifications represented by dimension 1 and ticket pricing represented by dimension 2. Stern Maritime Lines, Turkish Maritime Lines, Topas Maritime Lines and Neta Lines are the operators on the direct lines. Topas Maritime Lines and Turkish Maritime Lines position together indicating similarity about their service quality and price characteristics while each of the Stern Maritime Lines and Neta Lines position on opposite sides of the market away from these companies indicating similarity about place characteristics.

Figure 57: Positioning of the ferry operators on direct lines between Italy and Turkey

```
           DIRECT SERVICES RUN 1                                          FULL SET

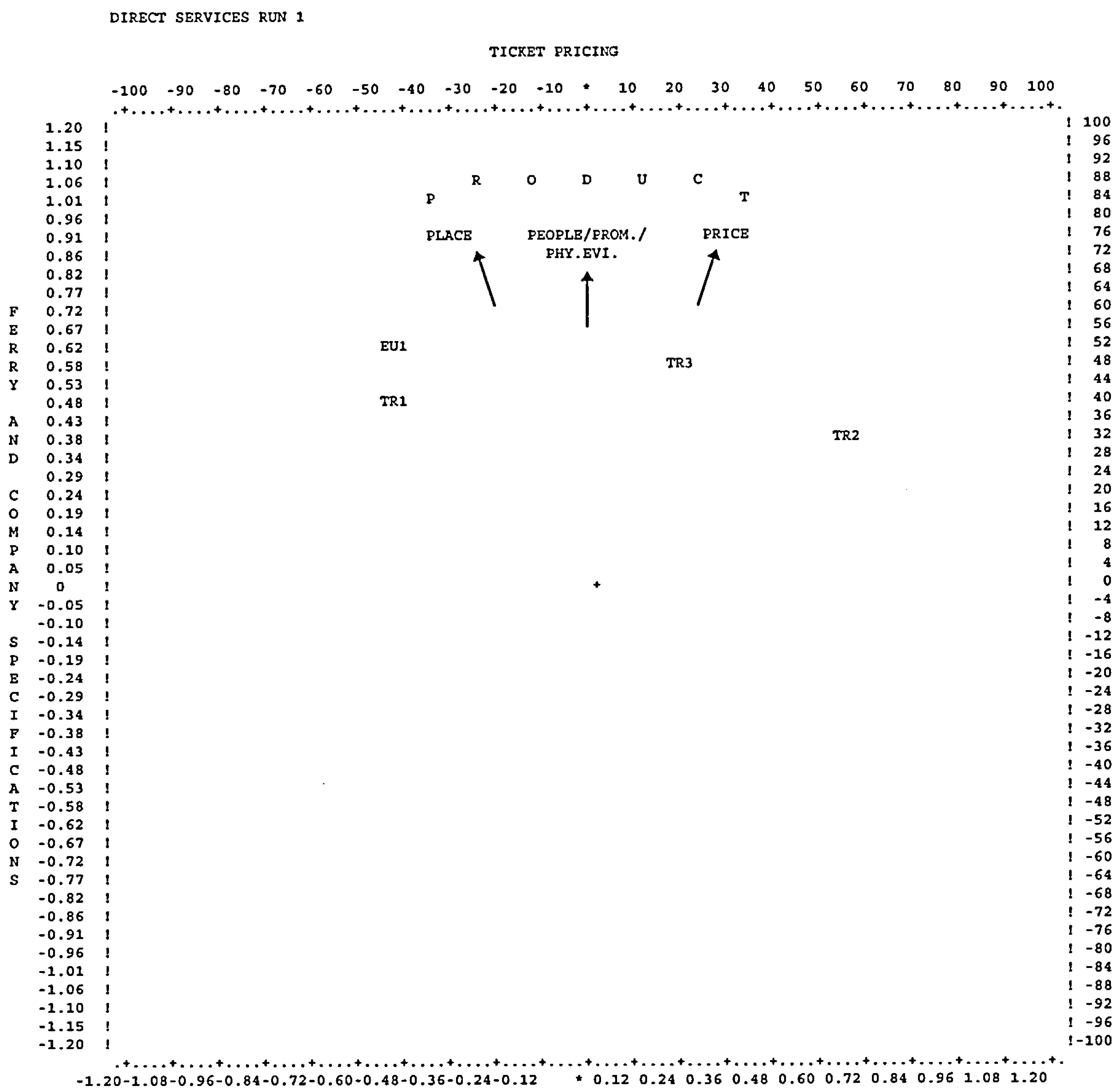
CONFIGURATION OF SUBJECTS AND STIMULI
DIMENSION  2 PLOTTED AGAINST DIMENSION  1                   DIMENSION
                                                                2
           -100  -90  -80  -70  -60  -50  -40  -30  -20  -10  *   10   20   30   40   50   60   70   80   90  100
           .+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+.
      1.20  !                                                                                                    ! 100
      1.15  !                                                                                                    !  96
      1.10  !                                                                                                    !  92
      1.06  !                                                                                                    !  88
      1.01  !                                  34 35 19 44 31    36  7                                           !  84
      0.96  !                                                             14                                     !  80
      0.91  !                                                             27 15                                  !  76
      0.86  !                                                                   26                               !  72
      0.82  !                                                                                                    !  68
      0.77  !                                                                                                    !  64
      0.72  !                                                                                                    !  60
      0.67  !                                                                                                    !  56
      0.62  !                             4                                                                      !  52
      0.58  !                                                          3                                         !  48
      0.53  !                                                                                                    !  44
      0.48  !                             1                                                                      !  40
      0.43  !                                                                                                    !  36
      0.38  !                                                                                2                   !  32
      0.34  !                                                                                                    !  28
      0.29  !                                                                                                    !  24
      0.24  !                                                                                                    !  20
      0.19  !                                                                                                    !  16
      0.14  !                                                                                                    !  12
      0.10  !                                                                                                    !   8
      0.05  !                                                                                                    !   4
DIMENSION  1                                                    +                                                !   0
     -0.05  !                                                                                                    !  -4
     -0.10  !                                                                                                    !  -8
     -0.14  !                                                                                                    ! -12
     -0.19  !                                                                                                    ! -16
     -0.24  !                                                                                                    ! -20
     -0.29  !                                                                                                    ! -24
     -0.34  !                                                                                                    ! -28
     -0.38  !                                                                                                    ! -32
     -0.43  !                                                                                                    ! -36
     -0.48  !                                                                                                    ! -40
     -0.53  !                                                                                                    ! -44
     -0.58  !                                                                                                    ! -48
     -0.62  !                                                                                                    ! -52
     -0.67  !                                                                                                    ! -56
     -0.72  !                                                                                                    ! -60
     -0.77  !                                                                                                    ! -64
     -0.82  !                                                                                                    ! -68
     -0.86  !                                                                                                    ! -72
     -0.91  !                                                                                                    ! -76
     -0.96  !                                                                                                    ! -80
     -1.01  !                                                                                                    ! -84
     -1.06  !                                                                                                    ! -88
     -1.10  !                                                                                                    ! -92
     -1.15  !                                                                                                    ! -96
     -1.20  !                                                                                                    !-100
           .+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+.
       -1.20-1.08-0.96-0.84-0.72-0.60-0.48-0.36-0.24-0.12    * 0.12 0.24 0.36 0.48 0.60 0.72 0.84 0.96 1.08 1.20
POINT  44 OVERLAYS POINT(S)    43  42  41  40  39  38  37  32  16  13  12   9   8   6
POINT  35 OVERLAYS POINT(S)    33  30  23  11   5
POINT  34 OVERLAYS POINT(S)    24  20
POINT  31 OVERLAYS POINT(S)    29  28  22  21  18
POINT  27 OVERLAYS POINT(S)    25
POINT  19 OVERLAYS POINT(S)    17  10

POINTS 1 TO  4 ARE STIMULI - POINTS   5 TO  44 ARE SUBJECTS.


POINTS 1, 2, 3: TURKISH FERRY OPERATORS
POINT 4: GREEK FERRY OPERATOR REPRESENTING THE EU


DIMENSION 1: Ferry and company specifications
DIMENSION 2: Ticket pricing
```

Figure 58: Details of the positioning of the ferry operators on direct lines between Italy and Turkey



TR1: STERN MARITIME LINES (TURKISH OPERATOR)

TR2: TURKISH MARITIME LINES (TURKISH OPERATOR)

TR3: TOPAS MARITIME LINES (TURKISH OPERATOR)

EU1: NETA LINES (EU OPERATOR)

Stern Maritime Lines and Neta Lines position closely because they are similar in the total number of passenger and car capacities, average number of passengers per journey, percentage of average full capacity of ferries, location of branches, having a less number of personnel with no training programmes and not having a membership of a shipping group. Topas Maritime Lines differentiates itself from these two operators with similar characteristics by positioning under the vector end of price because of having a fixed price strategy as a member of a shipping group.

Turkish Maritime Lines positions very differently and far from the other operators by illustrating different characteristics because it is one of the major operators in this market with a larger company size. Therefore, it has more experience in the ferry market by operating all the seasons in a year with the most total number of ferries, with more number of agencies and branches widely distributed in Turkey and various European countries.

(b) Indirect lines between Italy and Turkey via Greece and their market implications

Figure 59 and 60 illustrate the positioning of the companies operating on indirect ferry lines between Italy and Turkey via Greece with service line represented by dimension 1 and total number of passengers represented by dimension 2. All of the ferry companies operating on indirect lines are the Greek ferry operators representing the EU. Minoan Lines and Horizon Sea Lines position very closely indicating similar company characteristics while Marlines and Med Link Lines position away from them in the market indicating similarity of place characteristics. European Seaways position on very opposite sides of the market indicating no similarity with the other Greek companies, particularly with regards to the quality of its ferry.

Marlines positions differently because it is a larger company with more experience in the ferry

Figure 59: Positioning of the ferry operators on indirect lines between Italy and Turkey via Greece

```
              INDIRECT FERRY SERVICES RUN 1                                      FULL SET

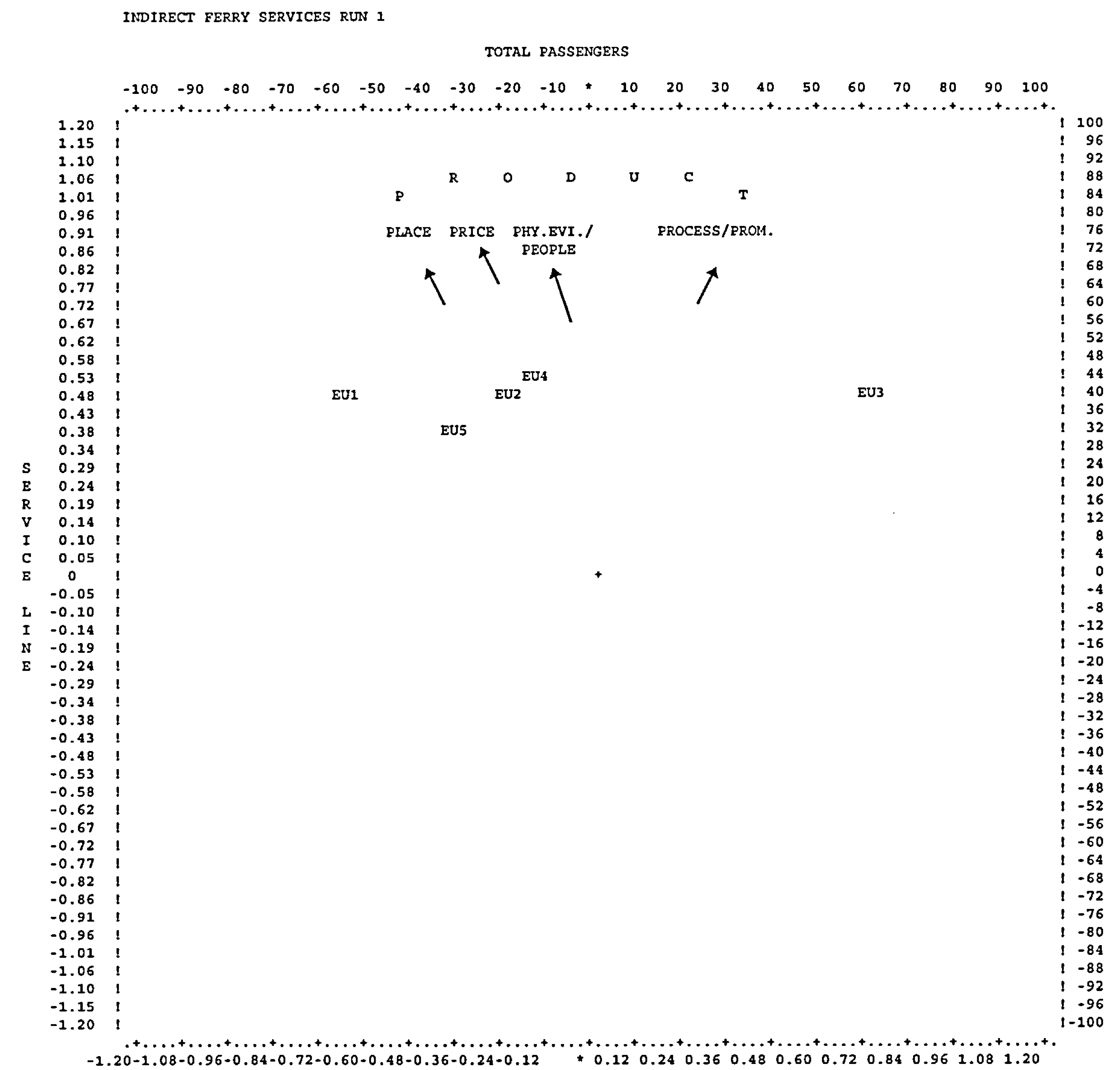
CONFIGURATION OF SUBJECTS AND STIMULI
DIMENSION  2 PLOTTED AGAINST DIMENSION  1                    DIMENSION
                                                                 2
             -100  -90  -80  -70  -60  -50  -40  -30  -20  -10   *   10   20   30   40   50   60   70   80   90  100
             .+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+.
      1.20  !                                                                                                       ! 100
      1.15  !                                                                                                       !  96
      1.10  !                                                                                                       !  92
      1.06  !                                                                                                       !  88
      1.01  !                                    30  9 26 42 37 43  34 32                                           !  84
      0.96  !                              19 31                          20 14                                     !  80
      0.91  !                              16                                                                       !  76
      0.86  !                                                                                                       !  72
      0.82  !                                                                                                       !  68
      0.77  !                                                                                                       !  64
      0.72  !                                                                                                       !  60
      0.67  !                                                                                                       !  56
      0.62  !                                                                                                       !  52
      0.58  !                                                                                                       !  48
      0.53  !                                              4                                                        !  44
      0.48  !                         1                 2                                       3                   !  40
      0.43  !                                                                                                       !  36
      0.38  !                                     5                                                                 !  32
      0.34  !                                                                                                       !  28
      0.29  !                                                                                                       !  24
      0.24  !                                                                                                       !  20
      0.19  !                                                                                                       !  16
      0.14  !                                                                                                       !  12
      0.10  !                                                                                                       !   8
      0.05  !                                                                                                       !   4
DIMENSION  1                                                     +                                                  !   0
     -0.05  !                                                                                                       !  -4
     -0.10  !                                                                                                       !  -8
     -0.14  !                                                                                                       ! -12
     -0.19  !                                                                                                       ! -16
     -0.24  !                                                                                                       ! -20
     -0.29  !                                                                                                       ! -24
     -0.34  !                                                                                                       ! -28
     -0.38  !                                                                                                       ! -32
     -0.43  !                                                                                                       ! -36
     -0.48  !                                                                                                       ! -40
     -0.53  !                                                                                                       ! -44
     -0.58  !                                                                                                       ! -48
     -0.62  !                                                                                                       ! -52
     -0.67  !                                                                                                       ! -56
     -0.72  !                                                                                                       ! -60
     -0.77  !                                                                                                       ! -64
     -0.82  !                                                                                                       ! -68
     -0.86  !                                                                                                       ! -72
     -0.91  !                                                                                                       ! -76
     -0.96  !                                                                                                       ! -80
     -1.01  !                                                                                                       ! -84
     -1.06  !                                                                                                       ! -88
     -1.10  !                                                                                                       ! -92
     -1.15  !                                                                                                       ! -96
     -1.20  !                                                                                                       !-100
             .+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+....+.
         -1.20-1.08-0.96-0.84-0.72-0.60-0.48-0.36-0.24-0.12     * 0.12 0.24 0.36 0.48 0.60 0.72 0.84 0.96 1.08 1.20
POINT  43 OVERLAYS POINT(S)   41  36  33
POINT  42 OVERLAYS POINT(S)   40  39  38  35  23  22  17
POINT  34 OVERLAYS POINT(S)   12
POINT  32 OVERLAYS POINT(S)   28  27  21  11  10   8
POINT  30 OVERLAYS POINT(S)   29  25  24  15   7
POINT  19 OVERLAYS POINT(S)   18
POINT  14 OVERLAYS POINT(S)   13
POINT   9 OVERLAYS POINT(S)    6

POINTS 1 TO  5 ARE STIMULI - POINTS   6 TO  43 ARE SUBJECTS.


POINTS 1, 2, 3, 4, 5: GREEK FERRY OPERATORS REPRESENTING THE EU


DIMENSION 1: Service line
DIMENSION 2: Total number of passengers
```

Figure 60: Details of the positioning of the ferry operators on indirect lines between Italy and Turkey via Greece



EU1: MARLINES (EU OPERATOR)

EU2: MINOAN LINES (EU OPERATOR)

EU3: EUROPEAN SEAWAYS (EU OPERATOR)

EU4: HORIZON SEA LINES (EU OPERATOR)

EU5: MED LINK LINES (EU OPERATOR)

services. Total number of passengers of European Seaways is greater than that of the other operators because it operates during all seasons of the year with two ferries operating in two different lines - indirect lines from Bari and Brindisi and therefore, has the most number of journeys with the most number of passengers. In addition, it gains more experience by providing more services for passengers in this market and has a distinct characteristic for promotion. Thus, it positions differently in the market place.

Minoan Lines, Horizon Sea Lines and Med Link Lines are similar to each other in the location of their agencies and in the international routing. However, Med Link Lines is positioned alittle different from the group because it is a member of a shipping group, which makes its fixed ticket prices different from others.

6.5. SOME CONCLUSIONS

After developing a positioning model in a quantitative approach to this research, the model was operationalised to identify the positioning of the Turkish ferry operators in comparison with the EU ferry operators in the Eastern Mediterranean ferry market. Various graphs were produced by the MDPREF programme of the MDS(X) Series of Multidimensional Scaling computer programmes and the positioning of the ferry operators in the market place were identified and illustrated. As a result of different alternatives of the illustrations of these graphs, the Turkish ferry operators, - Stern Maritime Lines, Turkish Maritime Lines and Topas Maritime Lines, appeared to position close to each other by illustrating various similar characteristics with each other e.g. facilities on board of ferries, ticket prices, service lines, places of branches and agencies, etc.. Similarly, the Greek operators, - Marlines, Minoan Lines, Horizon Sea Lines, Med Link Lines and Neta Lines, representing the EU, also position close to each other at a different place in the market place by illustrating similar characteristics in various fields e.g. service lines, places of branches and agencies, etc.. An exception was identified in one Greek ferry operator, - European Seaways, by positioning close to the Turkish ferry operators illustrating various similar characteristics with them e.g. seasons of journey, ticket prices, etc..

As a consequence, it was concluded in the results that the Turkish and the EU ferry operators position differently in the market place by illustrating different characteristics, particularly for product, price, place and physical evidence of the service marketing mix elements. It should be noted that this result match the requirements of the hypotheses - one main hypothesis and various sub-hypotheses - developed earlier in the previous chapter.

Having analysed various applications of data of the Turkish ferry operators in comparison with their EU competitors in the Italy-Greece-Turkey corridor in the Eastern Mediterranean market within the operationalisation of the positioning model, conclusions of the research together with the discussions and recommendations of the researcher will be given in the next chapter.

PART IV:

CONCLUSIONS, DISCUSSION AND RECOMMENDATIONS

PART IV:

CHAPTER 7: CONCLUSIONS, DISCUSSION AND RECOMMENDATIONS

7.1. INTRODUCTION

The first section of this chapter consists of conclusions derived from this research. The second section consists of discussions and recommendations of the researcher.

7.2. CONCLUSIONS

This section concentrates upon general conclusions for research and consists of two sections - operational and academic conclusions.

7.2.1. Operational conclusions

In general:

A positioning model using a quantitative approach was developed to identify the comparative positioning of the Turkish and the EU ferry operators in the market, particularly in the Italy-Greece-Turkey corridor. Identification of the positioning of the Turkish ferry operators and their European Union competitors in the Eastern Mediterranean market was analysed through the development of this model, which was suitable to analyse the market through the service providers' side - that of the ferry operators.

A multidimensional scaling technique derived from multivariate analysis was used to operationalise the positioning model. The positioning of the operators was identified using graphs illustrated in a two dimensional space. The MDPREF computer programme of the

MDS(X) Series of Multidimensional Scaling Programmes was used for the application of data of the ferry operators through which various graphs were produced to illustrate the comparative positioning of these operators in the market.

Although the model developed in this research was appropriate and sufficient to identify the comparative positioning of the ferry operators in the market, various problems arose during the analysis, i.e. data collection from the operators, interpretation of data for application into the technique and finding similar comparable applications in shipping services. However, this research represents a successful application of a positioning model based on the "7Ps" of the service marketing mix elements, to the comparative analysis of the ferry operators in the Eastern Mediterranean market. In addition, this research is the first application of shipping services using multidimensional scaling techniques. Furthermore, the Greek ferry operators appear to represent the EU because Greece is in the EU and there were no operators in this market from other countries in the EU in 1994. Therefore, a problem arose during the analysis because of EU ferry operators were represented by only Greece. However, the approach used could be applied to any market where EU and Turkish operators compete and therefore, be used to compare their marketing positions.

Hypotheses review:

Various hypotheses - a main hypothesis and seven sub-hypotheses - were developed in Chapter 4 before developing a positioning model for this research. These hypotheses were derived from the ferry services in the Eastern Mediterranean market and were based upon the theory of service marketing. They were examined during the operationalisation of the positioning model in Chapter 5. It was concluded that the Turkish and the EU ferry operators position differently in the market place by illustrating different characteristics with each other, particularly in various characteristics of product, place, physical evidence and price.

In addition to various hypotheses developed in Chapter 4, a new hypothesis was developed during the operationalisation of the model. Similarity of the Turkish ferry operators with each other in the market was tested with this hypothesis during the analysis. It concluded that there were similarities in the characteristics of the Turkish ferry operators in various fields e.g. services on board of ferries, ticket pricing, ferry service lines, etc. in contrast with their EU competitors in the Eastern Mediterranean market, particularly, in the Italy-Greece-Turkey corridor. Overall, it was noted during the analysis of the Eastern Mediterranean ferry market for the year 1994 that the Turkish ferry operators - Stern Maritime Lines, Turkish Maritime Lines and Topas Maritime Lines, and European Seaways of the Greek ferry operators grouped together and positioned close to each other in the market place by illustrating similar characteristics e.g. ticket pricing, seasons of journey, service lines and various services on board of ferries, such as passenger and car capacities. By comparison, the Greek ferry operators positioned together at another place in the market by illustrating similar characteristics with each other e.g. average capacity of the ferries, total number of ferries, ticket prices, service lines, annual total number of passengers, annual total number of journeys and seasons of journey. These characteristics were different from those of the Turkish ferry operators.

Marketing implications:

In general:

The Eastern Mediterranean ferry market was analysed through the operationalisation of the positioning model developed for identifying and meausuring the positioning of ferry operators. Data of the ferry operators was applied into the MDS technique. Calculations and graph illustrations were produced by the MDPREF programme of the MDS technique. Total data of the ferry operators were applied into the technique to discover the market positioning, in general.

In addition, data of the ferry operators for each "P" of the 7Ps and for each route in the Italy-Greece-Turkey corridor were applied into the technique to illustrate different market positioning of the operators for different cases. As a consequence, a number of market positioning of the ferry operators for different situations were achieved and the results derived from these positioning cases were explained in the previous chapter. These were achieved to match the objectives of this research.

Market implications of the results:

The ferry operators with a large size can provide a wide range of services for the passengers in this market. Therefore, they become the major operators in the market place, e.g. Turkish Maritime Lines. This operator has a distinct position in the market place because of reflecting its organisation structure and marketing strategy by having many outlets for serving a wide range of consumers, operating the youngest ferries in direct lines from Italy to Turkey, operating in all seasons of the year and therefore, having the greatest total number of journeys. This leads to the greatest share - 39% - in the total number of passengers in the market place in 1994.

Although some of other large companies - Marlines and Minoan Lines - have similarities with Turkish Maritime Lines and have more experience in the ferry services, they cannot be one of the major operators with more total number of passengers because of operating only in the high season and therefore, having limited number of journeys.

However, they are more experienced and some of the major operators in the ferry services between Italy and Greece. They operate with better quality and larger ferries in comparison with their ferries operating in the Italy-Greece-Turkey corridor.

European Seaways - the only EU operator positioning close to the Turkish operators - differentiates its position from other EU operators by operating in two different service lines - Bari and Brindisi lines - in all seasons of the year similar to Turkish Maritime Lines and by having more journeys with a greater total number of passengers in a year.

European Seaways and Turkish Maritime Lines contributes more to the development of this rapid growing ferry market through a number of areas, e.g. operating continuously during the year, having more outlets in various countries, therefore, reaching more consumers, having reasonable ticket prices, providing services by younger ferries - Turkish Maritime Lines, in particular - and employing Turkish crew for serving the Turkish passengers as the majority of the passengers in this market.

Topas Maritime Lines and Stern Maritime Lines, which are medium size companies, also contribute to the development of the ferry services on direct lines. Although Neta Lines of the EU operates in a direct line, it is positioned close to Horizon Sea Lines because both are small size companies with less experience in the market place.

Consequently, the ferry market in the Eastern Mediterranean has been a rapid growing and dynamic market by the contribution of a number of operators.

7.2.2. Academic conclusions

A positioning model was developed in a quantitative approach to this research as noted earlier. Success was achieved in identifying the comparative positioning of the Turkish ferry operators in comparison with their EU competitors by developing and operationalising a positioning model. The multidimensional scaling technique was sufficient and suitable for the application of data of the ferry operators. Furthermore, this technique could be applied into other areas in ferry services additional to this research, including further research for the market positioning of operators based on perceptions of consumers - passengers in this case.

Although there are many applications and much information and research related to positioning and service marketing, there is a lack of research and shortage of applications into the marketing of shipping services as also noted by Ledger and Roe (1996). In addition, the majority of positioning studies have concentrated on the services based on consumer perceptions, not on the services provided by the producers - ferry operators in this research. Therefore, further developments can be achieved for shipping services and, in particular, for service providers through further research. Furthermore, similar shipping markets could be analysed, both on the operator and passenger sides, to identify their comparative positions in the market place.

7.3. DISCUSSION AND RECOMMENDATIONS

The points that are noted in this section are derived from the research as a whole and are reviewed through two sub-sections - micro aspects and macro aspects. Various details of the maritime policy and industry, ferry market, passenger ferry operators, analysis and the technique are discussed within the micro aspects of this chapter while various points are discussed broadly in general within the macro aspects. Recommendations of the researcher are noted in each section. This chapter concludes by identifying various fields of further research related to this thesis.

7.3.1. Micro aspects

Maritime policy:

EU and Turkish maritime policies:

Among the maritime policies of the EU and Turkey, some appear to be more important for the ferry industry in the Eastern Mediterranean. These are flagging out - off-shore registries, Port State Control and the ISM Code, which have direct impacts over the ferry services to and from the EU ports and, therefore, over the ferry services in the Italy-Greece-Turkey corridor, in particular. In parallel to this application, the Undersecretariat of Shipping in Turkey also issued a recent regulation for ferry operators, which are operating on international ferry services, to provide various requirements providing a basis for the requirements of the ISM Code.

Ferry market:

Current situation:

Among the 2.5 million Turkish people living in various European countries, thousands of them are travelling to Turkey during the summer season for holiday. They preferred to travel by car until the beginning of the 1990s. However, ferry lines in the Italy-Greece-Turkey corridor, in the Eastern Mediterranean, have become busier and more dynamic since the beginning of the 1990s after the civil war in the former Yugoslavia. Therefore, ferry services in this corridor have started to grow and develop year by year. In addition to the Turkish ferry operators, Greek ferry operators have also started to operate in this corridor since 1991 and they have been competitors of Turkish ferry operators.

The state owned ferry operator, Turkish Maritime Lines, has been operating in the corridor of Italy-Greece-Turkey since the beginning of the 1970s, during all seasons of the year. Since it is a state owned company, it has a policy not of profit making, but of serving passengers. This is the main policy of all state owned companies in Turkey. Therefore, Turkish Maritime Lines continues to operate in the low seasons and sometimes carries few passengers and cars. As a result of this policy, the company makes a loss each year. However, Turkish Maritime Lines carries a large number of passengers in this corridor during the peak season. It is recommended that Turkish Maritime Lines operate only during the peak season. It is recommended that the Turkish Maritime Lines cancel the Eastern Mediterranean services of its oldest ferry - Truva, because of limited services on board and the few journeys in a year if operates. In addition, the vessel has a low capacity of passengers and has out-dated technology. If the services of this vessel are cancelled, then the average age of ferries of Turkish Maritime Lines will decrease from 12.75 to 6.25.

The total number of passengers carried by the Turkish ferry operators increased since 1991. For instance, this increase was reflected by the total number of ferry passengers carried by Turkish Maritime Lines. The increase of the total number of the passengers carried by this operator was 79% between 1990 and 1991 and the same amount increased by 595% between 1991 and 1995 (See Chapter 3).

Since the Eastern Mediterranean ferry market has been a rapid growing and a dynamic market with the increasing number of passengers and ferry operators every year, various problems have started to appear, i.e. ticket selling for a nonexisting ferry service and double booking (Milliyet, 31.08.1994).

Competition and seasonality:

A reasonable level of competition exists between the operators in the Eastern Mediterranean ferry market - total passengers including potential passengers, is greater than the capacity of the supply side - total ferry operators. Therefore, the ferry operators share the market by not having a high competition. Although full capacity of each ferry was approximately 50% in 1994 as noted earlier, they were operating with overcapacity during the high season - in July and August, indicating an increasing demand compared to supplied ferry services. Therefore, this market situation should be considered and number of ferry services should be increased in order to serve an increasing number of passengers during the high season.

Future market:

Only the data of ferry operations in 1994, was used as a snap shot of the market when focusing upon the positioning of ferry operators in this corridor. Therefore, no forecast of the market was made. However, ferry operations in this corridor, in 1995 were obtained subsequent to the main analysis period. In addition, it was found that the total number of passengers carried by the Turkish ferry operators almost doubled in 1995 compared to 1994. (See Table 16 in Chapter 3). Furthermore, it was observed that the total number of ferry operators also increased in that year because of a developing, growing and dynamic market after the strategical, political, social and economic changes in the area.

Positioning model:

Positioning and service marketing:

Although there is much information and there are many applications of positioning and service marketing to various areas, there is a lack of application to shipping services as noted earlier. Therefore, more research should be supported to achieve more applications into the positioning of shipping services.

Regarding the objectives of this research, identifying and measuring the positions of the Turkish ferry operators in comparison with their EU competitors were achieved through developing a positioning model.

Technique:

The total questions on the questionnaire were sufficient for the application of data into the MDPREF computer programme of the Multidimensional Scaling technique of the multivariate analysis techniques. However, it would have been better and more reliable from a statistical point of view if there would have been much detailed information related to the questions, and therefore, less gaps in data would have occurred.

Software programmes of MDS(X) Series of Multidimensional Scaling Programmes other than the MDPREF programme could also be used for the application of data of the market for further studies giving alternatives of other applications within the multidimensional scaling technique.

Operationalisation of positioning model:

Methodology:

The methodology used for the positioning model in this research was successful in achieving the results. In addition to the attributes - various characteristics of ferry companies, which were listed in the questionnaire, were based on and grouped under the "7Ps" of the service marketing mix elements. The characteristics could have been increased; however, they were sufficient to achieve the objectives of this research for identifying the comparative positioning of the ferry operators in the Eastern Mediterranean.

Data about passengers, rather than data of ferry operators, could also be used in further research. This data could be applied into the multidimensional scaling technique similar to the applications in this research and the positioning of ferry operators could be analysed by using preference data of passengers instead of data and information of ferry operators. Thus, potential repositioning of the ferry operators in comparison with each other in the market place could be identified through perceptions of passengers and not operators as here and, therefore, compared with the identified positioning which was already achieved in this research. This will contribute more to the analysis of the ferry industry in the Eastern

Mediterranean through an additional dimension, which is the demand side - passengers' side - of the market.

Implications of the research for ferry operators:

The ferry operators can find a general review of Turkish shipping and ferry industry in the operationalisation of the conceptual model. They can then review the Eastern Mediterranean ferry market in detail within the positioning model.

The ferry operators in the Italy-Greece-Turkey corridor should be aware of the increasing needs of passengers in this developing and growing market and, therefore, should try to match these requirements by providing sufficient services. In addition, the ferry operators should improve their services and refurbish their ageing ferries to provide better services to the passengers.

7.3.2. Macro aspects

Maritime policies and market positioning:

The maritime policies of the EU and Turkey, which are related to each other, are ISM Code, cabotage, flagging out and Port State Control as noted earlier. These policies also provide a background for the legislative policies of the EU and Turkey in the ferry services in the Eastern Mediterranean market. Therefore, the operators should review these policies and improve their ferry services and company characteristics for their operations between the EU countries and Turkey in this market.

Implications for other shipping and transport operators:

This research concentrated upon ferry services in the market. It should be noted that shipping and transport services require analysis together with other components of transport, e.g.

passengers, company characteristics, journey specifications etc., in order to achieve success in the total service provision.

Applications to other markets:

The model developed and the technique used for the analysis of this research are suitable for application to other shipping markets as noted earlier. For example, similar models could be developed for Mediterranean ferry services or for Black Sea services, which is also a rapid growing and developing market after the collapse of the former Soviet Union.

About the approach:

Having developed a positioning model in a quantitative approach to this research, it should be noted that detailed and specific data was used to analyse the market in the positioning model after drawing a general background to Turkey, its maritime industry and its relations with the European Union and after providing a more general understanding of the Turkish shipping and ferry industry. The model was useful to this research because of its compatibility with the rest of the research and its positive impact over achieving the objectives of the research as noted in the introductory chapter.

Recommendations for further research:

In general:

The positioning of the Turkish ferry operators in comparison with the Greek ferry operators, representing the EU, was identified in the Eastern Mediterranean ferry market. A positioning model was developed and operationalised to identify and measure the positioning of the Turkish ferry operators in comparison with their EU competitors by using the Multidimensional Scaling Technique of the Multivariate Analysis Techniques.

Data of the ferry operators was used for the analysis in this research to bring an originality for applications in the supply side of positioning cases in service marketing because consumer data is mostly used for analyses in the demand side of marketing. In addition to the analysis of this research, which was based upon the data of the ferry operators, MDS technique can be used to measure and identify the perceptions and preferences of passengers - consumers - in the Eastern Mediterranean ferry market in further research.

The passenger ferry market in the Italy-Greece-Turkey corridor in the Eastern Mediterranean has been a developing, growing and dynamic market with an increasing number of passengers and ferry operators every year. The data in this market can also be analysed by using different techniques and by developing different models in other approaches.

For Turkey:

Since this research is possibly the first application of shipping services at a Ph.D. level related to Turkish shipping, the conclusion, discussion and recommendations noted in this research should be considered by the Turkish shipping authorities at present for the expected establishment of the Ministry of Shipping. In addition, more research in shipping will be valuable for Turkey by giving more attention to the shipping industry, which contributes directly to the economy and has a considerable importance for the Turkish economy and geopolitical situation in that area.

PART V:

APPENDICES AND REFERENCES

Appendix 1

The distribution of the MDS(X) Series of Multidimensional Scaling programs together with the accompanying documentation is managed from the addresses below. Further information can be taken from the same addresses:

The MDS(X) Project	The Program Library Unit
Sociological Research Unit	18 Buccleuch Place
University College	University of Edinburgh
P.O.Box 78	Edinburgh
Cardiff CF1 1XL	U.K.
U.K.	

Further information can also be taken from the Principal Investigator of the MDS(X) Project, Professor A.P.M.Coxon, from the following address:

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Appendix 2

Questionnaire:

(a) Product:

1. Total number of ferries in general

2. Number of ferries operating in the Italy-Greece-Turkey corridor

3. Maximum speed of ferries [knots]

4. Flags of ferries:

Turkish=1, Greek=2, Cypriot=3, Maltese=4, others=5

5. Operators of the ferries:

Turkish=1, Greek, Italian=2, others=3

6. Total tonnages of ferries [grt]

7. Average tonnages of ferries [grt]

8. Average ages of ferries

9. Refurbishment of ferries:

Yes=1, no=2 (if age,15, then choose 1)

10. Any improvement plans for ferries:

Available=1, not available=2

11. Passenger capacity per ferry

12. Car capacity per ferry

13. Seasons of journey in a year:

All seasons=1, spring-summer-autumn=2, high season=3

14. Total number of one-way-journeys in 1994

15. Number of return journeys per week:

Once=1, twice=2, more than twice=3

16. Total number of passengers in 1994

17. Total number of passengers per ferry in 1994

18. Average number of passengers per journey

19. Percentage of average full capacity of ferries (one-way) [%]

20. General characteristics of passengers:

    Businessman=1, foreign tourist=2, native tourist=3, Turkish workers=4, others=5

21. General level of passengers (Standard, occupation, educational level):

    Good=1, average=2, poor=3

22. General satisfaction of passengers:

    Good=1, satisfactory=2, poor=3

23. Customer expectations for service improvement:

    Customers agree=1, disagree=2, no comment=3, not asked=4

24. Questionnaires applied to passengers:

    Yes=1, no=2

25. Services on board:

    Good=1, satisfactory=2, poor=3

26. Quality of ferries:

    Good=1, satisfactory=2, poor=3

(b) Price:

1. Ticket price variations in a year:

   Yes, seasonal=1, no=2

2. High season pullman seat one-way fares for adults:

   (a) Venice to Turkey [DM]

   (b) Ancona to Turkey [DM]

   (c) Bari to Turkey [DM]

   (d) Brindisi to Turkey [DM]

3. Minimum high season fares for children

   (a) Venice to Turkey [DM]

   (b) Ancona to Turkey [DM]

   (c) Bari to Turkey [DM]

   (d) Brindisi to Turkey [DM]

4. Minimum high season fares for cars

   (a) Venice to Turkey [DM]

   (b) Ancona to Turkey [DM]

   (c) Bari to Turkey [DM]

   (d) Brindisi to Turkey [DM]

5. Subsidies from government:

   Yes=1, no=2

6. Membership of

   A shipping group=1, Conferences=2, Consortia=3, none=4

7. Fixed pricing as

   A shipping group=1, Conferences=2, Consortia=3, none=4

(c) Place:

1. International routing:

Italy-Turkey=1, Italy-Greece-Turkey=2, Greece-Turkey=3

2. Operating line from Italy to Turkey:

Direct=1, indirect via Greece=2

3. Place of head office:

Italy=1, Greece=2, Turkey=3, Germany=4

4. Location of branches:

Italy+Greece+Turkey+others=1,

Italy+Greece, Greece+Turkey, Italy+Turkey=2,

Italy, Greece, Turkey=3, none=4

5. Location of agencies:

Italy+Greece+Turkey+others=1,

Italy+Greece, Greece+Turkey, Italy+Turkey=2,

Italy, Greece, Turkey=3, none=4

(d) Promotion:

1. Goods for promotion:

Yes (calender, stationery, accessories, etc.)=1, no=2

2. Budget for promotion:

Yes, up to 5% of total budget=1, more than 5% of total budget=2, no=3

3. Media used for advertising:

Yes, newspaper/journal=1, radio/TV/other=2, no=3

4. Budget for advertising:

Yes, up to 5% of total budget=1, more than 5% of total budget=2, no=3

5. Corporate image:

Excellent=1, good=2, satisfactory=3, poor=4, very poor=5

6. Marketing statistics:

Yes, available=1, no, not available=2

7. Customer statistics:

Yes, available=1, no, not available=2

8. Catalogue distribution to customers:

Yes, usually=1, sometimes=2, rarely=3

9. Sales promotion activities:

Yes, occasionally=1, none=2

10. Additional promotional achieves while competing on the same route:

Yes, available=1, no, not available=2

11. Budget for marketing:

Yes, up to 5% of total budget=1, more than 5% of total budget=2, no=3

12. Number of people working in marketing:

Up to 10=1, more than 10=2

13. Contributing to exhibitions: Yes (regularly / irregularly)=1, no=2

(e) People:

1. Number of personnel (head office & branch):

Up to 10=1, 11-20=2, 21-30=3, 31-40=4, more than 41=5

2. Training programmes:

Yes, inside / outside of company=1, none=2

3. Budget for training:

Yes, there is certain budget=1, no budget=2

4. Participating in decision making:

Unions, workers=1, management=2, director=3

5. Qualifications of personnel:

Excellent=1, good=2, satisfactory=3, poor=4, very poor=5

6. Shipping backgrounds: Yes=1, no=2

(f) Physical evidence:

1. Total number of branches, agencies and locations:

Up to 10=1, more than 10=2

2. Location of offices, branches and agencies:

Italy, Greece, Turkey=1, Italy, Greece, Turkey and other European countries=2

3. Organisation chart:

Available=1, not available=2

(g) Process:

1. Method of selling tickets:

Keeping stock of tickets=1, on-line reservation system=2

2. Selling tickets via which outlets:

Agencies, branches=1, offices, representatives=2, others=3

Appendix 3: Questionnaire in Turkish

(a) Ürün

1. Toplam işletilen feri sayısı

2. İtalya-Yunanistan-Türkiye koridorunda işletilen feri sayısı

3. Ferilerin maksimum hızı (knot)

4. Ferilerin bayrağı:

   Türk=1, Yunan=2, Kıbrıs=3, Malta=4, diğerleri=5

5. Ferilerin işletmecisi:

   Türk=1, Yunan, İtalyan=2, diğerleri=3

6. Ferilerin toplam tonajı (grt)

7. Ferilerin ortalama tonajı (grt)

8. Ferilerin ortalama yaşı

9. Ferilerin yenilenmesi:

   Evet=1, hayır=2, (şayet 15'ten küçük ise 1'i seçiniz)

10. Ferilerde iyileştirme planınız:

    Var=1, yok=2

11. Feribot başına yolcu kapasitesi

12. Feribot başına araba kapasitesi

13. Yıl içinde sefer sezonu:

    Bütün sezonlar=1, bahar-yaz-sonbahar=2, yüksek sezon=3

14. 1994'te tek yön toplam sefer sayısı

15. Haftada gidiş-dönüş sefer sayısı:

    Bir kere=1, iki kere=2, iki kereden fazla=3

16. 1994'te toplam yolcu sayısı

17. 1994'te feri başına toplam yolcu sayısı

18. Sefer başına ortalama yolcu sayısı

19. Ferilerin ortalama doluluk yüzdesi (tek yön) (%)

20. Yolcuların genel durumu:

İşadamı=1, yabancı turist=2, yerli turist=3, Türk işçiler=4, diğerleri=5

21. Yolcuların genel seviyesi (standardı, işi, öğreneim durumu):

İyi=1, orta=2, kötü=3

22. Yolcuların genel tatmini:

İyi=1, yeterli=2, kötü=3

23. Hizmetin iyileştirilmesi için yolcuların bekledikleri:

Yolcular tatminkar=1, tatminkar değil=2, yorum yok=3, sorulmadı=4

24. Yoculara anket uygulaması:

Var=1, yok=2

25. Gemideki hizmetler:

İyi=1, yeterli=2, kötü=3

26. Ferilerin kalitesi:

İyi=1, yeterli=2, kötü=3

(b) Fiyat

1. Yıl içindeki fiyat değişimleri:

Evet, sezonsal=1, yok=2

2. Tek yön sefer için pulman koltuk yetişkin fiyatı:

(a) Venedik'ten Türkiye'ye (DM)

(b) Ancona'dan Türkiye'ye (DM)

(c) Bari'den Türkiye'ye (DM)

(d) Brindis'den Türkiye'ye (DM)

3. Çocuk için minimum yüksek sezon fiyatı:

(a) Venedik'ten Türkiye'ye (DM)

(b) Ancona'dan Türkiye'ye (DM)

(c) Bari'den Türkiye'ye (DM)

(d) Brindis'den Türkiye'ye (DM)

4. Araba için minimum yüksek sezon fiyatı:

(a) Venedik'ten Türkiye'ye (DM)

(b) Ancona'dan Türkiye'ye (DM)

(c) Bari'den Türkiye'ye (DM)

(d) Brindis'den Türkiye'ye (DM)

5. Devletten teşvik alınması:

Evet=1, hayır=2

6. Üyelikler:

Bir denizcilik grubu=1, Konferanslar=2, Konsorsiyum=3, yok=4

7. Şunlarla belirlenmiş bir fiyat:

Bir denizcilik grubu=1, Konferanslar=2, Konsorsiyum=3, yok=4

(c) Yer:

1. Uluslararası rotalar:

İtalya-Türkiye=1, İtalya-Yunanistan-Türkiye=2, Yunanistan-Türkiye=3

2. İtalya'dan Türkiye'ye işletilen rotalar:

Direkt=1, Yunanistan yoluyla indirekt=2

3. Şirket merkezinin yeri:

İtalya=1, Yunanistan=2, Türkiye=3, Almanya=4

4. Şubelerin yerleri:

İtalya+Yunanistan+Türkiye+diğerleri=1,

İtalya+Yunanistan, Yunanistan+Türkiye, İtalya+Türkiye=2,

İtalya, Yunanistan, Türkiye=3, hiçbiri=4

5. Acentelerin yerleri:

İtalya+Yunanistan+Türkiye+diğerleri=1,

İtalya+Yunanistan, Yunanistan+Türkiye, İtalya+Türkiye=2,

İtalya, Yunanistan, Türkiye=3, hiçbiri=4

(d) Tutundurma:

1. Promosyon için mallar:

Evet (takvim, kırtasiye, aksesuarlar v.s.)=1, yok=2

2. Promosyon için bütçe:

Evet, toplam bütçenin %5'ine kadar=1, toplam bütçenin %5'inden fazlası=2, yok=3

3. Reklam için medya kullanımı:

Evet, gazete/dergi=1, radyo/TV/diğer=2, yok=3

4. Reklam için bütçe:

Evet, toplam bütçenin %5'ine kadar=1, toplam bütçenin %5'inden fazlası=2, yok=3

5. Firmanın genel imajı:

Mükemmel=1, iyi=2, yeterli=3, kötü=4, çok kötü=5

6. Pazarlama istatistikleri:

Evet, mevcut=1, hayır, mevcut değil=2

7. Müşteri istatistikleri:

Evet, mevcut=1, hayır, mevcut değil=2

8. Müşterilere katalog dağıtımı:

Evet, genelde=1, bazen=2, nadiren=3

9. Satış promosyon faaliyetleri:

Evet, duruma bağlı olarak=1, yok=2

10. Aynı rotada rekabet ederken ek promosyon faaliyetleri:

Evet, mevcut=1, hayır, mevcut değil=2

11. Pazarlama için bütçe:

Evet, toplam bütçenin %5'ine kadar=1, toplam bütçenin %5'inden fazlası=2, yok=3

12. Pazarlama için çalışanların sayısı: 10'a kadar=1, 10'dan fazla=2

13. Fuarlara katılım: Evet (düzenli/düzensiz)=1, hayır=2

(e) Kişiler:

1. Personel sayısı (merkez ofis ve şubeler):

10'a kadar=1, 11-20=2, 21-30=3, 31-40=4, 41'den fazlası=4

2. Eğitim programları:

Evet, firma içi / dışı=1, yok=2

3. Eğitim için bütçe:

Evet, belirli bir bütçe var=1, hayır, yok=2

4. Karar vermeye katılım:

Sendikalar, çalışanlar=1, yönetim=2, müdür=3

5. Personelin kalifiyesi:

Mükemmel=1, iyi=2, yeterli=3, kötü=4, çok kötü=5

6. Denizcilik eğitimi olanlar: Evet var=1, yok=2

(f) Fiziksel karakter:

1. Toplam şube, acente ve ofislerin sayısı:

10'a kadar=1, 10'dan fazla=2

2. Ofislerin, şubelerin ve acentelerin yeri:

İtalya, Yunanistan, Türkiye=1, İtalya, Yunanistan, Türkiye ve diğer Avrupa ülkeleri=2

3. Organizasyon şeması: Mevcut=1, mevcut değil=2

(g) İşlem:

1. Biletlerin satış metodları:

Biletlerin stok edilmesi=1, on-line bilgi işlem rezervasyon sistemi=2

2. Biletlerin şu çıkış noktalarından satışı:

Acenteler, şubeler=1, ofisler, temsilcilikler=2, diğerleri=3

Appendix 4: Input and output programmes

(a) Input programme of data application into MDPREF

```
RUN NAME                 FERRY SERVICES RUN 1
TASK NAME                FULL SET
COMMENT                  WITH 9 STIMULI AS POINTS, 43 SUBJECTS AS VECTORS
N OF SUBJECTS            43
COMMENT                  9 COMPANIES WITH 43 CHARACTERISTICS
N OF STIMULI             9
DIMENSIONS               2
PRINT DATA               YES
PRINT                    ALL
INPUT FORMAT             (10X,9F2.0)
PARAMETERS               DATA TYPE(4), MATFORM(0)
COMMENT                  ASSUMPTION IS THAT "1" MEANS MOST 'PREFERRED'
COMMENT                  WHEN DATA TYPE = 4
READ MATRIX
          3.1.2.5.3.4.2.4.5.
          3.3.2.3.3.2.1.3.3.
          4.5.6.2.4.1.3.7.5.
          2.2.2.2.2.2.1.2.2.
          2.2.2.2.2.1.1.1.2.
          8.6.5.9.2.3.1.4.7.
          6.4.9.7.1.8.3.2.5.
          5.6.7.3.2.4.1.5.5.
          1.2.2.2.1.2.1.2.2.
          1.3.6.5.2.7.8.4.4.
          1.2.5.3.1.6.7.8.4.
          2.2.1.2.2.2.1.2.2.
          8.4.2.5.6.3.1.4.7.
          1.2.1.2.1.1.1.2.2.
          9.7.2.6.4.3.1.5.8.
          9.7.4.5.2.6.1.3.8.
          4.8.9.7.1.5.2.6.3.
          7.9.8.6.2.3.1.5.4.
          2.1.2.2.2.3.1.2.2.
          2.1.2.2.2.3.1.2.3.
          6.7.4.5.4.1.3.3.2.
          7.8.4.5.4.1.6.3.2.
          5.8.3.7.2.1.6.6.4.
          1.1.2.2.1.2.2.1.2.
          1.1.2.2.1.2.2.1.2.
          2.2.2.2.2.1.1.1.1.
          2.2.1.2.2.1.1.1.1.
          2.2.2.2.2.2.1.1.2.
          3.1.1.3.3.3.3.2.3.
          2.1.1.1.3.1.1.1.3.
          2.2.3.2.2.2.1.2.3.
          1.1.2.2.2.3.1.2.3.
          1.1.2.1.2.2.1.2.3.
          2.2.2.1.2.1.2.1.2.
          1.1.2.2.2.2.1.2.2.
          3.1.4.5.5.5.1.5.5.
          2.1.2.2.2.2.1.2.2.
          2.1.2.2.2.2.1.2.2.
          3.2.3.3.3.3.2.3.3.
          1.1.2.2.2.2.1.2.2.
          2.2.2.2.2.1.1.1.2.
          2.1.2.2.2.2.1.2.2.
          1.1.2.2.2.2.2.2.2.
COMPUTE
FINISH
```

(b) Output programme of data application into the MDPREF

```
MDPREF   VERSION 3.20   MDPREF   VERSION 3.20   MDPREF   VERSION 3.20   MDPREF   VERSION 3.20   MDPREF   VERSION 3.20
MDPREF   VERSION 3.20   MDPREF   VERSION 3.20   MDPREF   VERSION 3.20   MDPREF   VERSION 3.20   MDPREF   VERSION 3.20
MDPREF   VERSION 3.20   MDPREF   VERSION 3.20   MDPREF   VERSION 3.20   MDPREF   VERSION 3.20   MDPREF   VERSION 3.20
MDPREF   VERSION 3.20   MDPREF   VERSION 3.20   MDPREF   VERSION 3.20   MDPREF   VERSION 3.20   MDPREF   VERSION 3.20
MDPREF   VERSION 3.20   MDPREF   VERSION 3.20   MDPREF   VERSION 3.20   MDPREF   VERSION 3.20   MDPREF   VERSION 3.20
```

```
                                  ORIGINATOR:  J.DOUGLAS CARROLL
                                                  AND J-J. CHANG,
                                               BELL LABORATORIES,
                                               MURRAY HILL,
                                               NEW JERSEY 07974,
                                               U.S.A.
```

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+-------------------------------------------------------------------------------------+
```

FIRST SCORE MATRIX

SUBJECT STIMULUS

	1	2	3	4	5	6	7	8	9
1	3.0000	1.0000	2.0000	5.0000	3.0000	4.0000	2.0000	4.0000	5.0000
2	3.0000	3.0000	2.0000	3.0000	3.0000	2.0000	1.0000	3.0000	3.0000
3	4.0000	5.0000	6.0000	2.0000	4.0000	1.0000	3.0000	7.0000	5.0000
4	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	1.0000	2.0000	2.0000
5	2.0000	2.0000	2.0000	2.0000	2.0000	1.0000	1.0000	1.0000	2.0000
6	8.0000	6.0000	5.0000	9.0000	2.0000	3.0000	1.0000	4.0000	7.0000
7	6.0000	4.0000	9.0000	7.0000	1.0000	8.0000	3.0000	2.0000	5.0000
8	5.0000	6.0000	7.0000	3.0000	2.0000	4.0000	1.0000	5.0000	5.0000
9	1.0000	2.0000	2.0000	2.0000	1.0000	2.0000	1.0000	2.0000	2.0000
10	1.0000	3.0000	6.0000	5.0000	2.0000	7.0000	8.0000	4.0000	4.0000
11	1.0000	2.0000	5.0000	3.0000	1.0000	6.0000	7.0000	8.0000	4.0000
12	2.0000	2.0000	1.0000	2.0000	2.0000	2.0000	1.0000	2.0000	2.0000
13	8.0000	4.0000	2.0000	5.0000	6.0000	3.0000	1.0000	4.0000	7.0000
14	1.0000	2.0000	1.0000	2.0000	1.0000	1.0000	1.0000	2.0000	2.0000
15	9.0000	7.0000	2.0000	6.0000	4.0000	3.0000	1.0000	5.0000	8.0000
16	9.0000	7.0000	4.0000	5.0000	2.0000	6.0000	1.0000	3.0000	8.0000
17	4.0000	8.0000	9.0000	7.0000	1.0000	5.0000	2.0000	6.0000	3.0000
18	7.0000	9.0000	8.0000	6.0000	2.0000	3.0000	1.0000	5.0000	4.0000
19	2.0000	1.0000	2.0000	2.0000	2.0000	3.0000	1.0000	2.0000	2.0000
20	2.0000	1.0000	2.0000	2.0000	2.0000	3.0000	1.0000	2.0000	3.0000
21	6.0000	7.0000	4.0000	5.0000	4.0000	1.0000	3.0000	3.0000	2.0000
22	7.0000	8.0000	4.0000	5.0000	4.0000	1.0000	6.0000	3.0000	2.0000
23	5.0000	8.0000	3.0000	7.0000	2.0000	1.0000	6.0000	6.0000	4.0000
24	1.0000	1.0000	2.0000	2.0000	1.0000	2.0000	2.0000	1.0000	2.0000
25	1.0000	1.0000	2.0000	2.0000	1.0000	2.0000	2.0000	1.0000	2.0000
26	2.0000	2.0000	2.0000	2.0000	2.0000	1.0000	1.0000	1.0000	1.0000
27	2.0000	2.0000	1.0000	2.0000	2.0000	1.0000	1.0000	1.0000	1.0000
28	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	1.0000	1.0000	2.0000
29	3.0000	1.0000	1.0000	3.0000	3.0000	3.0000	3.0000	2.0000	3.0000
30	2.0000	1.0000	1.0000	1.0000	3.0000	1.0000	1.0000	1.0000	3.0000
31	2.0000	2.0000	3.0000	2.0000	2.0000	2.0000	1.0000	2.0000	3.0000
32	1.0000	1.0000	2.0000	2.0000	2.0000	3.0000	1.0000	2.0000	3.0000
33	1.0000	1.0000	2.0000	1.0000	2.0000	2.0000	1.0000	2.0000	3.0000
34	2.0000	2.0000	2.0000	1.0000	2.0000	1.0000	2.0000	1.0000	2.0000
35	1.0000	1.0000	2.0000	2.0000	2.0000	2.0000	1.0000	2.0000	2.0000
36	3.0000	1.0000	4.0000	5.0000	5.0000	5.0000	1.0000	5.0000	5.0000
37	2.0000	1.0000	2.0000	2.0000	2.0000	2.0000	1.0000	2.0000	2.0000
38	2.0000	1.0000	2.0000	2.0000	2.0000	2.0000	1.0000	2.0000	2.0000
39	3.0000	2.0000	3.0000	3.0000	3.0000	3.0000	2.0000	3.0000	3.0000
40	1.0000	1.0000	2.0000	2.0000	2.0000	2.0000	1.0000	2.0000	2.0000
41	2.0000	2.0000	2.0000	2.0000	2.0000	1.0000	1.0000	1.0000	2.0000
42	2.0000	1.0000	2.0000	2.0000	2.0000	2.0000	1.0000	2.0000	2.0000
43	1.0000	1.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000

SOLUTION IN 2 DIMENSIONS
****

CROSS PRODUCT MATRIX OF SUBJECTS

	1	2	3	4	5	6	7	8	9	10
1	109.0000									
2	77.0000	63.0000								
3	114.0000	98.0000	181.0000							
4	56.0000	45.0000	71.0000	33.0000						
5	48.0000	40.0000	63.0000	29.0000	27.0000					
6	156.0000	125.0000	187.0000	89.0000	82.0000	285.0000				
7	149.0000	112.0000	172.0000	87.0000	77.0000	252.0000	285.0000			
8	119.0000	101.0000	173.0000	75.0000	66.0000	210.0000	210.0000	190.0000		
9	50.0000	39.0000	63.0000	29.0000	25.0000	79.0000	80.0000	68.0000	27.0000	
10	129.0000	91.0000	152.0000	72.0000	61.0000	178.0000	217.0000	160.0000	69.0000	220.0000
11	123.0000	86.0000	157.0000	67.0000	53.0000	159.0000	186.0000	154.0000	65.0000	200.0000
12	54.0000	43.0000	65.0000	31.0000	27.0000	84.0000	78.0000	68.0000	27.0000	66.0000
13	140.0000	113.0000	167.0000	79.0000	72.0000	230.0000	193.0000	173.0000	65.0000	142.0000
14	44.0000	35.0000	56.0000	25.0000	22.0000	71.0000	63.0000	57.0000	23.0000	56.0000
15	154.0000	128.0000	192.0000	89.0000	81.0000	272.0000	223.0000	205.0000	76.0000	161.0000
16	151.0000	123.0000	183.0000	89.0000	80.0000	270.0000	252.0000	214.0000	78.0000	177.0000
17	139.0000	117.0000	196.0000	88.0000	77.0000	252.0000	260.0000	221.0000	83.0000	206.0000
18	136.0000	122.0000	202.0000	89.0000	81.0000	266.0000	251.0000	225.0000	80.0000	181.0000
19	59.0000	44.0000	67.0000	33.0000	28.0000	86.0000	91.0000	73.0000	29.0000	76.0000
20	64.0000	47.0000	72.0000	35.0000	30.0000	93.0000	96.0000	78.0000	31.0000	80.0000
21	102.0000	94.0000	150.0000	67.0000	63.0000	195.0000	172.0000	155.0000	57.0000	135.0000
22	112.0000	103.0000	168.0000	74.0000	70.0000	212.0000	191.0000	169.0000	63.0000	163.0000
23	130.0000	110.0000	181.0000	78.0000	71.0000	231.0000	198.0000	179.0000	71.0000	181.0000
24	47.0000	34.0000	54.0000	26.0000	23.0000	70.0000	77.0000	58.0000	24.0000	70.0000
25	47.0000	34.0000	54.0000	26.0000	23.0000	70.0000	77.0000	58.0000	24.0000	70.0000
26	43.0000	37.0000	58.0000	27.0000	25.0000	75.0000	72.0000	61.0000	23.0000	57.0000
27	41.0000	35.0000	52.0000	25.0000	23.0000	70.0000	63.0000	54.0000	21.0000	51.0000
28	52.0000	42.0000	64.0000	31.0000	28.0000	85.0000	85.0000	70.0000	27.0000	68.0000
29	77.0000	56.0000	82.0000	41.0000	36.0000	109.0000	107.0000	83.0000	35.0000	98.0000
30	48.0000	38.0000	59.0000	27.0000	25.0000	71.0000	63.0000	57.0000	22.0000	53.0000
31	63.0000	50.0000	82.0000	37.0000	33.0000	101.0000	101.0000	87.0000	33.0000	82.0000
32	61.0000	44.0000	68.0000	33.0000	28.0000	85.0000	90.0000	73.0000	30.0000	79.0000
33	52.0000	39.0000	65.0000	29.0000	25.0000	73.0000	75.0000	66.0000	26.0000	67.0000
34	45.0000	38.0000	64.0000	28.0000	26.0000	74.0000	73.0000	64.0000	24.0000	64.0000
35	52.0000	39.0000	62.0000	29.0000	25.0000	75.0000	77.0000	64.0000	26.0000	68.0000
36	125.0000	91.0000	139.0000	67.0000	57.0000	176.0000	176.0000	145.0000	59.0000	148.0000
37	55.0000	42.0000	66.0000	31.0000	27.0000	83.0000	83.0000	69.0000	27.0000	69.0000
38	55.0000	42.0000	66.0000	31.0000	27.0000	83.0000	83.0000	69.0000	27.0000	69.0000
39	84.0000	65.0000	103.0000	48.0000	42.0000	128.0000	128.0000	107.0000	42.0000	109.0000
40	52.0000	39.0000	62.0000	29.0000	25.0000	75.0000	77.0000	64.0000	26.0000	68.0000
41	48.0000	40.0000	63.0000	29.0000	27.0000	82.0000	77.0000	66.0000	25.0000	61.0000
42	55.0000	42.0000	66.0000	31.0000	27.0000	83.0000	83.0000	69.0000	27.0000	69.0000
43	54.0000	40.0000	65.0000	30.0000	26.0000	76.0000	80.0000	65.0000	27.0000	76.0000

	11	12	13	14	15	16	17	18	19	20
11	205.0000									
12	62.0000	30.0000								
13	132.0000	77.0000	220.0000							
14	54.0000	24.0000	60.0000	21.0000						
15	152.0000	87.0000	244.0000	71.0000	285.0000					
16	159.0000	85.0000	232.0000	68.0000	274.0000	285.0000				
17	191.0000	79.0000	185.0000	69.0000	227.0000	239.0000	285.0000			
18	166.0000	81.0000	208.0000	69.0000	253.0000	258.0000	275.0000	285.0000		
19	71.0000	31.0000	78.0000	24.0000	85.0000	88.0000	85.0000	83.0000	35.0000	
20	75.0000	33.0000	85.0000	26.0000	93.0000	96.0000	88.0000	87.0000	37.0000	40.0000
21	118.0000	63.0000	165.0000	52.0000	194.0000	186.0000	190.0000	204.0000	61.0000	63.0000
22	142.0000	70.0000	180.0000	58.0000	213.0000	205.0000	208.0000	223.0000	67.0000	69.0000
23	171.0000	75.0000	186.0000	67.0000	228.0000	214.0000	227.0000	232.0000	71.0000	75.0000
24	62.0000	24.0000	58.0000	20.0000	65.0000	69.0000	71.0000	67.0000	27.0000	29.0000
25	62.0000	24.0000	58.0000	20.0000	65.0000	69.0000	71.0000	67.0000	27.0000	29.0000
26	49.0000	25.0000	65.0000	20.0000	73.0000	72.0000	74.0000	77.0000	26.0000	27.0000
27	44.0000	24.0000	63.0000	19.0000	71.0000	68.0000	65.0000	69.0000	24.0000	25.0000
28	59.0000	29.0000	75.0000	23.0000	84.0000	86.0000	82.0000	84.0000	31.0000	33.0000
29	89.0000	40.0000	104.0000	31.0000	112.0000	110.0000	95.0000	96.0000	43.0000	46.0000
30	48.0000	26.0000	74.0000	20.0000	78.0000	74.0000	57.0000	64.0000	27.0000	30.0000
31	76.0000	34.0000	88.0000	28.0000	99.0000	101.0000	100.0000	101.0000	37.0000	40.0000
32	74.0000	31.0000	77.0000	25.0000	84.0000	87.0000	84.0000	80.0000	35.0000	38.0000
33	65.0000	27.0000	69.0000	22.0000	75.0000	76.0000	72.0000	71.0000	30.0000	33.0000
34	57.0000	26.0000	68.0000	21.0000	76.0000	76.0000	72.0000	76.0000	27.0000	29.0000
35	64.0000	27.0000	67.0000	22.0000	73.0000	73.0000	76.0000	73.0000	30.0000	32.0000
36	142.0000	63.0000	162.0000	50.0000	173.0000	171.0000	168.0000	163.0000	71.0000	76.0000
37	65.0000	29.0000	75.0000	23.0000	82.0000	82.0000	80.0000	80.0000	32.0000	34.0000
38	65.0000	29.0000	75.0000	23.0000	82.0000	82.0000	80.0000	80.0000	32.0000	34.0000
39	102.0000	45.0000	115.0000	36.0000	127.0000	127.0000	125.0000	125.0000	49.0000	52.0000
40	64.0000	27.0000	67.0000	22.0000	73.0000	73.0000	76.0000	73.0000	30.0000	32.0000
41	53.0000	27.0000	72.0000	22.0000	81.0000	80.0000	77.0000	81.0000	28.0000	30.0000
42	65.0000	29.0000	75.0000	23.0000	82.0000	82.0000	80.0000	80.0000	32.0000	34.0000
43	71.0000	28.0000	68.0000	23.0000	74.0000	74.0000	78.0000	74.0000	31.0000	33.0000

	21	22	23	24	25	26	27	28	29	30
21	165.0000									
22	187.0000	220.0000								
23	186.0000	217.0000	240.0000							
24	50.0000	58.0000	63.0000	24.0000						
25	50.0000	58.0000	63.0000	24.0000	24.0000					
26	61.0000	68.0000	67.0000	21.0000	21.0000	24.0000				
27	57.0000	64.0000	64.0000	19.0000	19.0000	22.0000	21.0000			
28	64.0000	71.0000	72.0000	25.0000	25.0000	26.0000	24.0000	30.0000		
29	80.0000	93.0000	98.0000	35.0000	35.0000	33.0000	32.0000	39.0000	60.0000	
30	53.0000	59.0000	59.0000	21.0000	21.0000	22.0000	21.0000	26.0000	37.0000	28.0000
31	73.0000	80.0000	85.0000	30.0000	30.0000	30.0000	27.0000	35.0000	45.0000	31.0000
32	57.0000	62.0000	70.0000	28.0000	28.0000	25.0000	23.0000	31.0000	43.0000	28.0000
33	51.0000	56.0000	62.0000	24.0000	24.0000	22.0000	20.0000	27.0000	37.0000	26.0000
34	61.0000	71.0000	70.0000	23.0000	23.0000	24.0000	22.0000	27.0000	36.0000	25.0000
35	54.0000	59.0000	65.0000	24.0000	24.0000	23.0000	21.0000	27.0000	37.0000	24.0000
36	119.0000	126.0000	141.0000	54.0000	54.0000	52.0000	48.0000	62.0000	87.0000	57.0000
37	60.0000	66.0000	70.0000	25.0000	25.0000	25.0000	23.0000	29.0000	40.0000	26.0000
38	60.0000	66.0000	70.0000	25.0000	25.0000	25.0000	23.0000	29.0000	40.0000	26.0000
39	95.0000	106.0000	112.0000	39.0000	39.0000	39.0000	36.0000	45.0000	62.0000	40.0000
40	54.0000	59.0000	65.0000	24.0000	24.0000	23.0000	21.0000	27.0000	37.0000	24.0000
41	63.0000	70.0000	71.0000	23.0000	23.0000	25.0000	23.0000	28.0000	36.0000	25.0000
42	60.0000	66.0000	70.0000	25.0000	25.0000	25.0000	23.0000	29.0000	40.0000	26.0000
43	57.0000	65.0000	71.0000	26.0000	26.0000	24.0000	22.0000	28.0000	40.0000	25.0000

	31	32	33	34	35	36	37	38	39	40
31	43.0000									
32	38.0000	37.0000								
33	34.0000	32.0000	29.0000							
34	32.0000	27.0000	25.0000	27.0000						
35	33.0000	31.0000	27.0000	24.0000	27.0000					
36	76.0000	73.0000	63.0000	53.0000	63.0000	152.0000				
37	35.0000	32.0000	28.0000	26.0000	28.0000	66.0000	30.0000			
38	35.0000	32.0000	28.0000	26.0000	28.0000	66.0000	30.0000	30.0000		
39	54.0000	49.0000	43.0000	41.0000	43.0000	100.0000	46.0000	46.0000	71.0000	
40	33.0000	31.0000	27.0000	24.0000	27.0000	63.0000	28.0000	28.0000	43.0000	27.0000
41	33.0000	28.0000	25.0000	26.0000	25.0000	57.0000	27.0000	27.0000	42.0000	25.0000
42	35.0000	32.0000	28.0000	26.0000	28.0000	66.0000	30.0000	30.0000	46.0000	28.0000
43	34.0000	32.0000	28.0000	26.0000	28.0000	64.0000	29.0000	29.0000	45.0000	28.0000

	41	42	43
41	27.0000		
42	27.0000	30.0000	
43	26.0000	29.0000	30.0000

CORRELATION MATRIX OF SUBJECTS

	1	2	3	4	5	6	7	8	9	10
1	1.0000									
2	0.9292	1.0000								
3	0.8116	0.9177	1.0000							
4	0.9337	0.9869	0.9187	1.0000						
5	0.8848	0.9699	0.9012	0.9715	1.0000					
6	0.8851	0.9329	0.8233	0.9177	0.9348	1.0000				
7	0.8454	0.8358	0.7573	0.8971	0.8778	0.8842	1.0000			
8	0.8269	0.9232	0.9329	0.9472	0.9215	0.9024	0.9024	1.0000		
9	0.9217	0.9456	0.9012	0.9715	0.9259	0.9006	0.9120	0.9494	1.0000	
10	0.8330	0.7730	0.7617	0.8450	0.7915	0.7109	0.8666	0.7826	0.8953	1.0000
11	0.8228	0.7567	0.8150	0.8146	0.7124	0.6578	0.7695	0.7803	0.8737	0.9418
12	0.9443	0.9891	0.8821	0.9852	0.9487	0.9084	0.8436	0.9007	0.9487	0.8124
13	0.9041	0.9598	0.8369	0.9272	0.9342	0.9185	0.7708	0.8462	0.8434	0.6455
14	0.9197	0.9623	0.9083	0.9497	0.9239	0.9178	0.8143	0.9024	0.9659	0.8239
15	0.8737	0.9553	0.8454	0.9177	0.9234	0.9544	0.7825	0.8810	0.8664	0.6430
16	0.8567	0.9179	0.8057	0.9177	0.9120	0.9474	0.8842	0.9196	0.8892	0.7069
17	0.7886	0.8732	0.8630	0.9074	0.8778	0.8842	0.9123	0.9497	0.9462	0.8227
18	0.7716	0.9105	0.8894	0.9177	0.9234	0.9333	0.8807	0.9669	0.9120	0.7228
19	0.9552	0.9370	0.8418	0.9710	0.9108	0.8611	0.9111	0.8952	0.9434	0.8661
20	0.9693	0.9363	0.8462	0.9633	0.9129	0.8710	0.8991	0.8947	0.9433	0.8528
21	0.7606	0.9220	0.8680	0.9080	0.9439	0.8992	0.7932	0.8754	0.8540	0.7086
22	0.7233	0.8749	0.8419	0.8685	0.9082	0.8466	0.7628	0.8266	0.8174	0.7409
23	0.8038	0.8946	0.8684	0.8765	0.8820	0.8833	0.7571	0.8382	0.8820	0.7877
24	0.9189	0.8744	0.8193	0.9239	0.9035	0.8464	0.9310	0.8589	0.9428	0.9633
25	0.9189	0.8744	0.8193	0.9239	0.9035	0.8464	0.9310	0.8589	0.9428	0.9633
26	0.8407	0.9515	0.8800	0.9594	0.9821	0.9068	0.8706	0.9033	0.9035	0.7844
27	0.8570	0.9623	0.8434	0.9497	0.9659	0.9048	0.8143	0.8549	0.8819	0.7503
28	0.9093	0.9661	0.8685	0.9852	0.9838	0.9193	0.9193	0.9272	0.9487	0.8370
29	0.9521	0.9108	0.7869	0.9214	0.8944	0.8335	0.8182	0.7774	0.8696	0.8530
30	0.8689	0.9048	0.8288	0.8882	0.9092	0.7948	0.7052	0.7815	0.8001	0.6753
31	0.9202	0.9607	0.9295	0.9822	0.9685	0.9124	0.9124	0.9625	0.9685	0.8431
32	0.9605	0.9113	0.8309	0.9444	0.8859	0.8277	0.8764	0.8707	0.9492	0.8756
33	0.9249	0.9124	0.8972	0.9374	0.8934	0.8030	0.8250	0.8891	0.9292	0.8388
34	0.8295	0.9214	0.9155	0.9380	0.9630	0.8436	0.8322	0.8936	0.8889	0.8304
35	0.9585	0.9456	0.8869	0.9715	0.9259	0.8550	0.8778	0.8936	0.9630	0.8823
36	0.9711	0.9299	0.8380	0.9460	0.8898	0.8456	0.8456	0.8532	0.9210	0.8093
37	0.9618	0.9661	0.8957	0.9852	0.9487	0.8976	0.8976	0.9139	0.9487	0.8493
38	0.9618	0.9661	0.8957	0.9852	0.9487	0.8976	0.8976	0.9139	0.9487	0.8493
39	0.9549	0.9719	0.9086	0.9916	0.9593	0.8998	0.8998	0.9213	0.9593	0.8721
40	0.9585	0.9456	0.8869	0.9715	0.9259	0.8550	0.8778	0.8936	0.9630	0.8823
41	0.8848	0.9699	0.9012	0.9715	1.0000	0.9348	0.8778	0.9215	0.9259	0.7915
42	0.9618	0.9661	0.8957	0.9852	0.9487	0.8976	0.8976	0.9139	0.9487	0.8493
43	0.9443	0.9201	0.8821	0.9535	0.9135	0.8219	0.8652	0.8609	0.9487	0.9355

	11	12	13	14	15	16	17	18	19	20
11	1.0000									
12	0.7906	1.0000								
13	0.6216	0.9478	1.0000							
14	0.8230	0.9562	0.8827	1.0000						
15	0.6288	0.9409	0.9744	0.9178	1.0000					
16	0.6578	0.9193	0.9265	0.8790	0.9614	1.0000				
17	0.7902	0.8544	0.7388	0.8919	0.7965	0.8386	1.0000			
18	0.6868	0.8760	0.8307	0.8919	0.8877	0.9053	0.9649	1.0000		
19	0.8382	0.9567	0.8889	0.8853	0.8511	0.8811	0.8511	0.8310	1.0000	
20	0.8282	0.9526	0.9061	0.8971	0.8710	0.8991	0.8242	0.8148	0.9889	1.0000
21	0.6416	0.8954	0.8660	0.8834	0.8946	0.8577	0.8762	0.9407	0.8027	0.7755
22	0.6687	0.8616	0.8182	0.8533	0.8506	0.8187	0.8307	0.8906	0.7635	0.7355
23	0.7709	0.8839	0.8095	0.9438	0.8718	0.8182	0.8680	0.8871	0.7747	0.7655
24	0.8839	0.8944	0.7982	0.8909	0.7859	0.8343	0.8585	0.8101	0.9316	0.9360
25	0.8839	0.8944	0.7982	0.8909	0.7859	0.8343	0.8585	0.8101	0.9316	0.9360
26	0.6986	0.9317	0.8945	0.8909	0.8827	0.8706	0.8948	0.9310	0.8971	0.8714
27	0.6706	0.9562	0.9269	0.9048	0.9178	0.8790	0.8402	0.8919	0.8853	0.8626
28	0.7523	0.9667	0.9232	0.9163	0.9084	0.9301	0.8868	0.9084	0.9567	0.9526
29	0.8025	0.9428	0.9052	0.8733	0.8565	0.8412	0.7265	0.7341	0.9383	0.9390
30	0.6336	0.8971	0.9428	0.8248	0.8732	0.8284	0.6381	0.7164	0.8625	0.8964
31	0.8095	0.9466	0.9048	0.9318	0.8943	0.9124	0.9033	0.9124	0.9537	0.9645
32	0.8497	0.9305	0.8535	0.8969	0.8180	0.8472	0.8180	0.7791	0.9726	0.9878
33	0.8430	0.9154	0.8639	0.8915	0.8250	0.8360	0.7920	0.7810	0.9416	0.9689
34	0.7662	0.9135	0.8823	0.8819	0.8664	0.8664	0.8208	0.8664	0.8783	0.8824
35	0.8602	0.9487	0.8693	0.9239	0.8322	0.8322	0.8664	0.8322	0.9759	0.9737
36	0.8044	0.9329	0.8859	0.8850	0.8312	0.8216	0.8072	0.7831	0.9734	0.9747
37	0.8288	0.9667	0.9232	0.9163	0.8868	0.8868	0.8652	0.8652	0.9875	0.9815
38	0.8288	0.9667	0.9232	0.9163	0.8868	0.8868	0.8652	0.8652	0.9875	0.9815
39	0.8455	0.9750	0.9201	0.9323	0.8928	0.8928	0.8787	0.8787	0.9830	0.9758
40	0.8602	0.9487	0.8693	0.9239	0.8322	0.8322	0.8664	0.8322	0.9759	0.9737
41	0.7124	0.9487	0.9342	0.9239	0.9234	0.9120	0.8778	0.9234	0.9108	0.9129
42	0.8288	0.9667	0.9232	0.9163	0.8868	0.8868	0.8652	0.8652	0.9875	0.9815
43	0.9054	0.9333	0.8370	0.9163	0.8003	0.8003	0.8436	0.8003	0.9567	0.9526

	21	22	23	24	25	26	27	28	29	30
21	1.0000									
22	0.9815	1.0000								
23	0.9347	0.9444	1.0000							
24	0.7946	0.7982	0.8301	1.0000						
25	0.7946	0.7982	0.8301	1.0000	1.0000					
26	0.9694	0.9358	0.8828	0.8750	0.8750	1.0000				
27	0.9683	0.9416	0.9015	0.8463	0.8463	0.9800	1.0000			
28	0.9097	0.8739	0.8485	0.9317	0.9317	0.9690	0.9562	1.0000		
29	0.8040	0.8095	0.8167	0.9223	0.9223	0.8696	0.9015	0.9192	1.0000	
30	0.7797	0.7517	0.7197	0.8101	0.8101	0.8487	0.8660	0.8971	0.9027	1.0000
31	0.8667	0.8225	0.8367	0.9339	0.9339	0.9339	0.8985	0.9745	0.8859	0.8934
32	0.7295	0.6872	0.7428	0.9396	0.9396	0.8389	0.8251	0.9305	0.9126	0.8699
33	0.7373	0.7011	0.7432	0.9097	0.9097	0.8339	0.8104	0.9154	0.8870	0.9124
34	0.9139	0.9212	0.8696	0.9035	0.9035	0.9428	0.9239	0.9487	0.8944	0.9092
35	0.8090	0.7655	0.8075	0.9428	0.9428	0.9035	0.8819	0.9487	0.9193	0.8729
36	0.7514	0.6890	0.7382	0.8941	0.8941	0.8609	0.8496	0.9181	0.9110	0.8737
37	0.8528	0.8124	0.8250	0.9317	0.9317	0.9317	0.9163	0.9667	0.9428	0.8971
38	0.8528	0.8124	0.8250	0.9317	0.9317	0.9317	0.9163	0.9667	0.9428	0.8971
39	0.8777	0.8481	0.8580	0.9448	0.9448	0.9448	0.9323	0.9750	0.9499	0.8971
40	0.8090	0.7655	0.8075	0.9428	0.9428	0.9035	0.8819	0.9487	0.9193	0.8729
41	0.9439	0.9082	0.8820	0.9035	0.9035	0.9821	0.9659	0.9838	0.8944	0.9092
42	0.8528	0.8124	0.8250	0.9317	0.9317	0.9317	0.9163	0.9667	0.9428	0.8971
43	0.8102	0.8001	0.8367	0.9690	0.9690	0.8944	0.8765	0.9333	0.9428	0.8626

	31	32	33	34	35	36	37	38	39	40
31	1.0000									
32	0.9527	1.0000								
33	0.9628	0.9769	1.0000							
34	0.9391	0.8542	0.8934	1.0000						
35	0.9685	0.9808	0.9649	0.8889	1.0000					
36	0.9401	0.9734	0.9489	0.8273	0.9834	1.0000				
37	0.9745	0.9605	0.9493	0.9135	0.9838	0.9774	1.0000			
38	0.9745	0.9605	0.9493	0.9135	0.9838	0.9774	1.0000	1.0000		
39	0.9773	0.9560	0.9476	0.9364	0.9821	0.9626	0.9967	0.9967	1.0000	
40	0.9685	0.9808	0.9649	0.8889	1.0000	0.9834	0.9838	0.9838	0.9821	1.0000
41	0.9685	0.8859	0.8934	0.9630	0.9259	0.8898	0.9487	0.9487	0.9593	0.9259
42	0.9745	0.9605	0.9493	0.9135	0.9838	0.9774	1.0000	1.0000	0.9967	0.9838
43	0.9466	0.9605	0.9493	0.9135	0.9838	0.9478	0.9667	0.9667	0.9750	0.9838

	41	42	43
41	1.0000		
42	0.9487	1.0000	
43	0.9135	0.9667	1.0000

CROSS PRODUCT MATRIX OF STIMULI

	1	2	3	4	5	6	7	8	9
1	658.0000								
2	601.0000	635.0000							
3	502.0000	528.0000	585.0000						
4	584.0000	563.0000	533.0000	611.0000					
5	360.0000	315.0000	293.0000	339.0000	277.0000				
6	394.0000	361.0000	438.0000	436.0000	252.0000	419.0000			
7	260.0000	290.0000	300.0000	308.0000	186.0000	253.0000	277.0000		
8	454.0000	464.0000	464.0000	475.0000	300.0000	371.0000	288.0000	471.0000	
9	564.0000	499.0000	483.0000	542.0000	350.0000	432.0000	269.0000	466.0000	574.0000

CORRELATION MATRIX OF STIMULI

	1	2	3	4	5	6	7	8	9
1	1.0000								
2	0.9298	1.0000							
3	0.8091	0.8663	1.0000						
4	0.9210	0.9039	0.8915	1.0000					
5	0.8432	0.7511	0.7279	0.8240	1.0000				
6	0.7504	0.6999	0.8847	0.8617	0.7397	1.0000			
7	0.6090	0.6915	0.7453	0.7487	0.6715	0.7426	1.0000		
8	0.8155	0.8484	0.8840	0.8854	0.8306	0.8351	0.7973	1.0000	
9	0.9177	0.8265	0.8335	0.9152	0.8778	0.8809	0.6746	0.8962	1.0000

SECOND SCORE MATRIX

SUBJECT STIMULUS

	1	2	3	4	5	6	7	8	9
1	0.2968	0.3078	0.4052	0.3739	0.2184	0.3656	0.2755	0.3591	0.3564
2	0.4313	0.4091	0.3368	0.3895	0.2380	0.2521	0.1721	0.3086	0.3694
3	0.3725	0.3654	0.3709	0.3852	0.2308	0.3063	0.2211	0.3342	0.3662
4	0.3668	0.3611	0.3738	0.3846	0.2299	0.3112	0.2255	0.3364	0.3656
5	0.4360	0.4125	0.3338	0.3896	0.2385	0.2474	0.1679	0.3063	0.3694
6	0.4881	0.4499	0.2958	0.3886	0.2425	0.1907	0.1175	0.2770	0.3677
7	0.2880	0.3010	0.4086	0.3722	0.2168	0.3718	0.2813	0.3615	0.3549
8	0.3907	0.3790	0.3612	0.3870	0.2333	0.2904	0.2067	0.3270	0.3676
9	0.2965	0.3076	0.4053	0.3738	0.2183	0.3658	0.2757	0.3592	0.3563
10	0.0739	0.1312	0.4603	0.3125	0.1675	0.4891	0.3940	0.3936	0.3005
11	0.0417	0.1050	0.4635	0.3008	0.1587	0.5017	0.4068	0.3945	0.2896
12	0.3951	0.3823	0.3587	0.3874	0.2338	0.2864	0.2031	0.3251	0.3679
13	0.5086	0.4643	0.2784	0.3867	0.2433	0.1657	0.0954	0.2634	0.3656
14	0.3808	0.3716	0.3666	0.3861	0.2319	0.2992	0.2146	0.3310	0.3669
15	0.5304	0.4793	0.2580	0.3835	0.2435	0.1370	0.0703	0.2473	0.3622
16	0.4857	0.4482	0.2977	0.3887	0.2424	0.1935	0.1200	0.2785	0.3679
17	0.3413	0.3418	0.3862	0.3812	0.2260	0.3321	0.2446	0.3455	0.3628
18	0.4694	0.4366	0.3103	0.3895	0.2414	0.2121	0.1364	0.2883	0.3689
19	0.2779	0.2932	0.4124	0.3702	0.2149	0.3788	0.2878	0.3641	0.3531
20	0.2886	0.3015	0.4084	0.3723	0.2169	0.3714	0.2809	0.3613	0.3550
21	0.5070	0.4632	0.2798	0.3869	0.2432	0.1677	0.0972	0.2644	0.3658
22	0.4849	0.4477	0.2983	0.3888	0.2423	0.1944	0.1208	0.2789	0.3679
23	0.4333	0.4105	0.3355	0.3895	0.2382	0.2501	0.1703	0.3076	0.3694
24	0.2092	0.2395	0.4342	0.3542	0.2007	0.4222	0.3287	0.3788	0.3387
25	0.2092	0.2395	0.4342	0.3542	0.2007	0.4222	0.3287	0.3788	0.3387
26	0.4355	0.4121	0.3341	0.3896	0.2385	0.2479	0.1684	0.3065	0.3694
27	0.4712	0.4379	0.3090	0.3894	0.2415	0.2100	0.1346	0.2872	0.3688
28	0.3877	0.3768	0.3628	0.3867	0.2329	0.2931	0.2091	0.3282	0.3674
29	0.3111	0.3188	0.3994	0.3765	0.2210	0.3551	0.2658	0.3550	0.3586
30	0.4366	0.4129	0.3334	0.3896	0.2386	0.2468	0.1674	0.3060	0.3695
31	0.3472	0.3463	0.3834	0.3821	0.2270	0.3273	0.2403	0.3434	0.3635
32	0.2262	0.2529	0.4294	0.3585	0.2044	0.4121	0.3191	0.3757	0.3426
33	0.2535	0.2743	0.4208	0.3650	0.2101	0.3950	0.3029	0.3700	0.3484
34	0.3872	0.3765	0.3631	0.3867	0.2328	0.2935	0.2095	0.3284	0.3674
35	0.2552	0.2756	0.4203	0.3654	0.2104	0.3939	0.3019	0.3696	0.3488
36	0.2738	0.2900	0.4138	0.3694	0.2141	0.3816	0.2904	0.3652	0.3523
37	0.3231	0.3280	0.3944	0.3785	0.2230	0.3462	0.2576	0.3514	0.3604
38	0.3231	0.3280	0.3944	0.3785	0.2230	0.3462	0.2576	0.3514	0.3604
39	0.3244	0.3290	0.3938	0.3787	0.2233	0.3452	0.2567	0.3510	0.3606
40	0.2552	0.2756	0.4203	0.3654	0.2104	0.3939	0.3019	0.3696	0.3488
41	0.4360	0.4125	0.3338	0.3896	0.2385	0.2474	0.1679	0.3063	0.3694
42	0.3231	0.3280	0.3944	0.3785	0.2230	0.3462	0.2576	0.3514	0.3604
43	0.2124	0.2421	0.4333	0.3551	0.2014	0.4203	0.3269	0.3783	0.3395

RESIDUALS MATRIX (FIRST SCORE - SECOND SCORE)

	1	2	3	4	5	6	7	8	9
1	2.7032	0.6922	1.5948	4.6261	2.7816	3.6344	1.7245	3.6409	4.6436
2	2.5687	2.5909	1.6632	2.6105	2.7620	1.7479	0.8279	2.6914	2.6306
3	3.6275	4.6346	5.6291	1.6148	3.7692	0.6937	2.7789	6.6658	4.6338
4	1.6332	1.6389	1.6262	1.6154	1.7701	1.6888	0.7745	1.6636	1.6344
5	1.5640	1.5875	1.6662	1.6104	1.7615	0.7526	0.8321	0.6937	1.6306
6	7.5119	5.5501	4.7042	8.6114	1.7575	2.8093	0.8825	3.7230	6.6323
7	5.7120	3.6990	8.5914	6.6278	0.7832	7.6282	2.7187	1.6385	4.6451
8	4.6093	5.6210	6.6388	2.6130	1.7667	3.7096	0.7933	4.6730	4.6324
9	0.7035	1.6924	1.5947	1.6262	0.7817	1.6342	0.7243	1.6408	1.6437
10	0.9261	2.8688	5.5397	4.6875	1.8325	6.5109	7.6060	3.6064	3.6995
11	0.9583	1.8950	4.5365	2.6992	0.8413	5.4983	6.5932	7.6055	3.7104
12	1.6049	1.6177	0.6413	1.6126	1.7662	1.7136	0.7969	1.6749	1.6321
13	7.4914	3.5357	1.7216	4.6133	5.7567	2.8343	0.9046	3.7366	6.6344
14	0.6192	1.6284	0.6334	1.6139	0.7681	0.7008	0.7854	1.6690	1.6331
15	8.4696	6.5207	1.7420	5.6165	3.7565	2.8630	0.9297	4.7527	7.6378
16	8.5143	6.5518	3.7023	4.6113	1.7576	5.8065	0.8800	2.7215	7.6321
17	3.6587	7.6582	8.6138	6.6188	0.7740	4.6679	1.7554	5.6545	2.6372
18	6.5306	8.5634	7.6897	5.6105	1.7586	2.7879	0.8636	4.7117	3.6311
19	1.7221	0.7068	1.5876	1.6298	1.7851	2.6212	0.7122	1.6359	1.6469
20	1.7114	0.6985	1.5916	1.6277	1.7831	2.6286	0.7191	1.6387	2.6450
21	5.4930	6.5368	3.7202	4.6131	3.7568	0.8323	2.9028	2.7356	1.6342
22	6.5151	7.5523	3.7017	4.6112	3.7577	0.8056	5.8792	2.7211	1.6321
23	4.5667	7.5895	2.6645	6.6105	1.7618	0.7499	5.8297	5.6924	3.6306
24	0.7908	0.7605	1.5658	1.6458	0.7993	1.5778	1.6713	0.6212	1.6613
25	0.7908	0.7605	1.5658	1.6458	0.7993	1.5778	1.6713	0.6212	1.6613
26	1.5645	1.5879	1.6659	1.6104	1.7615	0.7521	0.8316	0.6935	0.6306
27	1.5288	1.5621	0.6910	1.6106	1.7585	0.7900	0.8654	0.7128	0.6312
28	1.6123	1.6232	1.6372	1.6133	1.7671	1.7069	0.7909	0.6718	1.6326
29	2.6889	0.6812	0.6006	2.6235	2.7790	2.6449	2.7342	1.6450	2.6414
30	1.5634	0.5871	0.6666	0.6104	2.7614	0.7532	0.8326	0.6940	2.6305
31	1.6528	1.6537	2.6166	1.6179	1.7730	1.6727	0.7597	1.6566	2.6365
32	0.7738	0.7471	1.5706	1.6415	1.7956	2.5879	0.6809	1.6243	2.6574
33	0.7465	0.7257	1.5792	0.6350	1.7899	1.6050	0.6971	1.6300	2.6516
34	1.6128	1.6235	1.6369	0.6133	1.7672	0.7065	1.7905	0.6716	1.6326
35	0.7448	0.7244	1.5797	1.6346	1.7896	1.6061	0.6981	1.6304	1.6512
36	2.7262	0.7100	3.5862	4.6306	4.7859	4.6184	0.7096	4.6348	4.6477
37	1.6769	0.6720	1.6056	1.6215	1.7770	1.6538	0.7424	1.6486	1.6396
38	1.6769	0.6720	1.6056	1.6215	1.7770	1.6538	0.7424	1.6486	1.6396
39	2.6756	1.6710	2.6062	2.6213	2.7767	2.6548	1.7433	2.6490	2.6394
40	0.7448	0.7244	1.5797	1.6346	1.7896	1.6061	0.6981	1.6304	1.6512
41	1.5640	1.5875	1.6662	1.6104	1.7615	0.7526	0.8321	0.6937	1.6306
42	1.6769	0.6720	1.6056	1.6215	1.7770	1.6538	0.7424	1.6486	1.6396
43	0.7876	0.7579	1.5667	1.6449	1.7986	1.5797	1.6731	1.6217	1.6605

SUBJECT MATRIX

	DIMENSION 1	DIMENSION 2
1	0.9869	0.1613
2	0.9965	-0.0834
3	0.9996	0.0288
4	0.9992	0.0393
5	0.9957	-0.0928
6	0.9794	-0.2019
7	0.9844	0.1759
8	1.0000	-0.0048
9	0.9868	0.1618
10	0.8699	0.4932
11	0.8448	0.5351
12	0.9999	-0.0132
13	0.9687	-0.2480
14	0.9999	0.0137
15	0.9541	-0.2994
16	0.9805	-0.1967
17	0.9964	0.0849
18	0.9869	-0.1616
19	0.9813	0.1925
20	0.9846	0.1749
21	0.9697	-0.2444
22	0.9808	-0.1950
23	0.9962	-0.0874
24	0.9537	0.3009
25	0.9537	0.3009
26	0.9958	-0.0918
27	0.9862	-0.1655
28	1.0000	0.0008
29	0.9906	0.1371
30	0.9956	-0.0939
31	0.9972	0.0744
32	0.9615	0.2749
33	0.9727	0.2319
34	1.0000	0.0016
35	0.9734	0.2292
36	0.9800	0.1992
37	0.9932	0.1166
38	0.9932	0.1166
39	0.9934	0.1144
40	0.9734	0.2292
41	0.9957	-0.0928
42	0.9932	0.1166
43	0.9552	0.2960

STIMULUS MATRIX

	DIMENSION 1	DIMENSION 2
1	0.3881	-0.5347
2	0.3771	-0.3991
3	0.3626	0.2938
4	0.3868	-0.0485
5	0.2329	-0.0711
6	0.2927	0.4754
7	0.2088	0.4307
8	0.3280	0.2194
9	0.3674	-0.0388

Appendix 5

Critical value of Spearman's rank correlation coefficient

n	Level of significance for one-tailed test			
	5%	2.5%	1%	0.5%
	Level of significance for two-tailed test			
	10%	5%	2%	1%
5	0.900	1.000	1.000	---
6	0.829	0.886	0.943	1.000
7	0.714	0.786	0.893	0.929
8	0.643	0.738	0.833	0.881
9	0.600	0.683	0.783	0.833
10	0.564	0.648	0.745	0.794
11	0.523	0.623	0.736	0.818
12	0.497	0.591	0.703	0.780
13	0.475	0.566	0.673	0.745
14	0.457	0.545	0.646	0.716
15	0.441	0.525	0.623	0.689
16	0.425	0.507	0.601	0.666
17	0.412	0.490	0.582	0.645
18	0.399	0.476	0.564	0.625
19	0.388	0.462	0.549	0.608
20	0.377	0.450	0.534	0.591
21	0.368	0.438	0.521	0.576
22	0.359	0.428	0.508	0.562
23	0.351	0.418	0.496	0.549
24	0.343	0.409	0.485	0.537
25	0.336	0.400	0.475	0.526
26	0.329	0.392	0.465	0.515
27	0.323	0.385	0.456	0.505
28	0.317	0.377	0.448	0.496
29	0.311	0.370	0.440	0.487
30	0.305	0.364	0.432	0.478

Source: Marascuilo, L.A. and Serlin, R.C. (1988) STATISTICAL METHODS FOR THE SOCIAL AND BEHAVIORAL SCIENCES, W.H. Freeman and Company, U.S.A., p. 765.

APPENDIX 6

(a) Input programme of "Product"

```
RUN NAME                 PRODUCT RUN 1
TASK NAME                FULL SET
COMMENT                  WITH 9 STIMULI AS POINTS, 20 SUBJECTS AS VECTORS
N OF SUBJECTS            20
COMMENT                  9 COMPANIES WITH 20 CHARACTERISTICS
N OF STIMULI             9
DIMENSIONS               2
PRINT DATA               YES
PRINT                    ALL
INPUT FORMAT             (10X,9F2.0)
PARAMETERS               DATA TYPE(4), MATFORM(0)
COMMENT                  ASSUMPTION IS THAT "1" MEANS MOST 'PREFERRED'
COMMENT                  WHEN DATA TYPE = 4
READ MATRIX
          3.1.2.5.3.4.2.4.5.
          3.3.2.3.3.2.1.3.3.
          4.5.6.2.4.1.3.7.5.
          2.2.2.2.2.2.1.2.2.
          2.2.2.2.2.1.1.1.2.
          8.6.5.9.2.3.1.4.7.
          6.4.9.7.1.8.3.2.5.
          5.6.7.3.2.4.1.5.5.
          1.2.2.2.1.2.1.2.2.
          1.3.6.5.2.7.8.4.4.
          1.2.5.3.1.6.7.8.4.
          2.2.1.2.2.2.1.2.2.
          8.4.2.5.6.3.1.4.7.
          1.2.1.2.1.1.1.2.2.
          9.7.2.6.4.3.1.5.8.
          9.7.4.5.2.6.1.3.8.
          4.8.9.7.1.5.2.6.3.
          7.9.8.6.2.3.1.5.4.
          2.1.2.2.2.3.1.2.2.
          2.1.2.2.2.3.1.2.3.
COMPUTE
FINISH
```

(b) Input programme of "Price"

```
RUN NAME                  PRICE RUN 1
TASK NAME                 FULL SET
COMMENT                   WITH 9 STIMULI AS POINTS, 5 SUBJECTS AS VECTORS
N OF SUBJECTS             5
COMMENT                   9 COMPANIES WITH 5 CHARACTERISTICS
N OF STIMULI              9
DIMENSIONS                2
PRINT DATA                YES
PRINT                     ALL
INPUT FORMAT              (10X,9F2.0)
PARAMETERS                DATA TYPE(4), MATFORM(0)
COMMENT                   ASSUMPTION IS THAT "1" MEANS MOST 'PREFERRED'
COMMENT                   WHEN DATA TYPE = 4
READ MATRIX
          6.7.4.5.4.1.3.3.2.
          7.8.4.5.4.1.6.3.2.
          5.8.3.7.2.1.6.6.4.
          1.1.2.2.1.2.2.1.2.
          1.1.2.2.1.2.2.1.2.
COMPUTE
FINISH
```

(c) Input programme of "Place"

```
RUN NAME                  PLACE RUN 1
TASK NAME                 FULL SET
COMMENT                   WITH 9 STIMULI AS POINTS, 5 SUBJECTS AS VECTORS
N OF SUBJECTS             5
COMMENT                   9 COMPANIES WITH 5 CHARACTERISTICS
N OF STIMULI              9
DIMENSIONS                2
PRINT DATA                YES
PRINT                     ALL
INPUT FORMAT              (10X,9F2.0)
PARAMETERS                DATA TYPE(4), MATFORM(0)
COMMENT                   ASSUMPTION IS THAT "1" MEANS MOST 'PREFERRED'
COMMENT                   WHEN DATA TYPE = 4
READ MATRIX
          2.2.2.2.2.1.1.1.1.
          2.2.1.2.2.1.1.1.1.
          2.2.2.2.2.2.1.1.2.
          3.1.1.3.3.3.3.2.3.
          2.1.1.1.3.1.1.1.3.
COMPUTE
FINISH
```

(d) Input programme of "Promotion"

```
RUN NAME                  PROMOTION RUN 1
TASK NAME                 FULL SET
COMMENT                   WITH 9 STIMULI AS POINTS, 5 SUBJECTS AS VECTORS
N OF SUBJECTS             5
COMMENT                   9 COMPANIES WITH 5 CHARACTERISTICS
N OF STIMULI              9
DIMENSIONS                2
PRINT DATA                YES
PRINT                     ALL
INPUT FORMAT              (10X,9F2.0)
PARAMETERS                DATA TYPE(4), MATFORM(0)
COMMENT                   ASSUMPTION IS THAT "1" MEANS MOST 'PREFERRED'
COMMENT                   WHEN DATA TYPE = 4
READ MATRIX
          2.2.3.2.2.2.1.2.3.
          1.1.2.2.2.3.1.2.3.
          1.1.2.1.2.2.1.2.3.
          2.2.2.1.2.1.2.1.2.
          1.1.2.2.2.2.1.2.2.
COMPUTE
FINISH
```

(e) Input programme of "People"

```
RUN NAME                  PEOPLE RUN 1
TASK NAME                 FULL SET
COMMENT                   WITH 9 STIMULI AS POINTS, 4 SUBJECTS AS VECTORS
N OF SUBJECTS             4
COMMENT                   9 COMPANIES WITH 4 CHARACTERISTICS
N OF STIMULI              9
DIMENSIONS                2
PRINT DATA                YES
PRINT                     ALL
INPUT FORMAT              (10X,9F2.0)
PARAMETERS                DATA TYPE(4), MATFORM(0)
COMMENT                   ASSUMPTION IS THAT "1" MEANS MOST 'PREFERRED'
COMMENT                   WHEN DATA TYPE = 4
READ MATRIX
          3.1.4.5.5.5.1.5.5.
          2.1.2.2.2.2.1.2.2.
          2.1.2.2.2.2.1.2.2.
          3.2.3.3.3.3.2.3.3.
COMPUTE
FINISH
```

(f) Input programme of "Physical evidence"

```
RUN NAME                  PHYSICAL EVIDENCE RUN 1
TASK NAME                 FULL SET
COMMENT                   WITH 9 STIMULI AS POINTS, 3 SUBJECTS AS VECTORS
N OF SUBJECTS             3
COMMENT                   9 COMPANIES WITH 3 CHARACTERISTICS
N OF STIMULI              9
DIMENSIONS                2
PRINT DATA                YES
PRINT                     ALL
INPUT FORMAT              (10X,9F2.0)
PARAMETERS                DATA TYPE(4), MATFORM(0)
COMMENT                   ASSUMPTION IS THAT "1" MEANS MOST 'PREFERRED'
COMMENT                   WHEN DATA TYPE = 4
READ MATRIX
          1.1.2.2.2.2.1.2.2.
          2.2.2.2.2.1.1.1.2.
          2.1.2.2.2.2.1.2.2.
COMPUTE
FINISH
```

(g) Input programme of Venice service line

```
RUN NAME                  VENICE LINE RUN 1
TASK NAME                 FULL SET
COMMENT                   WITH 2 STIMULI AS POINTS, 36 SUBJECTS AS VECTORS
N OF SUBJECTS             36
COMMENT                   2 COMPANIES WITH 36 CHARACTERISTICS
N OF STIMULI              2
DIMENSIONS                2
PRINT DATA                YES
PRINT                     ALL
INPUT FORMAT              (10X,2F2.0)
PARAMETERS                DATA TYPE(4), MATFORM(0)
COMMENT                   ASSUMPTION IS THAT "1" MEANS MOST 'PREFERRED'
COMMENT                   WHEN DATA TYPE = 4
READ MATRIX
          1.2.
          1.2.
          1.2.
          1.2.
          1.2.
          1.2.
          1.2.
          1.2.
          1.2.
          2.1.
          2.1.
          1.2.
          1.2.
          1.2.
          1.2.
          1.2.
          1.2.
          1.2.
          1.2.
          1.2.
          2.1.
          2.1.
          2.1.
          1.2.
          1.2.
          1.2.
          1.2.
          1.2.
          1.2.
          1.2.
          1.2.
          1.2.
          1.2.
          1.2.
          1.2.
          1.2.
COMPUTE
FINISH
```

(h) Input programme of Ancona service line

```
RUN NAME                 ANCONA LINE RUN 1
TASK NAME                FULL SET
COMMENT                  WITH 3 STIMULI AS POINTS, 36 SUBJECTS AS VECTORS
N OF SUBJECTS            36
COMMENT                  3 COMPANIES WITH 36 CHARACTERISTICS
N OF STIMULI             3
DIMENSIONS               2
PRINT DATA               YES
PRINT                    ALL
INPUT FORMAT             (10X,3F2.0)
PARAMETERS               DATA TYPE(4), MATFORM(0)
COMMENT                  ASSUMPTION IS THAT "1" MEANS MOST 'PREFERRED'
COMMENT                  WHEN DATA TYPE = 4
READ MATRIX
          1.3.2.
          2.1.3.
          2.2.1.
          2.3.1.
          2.3.1.
          3.1.2.
          1.3.2.
          1.2.3.
          1.2.1.
          3.2.1.
          3.2.1.
          3.2.1.
          3.2.1.
          1.2.2.
          1.2.2.
          3.2.1.
          3.2.1.
          3.2.1.
          1.2.1.
          1.2.1.
          2.2.1.
          2.2.1.
          2.2.1.
          1.3.2.
          1.2.2.
          1.1.2.
          2.1.1.
          1.2.2.
          1.2.2.
          1.2.2.
          1.2.2.
          1.2.2.
          1.2.2.
          2.2.1.
          1.2.2.
          1.2.2.
COMPUTE
FINISH
```

(i) Input programme of Bari service line

```
RUN NAME            BARI LINE RUN 1
TASK NAME           FULL SET
COMMENT             WITH 3 STIMULI AS POINTS, 36 SUBJECTS AS VECTORS
N OF SUBJECTS       36
COMMENT             3 COMPANIES WITH 36 CHARACTERISTICS
N OF STIMULI        3
DIMENSIONS          2
PRINT DATA          YES
PRINT               ALL
INPUT FORMAT        (10X,3F2.0)
PARAMETERS          DATA TYPE(4), MATFORM(0)
COMMENT             ASSUMPTION IS THAT "1" MEANS MOST 'PREFERRED'
COMMENT             WHEN DATA TYPE = 4
READ MATRIX
          2.1.3.
          2.1.1.
          2.3.1.
          2.2.1.
          3.2.1.
          1.3.2.
          2.3.1.
          1.2.2.
          1.2.3.
          1.2.3.
          2.1.2.
          3.1.2.
          3.1.2.
          3.1.2.
          1.3.2.
          2.3.1.
          1.1.2.
          1.1.2.
          3.2.1.
          3.2.1.
          3.2.1.
          1.2.2.
          1.2.2.
          2.2.1.
          2.1.1.
          2.1.2.
          2.1.1.
          1.2.1.
          1.2.3.
          1.2.2.
          2.2.1.
          1.2.2.
          1.2.3.
          1.2.2.
          2.2.1.
          1.2.2.
COMPUTE
FINISH
```

(j) Input programme of Brindisi service line

```
RUN NAME                  BRINDISI LINE RUN 1
TASK NAME                 FULL SET
COMMENT                   WITH 2 STIMULI AS POINTS, 23 SUBJECTS AS VECTORS
N OF SUBJECTS             23
COMMENT                   2 COMPANIES WITH 23 CHARACTERISTICS
N OF STIMULI              2
DIMENSIONS                2
PRINT DATA                YES
PRINT                     ALL
INPUT FORMAT              (10X,2F2.0)
PARAMETERS                DATA TYPE(4), MATFORM(0)
COMMENT                   ASSUMPTION IS THAT "1" MEANS MOST 'PREFERRED'
COMMENT                   WHEN DATA TYPE = 4
READ MATRIX
          1.2.
          1.2.
          2.1.
          2.1.
          2.1.
          2.1.
          2.1.
          2.1.
          2.1.
          1.2.
          1.2.
          1.2.
          2.1.
          2.1.
          2.1.
          2.1.
          2.1.
          2.1.
          1.2.
          1.2.
          1.2.
          2.1.
          1.2.
COMPUTE
FINISH
```

(k) Input programme of direct ferry services between Italy-Turkey

```
RUN NAME                  DIRECT SERVICES RUN 1
TASK NAME                 FULL SET
COMMENT                   WITH 4 STIMULI AS POINTS, 40 SUBJECTS AS VECTORS
N OF SUBJECTS             40
COMMENT                   4 COMPANIES WITH 40 CHARACTERISTICS
N OF STIMULI              4
DIMENSIONS                2
PRINT DATA                YES
PRINT                     ALL
INPUT FORMAT              (10X,4F2.0)
PARAMETERS                DATA TYPE(4), MATFORM(0)
COMMENT                   ASSUMPTION IS THAT "1" MEANS MOST 'PREFERRED'
COMMENT                   WHEN DATA TYPE = 4
READ MATRIX
          2.1.2.3.
          2.1.3.3.
          1.2.4.3.
          2.1.2.2.
          1.1.1.2.
          2.1.3.4.
          4.2.1.3.
          2.1.3.3.
          2.1.2.2.
          2.3.1.1.
          2.3.4.1.
          2.1.2.2.
          2.1.3.4.
          1.1.2.2.
          2.1.3.4.
          3.1.2.4.
          3.1.4.2.
          2.1.4.3.
          3.1.2.2.
          3.1.2.3.
          1.3.3.2.
          1.4.3.2.
          1.3.3.2.
          2.2.1.2.
          2.2.1.2.
          2.1.1.2.
          2.2.1.2.
          1.1.1.2.
          2.1.2.3.
          3.1.2.3.
          2.1.2.3.
          1.2.1.2.
          2.1.2.2.
          2.1.2.2.
          2.1.2.2.
          2.1.2.2.
          2.1.2.2.
          2.1.2.2.
          1.1.1.2.
          2.1.2.2.
COMPUTE
FINISH
```

(l) Input programme of indirect ferry services between Italy-Turkey via Greece

```
RUN NAME              INDIRECT FERRY SERVICES RUN 1
TASK NAME             FULL SET
COMMENT               WITH 5 STIMULI AS POINTS, 38 SUBJECTS AS VECTORS
N OF SUBJECTS         38
COMMENT               5 COMPANIES WITH 38 CHARACTERISTICS
N OF STIMULI          5
DIMENSIONS            2
PRINT DATA            YES
PRINT                 ALL
INPUT FORMAT          (10X,5F2.0)
PARAMETERS            DATA TYPE(4), MATFORM(0)
COMMENT               ASSUMPTION IS THAT "1" MEANS MOST 'PREFERRED'
COMMENT               WHEN DATA TYPE = 4
READ MATRIX
          3.1.2.4.3.
          2.2.1.2.2.
          2.3.4.1.2.
          4.3.2.5.1.
          3.2.5.4.1.
          3.4.5.2.1.
          1.2.2.2.1.
          1.3.5.4.2.
          1.2.4.3.1.
          2.2.1.2.2.
          5.2.1.3.4.
          1.2.1.2.1.
          5.4.1.3.2.
          5.4.1.3.2.
          2.4.5.3.1.
          3.4.5.2.1.
          2.1.2.2.2.
          2.1.2.2.2.
          3.4.1.2.1.
          3.4.1.2.1.
          3.5.2.4.1.
          1.1.2.2.1.
          1.1.2.2.1.
          2.2.1.2.2.
          2.1.1.2.2.
          2.1.1.1.3.
          1.1.2.1.1.
          1.1.2.2.2.
          1.1.2.1.2.
          2.2.2.1.2.
          1.1.2.2.2.
          2.1.3.4.4.
          2.1.2.2.2.
          2.1.2.2.2.
          2.1.2.2.2.
          1.1.2.2.2.
          2.1.2.2.2.
          1.1.2.2.2.
COMPUTE
FINISH
```

LIST OF REFERENCES

AA GUIDE TO FERRIES (1994) Hicks, P. (ed.), AA Print Services, U.K.

Aaker, D.A.; Kumar, V. and Day, G.S. (1995) MARKETING RESEARCH, Fifth edition, John Wiley and Sons Inc., U.S.A., pp.458-461, 639-640.

AKSAM (1995) Istanbul, Turkey, 01/11/95.

Anooshian, L.J.; Pascal, V.U. and McCreath, H. (1984), "Problem Mapping Before Problem Solving: Young Children's Cognitive Maps and Search Strategies in Large-Scale Environments", CHILD DEVELOPMENT, 55, October, pp.1820-1834.

Arnott, D.C. (1993) POSITIONING: REDEFINING THE CONCEPT, Warwick Business School Research Bureau, U.K., pp.21-22.

Association of Aegean Young Businessmen - AAYB (1995) ECONOMIC VISION, February, Izmir, Turkey, p.64.

Association of Independent Industrialists and Businessmen - AIIB (1996) THE TURKISH ECONOMY-1996, Istanbul, Turkey, p.5, 8, 27, 32, 39, 41.

Association of Turkish Industrialists and Businessmen - ATIB (1995) TURKISH ECONOMY'95, August, Istanbul, Turkey, p.7.

__________, (1996a) QUARTERLY ECONOMIC SURVEY, April, Istanbul, Turkey, pp.18-19.

__________, (1996b) QUARTERLY ECONOMIC SURVEY, July, Istanbul, Turkey, pp.18-20.

Backhaus, W.; Menzel, R. and Kreissl, S. (1987) "Multidimensional Scaling of Colour Similarity in Bees", BIOLOGICAL CYBERN., 56, 293-304.

Baron, S. and Phillips, D. (1994) "Attitude Survey Data Reduction: An Example in Shopping Centre Market Research", in Hooley, G.H. and Hussey, M.K. (eds.), QUANTITATIVE METHODS IN MARKETING, Academic Press, U.K., pp.75-88.

Bartolucci, A.A. (1986) "Multidimensional Scaling and the Information it Conveys", AMERICAN JOURNAL OF PUBLIC HEALTH, 76, July, U.S.A., pp.747-748.

Bhuiya, A.; Wojtyniak, B. and D'Souza, S. (1987) "Measles Case Fatality among the Under-Fives: A Multivariate Analysis of Risk Factors in a Rural Area of Bangladesh", SOCIAL SECIENCE & MEDICINE, 24, 5, pp.439-443.

Bojorquez-Tapia, L. A.; Ongay-Delhumeau, E. and Ezcurra, E. (1991) "Multivariate Approach for Suitability Assessment and Environmental Conflict Resolution", JOURNAL OF ENVIRONMENTAL MANAGEMENT, 41, July, pp.187-198.

Bredimas, A.E. and Tzoannos, J.G. (1981) "In Search of a Common Shipping Policy for the

E.C.", JOURNAL OF COMMON MARKET STUDIES, XX, no.2, December, pp.104-105.

Bredimas-Savopoulou, A. and Tzoannos, J. (1990) THE COMMON SHIPPING POLICY OF THE EC, Elsevier Science Publishers B.V., The Netherlands, p.1, 113-114.

Brooks, M.R. and Button, K.J. (1992) "Shipping within the Framework of a Single European Market", TRANSPORT REVIEWS, 12, 3, pp.238-247.

Brooner, R. K.; Templer, D. and Svikis, D. S. (1990) "Dimensions of Alcoholism: A Multivariate Analysis", JOURNAL OF STUDIES ON ALCHOL, 51, January, pp.77-81.

Buyukdeniz, A. (1996) "Macroeconomic expectations in the seventh five-year development plan", FRAME, Association of Independent Industrialists and Businessmen-AIIB, 1, Istanbul, Turkey, p.58-61.

Buyukkurt, B.K. and Buyukkurt, M.D. (1990) "Robustness and Small-Sample Properties of the Estimators of Probabilistic Multidimensional Scaling (PROSCAL)", JOURNAL OF MARKETING RESEARCH, 27, pp.139-149.

Carroll, J.D. and Chang,J.J. (1969) "Relating Preference Data to Multidimensional Scaling Solutions via a Generalisation of Coombs' Unfolding Model", BELL TELEPHONE LABORATORIES RECORDS, New Jersey.

Chamber of Shipping (1995a) REPORT ON SHIPPING SECTOR-1994, Istanbul, Turkey, p.97, 100, 156, 169-172, 228.

_________, (1995b) TURKISH SHIPPING AT THE BEGINNING OF 1995, Istanbul, Turkey, pp.6-8, 12, 17.

_________, (1995c) TURKISH SHIPPING WORLD, July-August, Istanbul, Turkey, p.32.

_________, (1995d) TURKISH SHIPPING WORLD, September-October, Istanbul, Turkey, pp.42-43.

_________, (1996a) REPORT ON SHIPPING SECTOR-1995, Istanbul, Turkey, p.118, 120, 213, 242.

_________, (1996b) TURKISH SHIPPING REPORT, Istanbul, Turkey, p.16.

_________, (1996c) TURKISH SHIPPING WORLD, January, Istanbul, Turkey, p.9, 11-12, 15, 19.

_________, (1996d) TURKISH SHIPPING WORLD, April, Istanbul, Turkey, pp.40-41, 69.

_________, (1996e) TURKISH SHIPPING WORLD, July, Istanbul, Turkey, p.24.

_________, (1996f) TURKISH SHIPPING WORLD, August, Istanbul, Turkey, p.12, 61, 64, 66.

Chatfield, C. and Collins, A. J. (1980) INTRODUCTION TO MULTIVARIATE

ANALYSIS, Chapman and Hall, London, pp.7-9, 190-191, 198.

Chisnall, P.M. (1992) MARKETING RESEARCH, 4th edition, McGraw Hill Book Company Europe, England, p.347.

Christopher, M. (1986) REACHING THE CUSTOMER: STRATEGIES FOR MARKETING AND CUSTOMER SERVICE, Cranfield School of Management, U.K., p.8.

Commission of the EC (1985) PROGRESS TOWARDS A COMMON TRANSPORT POLICY - MARITIME TRANSPORT, COM(85)90 Final, Brussels, pp.i-iii.

__________, (1989) COM(89) 266 final, Brussels, 03/08/89.

__________, (1990) EUROPEAN COMMUNITY TRANSPORT POLICY IN THE APPROACH TO 1992, Brussels, p.3, 5.

__________, (1991) COM(91) 335 final, Brussels, 20/09/91.

__________, (1993) COM(93) 66 final, Brussels, 24/02/93.

__________, (1995a) COM(95) 317 final, Brussels, 05/07/95.

__________, (1995b) COM(95) 383 final, Brussels, 06/09/95.

__________, (1996a) COM(96) 18 final, Brussels, 24/01/96.

__________, (1996b) COM(96) 81 final, Brussels, 03/04/96.

__________, (1996c) COM(96) 84 final, Brussels, 13/03/96.

__________, (1996d) COM(96) 149 final, Brussels, 03/04/96.

__________, (1996e) COM(96) 199 final, Brussels, 13/05/96.

Congram, C.A. and Friedman, M.L. (1991) THE AMA HANDBOOK OF MARKETING FOR THE SERVICE INDUSTRIES, American Management Association, New York, p.39, 41.

CONTAINERISATION INTERNATIONAL (1995) February, p.83.

Cooper, L.G. (1983) "A Review of Multidimensional Scaling in Marketing Research", APPLIED PSYCHOLOGICAL MEASUREMENT, 7, pp.427-450.

Corradino, C. (1990) "Proximity Structure in a Captive Colony of Japanese Monkeys: An Application of Multidimensional Scaling", PRIMATES, 31, pp.351-362.

Cousins, J.H. (1983) "Way Finding and Cognitive Mapping in Large-Scale Environments: A Test of a Developmental Model", JOURNAL OF EXPERIMENTAL CHILD PSYCHOLOGY, 35, February, pp.1-20.

Cowell, D.W. (1984) THE MARKETING OF SERVICES, Heinemann Ltd., U.K., p.23, pp.59-63, 69-74.

Cox, T.F. and Cox, M.A.A. (1994) MULTIDIMENSIONAL SCALING, Chapman and Hall, U.K., p.1, 5-9, 13, 22, 56-58, 76, 86, 105-112, 171-172.

Coxon, A.P.M. (1982) THE USER'S GUIDE TO MULTIDIMENSIONAL SCALING, Heinemann Educational Books Ltd., London., p.1, 9, 40, 117-151, 199.

Coxon, A.P.M. and Jones, C.L. (1974) "Occupational Similarities: Subjective Aspects of Social Stratification", QUALITY AND QUANTITY, 8, pp.139-157.

Coxon, A.P.M. and MDS(X) Project Team (1980a) MDS(X) SERIES OF MULTIDIMENSIONAL SCALING PROGRAMS, University College, Cardiff and University of Edinburgh, U. K., pp.0.1-0.12, 5.1-5.4, 5.12-5.14.

__________, (1980b) MDS(X) POCKET GUIDE, University College, Cardiff and University of Edinburgh, U. K., pp.1-24.

CRUISE & FERRY INFO (1994) 10, Marine Trading, Sweden, p.46.

Davies, G.J. and Brooks, J.M. (1989) POSITIONING STRATEGY IN RETAILING, Paul Chapman Publishing, London, p.69, 121-139.

Davies, P.M. and Coxon, A.P.M. (1982) KEY TEXTS TO MULTIDIMENSIONAL SCALING, Heinemann Educational Books Ltd., London, p.xi, 147-149, 163-180.

Davison, M.L. (1983) MULTIDIMENSIONAL SCALING, John Wiley and Sons, U.S.A., pp.1-2, 6.

__________, (1985) "Multidimensional Scaling versus Components Analysis of Test Intercorrelations", PSYCHOLOGICAL BULLETIN, 97, January-May, American Psychological Association, U.S.A., 94-105.

Davison, M.L. and Jones, L.E. (1976) "A Similarity-Attraction Model for Predicting Sociometric Choice from Perceived Group Structure", JOURNAL OF PERSONALITY AND SOCIAL PSYCHOLOGY, 33, pp.601-612.

Day, G.S.; Deutscher, T. and Ryans, A.B. (1976) "Data Quality, Level of Aggregation, and Nonmetric Multidimensional Scaling Solutions", JOURNAL OF MARKETING RESEARCH, 13, February, U.S.A., pp.92-97.

de Sarbo, W.S.; Manrai, A.K. and Manrai, L.A. (1994) "Latent Class Multidimensional Scaling: A Review of Recent Developments in the Marketing and Psychometric Literature", in Bagozzi, R.P. (ed.) ADVANCED METHODS OF MARKETING RESEARCH, Blackwell Publishers, U.S.A., pp.190-222.

de Soete, G. and Carroll, J.D. (1983) "A Maximum Likelihood Method for Fitting the Wandering Vector Model", PSYCHOMETRIKA, 48, pp.621-626.

Dillon, W. R. and Goldstein, M. (1984) MULTIVARIATE ANALYSIS: METHODS AND APPLICATIONS, John Wiley and Sons. Inc., New York, pp.1-3, 19-22, 125-145, 154-156.

Drewry Shipping Consultants (1995) THE SHIPBUILDING MARKET: ANALYSIS AND FORECASTING OF WORLD SHIPPING DEMAND - 1995-2010, U.K., p.69.

Dunfield, J.F. (1996) "Consumer Perceptions of Health Care Quality and the Utilisation of Non-conventional Therapy", SOCIAL SCIENCE AND MEDICINE, 43, no.2, July, pp.149-161.

Eaglstein, A.S. and Weisberg, J. (1990) "Categorical, Multivariate Analysis of Intra-Urban Migration", URBAN STUDIES, 27, August, pp.509-517.

EC NEWS (1995) March-April, European Commission Turkish Representation Publication, Ankara, Turkey, p.1.

________, (1996a) January, European Commission Turkish Representation Publication, Ankara, Turkey, pp.3-4.

________, (1996b) February-March, European Commission Turkish Representation Publication, Ankara, Turkey, pp.13-14.

________, (1996c) April-May, European Commission Turkish Representation Publication, Ankara, Turkey, p.1, 28-29.

________, (1996d) June-July, European Commission Turkish Representation Publication, Ankara, Turkey, p.1.

Eckardt, R.E. (1992) "Eldercare: Positioning Your Hospital for the Future", THE GERONTOLOGIST, 32, June, pp.423-424.

Eliashberg, J. and Manrai, A.K. (1993) "Optimal Positional of New Product Concepts, Some Analytical Implications and Empirical Result", EUROPEAN JOURNAL OF OPERATIONAL RESEARCH.

Erdmenger, J. and Stasinopoulos, D. (1988) "Developments in Transport Policy: The Shipping Policy of the European Community", JOURNAL OF TRANSPORT ECONOMICS AND POLICY, September, pp.355-359.

Erkan, H. (1994) EVALUATING THE RESULTS OF APRIL 5 APPLICATIONS, Association of Aegean Young Businessmen, Izmir, Turkey, pp.8-10.

EUROPE REVIEW 1995: THE ECONOMIC AND BUSINESS REPORT (1994) eighth edition, Kogan Page and Walden Publishing, London, p.258, 260-261.

European Commission (1995) BACKGROUND REPORT: INTERIM REPORT CONCERNING TURKEY, July, London, pp.2-4.

__________, (1996) SHORT SEA SHIPPING, Directorate General VII-39, Brussels, p.46.

EUROPEAN MARKETING POCKET BOOK: 1994 (1993) NTC Publications Ltd., U.K., pp.221-224.

Evrensel-Brown, A. (1991) "Turkey's membership in the EEC: Obstacles to economic integration" TIJDSCHRIFT VOOR ECONOMISCHE EN SOCIALE GEOGRAFIE, v.82, 4, p.255.

FAIRPLAY (1993) U.K., 02/12/93.

________, (1994) U.K., 15/12/94.

FAIRPLAY WORLD SHIPPING DIRECTORY 1995-96 (1995) Fairplay Publications Ltd., U.K., pp.50-71, 184-88, 306-7, 678-9, 686-87.

Farthing, B. (1993) INTERNATIONAL SHIPPING, second edition, Lloyd's of London Press Ltd., U.K., pp.134-136.

FINANCIAL TIMES (1994) Financial Times Survey: Turkey, U.K., 15/04/94.

Forgas, J.P. (1977) "The Perception of Social Episodes in Two Sports Teams: A Multidimensional Approach", JOURNAL OF SOCIAL PSYCHOLOGY.

Frankel, S.; Chan, R. and Lewandowski, M.E. (1984) "Methodological Observations on Applied Behavioral Science", THE JOURNAL OF APPLIED BEHAVIORAL SCIENCE, 20, no.2, pp.193-201.

Funk, S.G.; Horowitz, A.D.; Lipshitz, R. and Young, F.W. (1974) "The Perceived Structure of American Ethnic Groups: The Use of Multidimensional Scaling in Stereotype Research", PERSONALITY AND SOCIAL PSYCHOLOGY BULLETIN, 1, pp.66-68.

Gartner, W.C. (1989) "Tourism Image", JOURNAL OF TRAVEL RESEARCH, fall, pp.16-20.

Gordon, W. and Langmaid, R. (1988) QUALITATIVE MARKET RESEARCH, Gower Publishing Co. Ltd., England, pp.1-4.

Greaves, R. (1991) EEC MARITIME POLICY AND REGULATION, offprint, University of Southampton, U.K., pp.3-6.

Green, P.E. and Carmone, F.J. (1970) MULTIDIMENSIONAL SCALING AND RELATED TECHNIQUES IN MARKETING ANALYSIS, Allyn and Bacon Inc., Boston.

Green, P.E.; Carmone, F.J. and Smith, S.M. (1989) MULTIDIMENSIONAL SCALING: CONCEPTS AND APPLICATIONS, Allyn and Bacon, U.S.A., p.8, 139-157, 180-203.

Green, P.E.; Tull, D.S. and Albaum, G. (1988), RESEARCH FOR A MARKETING DECISION, 5th edition, Prentice Hall Inc., New Jersey, pp.242-243, 287, 566, 604-605, 608, 612, 616.

Green, P.E. and Wind, Y. (1973) MULTIATTRIBUTE DECISIONS IN MARKETING: A MEASUREMENT APPROACH, The Dryden Press, U.S.A., pp.73-74, 300-334.

Groenen, P.J.F. and Heiser, W.J. (1996) "The Tunneling of Method for Global Optimisation in Multidimensional Scaling", PSYCHOMETRIKA, September, pp.529-550.

Gronroos, C. (1990) SERVICE MANAGEMENT AND MARKETING, Lexington Books, U.S.A., p.122.

Hair, J.F.; Anderson, R.E.; Tatham, R.L. and Black, W.C. (1995) MULTIVARIATE DATA ANALYSIS, fourth edition, Prentice Hall International Inc., U.S.A., p.327, 333, 510-512.

Hart, P.; Ledger, G.; Roe, M. and Smith, B. (1993) SHIPPING POLICY IN THE EUROPEAN COMMUNITY, Avebury Ashgate Publishing Ltd., England, pp.13-15.

Heijveld, H. and Gray, R. (1993) "U.K. Shortsea Ferry Services: A Baseline Model Approach for Policy Decision Making", in Wijnolst, C.; Peeters, C. and Liebman, P. (eds.) EUROPEAN SHORTSEA SHIPPING, Lloyd's of London Press Ltd., pp.211-231.

Ho, L.; Luttges, M.W. and Shea, J.B. (1982) "Transcultaneous Electrical Nerve Stimulation Effects upon Linear Positioning Performance", PERCEPTUAL AND MOTOR SKILLS, 55, December, pp.983-990.

Hooley, G.J. and Saunders, J. (1993) COMPETITIVE POSITIONING, Prentice Hall International Ltd., U.K., pp.171-174.

Howard, K. and Sharp, J.A. (1983) THE MANAGEMENT OF A STUDENT RESEARCH PROJECT, Gower Publishing, U.K., pp.135-146.

Hubert, C.J. (1994) "Why Multivariate Analyses?", EDUCATIONAL AND PSYCHOLOGICAL MEASUREMENT, 54, fall, pp.620-627.

HURRIYET (1996a) Istanbul, Turkey, 25/04/96.

__________, (1996b) Istanbul, Turkey, 20/10/96.

INTERMEDIA ECONOMY (1995) March, Turkey, p.18.

INTERVIEW with Mr.Metin Kalkavan, shipowner and shipoperator (1996) Plymouth, U.K., 01/08/96.

INTERVIEW with Professor Antony P.M.Coxon (1995a) Russell Square, London, U.K., 03/03/95.

__________, (1995b) University of Essex, Colchester, U.K., 03/10/95.

Izmir Chamber of Trades (1994) ECONOMIC VISION, July-August, Turkey, p.62.

Kalpsuz, T. (1980) SHIPPING LAW, 1, Ankara, Turkey, pp.13-17, 51, 63.

Kazgan, G. (1985) OUTWARD GROWTH IN THE ECONOMY, Istanbul, Turkey, pp.5-8.

Kelly, M.J.; Wooldridge, L.; Hennessy, R.T.; Vreuls, D.; Barneby, S.F.; Cotton, J.C. and Reed, J.C. (1979) "Air Combat Maneuvering Performance Measurement", Williams Air Force Base, AZ: Flying Training Division, Air Force Human Resources Laboratory.

Kender, R. and Cetingil, E. (1992) SHIPPING LAW, 5th edition, Istanbul, Turkey, p.13, 23-

30.

Kent, R. (1993) MARKETING RESEARCH IN ACTION, Routledge, London, pp.165-166, 184, 197-199.

Kopits, G. (1986) "Structural Reform, Stabilisation and Growth in Turkey", Occasional paper no.52, IMF, Washington D.C., p.42.

Kotler, P. and Armstrong, G. (1993) MARKETING: AN INTRODUCTION, 3rd edition, Prentice Hall Inc., New Jersey, p.200.

Kruskal, J.B. (1964) "Multidimensional Scaling by Optimising Goodness of Fit to a Nonmetric Hypothesis", PSYCHOMETRIKA, 29, pp.1-27.

Kruskal, J.B. and Wish, M. (1978) MULTIDIMENSIONAL SCALING, Sage Publications, U.S.A., p.10.

Krzanowski, W.J. (1988) PRINCIPLES OF MULTIVARIATE ANALYSIS, Oxford University Press, U.K., p.xvii.

Kurian, G.; Sharma, N.K. and Santhakumari, K. (1989), "Left-arm Dominance in Active Positioning", PERCEPTUAL AND MOTOR SKILLS, 68, June, pp.1312-1314.

Kurdas, K. (1994) OBSERVATIONS ON ECONOMIC POLICY, Beta Publishing, Istanbul, Turkey, p.189.

Lake, M. (1996) "A Historical Decision: Customs Union", EC NEWS, European Commission Turkish Representative Publication, January, Ankara, Turkey, pp.1-2.

Lau, E. (1988) "Positioning for Power: Indirect Elections Reveal Behind-the-Scenes Manoeuvring", FAR EASTERN ECONOMIC REVIEW, 141, September, pp.29-29.

Ledger, G. D. (1995) ANALYSIS OF THE IMPACT OF EAST EUROPEAN CHANGE UPON EUROPEAN COMMUNITY, Unpublished Doctor of Philosophy Thesis, University of Plymouth, U.K.

Ledger, G. and Roe, M. (1995) "Positional Change in the Polish Liner Shipping Market: A Framework Approach", MARITIME POLICY AND MANAGEMENT, 22, no.4, p.296.

__________, (1996) EAST EUROPEAN CHANGE AND SHIPPING POLICY, Avebury Publications, U.K.

Lillien, G.L.; Kotler, P. and Moorthy, K.S. (1992) MARKETING MODELS, Prentice Hall Inc., New Jersey, pp.6-9.

Lloyd's Ship Manager (1993) TURKISH SHIPPING AND PORTS DIRECTORY-1993, August, Lloyd's of London Press Ltd., U.K., p.11.

__________, (1994a) CRUISE & FERRY, January, Lloyd's of London Press Ltd., U.K., p.5.

__________, (1994b) TURKISH SHIPPING AND PORTS DIRECTORY-1994, July, Lloyd's of London Press Ltd., U.K., p.7, 9, 39.

__________, (1995a) CRUISE & FERRY, July-August, Lloyd's of London Press Ltd., U.K., pp.21-22.

__________, (1995b) TURKISH SHIPPING AND PORTS DIRECTORY-1995, Lloyd's of London Press Ltd., U.K., p.7, 9, 23.

LLOYD'S LIST (1994a) Lloyd's of London Press Ltd., U.K., 10/06/94.

__________, (1994b) Lloyd's of London Press Ltd., U.K., 10/10/94.

__________, (1996a) Lloyd's of London Press Ltd., U.K., 02/03/96.

__________, (1996b) Lloyd's of London Press Ltd., U.K., 14/03/96.

__________, (1996c) Lloyd's of London Press Ltd., U.K., 18/03/96.

__________, (1996d) Lloyd's of London Press Ltd., U.K., 16/05/96.

__________, (1996e) Lloyd's of London Press Ltd., U.K., 18/05/96.

__________, (1996f) Lloyd's of London Press Ltd., U.K., 30/07/96.

Lovelock, G.H. (1984) SERVICES MARKETING, Prentice Hall Inc., New Jersey, pp.134-136.

__________, (1996) SERVICES MARKETING, 3rd edition, Prentice Hall Inc., New Jersey, pp.175-182, 208-214.

Luck, D.J.; Wales, H.G. and Taylor, D.A. (1982) MARKETING RESEARCH, 6th edition, Prentice Hall Inc., New Jersey, pp.459-460.

Manly, B.F.J. (1994) MULTIVARIATE STATISTICAL METHODS, 2nd edition, Chapman and Hall, London, pp.1-3, 6-9, 10-11.

Manrai, L.A. and Manrai, A.K. (1993) "Positioning European Countries as Brands in a Perceptual Map: An Empirical Study of Determinants of Consumer Perceptions and Preferences", JOURNAL OF EUROMARKETING, 2, no.3.

Manrai, A.K. and Sinha, P.K. (1989) "Elimination-by-Cutoffs", MARKETING SCIENCE, 8, no.2, pp.133-152.

Marascuilo, L.A. and Serlin, R.C. (1988) STATISTICAL METHODS FOR THE SOCIAL AND BEHAVIORAL SCIENCES, W.H. Freeman and Company, U.S.A., p. 765.

MARITIME DIRECTORY (1994) Lloyd's of London Press Ltd., London.

Matear, S.M. (1991) THE EXISTENCE AND USE OF BENEFIT SEGMENTS IN THE IRISH SEA FERRY MARKET, Unpublished Doctor of Philosophy Thesis, Plymouth Polytechnic, U.K., pp.73-85.

McGraw, K.O.; Gordji, S. and Wong, S.P. (1994) "How Many Subjects to Screen? A Practical Procedure for Estimating Multivariate Normal Probabilities for Correlated Variables", JOURNAL OF CONSULTING AND CLINICAL PSYCHOLOGY, 62, October, pp.960-964.

McIntyre, S.H. and Ryans, A.B. (1977) "Time and Accuracy Measures for Alternative Multidimensional Scaling Data Collection Methods: Some Additional Results", JOURNAL OF MARKETING RESEARCH, 14, November, U.S.A., p.607.

Mersin Chamber of Shipping (1995) SHIPPING PERIODICAL, August, Mersin, Turkey, p.16.

Middle East Research Institute (1985) MERI REPORT: TURKEY, University of Pennsylvania, Croom Helm Ltd., U.S.A., pp.4-6, 8, 10.

MILLIYET (1996) Istanbul, Turkey, 26/09/96.

Ministry of Transport (1992) SHIPPING LAW, Sea Transport General Directorate, Ankara, Turkey, p.179, 197, 198, 214, 227, 229, 493, 545, 552, 586.

Moeser, S.D. (1988) "Cognitive Mapping in a Complex Building", ENVIRONMENT AND BEHAVIOUR, 20, January, pp.21-49.

Mohrman, S.A.; Cohen, S.G. and Mohrman, A.M. (1995) DESIGNING TEAM-BASED ORGANISATIONS: NEW FORMS FOR KNOWLEDGE WORK, Jossey-Bass Inc., U.S.A., pp.8-9.

Moinpour, R.; McCullough, J.M. and MacLachlan, D.L. (1976) "Time Changes in Perception: A Longitudinal Application of Multidimensional Scaling", JOURNAL OF MARKETING RESEARCH, 13, August, U.S.A., pp.245-253.

Molinero, C.M. (1991) ON THE RELATIONSHIP BETWEEN MULTIDIMENSIONAL SCALING AND OTHER STATISTICAL TECHNIQUES, University of Southampton, U.K., p.19.

Morse, G.A.; Calsyn, R.J. and Burger, G.K. (1991) "A Comparison of Taxonomic Systems for Classifying Homeless Men", THE INTERNATIONAL JOURNAL OF SOCIAL PSYCHIATRY, 37, summer, pp.90-98.

Morse, J.M. (1994) "Qualitative Research: Fact or Fantasy?", in Morse, J.M. (ed.), CRITICAL ISSUES IN QUALITATIVE RESEARCH METHODS, Sage Publications Inc., U.S.A., pp.1-8.

OBSERVATION (1996) Shipping Supplement, Milliyet Publications, Istanbul, Turkey, 07/10/96.

Official Journal of the European Communities - OJL (1986) No.378, vol.29, 31/12/86.

__________, (1995a) No.89, vol.38, 21/04/95.

__________, (1995b) No.157, vol.38, 07/07/95.

__________, (1995c) No.320, 30/12/95.

Olali, H. and Timur, A. (1992) TOURISM IN THE TURKISH ECONOMY, Izmir,Turkey, p.9.

Oltman, P.K.; Stricker, L.J. and Barrows, T.S. (1990) "Analysing Test Structure by Multidimensional Scaling", JOURNAL OF APPLIED PSYCHOLOGY, 75, February-December, American Psychological Association, U.S.A., pp.21-27.

Organisation for Economic Cooperation and Development - OECD (1988) REGIONAL PROBLEMS AND POLICIES IN TURKEY, Paris, pp.12-15.

Oyan, O. (1987) OUTWARD LOOKING AND FISCAL POLICIES IN THE 24-JANUARY-ECONOMY, Ankara, Turkey, pp.15-18, 167, 205.

________, (1989) OUTWARD LOOKING ECONOMIC AND FISCAL POLICIES: 1980-1989, 2nd edition, Ankara, Turkey, p.167, 209, 225, 251, 301.

Ozkan, I.R. (1995) "Approaches to the Problems of Cyprus", YENI YUZYIL, Ankara, Turkey, 29/07/95.

Ozturk, I. (1996) "Urban Substructures and Environmental Protection in the Seventh Five-Year Development Plan", FRAME, Association of Independent Industrialists and Businessmen-AIIB, 1, Istanbul, Turkey, pp.151-155.

Palmer, A. (1994) PRINCIPLES OF SERVICES MARKETING, McGraw Hill Book Company Int. Ltd., U.K., pp. 1, 3-7, 31, 35, 73, 76, 109.

Parasuraman, A. (1991) MARKETING RESEARCH, 2nd edition, Addison-Wesley Publishing Co.Inc., U.S.A., pp.252-252, 767, 882.

Polzella, D.J. and Reid, G.R. (1989) "Multidimensional Scaling Analysis of Simulated Air Combat Maneuvering Performance Data", AVIATION-SPACE, 60, pp.141-144.

Reap, M. and Popovics, A.J. (1989) "Perceptions of a College According to Intended Department of Study (Marywood College)", PERCEPTUAL AND MOTOR SKILLS, 69, December, pp.1347-1350.

Ries, A. and Trout, J. (1986) POSITIONING: THE BATTLE FOR YOUR MIND, 1st edition-revised, Warner Books, New York.

Rosario, L. (1994), "Softer Options: Newspaper Owners Start Positioning for 1997", FAR EASTERN ECONOMIC REVIEW, 157, January, p.28.

Sabah (1995) THE NEW GEOGRAPHIC ATLAS, Istanbul, Turkey, p.19.

Savolainen, T.; Beeckmann, D. and Groumpos, P. (1995), "Positioning of Modelling Approaches, Methods and Tools", COMPUTERS IN INDUSTRY, 25, March, pp.255-262.

Sayari, S. (1992) "Politics and Economic Policy-Making in Turkey, 1980-1988", in Nas, T.F. and Odekon, M. (eds.), ECONOMICS AND POLITICS OF TURKISH LIBERALISATION, Associated University Presses, New Jersey, p.26, 29.

Schori, T.R. and Meadow, H.L. (1985), "Brand Choice Modelling: Identifying a Brand's Optimal Positioning", PSYCHOLOGICAL REPORTS, 57, December, pp.1260-1262.

SEATRADE (1993) TURKISH SHIPPING GUIDE, November, U.K., p.118.

__________, (1995) July, U.K., p.63.

Shepard, R.N.; Romney, A.K. and Nerlove, S.B. (1972) MULTIDIMENSIONAL SCALING: THEORY AND APPLICATIONS IN BEHAVIORAL SCIENCES, 1, Seminar Press Inc., New York, p.1, 5-6.

SHIELD (1995) 4th quarter, The BP Publication, U.K., pp.6-8.

Shostack, G.L. (1977) "Breaking Free from Product Marketing", JOURNAL OF MARKETING, April, 41, no.2.

Sinclair, S.A. and Stalling, E.C. (1990) "Perceptual Mapping", JOURNAL OF BUSINESS AND INDUSTRIAL MARKETING, spring, pp.55-66.

State Institute of Statistics - SIS (1991) ANNUAL STATISTICS: 1990, Ankara, Turkey, p.22.

__________, (1994) TRANSPORT STATISTICS:1993, Ankara, Turkey, p.16.

__________, (1995) STATISTICS AND ANALYSIS OF THE TURKISH ECONOMY, Ankara, Turkey, p.1, 199, 214-217, 322-323.

__________, (1996) ANNUAL STATISTICS OF THE FOREIGN TRADE-1995, Ankara, Turkey, p.iii-xii.

State Planning Organisation, (1996a) SEVENTH FIVE-YEAR DEVELOPMENT PLAN, Prime Ministry Press, Ankara, Turkey, pp.3-5.

__________, (1996b) SEVENTH FIVE-YEAR DEVELOPMENT PLAN:SHIPBUILDING INDUSTRY, Prime Ministry Press, Ankara, Turkey, p.18.

Sufian, A.J.M. (1993) "A Multivariate Analysis of the Determinants of Urban Quality of Life in the World's Largest Metropolitan Areas", URBAN STUDIES, 30, October, pp.1319-1329.

Takane, Y.; Young, F.W. and de Leeuw, J. (1977) "Nonmetric Individual Differences Multidimensional Scaling: An Alternating Least Squares Method with Optimal Scaling Features", PSYCHOMETRIKA, 42, March, The Psychometric Society, U.S.A., pp.45-47.

Temel, A. (1996) "The Seventh Five-Year Development Plan: 1996-2000", FRAME, Association of Independent Industrialists and Businessmen-AIIB, Istanbul, Turkey, pp.30-33.

Tez, I., (1992a) GENERAL VIEW OF THE SHIPPING SECTOR, Prime Ministry Press, Ankara, Turkey, pp.15-16.

______, (1992b) INVENTORY OF COASTS AND MINISTRY OF MARITIME, Prime

Ministry Publishing, Ankara, Turkey, pp.9-10, 131-135, 167-168.

The Reed Travel Group (1994) ABC CRUISE & FERRY GUIDE, London, pp.207-250.

THE ECONOMIST (1992) "Consumer Behaviour: Strategic Shopping", 324, September, p.82.

The Institute of Personnel Development - IPD (1996) THE IPD GUIDE ON TEAM REWARD, U.K., p.1.

Tittle, C.K.; Weinberg, S.L. and Hecht, D. (1996) "Investigating the Construct Validity of Scores from a Measure of Student Perceptions about Mathematics Classroom Activities Using Multidimensional Scaling", EDUCATIONAL AND PSYCHOLOGICAL MEASUREMENT, 56, August, pp.701-709.

Togan, S.; Olgun, H. and Akder, H. (1987) REPORT ON DEVELOPMENTS IN EXTERNAL ECONOMIC RELATIONS OF TURKEY, Research Centre of the Foreign Trade Association of Turkey, Ankara, p.5, 7, 9, 43.

Tongerson, W.S. (1952) "Multidimensional Scaling: I-Theory and Method", PSYCHOMETRIKA, 17, pp.401-419.

__________, (1960) THEORY AND METHODS OF SCALING, John Wiley and Sons Inc., New York.

Tongzon, J.L. (1995) "Systematising International Benchmarking for Ports", MARITIME POLICY AND MANAGEMENT, 22, no.2, pp.171-177.

Tull, D.S. and Hawkins, D.I. (1987) MARKETING RESEARCH: MEASUREMENT AND METHOD, fourth edition, Macmillan Publishing Company, New York, p.299, 463, 466, 495-496, 498, 508, 517, 521, 526.

__________, (1993) MARKETING RESEARCH: MEASUREMENT AND METHOD, sixth edition, Prentice Hall Ins., U.S.A., p.426, 431-432, 693-694.

Turkish Maritime Lines - TML (1993) VOICE OF THE SEA, 101, July-August, Istanbul, Turkey, p.39.

Turkish Maritime Organisation - TMO (1994) DATA FILES, Izmir, Turkey.

__________, (1995) DATA FILES, Izmir, Turkey.

__________, (1996) DATA FILES, Izmir, Turkey.

Undersecretariat of Shipping, (1996a) REPORT ON FERRY SERVICES: ITALY-TURKEY, Ankara, Turkey, pp.11-13.

__________, (1996b) REPORT ON LINE PERMIT FOR FERRY SERVICES, Ankara, Turkey, pp.1-2.

__________, (1996c) LEGISLATION PAPER: LINE PERMIT, Ankara, Turkey, 25/01/96.

UNDERSTANDING GLOBAL ISSUES (1993) 1, European Schoolbooks Publishing Ltd., U.K., p.11.

Union of Turkish Chambers (1994) REPORT ON THE TURKISH ECONOMY, Ankara, Turkey, p.40.

Uslu, S. (1996) "Social Life in the Turkish Society", FRAME, Association of Independent Industrialists and Businessmen-AIIB, 1, Istanbul, Turkey, pp.138-140.

Uysal, Y. and Mazgit, I. (1996) THE TURKISH ECONOMY AT THE BEGINNING OF 1996, Association of Turkish Young Businessmen-ATYB, Izmir, Turkey, p.13, 28.

Various ferry operator company catalogues, 1994.

Vriens, M. (1994) "Solving Marketing Problems with Conjoint Analysis", in Hooley, G.H. and Hussey, M.K. (eds.), QUANTITATIVE METHODS IN MARKETING, Academic Press, U.K., pp.37-55.

Weeks, D.G. and Bentler, P.M. (1982) "Restricted Multidimensional Scaling Models for Asymmetric Proximities", PSYCHOMETRIKA, 47, June, The Psychometric Society, U.S.A., pp.201-208.

Weiner, E. and Brown, A. (1995), "The New Marketplace", THE FUTURIST, 29, May/June, pp.12-14.

Wind, Y.J. (1982), PRODUCT POLICY: CONCEPTS, METHODS AND STRATEGY, Addison-Wesley Publishing Company Inc., U.S.A., pp.21, 82-93.

WORLD SHIPPING DIRECTORY (1994) Fairplay Publications Ltd., U.K.

Yalcintas, N. (1996) "Regarding the Seventh Five-Year-Development Plan", FRAME, Association of Independent Industrialists and Businessmen-AIIB, 1, Istanbul, Turkey, pp.39-40.

YENI YUZYIL (1994) Ankara, Turkey, 18/12/94.

YENI ASIR, (1995) Izmir, Turkey, 16/09/95.

__________, (1996) Izmir, Turkey, 12/12/96.

Young, F.W.; de Leeuw, J. and Takane, Y. (1976) "Regression with Qualitative and Quantitative Variables: An Alternating Least Squares Method with Optimal Scaling Features", PSYCHOMETRIKA, 41, December, The Psychometric Society, U.S.A., pp.505-529.

Young, G. and Householder, A.S. (1938) "Discussion of a Set of Points in Terms of Their Mutual Distances", PSYCHOMETRIKA, 3, pp.19-22.

Zeithaml, V.A. and Bitner, M.J. (1996) SERVICES MARKETING, McGraw Hill Book Co., U.S.A., pp.25-27, 138-140, 144, 207-208.

Zins, A.H. (1994) "On the Derivation of a Common Space of Competing Leisure Attraction Types", JOURNAL OF MARKETING MANAGEMENT, 10, Jan.-Apr., The Dryden Press, U.K., pp.179-190.