
**AN EMPIRICAL STUDY ON THE EFFECTS OF MARITIME TRANSPORTATION ON
TURKISH ECONOMY**

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ABSTRACT

Maritime transportation have significant place at national and international policy because of its nature. Maritime policies and transport trade are influenced by many factors. The present situation in the world takes it difficult to make strategic decisions and create a policy for maritime transport coverage. The biggest reason for that; many events in the world affect all markets. For example; the rapid progress of technology, any political event changing the market, this area has many influences that will increase the difficulty such as the existence of socio-cultural mobility at high speed and finding of world conditions standardized by statutory responsibilities. It is relevant literature was used for this purpose, made from different studies. In our study; it preferred the multiple regression analysis of the quantitative method. Consequently, Marine Transportation is positively, linearly and exactly but a limited effect on the Turkish Economy. This is evidence of; all the coefficients of the predicted regression model are positive. At our model; Total Handling Amounts Performed in Our Ports Unloading Total Importing, Handling Amounts Performed in Our Ports Unloading Total Exports, Ports Based on Port Headquarters Ship Statistics Total Number of Turkish Flagged Ships, Balance of Payments Services Balanced Transportation Income and Balance Balanced Services Balance Freight Income has been accepted as the indicators of sea freight transportation Industrial production index, which has big effect to economic growth, has been found to be positive effects. The most effective variables were the total export, while the least effective was the number of Turkish flagged vessels. The most important reason for that; Since the effect of exports on growth is greater, the ratio of influencing the dependent variable, industrial production index, is higher than the other data. In all these results, the research hypothesis, which is that maritime transportation has positive influence on the country's economy, was accepted and it was seen that the maritime transport affected the Turkish economy.

Keywords:. Freight, Turkish Economy, Maritime Transport, Countries Economies

INTRODUCTION

International marketing is a term that serves as a bridge connecting different societies and cultures with each other. In addition to tying societies, cities and countries together, international marketing helps the interactions of societies to get stronger and also helps these societies to build strong relationships. Furthermore, international marketing encourages the level of welfare to increase by contributing to the economy of country and also enrich countries in various aspects. Also, it encourages social and scientific developments and takes the civilization to a higher level.

In simple words, international marketing takes place through mutual shopping. Although the term "logistics" seems to be quite different from international marketing, it is not possible to mention international marketing without mentioning logistics. Many people focus on transportation when logistics is mentioned. However, logistics does not only contain transportation. Logistic is the sine qua non of international trade as a gear in a machine. All of the terms concerned with international marketing can be resembled to the elements associated with logistics.

Information technologies form the substructure of globalization. Every day a huge amount of merchandise and service procurement takes place through internet. Logistics plays a major role in transportation of merchandise and service procurement to customers. In this regards, logistics does not only deal with transportation of products, it also plays an effective role in providing customer satisfaction by decreasing transportation costs.¹ According to this explanation, logistics refers to the transportation of products from the starting point of raw material to the point where the product is consumed, planning and inspection of storage of these products.² Maritime transportation which is a fundamental part of transportation in general, influences the economy of countries within the context of logistics. In that regard, this study examines the significance of maritime transportation and the effects of maritime transportation on Turkish economy with an empirical study.

In logistics the type of the product, time, cost and security elements play a substantive role in determining the transportation system? Although maritime seems to be the slowest transportation system, it is the most widely preferred type of transportation for the bulky products. Maritime transportation costs have a huge impact on this choice. The fact that maritime transportation is low-cost by 86% compared to road transportation, by 71% compared to railroad transportation and by 95% compared to airway transportation. This cost advantage of maritime transportation

¹Effect on Some Economic Indicators of Ship Transport in Turkey Business and Economics Research Journal, Volume 3 Number 2 2012, pp. 97-109, ISSN: 1309-2448, S.2

² General Definition Of Logistic, CSCMP (Counsel of Supply Chain Management Professionals), (Online), <http://cscmp.org>

increased the preference of this mode for international transportation operations.³ In 2013, the amount of products carried through maritime transportation is more than 9.5 billions of ton in the world.⁴ It corresponds to \$400 billion of income in worldwide maritime volume of trade.⁵ Thus, we can say that maritime transportation has a significant impact on national economy.

2. Literature Review

2.1. General Features of Maritime Transportation

Maritime transport is transportation of loads from one port to another by sea. Maritime transportation is an integrated process which includes; ship building and supporting industry, agency, class establishment, ports and other substructures, water products, sea-environment, sea-tourism, sea-international relations and sea-principles of law. Pamukçu (1982) states that maritime transportation is composed of: shipping operation, ports (substructure) and ship building industry. However, Stanford (2004) indicates that maritime transport is comprised of; new ship building industry, second hand vessel industry, vessel scrap industry and freight market.

According to the approach adopted by the State Planning Organization, maritime transport is formed of transportation service and port activities. Furthermore, operational areas of transportation service and port activities are listed below:

- Transport of passengers and loads in cabotage fields
- Import, export, transport of loads between international ports, transportation of international passengers
- Transportation of passengers and loads on lakes and rivers
- Coastal safety, salvage and security

As understood from the above mentioned descriptions, maritime transportation is explained differently by various authors. Although descriptions are close to each other, there are some differences in terms of contents. This study focuses on the description which is offered by State Planning Organization.

2.2 Maritime Transportation in Turkey and Its Effects on Economy

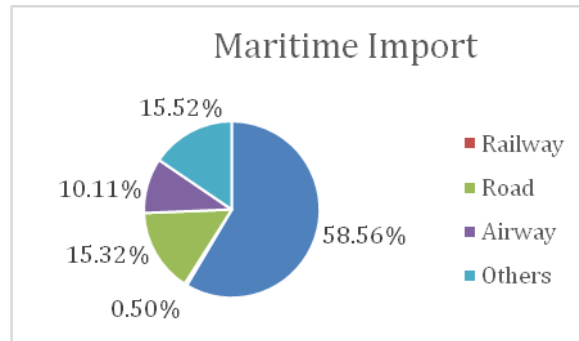
Maritime transport plays a significant role in foreign trade of Turkey whose coastal line is 8333 km. According to the data published in *November-January 2014; Turkish Trade Reports*; foreign trade shares in Turkey is as follows:

³RekabetRaporu, The Competition Report, Ankara, 2012, S.31

⁴United Nations Conference on Trade and Development, Review of Maritime Transport, 2014, s.6

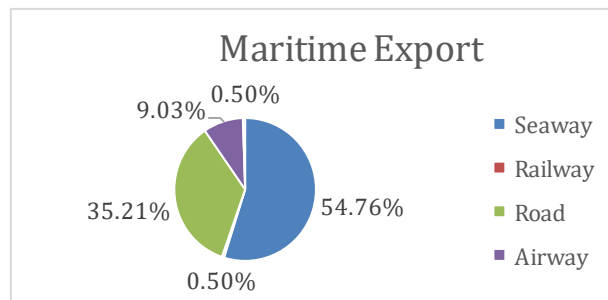
⁵ Denizcilik Müsteşarlığı Raporu, Maritime Affairs Report 2010, s.5

Figure 1: Import Rates of Maritime Transportation in Turkey by Different Modes in Turkey



Source: UNCTAD

Figure 2: Export Rates of Maritime Transportation in Turkey by Different Transportation Modes



Source: UNCTAD

It is seen that maritime transportation covers more than 50% of import and export of maritime transportation in Turkey. Considering that almost 90% of world trade takes place by sea, it is further expected that there will be an increase in the rates of maritime transportation in the future. In November-January 2014 in Turkey, 144 billion 485 million dollars of export was accomplished. 55% of this export (78 billion 899 million dollar) took place by sea. In the same period in 2014, 220 billion 450 million dollar of import was accomplished by sea and 58% of this import took place.⁶

⁶ TÜİK, Turkish Statistical Institute, Foreign Trade Statistics January to November 2014

Maritime transportation triggers production. Maritime transport companies act as a source for product and service from Turkish suppliers. In addition to this, workers employed by shipping industry also affect the economy of suppliers. These effects on economy are categorized as direct effect, indirect effect and bound effect. In relation to direct, indirect and bound effects, shipping industry in Turkey has employed 3500 employers in 825 ship agencies and 176 related branches as of 2010. Whereas 15.000 employers are employed directly in ship building industry, approximately 60.000 people are employed in ship building industry. As of January 2011, 81.060 deck hand, 22.046 mechanic, 24.960 deck officer and 13.740 engine officer are employed in Turkey.⁷

The transmission of Turkey to tonnage based taxation⁸ has contributed to Turkish economy significantly. Tonnage Taxation Application which was initiated by TISRL (Turkish International Ship Registry Law) law in 1999 affected Turkish economy fundamentally. In the light of this development, Turkey went into a critical period in terms of encouragement of maritime transportation. When tonnage taxation application was initiated, maritime lines were excluded from income and corporation tax, stamp tax, fee, banking and insurance transaction tax. This provided major advantages in terms of rivalry with countries owning flag of convenience and tonnage taxation regime.

Costs of employment of shipmen which is a significant factor for maritime transportation companies have been reduced and no income tax has been demanded from shipmen regardless of nationality. By this means, Turkey which was ranked 35th in terms of tonnage in early 1980s has reached to a higher level with the introduction of tonnage taxation in 2000s, and also ranked as the 16th country in the period of global crisis.⁹ If workers are employed in various sections of economy, these effects may lose their power. However, maritime transportation is an industry of international employment mobility and if tonnage taxation does not exist, employers may look for jobs in foreign countries which may cause a striking loss for Turkish economy.

⁷Maritime Chamber of Commerce Report 9 Mayıs 2012.

⁸ Tonnage based taxation model is a regime developed due to the difficulties experienced in the detection of incomes of ship owners in the 15th century. The application shows differences in countries. Taxation in tonnage taxation is measured as "lump sum" according to the tonnage of the ship or the number of the days it is operated. For this reason, as the endorsement of the operation is not grounded on, tax saving is provided. Studies show that tax assessment of tonnage tax corresponds to 10% of income taxes. This makes tonnage tax attractive for shipping operations, Maritime Chamber of Commerce Report, 2012, s.75.).

⁹ Ali Çelikkaya, Tax Incentives Granted to A Study on Maritime Transport in Turkey, Finance Magazine Issue 162 January-June 2012

3. Methodology

3.1 Research Objectives

The aim of this study is to examine the effects of maritime transportation on Turkish economy by an empirical method. In this regard, regression analysis has been conducted by combining macroeconomic and microeconomic variances with data concerned for maritime transportation. As studied in literature review, factors investigated in terms of effects for maritime transportation on economy are passenger, transportation cost and renting services. The choice of variables in this study depends on this effect.

3.2 Scope of the Research and Limitations of the Research

Monthly and annual data that used in this study are taken from TSI (Turkish Statistics Institute) and CBRT (Central Bank of the Republic of Turkey). Due to the data is numerically insufficient, monthly data is used. In this regards, the set of data which is used in this study extends from January 2005 to December 2013.

3.3 Research Method

Multivariate regression analysis used to analyze the effects of maritime transportation on Turkish economy. And also, E-views 7 program was used for multivariate regression analysis.

3.4 Research Findings and Evaluation

Within the content of analysis, regression analysis has been conducted in this study. In order to determine the appropriate model form, predictions were made in data set and direct ($Y=a+bX$) and log-linear ($\log Y=a+b\log X$), and fully logarithmic ($\log Y=a+b\log X$) model forms. Also, finally ideal variable combination and mathematical model form were selected.

The main objective in this study is to reach the ideal form by using these variables. For this reason, various tests were conducted in the selected model and its meaningfulness was tested in many aspects. Two alternative model predictions, direct and fully logarithmic models, were made statistically by depending on meaningful variables in all of the models containing various mathematical forms. Variables of these two models are statistically meaningful. F test is meaningful and R-root value is high. In both of these models, parameter of TOPITHIHR variable was found to be negative. As a result, after this variable was taken out, it was decided to move with the fully logarithmic model in terms of interpretation advantage.

Abbreviations of variables used in the predicted regression equation are as follows:
IPI=Industrial Production Index (Total industry)

Totex=The Monthly Amount of Handling in Ports and Total Export in Terms of Loading (With Turkish Flag) (Ton)

Totim=The Monthly Amount of Handling in Ports and Total Export in Terms of Unloading (With Turkish Flag) (Ton)

Totexim=The Monthly Amount of Handling in Ports and Total Export-Import (With Turkish Flag) (Ton)

FRHT=Balance of Payments, Balance of Services, Transportation Incomes (Million\$)

TRPT=Balance of Payments, Balance of Services, Transportation Income (Million\$)

IM=Import-seaway According to Transportation Systems (000 \$)

EX=Export-seaway According to Transportation Systems (000 \$)

Totves=Statistics of Ships Calling In Turkish Ports In terms of Port Authorities, Total Number of Ships Calling At Ports

Totrves=Statistics of Ships Calling In Turkish Ports In terms of Port Authorities, Total Number of Ships With Turkish Flags Calling At Ports

The functional form of ideal model:
 $\log(IPI) = a + b \cdot \log(totex) + c \cdot \log(totim) + h \cdot \log(totves) + j \cdot \log(trpt) + k \cdot \log(frht)$

The predicted results of the model are shown below:

Table1: Prediction of Regression Model

Dependent Variable: LOGIPI			
Method: Least Squares			
Date: 05/15/15 Time: 03:15			
Sample (adjusted): 2006M01 2013M10			
Included observations: 94 after adjustments			
Variable	Coefficient	Std. Error	t-Statistic Prob.

LOGTOPIM	0.155740	0.030273	5.144609	0.0000
LOGTOPEX	0.229123	0.056194	4.077362	0.0001
LOGTOTVES	0.063722	0.020323	3.135410	0.0023
LOGTRPT	0.074571	0.030954	2.409065	0.0181
LOGFRHT	0.164629	0.043254	3.806074	0.0003
C	-5.492203	0.771480	-7.119049	0.0000
R-squared	0.746144	Mean dependent var	4.615588	
Adjusted R-squared	0.731721	S.D. dependent var	0.115504	
S.E. of regression	0.059826	Akaike info criterion	-2.733048	
Sum squared resid	0.314966	Schwarz criterion	-2.570710	
Log likelihood	134.4533	Hannan-Quinn criter.	-2.667475	
F-statistic	51.73073	Durbin-Watson stat	1.089990	
Prob(F-statistic)	0.000000			

Interpretation of parameters:

When the Amount of Handling in Turkish Ports, Amount of Unloading, Total Import increases by 1%, Industrial Production Index increases 0,15%.

When the Amount of Handling In Turkish Ports, Amount of Loading, Total Import increases by 1%, Industry Production Index increases by 0,22%.

When Statistics of Ships Calling In Turkish Ports In terms of Port Authorities, Total Number of Ships With Turkish Flags Calling At Ports increases by 1%, Industry Production Index increases by 0,06%.

When Balance of Payments, Balance of Services, Transportation Income increases by 1%, Industry Production Index increases by 0,007.

When Balance of Payments, Balance of Services, Freight Incomes increases by 1%, Industry Production Index increases by 0,16%.

4. Conclusion

Maritime transportation has a great importance in the development of economy and arrangement of social and political events. When we look at history, sea has played a major role in the development of countries and increasing welfare of countries.

As in the past, maritime transportation still keeps its importance and even increases its importance day by day. Nowadays, maritime transportation is considered as the mirror of economic situation and international industry of a country. Maritime transportation and loads handled at ports are one of the most significant indicators of export and import.

Maritime is a sector including a variety of elements such as mercantile fleets, ports, shipyards, educational institutions and related to technical, economical, legal and political subjects. In addition to economic value, export and import of petroleum which is a fundamental political weapon is carried out by sea. Turkey whose coastal line is 8333 km. and has a crucial value in terms of transportation, does not receive as much value as it deserves.

The findings of the empirical study conducted within the scope of this study, it was found that maritime transportation had positive effects on the Turkish economy. The fact that parameters in the regression model were positive proves that. As bound variable, Turkish economy was taken as industry production index in the model. It was also found that industry production index was preferred as it was one of the indicators of Turkish economy, monthly data was not obtained and also other restrictions existed in the model. The amount of handling at Turkish ports, unloading total import, the amount of handling in Turkish ports, loading total export, statistics of ships calling in Turkish ports in terms of port authorities, the total number of ships with Turkish flags calling in Turkish ports, balance of payments, balance of services, freight incomes are accepted as indicators of maritime transportation and it was found that these variables had a positive effect on industry production index. Within the content of these variables, the increase in Industry Production Index is shown below:

When The Amount of Handling in Turkish Ports, Amount of Unloading, Total Import increases by 1%, Industrial Production Index increases 0,15%.

When The Amount of Handling in Turkish Ports, Amount of Loading, Total Import increases by 1%, Industry Production Index increases by 0,22%.

When Statistics of Ships Calling In Turkish Ports In terms of Port Authorities, Total Number of Ships With Turkish Flags Calling At Ports increases by 1%, Industry Production Index increases by 0,06%.

When Balance of Payments, Balance of Services, Transportation Income increases by 1%, Industry Production Index increases by 0,007.

When Balance of Payments, Balance of Services, Freight Incomes increases by 1%, Industry Production Index increases by 0,16%.

While total export was the most effective variable in the model, the least effective variable in the model was the number of ships with Turkish flags.

In that regard, the hypothesis of this study is accepted. In other words, the effect of maritime transportation on Turkish economy is positive but limited.

As a result, when the results of analysis are considered, adaptation to the rules in terms of maritime and EU, following a rationalist and farsighted policy related to maritime transport, and most importantly providing maritime training and creating an image as a sea lover country will improve maritime transport, economy of the country and provide expansion of the Turkish economy. In addition to this, when we consider that maritime transportation is very crucial for the location of our country, it is suggested that increasing the institution associated with maritime to the level of ministry will provide more advantages.

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