

Trends, Analyses and Future Forecasts for Sports Media Investments

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Abstract

The main objective of this study is to analyze the trends in sports media investments in Türkiye between 2011 and 2024 and to make forecasts for the future. Using data from the Association of Advertisers and Deloitte, investment figures for television, press, outdoor, radio, cinema and digital media were analyzed. The study was tested at 5% significance level by performing basic statistical analysis with EvIEWS 8.0 software. The results show that digital media investments are gradually increasing their dominance in the sports media ecosystem. While digital media advertising investments have increased 14 times in the last 8 years, TV media investments have increased by 194%, press by 40%, outdoor by 446%, radio by 348% and cinema by 218%. By 2023, digital media accounts for 72.6% of total media investments, reaching TL 86.50 billion, an increase of 136.9%. The annual rate of increase in total media investments was found to be 1,097 million TL. These analyses show that media investments will continue to increase in the future, but the balance between traditional and digital media will change.

Keywords: Sports Media investments, Time series analysis, Stationarity tests, Regression analysis, Future forecasts

Spor Medya Yatırımlarına Yönelik Trendler Analizler ve Gelecek Tahminleri

Öz

Bu çalışmanın temel amacı 2011-2024 yılları arasında Türkiye'deki spor medya yatırımlarının trendlerini analiz etmek ve geleceğe yönelik tahminlerde bulunmaktır. Reklamcılar Derneği ve Deloitte şirketlerinin verileri kullanılarak televizyon, basın, açık hava, radyo, sinema ve dijital medya türlerine ait yatırım rakamları incelenmiştir. Çalışma EvIEWS 8.0 yazılımı ile temel istatistiksel analizler gerçekleştirilerek %5 anlamlılık düzeyinde test edilmiştir. Sonuçlar, dijital medya yatırımlarının spor medya ekosistemindeki baskınlığını giderek artırdığı ise saptanan bulgular arasındadır. Dijital medya reklam yatırımları son 8 yılda 14 kat artarken, TV medya yatırımları %194, basın %40, açık hava %446, radyo %348 ve sinema %218 artış göstermiştir. 2023 yılı itibarıyla dijital medya, %136,9'luk bir artışla 86,50 milyar TL'ye ulaşarak toplam medya yatırımlarının %72,6'sını oluşturmuştur. Toplam medya yatırımlarının yıllık artış oranı ise 1.097 milyon TL olarak bulunmuştur. Bu analizler, medya yatırımlarının gelecekte de artarak devam edeceğini göstermekte, ancak geleneksel ve dijital medya arasındaki dengelerin değişeceğini ortaya koymakta ve göstermektedir.

Anahtar Kelimeler: Spor medya yatırımları, Zaman serisi analizi, Durağanlık testleri, Regresyon analizi, Geleceğe yönelik tahminler

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INTRODUCTION

Sport is more than just a daily way of life, it is an important element that supports local, national and international economies that directly affects the power and social development of countries (Gedik, 2022; Jankovic & Stojanović, 2019). Sport has developed as a social phenomenon that brings together large masses in social life and attracts the attention of the media (Yang et al., 2022). Today, sport is accepted as a commercial phenomenon and used as a marketing tool by companies in the globalising world (Yanmiyan & Yildiz, 2021). For this reason, sports image and events have had a great impact on consumer markets and companies have made this field a part of their advertising and marketing strategies (Martínez-Cevallos et al., 2020).

The global sports industry has been reshaped within the scope of commercialisation (Zipp & Nauright, 2024). In addition to technological developments, the transition from traditional mass media to new media tools has enabled sports to gain a different dimension. With the development of digital platforms in sports broadcasts, there has been a significant increase in broadcasting revenues. Sports and the media industry have become two important sectors that support and grow each other (Zheng & Mason, 2022).

Social media and digital publications have become central to marketing strategies to better reach sports audiences (Kuster-Boluda et al., 2024). Major sports organisations and professional teams increase their online interactions by investing in social media strategies (Ucuncuoglu, 2021). In this context, sports brands and organisations create benefits for themselves by actively communicating with fans through social media platforms.

With the development of new media tools in the media sector, sports rights and broadcasting revenues have also become a major commercial area. In Türkiye, football clubs generate the most revenue from broadcasting rights, which strengthens the link between the media and the sports industry (Budak, 2019). In Türkiye, the share of media investments in GDP has the potential to double in 2024 and digital media investments have become the leader in the sector, surpassing traditional media (Cagiran-Kendirli, 2024).

The global value of sports media rights grew by 1% between 2018 and 2023, with media and entertainment revenue increasing by 5%, gaming revenue by 15% and digital advertising revenue by 16%. Changing economic conditions in the coming years will continue to create huge opportunities for the sports industry. These data show that the media and sports sectors are growing globally by supporting each other and that digital media investments are transforming the sports industry by overtaking traditional media (Vardi, 2021).

The development of advertising in the media sector gained a great momentum when it started to appear in the press in the late 19th century. In the 20th century, advertising entered books and other media tools and advertising agencies turned into corporate structures managed by the market (Taskiran, 2024). In Türkiye, the establishment of private television and radio channels in 1989 and the increase in advertising media with the effect of globalisation since the 1990s has been an important turning point in the development of advertising (Saglik, 2023). While adverts contribute to economic reproduction by encouraging the sale of products and services, they also play a role in the reproduction of the social structure (Yilmaz Guntay, 2020).

The media and the advertising sector have contributed greatly to the development of the sports industry. Sports has been delivered to large masses through both traditional media and new media tools, and the media has earned significant income from sports content. Sports

broadcasts with high ratings on television have become an important source of income for media organisations by attracting more advertising investment. A large portion of the investments in the media sector is provided by advertising revenues generated through television broadcasting and digital platforms (Dwivedi et al., 2021; Filo et al., 2014).

In television channels, adverts featuring famous athletes have become an important marketing strategy in the promotion of products. For example, many sports figures such as goalkeeper Rüştü's chocolate advertisement and Rıdvan Dilmen's tyre advertisement have been used in advertising campaigns. The main purpose of advertising is to increase sales by promoting products and services through mass communication tools. The presence of athletes in these adverts is effective on young audiences and encourages the sale of products (Stone et al., 2003; Simsek & Ugur, 2003). The Castrol brand's use of Cristiano Ronaldo as a global football ambassador clearly shows how sports stars are used effectively in advertising campaigns (Goksu & Ozcan Kececi, 2021).

Social media and digital platforms have become important distribution channels of sports content for advertisers and marketers. A large portion of young people consume sports content on social media platforms and these platforms have become an important channel for advertisers (Can, 2017). Brands have also started to invest in this field by recognising these advantages offered by social media networks.

Investments in sport have become increasingly important in the global economy. The sports industry has become an economic entity representing approximately 1.5-2 per cent of global GDP worldwide and 2 per cent of Europe's GDP. Especially with the popularity of football, the increase in sports broadcasts and investments in advertising, sport has become a great commercial power by reaching wider masses. The inclusion of athletes in product promotion advertisements provides a great advantage to businesses (Ozgen et al., 2018).

While the broadcasting of sports on television enables the globalisation and widespread consumption of sports, sports also helps channels to increase their advertising revenues by extending the viewing times of television broadcasts. There is a direct relationship between television broadcasting and advertising revenues; programmes with high ratings generate higher advertising revenues. In this context, sports organisations with high viewership rates also increase the commercial earnings of media organisations by increasing advertising prices. Sports and the advertising sector are two important elements that feed and develop each other. The delivery of sports content to large masses through the media makes a great contribution to the advertising sector. The use of sports imagery in advertising activities offers a significant advantage in reaching target markets (Yildiz et al., 2017).

The aim of this study is to analyse the trends of sports media investments in Türkiye between 2011 and 2024 and to forecast the possible future developments of these investments. The main objective of the study is to evaluate the investment changes and forecast future trends for media types such as television, press, outdoor, radio, cinema and digital media.

METHODS

The Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests used in this paper are common methods used to determine whether time series are stationary. These tests ensure that the data are reliable when analyzing time series in the long run. Since non-stationary series can lead to incorrect forecasts and misleading results, it is imperative to apply these tests to ensure the accuracy of the analysis. The statistical tests conducted with Eviews 8.0 software used in this study were preferred to increase the reliability of the forecasting models and to reveal the media investment projections for the coming years in a healthier way. In addition, regression analyses used in the study provide guiding data for sector professionals by identifying trends in media investments.

Study Design

This study covers media investment data for a total of 8 periods between 2011-2024. The data are taken from the website of the Association of Advertisers and presented in panel data format. The study aims to analyse the change trends in media investments. The necessary permission for the study was obtained from the Advertisers Association on January 23, 2025. The study data were obtained between January 23-27.

In this study, sports media investments between 2011 and 2024 were analysed in the form of time series using annual data. First, the stationarity of the series was tested using ADF and PP tests, and non-stationary series were transformed before analysis. Then, the trend of change over time was determined for each media type, and future predictions were made using models such as ARIMA and Exponential Smoothing. The analysis was conducted at a 5% significance level, and the accuracy of the forecasts was evaluated using R^2 , p-values, and Durbin-Watson statistics. The results indicate that digitalisation is prominent in media investments and that this trend will continue to grow in the future.

Data Analysis

Using data from the Association of Advertisers and Deloitte, investment figures for television, press, outdoor, radio, cinema and digital media were analyzed. The sources from which the data on media investments were obtained were clarified, and the “Advertisers Association 2023 Media Investments Report” and “Deloitte Turkish Media and Advertising Report 2022” were taken as basis. Statistical analyses were performed using EViews 8.0 software. Unit root tests were used to determine whether the data are stationary or not. Using the stationary series, forecasts were made on future media investments. The analyses were performed with a significance level of 5%. Basic statistical analyses were used to provide summary information about the data.

Determination of Stationarity of Data

In order to provide reliable forecasts, the stationarity of the time series is analysed by Augmented Dickey-Fuller (ADF) Test and Phillips-Perron (PP) Test. Stationarity means that the mean and variance of a series remain constant over time. As a result of ADF and PP tests, stationary series were identified and used in forward-looking analyses. Basic statistical information about the variables in the data set was obtained. The measures used in this analysis were used. These are;

- **Mean:** It shows the central tendency value of the variable.
- **Median:** Shows the median value and is not affected by extreme values.

- **Standard Deviation:** It measures how much the data deviate from the average.
- **Skewness and Kurtosis:** Skewness determines the symmetry of the distribution; Kurtosis determines the density of extreme values.

Future media investments are estimated by time series analysis methods using the series that are determined to be stationary.

- **ARIMA (Autoregressive Integrated Moving Average):** Future values are estimated using past data and error terms.
- **Exponential Smoothing:** By taking the weighted averages of the data, more accurate estimates were obtained.

All statistical analyses were tested with a significance level of 5% ($p < 0.05$). This shows that the analyses give accurate results with 95% reliability.

As a result of the analyses performed using EViews 8.0 software, this study provides information to predict the trends and future developments of sports media investments between 2011 and 2024. By using stationarity tests, basic statistical analyses and time series forecasting methods, reliable results about the future direction of media investments are obtained.

RESULTS

According to statistics on media investments obtained from the Association of Advertisers;

- Digital media advertising investments have increased 14 times in the last 8 years.
- Between the same periods, TV media investments increased by 194%, press by 40%, outdoor by 446%, radio by 348% and cinema by 218%.
- Press is the only medium with a shrinking investment among all media. Press media investments decreased by 20% in 2024 compared to the previous year.

In 2023, sports media and advertising investments in Türkiye showed a significant increase and reached 140.69 billion TL. 18.12% of these investments consist of creative works, production, printing, BTL, sponsorship and advertiser service fees. The largest share in media investments is in digital media, followed by television, outdoor, radio, press and cinema.

Digital media investments increased by 136.9% from TL 36.50 billion in 2022 to TL 86.50 billion in 2023, accounting for 72.6% of total media investments. The share of mobile adverts is 81%.

Television sports advertisement investments increased by 94.5% to TL 24.90 billion and accounted for 20.9% of total media investments.

Press and sports media investments increased by 42.5 per cent to TL 792 million, but accounted for only 0.7 per cent of total investments.

Outdoor sports media investments increased by 138.6% to TL 5.08 billion, accounting for 4.3% of total investments, while digital outdoor advertising accounted for 32% of total outdoor investments.

Radio sports media investments increased by 101.9% to TL 1.65 billion and accounted for 1.4% of total investments.

Investments in cinema sports media increased by 65.6% to TL 183.32 million, representing only 0.2% of total investments.

2023 data show that digital media, television and outdoor advertising have a large share in media investments and that these investments will increase further in the future.

Stationarity tests

The unit root analysis of media investments is analysed by ADF analysis. Unit root analysis is used to determine whether the data show variability between periods. It is stated that time series without unit root can be used safely in long term data analyses. The null hypothesis states that the series contains a unit root.

Unit root analysis results for television media investments

According to the unit root tests; since the probability values are less than 0.05 confidence level, the hypothesis H^0 is not accepted. Therefore, the TV media investment variable does not contain a unit root and is stationary at its level, so it is determined that it can be used in further analyses (Table 1).

Table 1. Unit root analysis results for TV media investments

Null Hypothesis: TV has a unit root		
Exogenous: Constant		
Lag Length: 1 (Automatic - based on SIC, maxlag=1)		
	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	5.348255	0.0029
Test critical values:	1% level	-5.119808
	5% level	-3.519595
	10% level	-2.898418

*MacKinnon (1996) one-sided p-values. Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 6

Augmented Dickey-Fuller (ADF) test was used to test whether the TV variable contains unit root. According to the results of this test;

The ADF Test Statistic (5.348255) is well above the critical values (especially -3.519595 and -2.898418). This indicates that the absolute value of the test statistic is greater than the critical values.

The p-value (0.0029) is less than 5% significance level. This is sufficient evidence to reject the null hypothesis (H^0).

These results indicate that the null hypothesis (H^0) is rejected and the TV variable does not contain a unit root, i.e. it is stationary. According to the data obtained, it can be said that the TV variable is stationary and therefore it can be used in further analyses. Since these results are based on a small sample size, they should be interpreted cautiously.

Unit root analysis results for press and media investments

According to the unit root tests; since the probability values are less than 0.05 confidence level, the hypothesis H^0 is not accepted. Therefore, it is determined that the media investment variable does not contain unit root and is stationary at its level and therefore can be used in further analyses (Table 2).

Table 2. Unit root analysis results for media investments

Null Hypothesis: BASIN has a unit root		
Exogenous: Constant		
Lag Length: 1 (Automatic - based on SIC, maxlag=1)		
	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.270027	0.0063
Test critical values:	1% level	-5.119808
	5% level	-3.519595
	10% level	-2.898418

*MacKinnon (1996) one-sided p-values. Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 6

Augmented Dickey-Fuller (ADF) test was used to test whether the TV variable contains unit root. According to the results of this test;

The ADF Test Statistic (5.348255) is well above the critical values (especially -3.519595 and -2.898418). This indicates that the absolute value of the test statistic is greater than the critical values.

The p-value (0.0029) is smaller than the 5% significance level. This is sufficient evidence to reject the hypothesis (H^0).

These results indicate that the null hypothesis (H^0) is rejected and the TV variable does not contain unit root, i.e. it is stationary. According to the data obtained, it can be said that the TV variable is stationary.

Unit root analysis results of outdoor media investments

According to the unit root tests; since the probability values are less than 0.05 confidence level, the hypothesis H^0 is not accepted. Therefore, the variable of outdoor media investment does not contain a unit root and is stationary at its level, so it is determined that it can be used in further analyses (Table 3).

Table 3. Unit root analysis results for outdoor media investments

Null Hypothesis: OUTDOOR has a unit root		
Exogenous: Constant		
Lag Length: 1 (Automatic - based on SIC, maxlag=1)		
	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	1.932709	0.9973
Test critical values:	1% level	-5.119808
	5% level	-3.519595
	10% level	-2.898418

*MacKinnon (1996) one-sided p-values. Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 6

Augmented Dickey-Fuller (ADF) test was used to test whether the outdoor variable contains unit root. According to the results of this test;

The ADF Test Statistic (1.932709) is well above the critical values (especially -3.519595 and -2.898418). This shows that the absolute value of the test statistic is not greater than the critical values.

The p-value (0.9973) is significantly greater than the 5% significance level. This shows that there is not enough evidence to reject the hypothesis (H^0).

These results show that the null hypothesis is not rejected and the outdoor variable contains a unit root, i.e. it is non-stationary. According to the data obtained, it can be said that the outdoor variable is non-stationary and in this case, the data should be stationary before being used in further analyses.

Unit root analysis results of digital media investments

According to the unit root tests; since the probability values are less than 0.05 confidence level, the hypothesis H^0 is not accepted. Therefore, it is determined that the digital media investment variable does not contain a unit root and is stationary at its level and therefore can be used in further analyses (Table 4).

Table 4. Unit root analysis results for digital media investments

Null Hypothesis: DIGITAL has a unit root		
Exogenous: Constant		
Lag Length: 1 (Automatic - based on SIC, maxlag=1)		
	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	1.902464	0.9972
Test critical values:	1% level	-5.119808
	5% level	-3.519595
	10% level	-2.898418

*MacKinnon (1996) one-sided p-values. Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 6

Augmented Dickey-Fuller (ADF) test was used to test whether the digital media investment variable contains a unit root. According to the results of this test;

The ADF Test Statistic (1.902464) is well above the critical values (especially -3.519595 and -2.898418). This shows that the absolute value of the test statistic is not greater than the critical values.

The p-value (0.9972) is significantly greater than the 5% significance level. This shows that there is not enough evidence to reject the hypothesis (H^0).

These results show that the null hypothesis is not rejected and the digital media investment variable contains a unit root, that is, it is non-stationary. According to the data obtained, the digital media investment variable is non-stationary.

Unit root analysis results of radio media investments

According to the unit root tests; since the probability values are less than 0.05 confidence level, the hypothesis H^0 is not accepted. Therefore, the radio media investment variable does not contain a unit root and is stationary at its level, so it is determined that it can be used in further analyses (Table 5).

Table 5. Unit root analysis results for radio media investments

Null Hypothesis: RADIO has a unit root		
Exogenous: Constant		
Lag Length: 0 (Automatic - based on SIC, maxlag=1)		
	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-0.022574	0.0227
Test critical values:	1% level	-4.803492
	5% level	-3.403313
	10% level	-2.841819

*MacKinnon (1996) one-sided p-values. Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 7

The Augmented Dickey-Fuller (ADF) test was used to test whether the radio media investment variable contains a unit root. According to the results of this test:

The ADF Test Statistic (-0.022574) is above the critical values (especially -3.403313 and -2.841819). This indicates that the absolute value of the test statistic is smaller than the critical values.

The p-value (0.0227) is less than 5% significance level. This is sufficient evidence to reject the hypothesis (H^0).

These results show that the null hypothesis is rejected and the radio media investment variable does not contain a unit root, i.e. it is stationary. Again, according to the data obtained, it can be said that the radio media investment variable is stationary and therefore it can be used in further analyses.

Cinema media investments unit root analysis results

According to the unit root tests; since the probability values are less than 0.05 confidence level, the hypothesis H^0 is not accepted. Therefore, the Cinema media investment variable does not contain a unit root and is stationary at its level, and therefore it is determined that it can be used in further analyses (Table 6).

Table 6. Unit root analysis results for cinema media investments

Null Hypothesis: CINEMA has a unit root		
Exogenous: Constant		
Lag Length: 1 (Automatic - based on SIC, maxlag=1)		
	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	13.04665	0.9999
Test critical values:	1% level	-5.119808
	5% level	-3.519595
	10% level	-2.898418

*MacKinnon (1996) one-sided p-values. Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 6

Augmented Dickey-Fuller (ADF) test was used to test whether the cinema media investment variable contains unit root. According to the results of this test:

The ADF Test Statistic (13.04665) is well above the critical values (especially -3.519595 and -2.898418). This shows that the absolute value of the test statistic is not greater than the critical values.

The p-value (0.9999) is significantly greater than the 5% significance level. This shows that there is not enough evidence to reject the hypothesis (H^0).

These results show that the null hypothesis is not rejected and the cinema media investment variable contains a unit root, i.e. it is non-stationary. According to the data obtained, it can be said that the cinema media investment variable is non-stationary and in this case, the data should be made stationary before being used in further analyses.

Future media investment forecasts (forecast)

Forecast study will help to determine the forecast model for each media type for the coming years. The following forecast prediction model was established using the media investments data for the television channel between 2011 and 2024. The coefficient of explanation of this model, which is calculated linearly with the least squares method, is 53%.

When TV media investments are considered, it is seen that each year there is an increase of 540 million TL compared to the previous year. Using the relevant forecasting model, the TV media investment forecast for 2019 is expected to be 4,860 million TL. The expectation rate between 2020 and 2022 is due to the expectation that the expectation for 2019 will be between 5% and 10%; It aims to maintain sports advertising expenditures at a stable level due to the covid-19 pandemic that started at the beginning of 2020 (Table 7).

Table 7. Future forecast model for TV media investments

Dependent Variable: TV				
Method: Least Squares				
Sample: 2011 2024				
Included observations: 8				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
@TREND	540.6571	62.14285	8.700230	0.0001
R-squared	0.533579	Mean dependent var		2138.750
Adjusted R-squared	0.533579	S.D. dependent var		1076.629
S.E. of regression	735.2842	Akaike info criterion		16.15486
Sum squared resid	3784500.	Schwarz criterion		16.16479
Log likelihood	-63.61944	Hannan-Quinn criter.		16.08788
Durbin-Watson stat	0.782315			

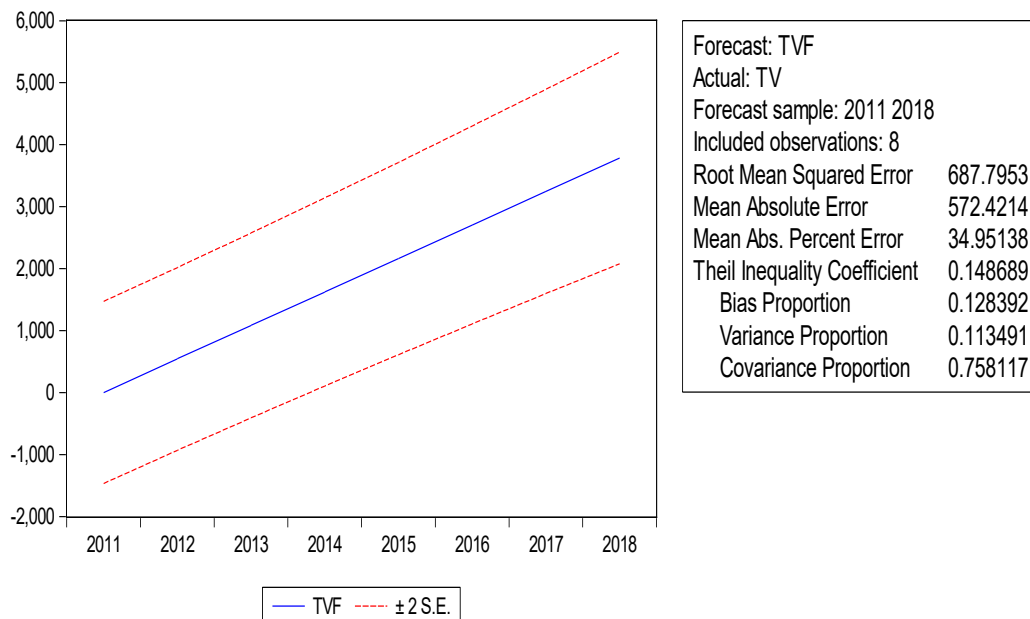


Figure 1. TV time series forecasting model results and error criteria for the period 2011-2018

Coefficient of Trend Variable (TREND)

This coefficient shows the positive effect of the time trend on the TV variable. That is, as time progresses, TV media investments increase approximately 540.6571 units for each unit of time.

t-Statistic and Probability Value

t-Statistic 8.700230 and p-value 0.0001 indicate that this coefficient is statistically significant ($p < 0.05$).

R-square and Adjusted R-square

It shows that the model explains 53.36% of the variance of the dependent variable. This shows that the model provides a reasonable fit, but the unexplained variance is also significant.

Durbin-Watson Statistic

The value of 0.782315 indicates that the error terms of the model contain positive autocorrelation. This may indicate that the error terms of the model are not independent and therefore improvements should be made in the model.

These results show that TV media investments have increased significantly over time and this increase is statistically significant. However, considering the autocorrelation problems and unexplained variance of the model, it is suggested that more advanced models should be used.

Results of future analysis of press and media investments

The following forecast prediction model is constructed by using the media investments data for the period between 2011 and 2024. The coefficient of explanation of this model, which is calculated linearly using the least squares method, is 38%. When press media investments are considered, it is seen that there is an increase of 140 million TL each year compared to the previous year. Using the relevant forecast model, the Press media investment forecast for 2019 is expected to be 1,260 million TL (Table 8).

Table 8. Future forecast model for press media investments

Dependent Variable: PRESS					
Method: Least Squares					
Sample: 2011 2024					
Included observations: 8					
Variable	Coefficient	Std. Error	t-Statistic	Prob.	
@TREND	140.4286	26.66304	5.266788	0.0012	
R-squared	0.383717	Mean dependent var		642.1250	
Adjusted R-squared	0.383717	S.D. dependent var		150.6789	
S.E. of regression	315.4813	Akaike info criterion		14.46254	
Sum squared resid	696699.3	Schwarz criterion		14.47247	
Log likelihood	-56.85018	Hannan-Quinn criter.		14.39557	
Durbin-Watson stat	0.413779				

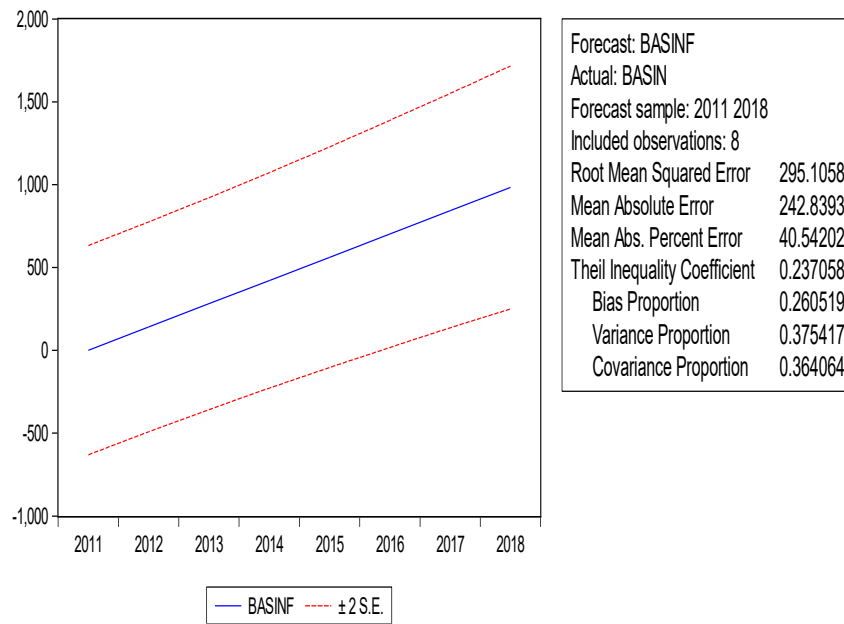


Figure 2. Press time series forecasting model results and error analysis for the period 2011-2018

Coefficient of Trend Variable (TREND)

This coefficient shows the positive effect of the time trend on the press variable. In other words, as time progresses, press media investments increase approximately by 140.4286 units for each unit of time.

t-Statistic and Probability Value

t-Statistic 5.266788 and p-value 0.0012 indicate that this coefficient is statistically significant ($p < 0.05$).

R-square and Adjusted R-square

It shows that the model explains 38.37% of the variance of the dependent variable. This shows that the model provides a reasonable fit, but the unexplained variance is also significant.

Durbin-Watson Statistic

The value of 0.413779 indicates that the error terms of the model contain positive autocorrelation. This indicates that the error terms of the model are not independent and therefore improvements should be made in the model.

These results show that press media investments have increased significantly over time and this increase is statistically significant.

Analysis results for the future of outdoor media investments

The following forecast prediction model was established using the media investments data for the outdoor media between 2011 and 2024. The coefficient of explanation of this model, which is calculated linearly with the least squares method, is 66%.

When outdoor media investments are considered, it is seen that each year there is an increase of 99 million TL compared to the previous year. Using the relevant forecasting model, the Outdoor media investment forecast for 2019 is expected to be 891 million TL (Table 9).

Table 9. Future forecast model for outdoor media investments

Dependent Variable: OUTDOOR					
Method: Least Squares					
Sample: 2011 2024					
Included observations: 8					
Variable	Coefficient	Std. Error	t-Statistic	Prob.	
@TREND	99.50714	14.61771	6.807299	0.0003	
R-squared	0.660630	Mean dependent var		349.7500	
Adjusted R-squared	0.660630	S.D. dependent var		296.8976	
S.E. of regression	172.9591	Akaike info criterion		13.26046	
Sum squared resid	209404.0	Schwarz criterion		13.27039	
Log likelihood	-52.04182	Hannan-Quinn criter.		13.19348	
Durbin-Watson stat	1.243691				

Coefficient of Trend Variable (TREND)

This coefficient shows the positive effect of time trend on the outdoor variable. In other words, as time progresses, outdoor media investments increase by 99.50714 units for each unit of time.

t-Statistic and Probability Value

t-Statistic 6.807299 and p-value 0.0003 indicate that this coefficient is statistically significant ($p < 0.05$).

R-square and Adjusted R-square

It shows that the model explains 66.06% of the variance of the dependent variable. This shows that the model provides a good fit.

Durbin-Watson Statistic

1.243691 indicates that the error terms of the model contain positive autocorrelation and this value is considerably lower than 2. This indicates that the error terms of the model are not independent and therefore improvements should be made in the model.

These results show that outdoor media investments have increased significantly over time and this increase is statistically significant.

Analyses of digital media investments for the future

The following forecast prediction model was established using the media investments data for the digital media between 2011 and 2024. The coefficient of explanation of this model, which is calculated linearly with the least squares method, is 78%.

When digital media investments are considered, it is seen that there is an increase of 272 million TL every year compared to the previous year. Using the relevant forecasting model, the digital media investment forecast for 2019 is expected to be 2,448 million TL (Table 10).

Table 10. Future forecast model for digital media investments

Dependent Variable: DIGITAL					
Method: Least Squares					
Sample: 2011 2024					
Included observations: 8					
Variable	Coefficient	Std. Error	t-Statistic	Prob.	
@TREND	272.4857		33.78919	8.064287	0.0001
R-squared	0.786938	Mean dependent var			884.7500
Adjusted R-squared	0.786938	S.D. dependent var			866.1408
S.E. of regression	399.7991	Akaike info criterion			14.93627
Sum squared resid	1118875.	Schwarz criterion			14.94620
Log likelihood	-58.74508	Hannan-Quinn criter.			14.86929
Durbin-Watson stat	1.025947				

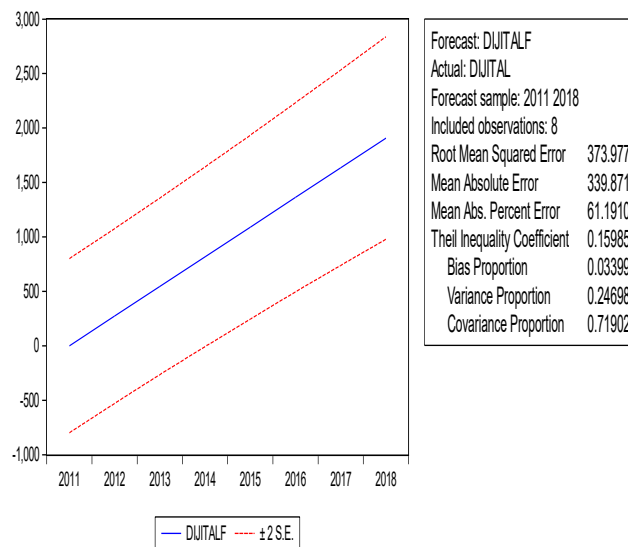


Figure 3. Digital time series forecasting model and error criteria for the period 2011-2018

Coefficient of Trend Variable (TREND)

This coefficient shows the positive effect of the time trend on the digital variable. In other words, as time progresses, digital media investments increase approximately by 272.4857 units for each unit of time.

t-Statistic and Probability Value

t-Statistic 8.064287 and p-value 0.0001 indicate that this coefficient is statistically significant ($p < 0.05$).

R-square and Adjusted R-square

It shows that the model explains 78.69% of the variance of the dependent variable. This shows that the model provides a good fit.

Durbin-Watson Statistic

1.025947 indicates that the error terms of the model contain autocorrelation and this value is considerably lower than 2. This indicates that the error terms of the model are not independent and therefore improvements should be made in the model.

These results indicate that digital media investments have increased significantly over time and this increase is statistically significant.

Results of future analysis of radio media investments

The following forecast prediction model was established by using the media investments data for the radio channel between 2011 and 2024. The coefficient of explanation of this model, which is calculated linearly with the least squares method, is 62%.

When radio media investments are considered, it is seen that each year there is an increase of 31 million TL compared to the previous year. Using the relevant forecasting model, the Radio media investment forecast for 2019 is expected to be 287 million TL (Table 11).

Table 11. Future forecast model for radio media investments

Dependent Variable: RADIO				
Method: Least Squares				
Sample: 2011 2024				
Included observations: 8				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
@TREND	31.90000	4.716623	6.763314	0.0003
R-squared	0.622652	Mean dependent var		115.3750
Adjusted R-squared	0.622652	S.D. dependent var		90.84986
S.E. of regression	55.80783	Akaike info criterion		10.99817
Sum squared resid	21801.60	Schwarz criterion		11.00810
Log likelihood	-42.99270	Hannan-Quinn criter.		10.93120
Durbin-Watson stat	1.102950			

Coefficient of Trend Variable (TREND)

This coefficient shows the positive effect of time trend on the radio variable. In other words, as time progresses, radio media investments increase by approximately 31.90000 units for each unit of time.

t-Statistic and Probability Value

t-Statistic 6.763314 and p-value 0.0003 indicate that this coefficient is statistically significant ($p < 0.05$).

R-square and Adjusted R-square

It shows that the model explains 62.27% of the variance of the dependent variable. This shows that the model provides a good fit.

Durbin-Watson Statistic

1.102950 indicates that the error terms of the model contain autocorrelation and this value is considerably lower than 2. This implies that the error terms of the model are not independent and therefore improvements should be made in the model.

These results show that radio media investments have increased significantly over time and this increase is statistically significant. However, considering the autocorrelation problems of this model, we should suggest the use of more advanced models.

Future analysis results of cinema media investments

The following forecast prediction model was established using the media investments data for the cinema channel between 2011 and 2024. The coefficient of explanation of this model, which is calculated linearly with the least squares method, is 66%.

When cinema media investments are considered, it is seen that each year there is an increase of 12 million TL compared to the previous year. Using the relevant forecasting model, the Cinema media investment forecast for 2019 is expected to be 110 Million TL (Table 12).

Table 12. Future forecast model for cinema media investments

Dependent Variable: CINEMA				
Method: Least Squares				
Sample: 2011 2024				
Included observations: 8				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
@TREND	12.27857	1.231448	9.970838	0.0000
R-squared	0.665877	Mean dependent var		47.62500
Adjusted R-squared	0.665877	S.D. dependent var		25.20735
S.E. of regression	14.57069	Akaike info criterion		8.312370
Sum squared resid	1486.136	Schwarz criterion		8.322300
Log likelihood	-32.24948	Hannan-Quinn criter.		8.245395
Durbin-Watson stat	0.760602			

Coefficient of Trend Variable (TREND)

This coefficient shows the positive effect of time trend on the cinema variable. In other words, as time progresses, cinema media investments increase approximately by 12.27857 units for each unit of time.

t-Statistic and Probability Value

t-Statistic 9.970838 and p-value 0.0000 indicate that this coefficient is statistically significant ($p < 0.05$).

R-square and Adjusted R-square

It shows that the model explains 66.59% of the variance of the dependent variable. This shows that the model provides a good fit.

Durbin-Watson Statistic

The value of 0.760602 indicates that the error terms of the model contain autocorrelation and this value is considerably lower than 2. This indicates that the error terms of the model are not independent and therefore improvements should be made in the model.

These results suggest that cinema media investments have increased significantly over time and this increase is statistically significant.

Total media investments analysed for the future

The following forecast prediction model was established using the media investments data for all channels between 2011 and 2024. The coefficient of explanation of this model, which is calculated linearly with the least squares method, is 66%.

When total media investments are considered, it is seen that each year there is an increase of 1097 million TL compared to the previous year. Using the relevant forecasting model, the total media investment forecast for 2019 is expected to be 9,873 million TL (Table 13).

Table 13. Future forecast model for all media investments

Dependent Variable: TOTAL					
Method: Least Squares					
Sample: 2011 2024					
Included observations: 8					
Variable	Coefficient	Std. Error	t-Statistic	Prob.	
@TREND	1097.257	120.6704	9.093008	0.0000	
R-squared	0.669335	Mean dependent var			4178.375
Adjusted R-squared	0.669335	S.D. dependent var			2482.966
S.E. of regression	1427.792	Akaike info criterion			17.48211
Sum squared resid	14270126	Schwarz criterion			17.49204
Log likelihood	-68.92846	Hannan-Quinn criter.			17.41514
Durbin-Watson stat	1.038735				

Coefficient of Trend Variable (TREND)

This coefficient shows the positive effect of time trend on total media investments. In other words, as time progresses, total media investments increase by approximately 1097.257 units for each unit of time.

t-Statistic and Probability Value

t-Statistic 9.093008 and p-value 0.0000 indicate that this coefficient is statistically significant ($p < 0.05$).

R-square and Adjusted R-square

It shows that the model explains 66.93% of the variance of the dependent variable. This shows that the model provides a good fit.

Durbin-Watson Statistic

1.038735 indicates that the error terms of the model contain autocorrelation and this value is considerably lower than 2. This indicates that the error terms of the model are not independent and therefore improvements should be made in the model.

These results show that total media investments have increased significantly over time and this increase is statistically significant. However, considering the autocorrelation problems of the model, we recommend the use of more advanced models.

DISCUSSION

The analyses used and presented in this article show that sports media investments are shifting towards digitalization and that the increase in digital media investments in particular has overtaken television advertising. This situation leads to changes in media planning strategies and causes industry professionals to direct their advertising budgets to digital platforms.

Digital media has become a source of revenue for sports organizations and sports clubs in many countries around the world. Due to the increase in the use of social media platforms, this has led brands to prefer digital advertising over traditional media. This change has led to significant transformations in the business models of media companies.

The horizontal and vertical growth of sports with the effect of technological developments and sponsorship has turned the structure of sports into an economic commodity

and made it an important sector worldwide (Senturk & Ozer, 2022). Since the 1960s, the development of sports-related businesses, companies producing sporting products and media organisations has turned sports into an industry and further strengthened the sports-media relationship (Tian et al., 2023). With the development of information communication technologies, the media has increased the global impact of sport and enabled both traditional and new media tools to contribute to the development of sport. In particular, the media makes it possible for sports to reach large audiences and for brands to convey their messages to these audiences (Glebova et al., 2022).

The strong relationship of sports with the audience has led television broadcasts to give more space to sports events and high viewing rates have contributed to the increase in advertising revenues; with the increase in the role of sports in social life, the media has started to give more space to sports events and this has enabled sports to be accepted as a cultural product (Arikan et al., 2021). In addition to introducing sports to the masses, the media has also undertaken the function of shaping sports culture and presents sports content to the audience in various ways. In this context, advertisements have also played an important role and have become an effective tool for the promotion of sports products (Thorpe & Dumont, 2018).

The economic and cultural impact of the advertising sector in Türkiye has developed rapidly since the 1970s (Aslaner & Aydin-Aslaner, 2020). Television has become one of the most preferred media tools by advertisers due to its ability to reach large masses. The value of television broadcasting rights has increased since the 1970s and these rights have provided a great economic gain for commercialised sports (Ozkandas, 2021). Sports media investments in Türkiye showed a significant increase in 2023. Media investments reached 140.69 billion TL, with digital media having the largest share with 72.6%. Digital media investments have increased especially in adverts made on mobile devices. In 2023, digital media investments increased by 136.9%, reaching TL 86.50 billion.

Television sports advertisement investments also increased by 94.5% in 2023, reaching 24.90 billion TL and constituting 20.9% of media investments. The ability of television to reach large masses contributes greatly to advertising revenues by increasing the viewing rates of sports broadcasts (Yildiz et al., 2017). Sports has an important place in the advertising strategies of businesses as an element that affects consumer behaviour. The use of famous athletes as the face of advertisements has increased the impact of advertisements and strengthened the interaction of sports lovers with brands. When we examine the results of a different study that supports the data obtained at the end of the study on this subject; Examples such as Arda Turan being the face of an advertisement for a tourism brand or Seren Yalçın taking part in a shopping website reveal the power of sports in the advertising sector (Katirci & Yuce, 2016).

Digital media has been one of the fastest growing areas of advertising and has shown a significant increase in recent years. Again, when we examine the findings of a different study that supports the findings of the study; As of 2023, digital media advertisements have the largest share in media investments and 81% of these investments consist of advertisements made on mobile devices. Digital advertisements have become interactive and shaped in line with the demands of consumers. Thanks to the developing technology, advertising strategies

have also changed and digital media has become an indispensable platform for sports advertisements (Aktas, 2013).

In addition to digital media advertisements, outdoor advertisements also showed a significant increase in 2023. Outdoor sports media investments increased by 138.6% to reach TL 5.08 billion, accounting for 4.3% of total media investments. Digital outdoor advertisements have become an important medium for advertisements with sports content, especially in big cities and densely populated areas. In 2013, we see that the results of a different study conducted in 2013 and the findings and results of our study support each other. In this study, the strong bond between sports; media and advertising sectors enabled businesses to reach consumer masses through sports. The fact that sport has an impact on large masses has enabled brands to influence consumer behaviour through sport organisations. Sports organisations and athletes create a positive impact on the target audiences of brands and this interaction increases the importance of sports in the advertising world (Pitts & Stotlar, 2013).

Television broadcasting is one of the most important factors enabling the globalisation of sport. Sports broadcasts provide more advertising revenues by increasing viewership rates and these revenues contribute to the growth of sports organisations. The increase in television sports advertisement investments in Türkiye, especially in 2023, has provided a great economic opportunity in this context. Advertisers reach a wide audience by acquiring television broadcasting rights and maximise the economic potential of sports (Budak, 2019; Cetin, 2015).

Social media also enables the effective use of sports advertisements. Social networks have become a medium that enables brands to reach their target audiences directly with their large user masses. When we examine the findings of a different study conducted by Taskiran; it reveals that digital media offers a great advantage to businesses, especially with sports advertisements made on social media platforms. It shows that sports organisations increase their interaction with brands by reaching large masses through social media and that this provides serious advertising revenues to the relevant sports brands (Taskiran, 2018).

The relationship between sports and media has gradually strengthened and the reach of sports to large masses through the media has increased the importance of sports in the advertising world. The increase in digital media and television sports broadcasts has increased the economic value of sports and offers great opportunities to businesses. The fact that media investments in Türkiye will increase significantly in 2023 reveals the future growth potential of the sports and media sectors. It is also seen that the role of sports in advertising strategies will continue to be a critical factor for brands to reach large audiences.

CONCLUSION

This study analyses the general trends of sports media and advertising investments in Türkiye between 2011 and 2024. The data compiled for the study were analysed through media investment reports provided by the Association of Advertisers and Deloitte, and investments in different media types such as digital media, television, outdoor, press, radio and cinema were evaluated in detail with different statistical methods. The findings show that there has been a significant increase especially in digital media investments. Digital media investments reached 86.5 billion TL by 2023, accounting for 72.6% of media investments. This rapid growth reveals that the demand for sports content has increased significantly on digital platforms. Digital

media advertising on mobile devices accounts for 81% of these investments, with video impression-based ads and search engine ads taking the largest share of digital ad spending.

Television sports advertisement investments also increased by 94.5% in 2023, reaching 24.9 billion TL. This constitutes 20.9 per cent of total media investments. Outdoor media investments increased by 138.6% to reach TL 5.08 billion. The share of digital outdoor advertisements reached 32%. On the other hand, press media investments increased by 42.5% to TL 792 million and accounted for only 0.7% of total media investments. Radio and cinema media investments increased by 101.9% and 65.6%, respectively.

In general terms, sports media and advertising investments recorded a significant growth with the digitalisation trend. It is predicted that digital media investments will continue to increase, and television and outdoor advertisements will continue to grow strongly. These data obtained and determined reveal the importance of sports in the advertising industry and the dynamics of media investments through sports.

Recommendations for industry professionals and decision makers

1. Following the data and findings of this study, advertisers should allocate more budget to digital platforms when planning their media investments. Data from 2023 shows that 72.6% of total media investments are directed towards digital channels.
2. Television advertising, while still an important medium, shows that more targeted advertising strategies need to be developed. In particular, advertising during live sports broadcasts continues to attract viewers' attention.
3. Sports clubs should be more active on digital platforms to increase their media revenues. Because social media sponsorship, influencer collaborations and e-sports investments can transform the revenue models of sports organizations.
4. Government and regulatory bodies should take into account the growing impact of digital advertising and make regulations to ensure fair competition in the sector.

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Researchers' Statement of Contribution Rate: MMK, MK and ASY designed the study research design. ASY, PA supervised the study AA and MK collected and analysed the data. All authors prepared and approved the final manuscript.

Ethical Approval: Since the study involved panel data analysis, an ethics committee was not consulted.

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