

TRANSPORTATION SECTOR IN TURKEY: FUTURE EXPECTATIONS REGARDING THE RAILWAY TRANSPORTATION



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ABSTRACT | Transportation sector in Turkey, in the early years of the Republic, short range railway and seaway transportation is observed to be made in the Western Anatolia. Upon the establishment of the Republic, much importance was put on railway transportation and the railway systems which would provide east-west and north-south connection were built. In recent years, Turkey has been experiencing important developments related with railway transportation. Due to playing great role of railway transportation in Turkey's effectiveness in carrying international cargo, being on an important location in the international corridor, increasing the public investments and allowances for the railway transportation, works have been started especially in terms of international cargo transportation. In this study, by examining the overall structure of the transport sector in Turkey, foresight of railway transportation until 2025 has been aimed to be made

Keywords: *Transportation Sector In Turkey: Future Expectations About Railway Transportation Of Turkey*

Jel Code: O02, F06, R04



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TÜRKİYE'DE ULAŞTIRMA SEKTÖRÜ: DEMİRYOLU TAŞIMACILIĞINDA GELECEĞE YÖNELİK BEKLENTİLER



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ÖZ | Ekonomik gelişme sürecinde, gelişmiş pek çok ülkede hizmetler sektörü önem kazandığı görülmektedir. Hizmetler sektörü içinde en fazla yatırımın yapıldığı ve katma değer yaratıldığı sektör ise ulaştırma sektörüdür. Türkiye'de ulaştırma sektörüne bakıldığında, Cumhuriyetin ilk yıllarına kadar Batı Anadolu'da kısa mesafelerde demiryolu ve denizyolu ile yapılan kısa mesafeli taşımacılığın yapıldığı görülmektedir. Cumhuriyetin kurulması ile demiryolu taşımacılığına önem verilmiş, Türkiye'de doğu-batı ve kuzey-güney bağlantısını kuracak demiryolları yapılmıştır. Türkiye'de son yıllarda demiryolu taşımacılığına ilişkin önemli gelişmeler yaşanmaktadır. Uluslararası koridor arasında önemli bir konumda bulunan Türkiye'nin, uluslararası yüklerin taşınmasındaki etkinliğinin artmasında demiryolu taşımacılığının rolünün büyük olması nedeniyle, demiryolu taşımacılığına ilişkin kamu yatırımları ve ödenekleri arttırılarak, özellikle uluslar arası yük taşımacılığına ilişkin çalışmalar başlatılmıştır. Çalışmada, Türkiye'de ulaştırma sektörünün genel yapısı incelenerek, demiryolu taşımacılığının gelecek 25 yıllık öngörüsünün yapılması amaçlanmaktadır. Bu çerçevede, Türkiye'nin potansiyel ekonomik kalkınmasında demiryolu taşımacılığının rolünün belirlenmesi hedeflenmektedir.

Anahtar Kelimeler: Lojistik, Demiryolu Taşımacılığı, Ulaştırma

Jel Kodu: O02, F06, R04

1. INTRODUCTION

Transportation can simply be defined as moving people or goods to fulfill any requirement in a way that would bring benefit in time and space (Barda, 1964:5). Transportation activities which are the key factor of economic, social and cultural activities are a service activity whose demand is created by other sectors. The most important sectors which create demand can be named as industry, trade, agriculture and tourism. In addition, transportation is sector which plays effective role on productivity of all sectors (Kabasakal and Solak, 2009: 27).

Transportation sector is one of the important sectors for arranging product flow, enabling sustainability of this process and being a sector which generating employment. Within economic structure, improvement of transportation opportunities has positive effect on employment structure, investments and production level in macro-economic sense and on activities, sales and distribution process of enterprises in micro economic sense (Nalçakan, 2009: 34).

Transportation systems and networks serve in freight which is the subject of world trade. It is seen that transportation networks, systems and transportation ways play effective role in determination of economic and political strategies of nations (Nalçakan, 2009: 34). Improvements in transportation created great changes in nations economically, politically and socially. In this process, the first great improvement was enabled in the field of railway transportation systems. By providing dynamism to the process; the breakthrough which began in the field of railway transportation both brought solutions for labor and raw material problem and market requirement of infant industry, and made great contributions by enabling mass production in the fields out of industrial centers.

The main aim of this study which was carried out based on the importance of railway transportation within transportation systems is to analyze the development of railway transportation in Turkey and put forwards expectations in railway transportation until 2025. For this aim, first of all, developments in transportation sector in Turkey were examined generally. Then the current position of railway transportation in transportation sector was aimed to determine by pointing out superior and disadvantageous aspects of railway transportation. In the last section foresight of railway transportation until 2025 was made and the study is concluded with overall assessment and suggestions.

2. TRANSPORTATION SECTOR IN TURKEY

Transportation sector which has become the one that creates the most added values for national economies has an important place for Turkey as well. One of the most important factors which makes transportation sector that has around 14% share within GDP as of 2010 and has 12.2% growth compared to previous year (TOBB, 2012) special for Turkey is its geographical location. When the geography of Turkey is considered together with its environment, it is seen that Turkey is located in a place where political, military, demographic, economic and commercial

power balances change continuously, trade and raw material flow is carried out intensely in the sense of global competition (Nalçakan, 2009: 37). Turkey which serves as a bridge between Asia, Europe and Africa is like a basis both in freight and passenger transportation and can serve in all types of transportation. Turkey especially has important potential in the sense of shores and harbor with broad hinterland in order to do business with overseas countries through seaway.

However Turkey’s bringing this superiority in transportation sector to more developed economic level depends on better evaluating its potential in this sector. In this scope, general characteristics of transportation sector can be summarized as such (Aktan and Dileyici, 2005: 18):

- Causing great infrastructure requirements and high fixed cost,
- Providing special benefits in economy by spreading positive externality,
- Increasing mobility of goods and services,
- Multi-dimensional service (being both for transportation of passengers and freight).

Due to increase of international trade, movement of goods among markets has gained importance today, conditions of competition have changed and transformed into rather dynamic structure. At this point, costs of transportation have to be considered in order not to cause malfunction in operation of comparative superiorities with market mechanism (Hummels, 2006: 24).

Investments of transportation infrastructure which is the most important factor in providing effectiveness of transportation sector requires enduring costs so high that a single enterprise or organization cannot overcome. For this reason, such kind of investments is generally regarded as those undertaken by the public (Han and Kaya, 2002: 248). Studies in literature show that economic effectiveness of railway transportation within all transportation types is much more compared to highway investments (Kabasakal and Solak, 2010: 134). This advantage of railways has important effects especially in mobility of goods and services.

However priorities in Turkish transportation policy have changes considerably since the early years of Turkish Republic. Railway transportation undertook the most important role in improvement of infrastructure of public transportation until 1950. However, the dominant role of railway transportation has decreased, leaving its superiority to highway transportation. While 78% of freight was carried out with railways in 1950, this rate dropped down to %3,6 in 2011. As of the year 2011, the share of freight transported by rail has been at the level of 4.1% (TCDD, 2013)

3. DEVELOPMENT OF RAILWAY TRANSPORTATION IN TURKEY AND POLICIES ADOPTED

Beginning of railway transportation in modern sense dates back to the discovery of locomotive in 19th century. The first steam locomotive was invented by Richard Trevithick in England in 1804. Afterwards, especially English, American and French people speed up building railway lines among various cities and region in their own country and other European countries followed these innovations. It is seen that these countries which are powerful in railway transportation are also powerful in economy (Murat and Şahin, 2010: 45).

Rail system which is used in intracity, intercity and international passenger and freight transportation has superior aspects compared to other types of transportation. Being an alternative for solution of traffic density, being more advantageous than other transportation systems in the sense of energy consumption, having large capacity in transportation of passengers and freight, having less damage to environment, having fixed price guarantee for long terms and having equipment which is not easily influenced by weather conditions are among these superior aspects. In addition to this, there are also weaknesses of railway transportation. Most important ones are the necessity that nearly all the stations should be large and comfortable, that the construction of roads and facilities, supply of vehicles have high cost that cannot be easily overcome by private corporation, that through trip takes long time and that railway transportation does not enable door to door delivery (Koban and Yıldırım Keser, 2011: 223-224).

The history of railway transportation in Turkey goes back to Ottoman Empire. However, planned developments started in turkey with the foundation of Turkish Republic in 1923. 1000 km railway construction was completed and put into practice until 1929 and nearly 200 km. railway construction was completed until 1940. However the following process was not that fast and the total length of railway constructed between 1940 and 1950 was only 300 km. (Murat and Şahin, 2010: 75-76).

1950's are regarded as stagnation period in railway transportation. It is thought that this stagnation has two important reasons. First of all; regression caused by II. World War and Turkey's inability in sustaining its advances in coal, iron, steel and machine industry had negative effects in its advances in railway. In fact, it must be remembered that development of railways in inland passenger and goods transportation depends on analysis of industrialization process rather than aims written in development plans (Kaynak, 2002: 39). The second reason for stagnation in railways is thought to be the advances in projects about highways within the frame of Marshall Plan. Similarly, due to production and consumption of consumer goods becoming widespread within economic structure of Turkey, it has become compulsory concentrate on highway transportation which enables fast and convenient door to door transportation of such kind of freight (Gerçek, 1999: 39).

After 1950, highway transportation gained superiority over railway transportation. Between 1952 and 1962 the budget of T.R General Directorate of Highways began to compose 10% of government budget. After 1960's, as a result of transportation policies based on highways, goals anticipated for railways could not be achieved. Coordination could not be enabled between sub-systems of transportation and investments made on highways sustained its effectiveness. In the beginning of 1970's railway transportation experienced important recession due to establishment of motor vehicle industry, importance given on highway construction, starting ring-road projects and Bosphorus Bridge which connects Asia and Europe being put into service (Çetin et al., 2011: 137). As a result, only 30 km. new line in average could be constructed per year between 1950 and 1980 (TUSİAD, 2007: 117).

With "1983-1993 Main Plan for Transportation" which is the first comprehensive national transportation plan in Turkey it was aimed to decrease highway transportation share from 72% to 36% and increase railway share within freight transportation to 30% but it could not be accomplished.

When the share of transportation types in inland passenger and freight transportation between 1950 and 2010 are observed (Table 1) the recession in railway transportation and importance given to highway transportation can be seen (TCDD, 2011: 9).

Table.1: The Share of Transportation Types in Freight and Passenger Transportation: 1950-2010 (%)

YEAR	Freight (Netton-Km)				Passenger (Passenger-Km)			
	Highway	Rail way	Sea way	Air way	High way	Rail way	Sea way	Air way
1950	25	68,2	6,8	0,0	50,3	42,2	7,5	0,0
1960	45	52,9	2	0,1	72,9	24,3	2	0,8
1970	75,4	24,3	0,2	0,1	91,4	7,6	0,3	0,7
1980	88	11,8	0,1	0,1	94,7	4,6	0,2	0,5
1990	81,7	9,8	8,9	0,1	96	2,5	0,1	0,9
2000	90	5,4	4,4	0,2	96	2,2	0	1,8
2008	89,4	5,2	5,5	No Data	97,9	1,7	0,4	No Data
2009	89,1	5,1	5,8	No Data	97,9	1,6	0,4	No Data
2010	88,9	5,3	5,9	No Data	97,8	1,6	0,7	No Data

Resource: TCDD, Railway Sector Report, 2011

Investments in transportation sector being based on highway from 1950 until 2003 brought together structural problems such as inadequacy of railway lines, low standards of infrastructure, inadequacy of railway vehicles in number and quality, scarcity of lines with signal and electric, inadequacy of expert staff and problems experienced in integration and competition with other transportation types (TCDD, 2011: 9).

When the current situation in railway transportation is evaluated in Turkey, it is seen that of all 81 cities only 37 of them are connected with railways. 28% of the population does not have railway access. There is no railway connection in some of the most important industrial and commercial cities such as Bursa. There is no railway connection of specific harbors such as Trabzon in The Black Sea, Antalya in the Mediterranean and Tekirdağ in The Aegean Sea. These harbors which cannot make railway connection with their hinterlands are not able to use their potential in transportation of both passengers and freight (Ülgen et al., 2007: 138).

With the funds provided for TCDD (Turkish State Railways) between 2003 and 2011 which is the basic executive organ in railway transportation, it was aimed to enable economic and secure railway transportation and increase share of TCDD in transportation of passengers and freight by increasing its competition power against other types of transportation. In this scope, aims were determined in order to put high-speed train lines into operation, enhance current lines and vehicle parks, targets were detected for private sector to carry out railway management and these aims were achieved considerably. In this frame, by the end of 2011 TCDD has 11.112 km. conventional line; 8.770 km. being conventional mainline and 2.342 km. being secondary line and 888 km. high-speed train line; 872 km. being high-speed train line and 16 km. being high-speed line within station, thereby has 1200 km. railway line in total (TCDD, 2011: 9- 14).

Positive results were taken from studies carried out in order to involve private sector into railway sector, which is amongst the aims of TCDD; while the number of wagons belonging to private sector and operated on TCDD lines was 771 in 2003, this number increased up to 2.870 as of 2011. Transportation made by wagon belonging to owners in 2011 reached 5, 6 million tones and its rate within total transportation reached 25% (TCDD, 2011: 19). As a natural result of unplanned practices, there has been serious imbalance between types of transportation, highway transportation became important both in transportation of passenger and freight. This situation not only caused increase in transportation costs but also resulted in traffic density on highways and increases of traffic accidents which results in important loss of life and property.

Within the scope of 9th Five-Year Development Plan for 2007-2013 period, it is seen that railway transportation is given more important within transportation policies. In this frame, practices were initiated in order to consider system holistically in forming an effective transportation infrastructure and improve important harbors as logistic centers by shifting freight transportation toward railways (DPT, 2006: 70). Studies upon plan and actualization of logistic centers within TCDD have been carried out since 2007. Logistic centers are specific

centers where all the activities about transportation, logistic and freight both in national and international level are conducted by various operators. Transportation focuses on intermodal activities and logistic activities in logistic centers and these centers are generally chosen from regions which are out of metropolitan areas and close to different types of transportation (Gülen, 2011: 143).

Within the scope of 9th Five-Year Development Plan, there were also issues discussed such as developing private sector train management on railways and liberalization in making use of management mentality of private sector; initiation of passenger transportation by high-speed train on a core network Ankara being the center and then through İstanbul-Ankara-Sivas, Ankara-Afyonkarahisar-İzmir, Ankara-Konya corridors and application of public-private sector cooperation in construction and management of lines to be built on these networks (DPT, 2007: 71). The legislation about inclusion of third person in State Railway line which terminates the monopoly of TCDD in passenger and freight services was put into force in April, 2005. However it is seen that application mechanisms in this area are not sufficient (Gülen, 2011: 113).

The most important project about railways in Turkey which is in progress is the project Marmaray which connects Europe to Asia through a railway tunnel passing under Bosphorus. Currently Marmaray is one the main projects of transportation infrastructure throughout the world. With Marmaray it is aimed to relieve traffic flow in the city by transportation of 75.000 passengers per hour with 440 wagons on 76 km. railway line and increase the duration of travel between two sides (Ülgen et al., 2007: 138). With the actualization of projects such as Marmaray which is an important step towards adjustment with high-speed trains of European Union, Ankara-İstanbul High-Speed Train, Kars-Tbilisi Projects; it is expected to enable direct, fast and economic railway connection from Europe to Asia, from West to East (TCDD, 2011: 21).

There are various transportation networks which are alternatives of each other throughout the world. Considering together with the fact of globalization, it is not possible to think different regions of world independent from each other. This dependency should not be ignored in configuring transportation infrastructure and networks which have private importance in providing benefit of time and space for goods and services. International transportation networks which were built within this frame have great importance in the sense of transportation sector in Turkey. Turkey is on the transition point in international railway networks and included in two main projects of transportation network. The first one is the Project of Trans Asian Railway – TAR. This is a project which was started in 1960’s and connects 28 Asian countries between Singapore and Turkey uninterruptedly with 114.000 km. railway network. The main purpose is to provide effective railway transportation service in freight and passenger transportation between Asia, Pacific and European regions. Another important purpose of the project is to create added value by way of providing harbor connection to shoreless countries (UNESCAP, 2009: 1). The second one is Trans-European Railway Project- TER in Europe. The project which was started in

1990 aims to improve infrastructure of railway transportation, provide standards about railway transportation among countries, use recent technologies about railway transportation (UNECE, 2006: 58). There is a requirement for important railway projects in order to enable functionality to Turkey, which serves as a bridge due to its geographic location and provide sustainability of transportation networks between Europe-Asia. Projects carried out in this scope, as observed in Map. 1, are Marmaray whose construction has started, İstanbul-Basra Railway, North Railway, Hejaz Railway, Southeast Asia Railway, Kars-Tbilisi, Baku Railway, Caucasian-Samsun-Basra Railway corridors (TCDD, 2011: 20-21).

4. DATA AND EMPIRICAL RESULTS

7 data about sector were used in order to put forward expectations about railway transportation in Turkey. These are “number of stations” on railways, “length of lines”, “netton”, “freight income”, “number of passengers”, “passenger income”. In this study these series will be handled using line graphs. The data are between the years of 1923-2011. Data were taken from TCDD official site.

The aim of this study is to forecast the future of these sector data. Various techniques exist for estimating the future. In the literature these techniques can be handled in to groups as statistical and econometric. In this study statistical models were used for forecasting. ARIMA, Single Exponential Smoothing (SES) and linear trend models were considered. Using these models, how the series will follow a course was estimated. Using these results, we will be able to comment on Turkish railway transportation.

For data, first of all stationarity of series was analyzed with unit root test using structural break tests. For this, structural break test and unit root test was handled together. Various unit root tests are available in the literature. In this study, structural breaks were also considered. So, unit root tests with structural breaks were applied to the series. After all, the stationary analysis was completed. In this study, the stationary level of series was taken into account for future expectations. Then, the suitable model was chosen according to absolute and relative error statistics. Finally, compatibility of models with data was analyzed (ex-post analysis) and future estimations of these models were made (ex-ante analysis).

As is well known the issue of structural change and its consequential implications for structural breaks, in macroeconomic time series data must be robustly addressed in order to ensure non spurious results of unit root tests of such data. There can, of course, be many reasons for structural change and these can include such diverse circumstances as economic crises, policy changes or regime shifts. First of all unit root test was handled. The debate on unit root hypothesis underwent renewed interest following the important findings of Nelson and Plosser (1982).

These findings were challenged by Perron (1989) proposed a unit root test allowing for

a structural break with three alternative models: crash model, changing growth model and the change both in the intercept and the slope. On the other hand, the Perron (1989) test has been generally criticized for treating the time of breaks as exogeneous. Zivot and Andrews (1992) endogenous structural break test is a sequential test which utilizes the full sample and uses a different dummy variable for each possible break date. The break date is selected where the t-statistic from the ADF test of unit root is at a minimum (most negative).

Consequently a break date will be chosen where the evidence is least favorable for the unit root null. Zivot and Andrews (1992) propose a testing procedure where the time of the break is estimated rather than assumed as an exogenous phenomenon. By endogenously determining the time of structural breaks they argue that the results of unit root hypotheses previously suggested by earlier conventional tests. Zivot and Andrews (1992) further developed the Perron unit root test that considers the breakpoint as endogenous. To test for a unit root against the alternative of trend stationary process with a structural break both in slope and intercept.

Table 2: The Zivot and Andrews Unit Root Test results

Series		Lag		θ	B	Γ	α	SSR
Number of Station	1988	5	14.050 (5.05)	-0.123 (-4.93)	0.085 (6.48)	-0.015 (-5.47)	-0.64 (-5.1)***	0.0312
Line Length	1974	4	10.256 (8.58)	0.125 (7.84)	0.036 (5.23)	-0.065 (-3.42)	0.245 (-6.89)**	0.0135

The numbers in parantheses are t-statistics. The t-statistics for α is for testing . (***) and (**) denote significance at 1% and 2.5% levels respectively, using the critical values from Zivot and Andrews table. For this test here is strong evidence against the unit root hypothesis at %5 and %10 levels.

As can be seen from Table 2, there is strong evidence against the unit root hypothesis. The ZA results indicate that the breakpoint occurs in 1988 for Number of station series, in 1974 for overall total series, in 1974 for line length series, in 1932 for passenger wagon series and in 1974 for freight series. To find out whether the inferences are affected by a different lag length procedure, the Schwarz bayesian criterion, as suggested by Lee and Strazicich (2001) was also used to determine the lag length. The break point was determined by the minimum SBC value. Then, the SBC-based unit root test was conducted by the t-statistic testing the null hypothesis $\alpha=1$. The minimum SBC's indicate same breakpoints in ZA procedure.

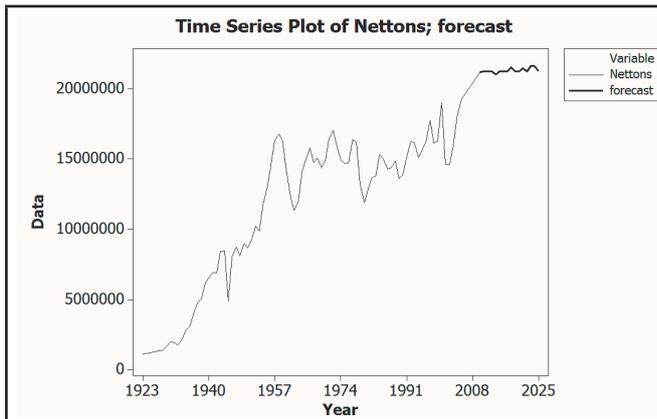
Table 3: Appropriate Models for Series

Series	Model	Series	Model
Number of Station	SES	Passenger	ARIMA(1,1,0)
Line Length	Linear Trend	Freight	AR(1)
Nettons	ARIMA(1,1,0)	Freight Income	ARIMA(1,1,0)
Staff	AR(1)		

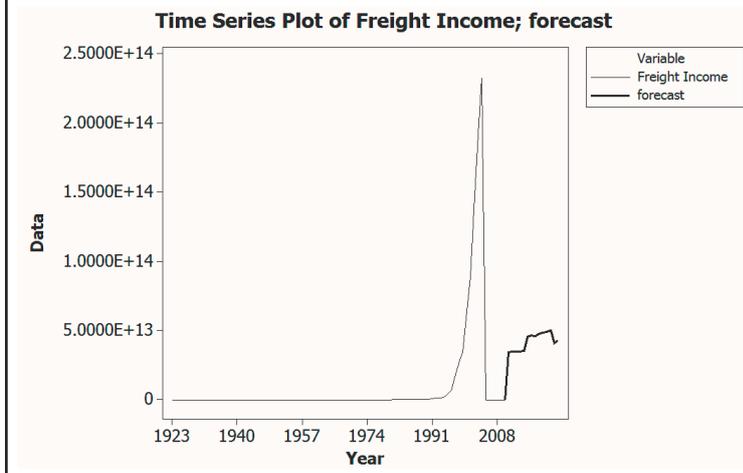
Results of ex-ante analysis of 7 data observed in order to make prediction for railway transportation of passenger and freight until 2025 in Turkey are given in Table 4.

Table 4: Ex-ante Forecasts

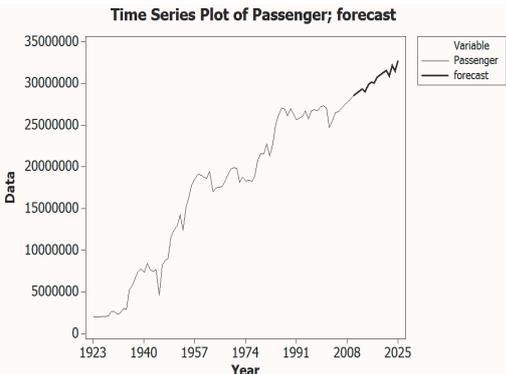
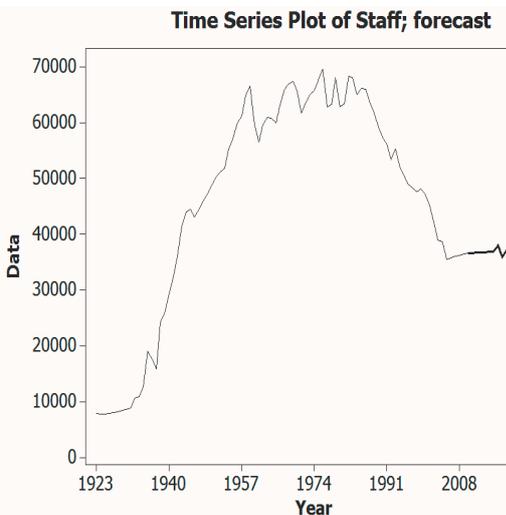
	<p>When the structure of series is observed, it is seen that there is an increase until 1970's. As a result of transportation policies based on highway between 1970 and 2000, railway has lost importance and many terminals and stations became inactive. With the beginning of high-speed train project in 2005 and the importance given to railway, it is expected that effectiveness of terminal, station and train stops which were built by TCDD and operate in the current situation would increase. ARMA (1, 1) model is suitable for the period until 2025.</p>
	<p>Transportation policies based on highway in 1970's decreased construction of railway line importantly. As a result of policies adopted in 2005 and afterwards, and actualization of short and medium term projects and concentrating on railway investments within transportation types; increase trend is expected in main lines. This result was attained by using linear trend model for the period until 2025. The trend of series in 1923-2010 will continue until 2025.</p>



Transportation policies based on highway in 1970's caused important decrease in netton amount. Policies applied within the frame of 8th Five-Year Progress Plan caused increase in netton amount after 2005. This situation is expected as an increase trend until 2025 with the actualization of planned projects. This increase trend in series was found considering ARMA (1, 1, and 0) time series model. This situation would also cause increase in freight income.



As a result of stagnation analysis made for series it was concluded that series was stationary within time. ARMA (1, 1) model was suitable for future foresights of series.

 <p>Time Series Plot of Passenger; forecast</p> <p>This line graph shows the number of passengers from 1923 to 2025. The y-axis represents the number of passengers, ranging from 0 to 35,000,000. The x-axis represents the year, with major ticks at 1923, 1940, 1957, 1974, 1991, 2008, and 2025. The data shows a steady upward trend, with a slight dip around 1940. The forecast for 2025 is shown as a solid line, indicating a continued increase in passenger numbers.</p>	<p>Within the scope of expectations until 2025, an important increase is expected in the number of passengers. The main reason of that can be defined as completion of high-speed train projects and actualization of them in short and medium term. At the same time, planning railway investments in intracity transportation would increase number of passengers. An increase in passenger number is also expected according to this. This expectation supports past values of series. As a result of analysis, ARIMA (1, 1, and 0) model was used for future estimation.</p> <p>As a result of stationary analysis done for series, it was concluded that series was stationary within time. ARMA (1, 1) model was found to be suitable for future foresights of series.</p>
 <p>Time Series Plot of Staff; forecast</p> <p>This line graph shows the number of staff from 1923 to 2025. The y-axis represents the number of staff, ranging from 0 to 70,000. The x-axis represents the year, with major ticks at 1923, 1940, 1957, 1974, 1991, 2008, and 2025. The data shows a significant increase in staff numbers until the late 1970s, peaking around 65,000. After 1974, there is a general downward trend, with a sharp drop around 1991. The forecast for 2025 is shown as a solid line, indicating a slight increase in staff numbers compared to 2008.</p>	<p>In the graphic, there is a decrease in the number of TCDD staff after 1974 and important increase is expected in staff number until 2025. The series display typical auto correlational structure between 1923 and 2010. It is seen that this structure will continue until 2025. Despite the aim of increasing investments in railway transportation, it is thought that not achieving important increase in staff number would not have negative effect in sector economically. Because it is thought that apart from technological developments, staff of TCDD which is open to competition due to privatization would be more efficient. In fact, although staff number does not increase much, the expectation of increase of passenger and freight income, as mentioned before, supports this thought.</p>

Results of ex-post and ex-ante analysis of these data about railway passenger and freight transportation in Turkey are given in Table 5 in five-year periods.

Table 5: Ex-Post and Ex-ante Forecasts

Series Name	2000	2005	2010	2015	2020	2025
Number of Station	908	718	725	825	850	885
Line Length	10922	10954	11052	12564	12547	12625
Nettons	18980000	19195000	19255000	20120000	22145000	22250000
Freight Income	5.893E+13	5.190E+13	5.225E+13	6.221E+13	6.293E+13	7.256E+13
Passenger	27324025	26544959	27548796	28547556	28885856	29545765
Passenger Income	3.886E+13	4.886E+13	4.892E+13	5.225E+13	5.345E+13	5.325E+13
Staff	47212	35593	32548	33524	32548	32967

As can be seen in Table 5 it is expected that effectiveness of terminal, station and train stops which were built by TCDD and operate in the current situation would increase in 2015, 2020 and 2025. On the other hand for other series, an increase is expected until 2025.

5. CONCLUSIONS

Transport sector is one of the most value-added generating sectors. When Turkey is evaluated in terms of modes of transportation, it is observed that road transportation is the most widely used mode of transportation, while the railway transportation is the least widely used one despite its many superiorities such as being environmentally friendly, offering most cost-effective services, having lower accident rates.

The use of rail transport in Turkey after 1950's decreased due to the importance given to the highway, this situation continued until the beginning of the 2000's. Targeting the policies towards increasing the competitiveness of rail transport against other transport modes coincides the year of 2003. After the year of 2003, special attention has been started to be given to rail transport in the development plans within the context of transport sector, works have been accelerated towards strengthening the railway infrastructure. In the framework of these policies, implementing the high-speed train projects, modernization of the existing stations and terminals, connecting the railway network to the ports production centers, establishing logistics centers, establishing the continuous railway corridor between the continents of Europe and Asia, and together with the private sector configuration of the sector have been aimed.

7 data pertaining to the sector have been used in this study in which the expectations until the year of 2025 have been evaluated within the framework of the policies related with the railway

transport in Turkey. Primarily, by performing structural break unit root tests of the data of “the number of stations”, “the line length”, “payload weight (netton)”, “payload revenue”, “number of passengers”, “passenger revenues” and “ number of employees stabilities have been observed. Afterwards, according to the absolute and relative error statistics, an appropriate model has been selected. Finally, by analyzing the suitability of the models with the data (ex-post analysis) future predictions of the selected models have been made (ex-ante analysis).

The number of stations and terminals is expected to increase especially due to the high-speed train projeect which began in 2005. At the sama time, in the scope of medium- and long-term policies, the expectation of upward trend in railway lines in the purpose of the establishment of the rail link in more cities is remarkable. Due to these infrastructure investments, it is estimated that freight and passenger transportation and revenues obtained from this will increase. These estimations seem to be consistent with the aim of increasing the passenger transport by rail %10, and freight transport %15 for 2023. İn spite of the increase expectation in the other data, it is predicted that the number of emplyoees will not increase signaficantly. Because, rather than the increase in the number of employees, it is contemplated that productivity will grow on the railways which are opened to competition with the developing technology.

As a result, for many years, rail transport in Turkey has been in a position of being in public monopoly and constantly being subsidized by the public sector . This situation has prevented the formation of the competitive environment and the sector has not reached the desired level of efficiency. Opening up the sector to competition and realization of the regulations that will ensure the private enterprise go into the sector is regarded as importatnt for thr future of rail transport.

In the upcoming years, as the result of continuation of development of rail transport and growth of the public sensitivity to environmental issues, it expected that the traffic will shift from highway to railway. Also, the Railways will be required to take measures to increase their competitiveness by making improvements in the quality of service, comfort, relaibility and cost in order to take advantage of this positive development.

On the other hand, the improvement of the “combined transport” which has been formed with concept that transportation systems will use their superiorities to each other to complement each other, and providing the connection between the railway and other transportation systems, and accordingly implementing the logistics centers will increse the share of the rail transport in future terms.

6. REFERENCES

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