Understanding Media Performance Through Statistics: TV News Ratings in Romania

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Abstract

This study analyzes the performance of the main news programs of the five largest television channels in Romania: TVR1, PRO TV, Antena 1, Kanal D, and Prima TV. By examining monthly average ratings over a five-year period (2018–2022), the study identifies key trends and performance disparities between these channels. The results highlight significant differences in the performance of TVR1's Telejurnal *compared to its commercial competitors. While* Telejurnal *demonstrates stability with a loyal but relatively small audience, commercial channels like PRO TV, Antena 1, and Kanal D exhibit higher variability and significantly higher mean ratings, reflecting their ability to attract diverse and dynamic audiences. Seasonal patterns in* Telejurnal*'s ratings reveal higher viewership in winter months, with declines in summer, but the overall trend remains stationary. These findings suggest that TVR1 operates in a distinct niche but faces significant challenges in competing with commercial channels.*

Keywords: *traditional media, statistics, TV ratings, audience analysis, Romanian television*

JEL classification: C10, C12, Z1, H0, H82, M37

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1. Introduction

The rating of a TV program is a crucial indicator for assessing its performance among the audience. To better understand the significance of ratings and their impact on the media landscape, a comprehensive analysis is necessary, taking into account its various aspects and interpretations. According to Webster and Phalen (1994), ratings serve as a foundational tool for understanding audience behavior and assessing the success of television programming, offering a critical measure of a program's ability to attract and retain viewers.

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The monthly average rating of a TV program measures the average number of viewers who watched the program over a specific period, typically a week or a month. This metric reflects the program's success in engaging its audience and significantly influences programming decisions and advertising revenue allocation (Litman & Kohl, 1989). Beyond average ratings, market share is another essential metric, representing the proportion of viewers watching a specific program compared to the total audience at that time. Segmenting ratings based on demographic variables, such as age, gender, and income, provides advertisers and content producers with deeper insights into consumer preferences and behaviors, facilitating targeted marketing strategies (Brown & Cavazos, 2017).

Feedback from critics and the audience also plays a vital role in evaluating the success of TV programs. Even programs with lower ratings can achieve cultural or critical acclaim, influencing their longevity and production investments. For instance, Wakamiya, Lee, and Sumiya (2011) demonstrated that sentiment analysis of social media interactions could complement traditional audience metrics, providing a holistic view of program performance.

This paper focuses on analyzing the monthly average ratings of news programs on several television channels in Romania. By examining these ratings and their impact on the local media landscape, we aim to better understand the performance and relevance of these programs within the Romanian audience. Such an approach aligns with the work of Pătruț and Pătruț (2013), who emphasize the need to adapt international methodologies to local contexts for meaningful analysis of Romanian TV audiences.

A comparative statistical study of news program ratings provides several benefits, offering a clearer perspective on their performance relative to competitors and identifying trends in audience preferences. These results can inform programming strategies, advertising decisions, and content development. For example, studies by Gensch and Shaman (1980) highlight how regression and time series models can predict audience behavior and inform scheduling strategies. Additionally, Min, Zang, and Liu (2015) underscore the influence of social media engagement in driving viewer interest, suggesting a need for integrated promotional strategies.

By analyzing and interpreting the data obtained from this study, we contribute to the broader understanding of audience dynamics in Romania's media industry. This study supports the continuous development of strategies for improving programming and marketing initiatives, ensuring that television remains relevant in an increasingly fragmented media landscape (Bae & Taneja, 2019).

In conclusion, this study offers a significant contribution to the development of effective strategies for television networks and the media industry as a whole. By integrating audience metrics, social media interactions, and demographic insights, it provides a comprehensive understanding of the performance and relevance of news programs in Romania's media environment, aligning with global best practices in audience analysis (Napoli, 2011).

2. Literature review

The study of the media phenomenon, and particularly television ratings, represents a subject of great interest for both researchers and practitioners in the fields of media and marketing. Evaluating audiences and understanding the behavior of media consumers are essential for strategic decision-making, content development, and the allocation of advertising resources. In this literature review, we will explore relevant works that address audience measurement, statistical methods applied in ratings analysis, and the application of these methods in the Romanian context.

The study by Gensch and Shaman (1980) analyzes time series data of television viewing using a weekly trigonometric regression model to predict total network viewing for specific times on certain days of the year. Traditional methods of TV audience measurement include the use of audience panels, where selected households are equipped with devices that record which channels are watched and for how long. Webster and Phalen's (1994) work is one of the classics in this field, providing a detailed analysis of measurement methodologies and associated challenges. With technological advancements, audience measurement methods have expanded to include data from set-top boxes, mobile applications, and online streaming. Napoli's (2011) study explores how new technologies have influenced the measurement and interpretation of TV audiences.

Regression models are frequently used to analyze and predict TV ratings. Beyond Gensch and Shaman (1980), numerous studies employ advanced regression techniques to understand audience dynamics. For instance, Litman and Kohl's (1989) work uses linear regression to analyze factors influencing the success of TV programs. Time series analysis is essential for understanding cyclical behaviors and long-term trends in TV viewing. Eastman and Ferguson's (2009) study provides a comprehensive review of time series analysis methods applied to audience research. Gensch and Shaman (1980) are not the only ones to use trigonometric models for audience prediction. Other works, such as Adhikari and Adhikari (2011), explore the use of trigonometric functions and seasonal models to improve audience prediction accuracy.

Social media has become an important marketing tool for TV content producers, making it crucial to understand how social media can be managed to influence TV ratings (Năstase et al., 2024; Geambasu et. al., 2024, Ciocîrlan et. Nițoi, 2024, Busu et al., 2024). Min, Zang, and Liu's (2015) article reports on the design and results of an initial study to determine whether the combination of TV content producers' engagement on social networks and unique audience involvement can help predict TV ratings. The study employed multiple regression analysis, principal component analysis, and time series analysis. Recent studies highlight the importance of social media in promoting TV programs. Min, Zang, and Liu (2015) exemplify this by demonstrating how social media engagement can positively influence TV ratings. Other studies, such as Gong and Cummins (2016), show that social media interactions can serve as predictors for TV program success. Sentiment analysis of social media posts can provide valuable insights into

audience perceptions. Wakamiya, Lee, and Sumiya (2011) explore how sentiment analysis can be used to predict audience fluctuations.

Studies on TV audiences in Romania are relatively limited, but some research, such as that by Pătruț and Pătruț (2013), offers insights into Romanian media consumer behavior. These studies emphasize the importance of adapting international methodologies to the local contexnapot to achieve relevant results. Factors such as cultural preferences and socio-economic conditions play a crucial role in viewing behavior. Dinu and Dumitru's (2017) studies analyze these aspects in the Romanian context, providing a deeper understanding of the factors influencing TV audiences in Romania.

Another significant study is by Bae and Taneja (2019), which examines how audience fragmentation affects TV ratings measurement, considering the diversification of content platforms and changing consumer preferences. Chen and Leung (2016) explore the impact of embedded advertising within TV programs on viewing behavior, using econometric models to analyze audience data. A critical aspect of TV audience measurement is the impact of cultural and social phenomena on viewing preferences. In this regard, Hallin and Mancini's (2004) work offers a comparative analysis of media systems in different countries, highlighting how cultural and political factors influence media consumption. Schulz (2014) also explores the effect of major sports events on TV ratings, demonstrating how these events can cause significant fluctuations in viewing behavior.

Another relevant example is Stipp's (2013) study, which analyzes how multi-platform integration and content availability across various devices impact the measurement and interpretation of TV ratings. This study underscores the importance of adopting flexible and adaptive methodologies to keep pace with rapid changes in the media landscape. Additionally, a study by Lee, Nagler, and Wang (2015) explores the interaction between TV ratings and online marketing campaigns, demonstrating how digital promotion strategies can influence traditional TV viewing.

Another important aspect is analyzing viewing behavior based on audience demographics. Brown and Cavazos's (2017) study examines how demographic variables such as age, gender, and income influence viewing preferences and responses to advertising. This type of analysis is crucial for developing targeted and effective marketing strategies. Finally, studies by Katz and Wedell (1978) and Webster, Phalen, and Lichty (2006) provide a solid theoretical foundation for understanding viewing behavior and the factors influencing audience choices. These works emphasize the importance of cultural and social context in TV audience analysis and offer valuable perspectives for future research in this field.

3. Methodology

To conduct a comprehensive statistical analysis of the ratings for the main news programs of the five largest television channels in Romania (TVR1, PRO TV, Antena 1, Kanal D, and Prima TV), we followed a series of structured methodological steps. These steps included data collection, descriptive analysis, normality testing, inferential analysis, and result interpretation. Rating data for the

main news programs were collected over a specified period, ensuring that each television channel was fairly represented. The data sources included audience measurement agencies and publicly available TV audience reports. The collected data were preprocessed to eliminate any anomalies and ensure their integrity. This step involved verifying the consistency and completeness of the data, removing missing values, and correcting evident errors. For each television channel, basic descriptive statistical indicators were calculated.

To verify whether the distribution of ratings follows a normal distribution, the Jarque-Bera test was applied, which evaluates the skewness and kurtosis of the data distribution. The test results indicated that all channels, except Prima TV, follow a normal distribution.

The F-test was used to compare the variations in ratings between TV channels and to determine whether they differ significantly. This test is essential for establishing the correct method for applying the t-test. The Jarque-Bera test (Jarque and Bera, 1980) is a statistical test used to assess the hypothesis of normality in a distribution. The variable tested is:

$$JB = \frac{n}{6}\left(S^2 + \frac{(K-3)^2}{4}\right)$$

which follows a chi-squared distribution, where *n* represents the number of observations or degrees of freedom. The null hypothesis of the Jarque-Bera test is H_0: the data are normally distributed, and it is evaluated against the alternative hypothesis H_1: the data are not normally distributed and follow a different distribution. Moreover, we use t-test to compare the means of two independent samples to determine whether there is a statistically significant difference between them. In this analysis, a two-sample t-test assuming unequal variances (also known as Welch's t-test) was applied to compare the mean ratings of Telejurnal on TVR1 with those of the news programs on PRO TV, Antena 1, and Kanal D.

4. Results

This analysis examines and compares the performance of the main news programs of the five largest television channels in Romania: TVR1, PRO TV, Antena 1, Kanal D, and Prima TV. The aim is to provide a clear picture of the viewership of these programs through a series of descriptive and inferential statistical indicators.

- Series: SER01 (TVR 1)
- Sample: 2018:01 - 2022:12
- Observations: 60

Jarque-Bera test

Table 1

	Jarque-Bera test	**Probability**	**Skewness**	**Kurtosis**	**Conclusion**
Rtg *Telejurnal*	3.952713	0.138573	0.627879	3.064464	normal distribution

Table 1 and Figure 1 present the results. For the analyzed period, an average of 1.176 was calculated, with a standard deviation of 0.306. The coefficient of variation is 26.05% (less than 30%), indicating a sufficiently homogeneous series and a significant mean. The minimum value of 0.7% was recorded during the summer months of 2022 (June-August), while the maximum value of 2% was observed in February 2018. The series tends toward a normal distribution, according to the Jarque-Bera test, with a value of 3.952713 and an associated probability of 0.138573 (skewness: 0.627879; kurtosis: 3.064464). The confidence interval for the calculated mean is [1.097; 1.255]. It is evident that the series exhibits seasonality, with ratings increasing in the winter months and decreasing in the summer months. The series is stationary, showing no specific trend.

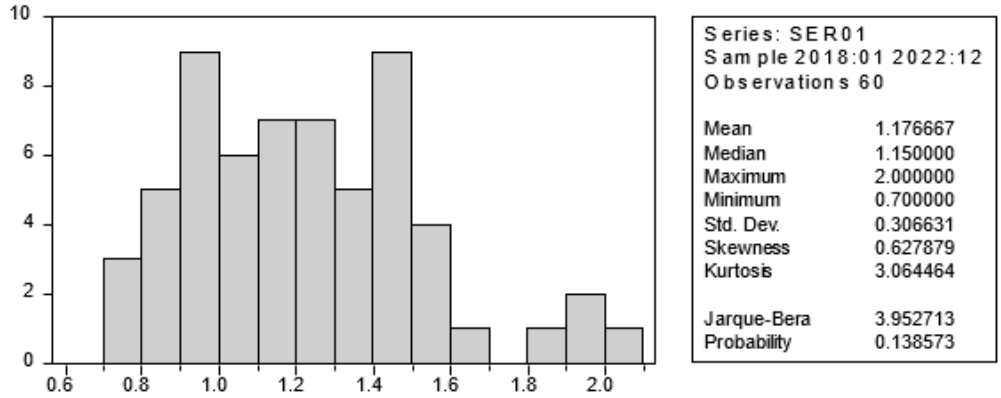

Figure 1. Descriptive statistics for *Telejurnal* raiting

Table 2 presents the results of the F-tests, which indicate that the variances of the Telejurnal ratings on TVR1 and the news program ratings on PRO TV, Antena 1, and Kanal D are significantly different ($p < 0.05$). These differences reflect a series of important implications.

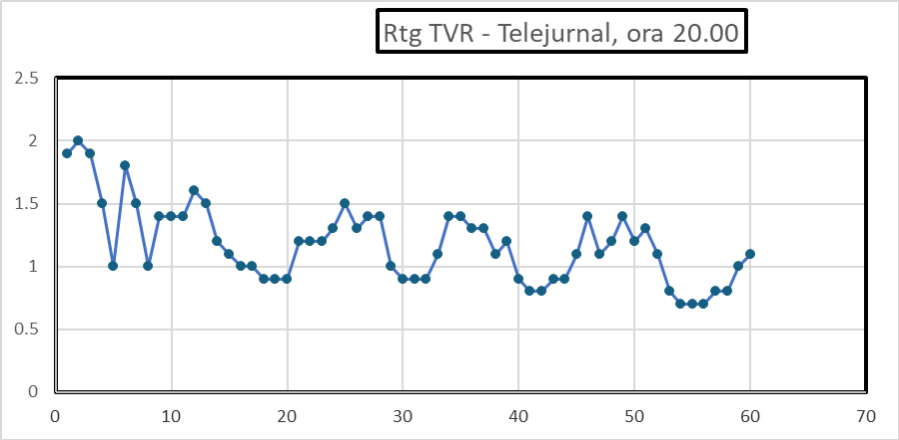

Figure 2. *Telejurnal* raiting for 20.00

First, the characteristics of rating variability between channels show that Telejurnal ratings are more stable, with lower variance than those of PRO TV, Antena 1, and Kanal D. This suggests that Telejurnal's audience is less fluctuating over time, while the commercial channels attract a more dynamic audience influenced by contextual factors such as program content, special events, or competition.

From the perspective of relative performance, the significant differences in variance highlight that TVR's audience is more consistent but likely smaller compared to that of the commercial channels. On the other hand, commercial channels manage to attract a more diverse audience, although with greater fluctuations in ratings caused by aggressive programming and marketing strategies.

The implications for market strategies emphasize that, for TVR, the stability of its ratings reflects a loyal viewer base but also a limited capacity to attract new audiences. This underscores the need for a more dynamic approach, creating adapted content to attract and retain new audience segments. For commercial channels, the variability in ratings may signal the success of popular programs that temporarily boost viewership but also highlights their vulnerability to sudden changes in audience preferences.

The significant differences in variances have implications for competitiveness, suggesting that TVR operates in a distinct manner compared to its commercial competitors, positioning itself more in a niche segment rather than in a directly competitive environment. To increase its relevance, TVR could implement strategies that capitalize on seasonality and diversify its content, thereby contributing to an increase in positive rating variance and attracting a larger audience.

Analysis of the comparison of rtg between TVR and other channels.
F-Test Two-Sample for Variances

Table 2

Value	Calculated value of F-test / probability associated with the F-test	The theoretical value of the F-test	Conclusions
Raiting TVR – PRO TV	Fc= 0,01485907 P-value = 0.00	0,64	The null hypothesis H0 is rejected. The alternative hypothesis H1 is accepted. There is a significant difference between variances because p-value < 0.05.
Raiting TVR – ANTENA 1	Fc= 0,02189339 P-value =0.00	0,64	
Raiting TVR – KANAL D	Fc= 0,109285527 P-value =0.00	0,64	

Table 3 illustrates the results of the t-test used to compare the mean ratings between Telejurnal on TVR1 and the news programs on PRO TV, Antena 1, and Kanal D, under the assumption of unequal variances. The analysis results highlight the following conclusions:

In the comparison between the ratings of Telejurnal and PRO TV, the t-test value is tc = 22.59, with a p-value of p = 0.00, which is lower than the significance threshold of 0.05. This result leads to the rejection of the null hypothesis (H0), which states that there are no significant differences between the mean ratings, and the acceptance of the alternative hypothesis (H1), which asserts that there is a significant difference between the means. The interpretation suggests that PRO TV records a significantly higher mean rating compared to Telejurnal.

For the comparison between the ratings of Telejurnal and Antena 1, the t-test value is tc = -17.60, with a p-value of p = 0.00, also below the significance threshold of 0.05. The null hypothesis is rejected, and the alternative hypothesis is accepted. This result indicates a significant difference between the mean ratings of the two channels, with Antena 1 having a higher mean.

In the case of the comparison between the ratings of Telejurnal and Kanal D, the t-test value is tc = -16.04, with a p-value of p = 0.00, again below the significance threshold. The null hypothesis is rejected, confirming the existence of a statistically significant difference between the mean ratings. Kanal D is likely to have a higher mean rating than Telejurnal.

The general conclusion emphasizes that there are statistically significant differences between the mean ratings of Telejurnal on TVR1 and those of the news programs broadcast by PRO TV, Antena 1, and Kanal D. All three commercial channels appear to have considerably higher mean ratings than Telejurnal. These significant discrepancies highlight a major performance gap, suggesting the need for adaptive strategies to improve Telejurnal's position in a competitive media market.

t-Test: Two-Sample Assuming Unequal Variances between TVR and other channels

Table 3

Value	Calculated value of t-test / probability associated with the t-test	The theoretical value of the F-test	Conclusions
Raiting TVR – PRO TV	tc= 22,59408656 P-value =0.00	1,99	The null hypothesis H0 is rejected. The alternative hypothesis H1 is accepted. There is a significant difference between variances because p-value < 0.05.
Raiting TVR – ANTENA 1	tc= -17,60030498 P-value =0.00	1,99	
Raiting TVR – KANAL D	tc= -16,04303708 P-value =0.00	1,99	

5. Conclusions

The findings from the literature review and statistical analysis of television ratings in Romania reveal significant transformations in the media landscape and consumer behavior. These shifts are primarily driven by rapid technological advancements and the growing diversity of content consumption platforms. The integration of advanced statistical analysis techniques and emerging technologies into audience measurement practices is crucial for understanding audience preferences and enabling TV channels to adapt to the dynamic market environment effectively.

One key observation is the general trend of declining ratings for most television news programs, indicating a steady decrease in viewership over time. This decline reflects a broader shift in media consumption behavior, as audiences increasingly gravitate toward streaming platforms and digital content. Traditional television faces growing competition in retaining and attracting viewers who now have more content choices than ever before.

To remain competitive, TV networks must prioritize adapting to new technologies**.** Emerging tools such as artificial intelligence and advanced algorithms are playing an increasingly pivotal role in providing personalized recommendations and fostering audience loyalty. Implementing such innovations can help networks deliver tailored content that resonates with their audiences, thereby enhancing engagement and retention.

For TVR, analysis of the performance of TVR1's *Telejurnal* compared to the main news programs on PRO TV, Antena 1, and Kanal D highlights significant challenges and opportunities for TVR in the competitive Romanian media

landscape. Telejurnal demonstrates greater stability in its ratings, as indicated by lower variance compared to its commercial counterparts. This reflects a consistent but relatively small loyal audience base. In contrast, PRO TV, Antena 1, and Kanal D exhibit higher variability, showcasing their ability to attract a more diverse and dynamic audience, likely driven by aggressive marketing and programming strategies. The ratings of Telejurnal show clear seasonal patterns, with higher viewership during the winter months and declines in the summer. However, the series is stationary, indicating no significant upward or downward trend over the analyzed period. The t-test results reveal that the mean ratings of Telejurnal are significantly lower than those of PRO TV, Antena 1, and Kanal D. This indicates a substantial performance gap between TVR1 and its commercial competitors. Among these, PRO TV records the highest performance difference, with a mean rating significantly higher than Telejurnal. Antena 1 and Kanal D also outperform Telejurnal, though their advantage is slightly less pronounced compared to PRO TV.

The stability of Telejurnal ratings reflects a loyal core audience, but this consistency should not replace the pursuit of growth. TVR needs to develop strategies to retain its loyal viewers while simultaneously attracting new audiences. Seasonal variations present an opportunity for TVR to enhance programming during high-viewership periods, such as winter. Special content, campaigns, or events targeted at these times could help amplify audience engagement. To bridge the performance gap with competitors, TVR must diversify its content offerings. Experimenting with new formats, genres, and storytelling approaches tailored to younger or underserved demographics could increase its appeal. Additionally, the rise of streaming platforms and digital content necessitates the integration of digital strategies. Collaborating with digital platforms or creating exclusive online content could help TVR expand its reach and remain competitive.

The success of commercial channels highlights the importance of robust marketing strategies. TVR should improve its promotional efforts to emphasize the unique value of Telejurnal and attract a broader viewership. Leveraging advanced audience measurement techniques and predictive analytics can provide deeper insights into audience preferences, helping to guide programming decisions and advertising strategies. These efforts would position TVR more competitively within the evolving media landscape. The results emphasize the need for TVR to adopt a more dynamic and competitive approach. By leveraging its strengths in stability and loyal viewership while addressing gaps in content innovation, marketing, and adaptability, TVR can strengthen its position in the Romanian media market. These changes are essential not only for closing the performance gap with commercial channels but also for ensuring long-term relevance in a rapidly evolving media landscape.

This study has several limitations. The data collection period may not fully capture seasonal variations or special events that could significantly influence ratings. Furthermore, the source of the data presents a potential limitation, as the

accuracy and reliability of audience ratings may vary based on the methodology used by the audience measurement agencies.

References

1. Adhikari, R., & Adhikari, B. (2011). Modified simple seasonal model for forecasting time series data. Neural Computing and Applications, 19(1), 187-191.
2. Bae, S. Y., & Taneja, H. (2019). Measuring fragmentation of audience time and attention across media platforms. Journal of Broadcasting & Electronic Media, 63(3), 394-411.
3. Brown, T. J., & Cavazos, R. (2017). Understanding the impact of demographic factors on television viewing patterns. Journal of Media Economics, 30(2), 101-116.
4. Busu, C., Busu, M., Grasu, S., Skackauskiene, I., & Fonseca, L. M. (2024). An Econometric Analysis of the Economic and Social Preferences in Energy-Saving Behavior Using a Structural Equation Modeling Approach.
5. Chen, H., & Leung, L. (2016). Impact of embedded advertising on television audience behavior: An econometric analysis. Journal of Advertising Research, 56(3), 242-254.
6. Ciocirlan, C., & Nițoi, M. (2024). Policy complementarity: major fiscal and monetary announcements during the pandemic. *Applied Economics Letters*, *31*(6), 530-534.
7. Dinu, A., & Dumitru, I. (2017). Cultural and socio-economic influences on television viewing behavior in Romania. Romanian Journal of Communication and Public Relations, 19(3), 45-60.
8. Eastman, S. T., & Ferguson, D. A. (2009). Media Programming: Strategies and Practices. Cengage Learning.
9. Geambasu, C. M., Manta, E. M., & Florescu, M. S. (2024, May). Digitalization and Shadow Economy. A Literature Review. In *International Conference on Digital Economy* (pp. 253-264). Cham: Springer Nature Switzerland.
10. Gensch, D. H., & Shaman, P. (1980). Time series analysis of television viewing data. Journal of Marketing Research, 17(3), 345-354.
11. Gensch, D., Shaman, P. (1980). Models of Competitive Television Ratings. Journal of Marketing Research, 17(3), 307-315. https://doi.org/10.1177/002224378001700303
12. Gong, T., & Cummins, R. G. (2016). Predicting television show popularity using social media data: A comparative analysis. Journal of Broadcasting & Electronic Media, 60(2), 302-323.
13. Hallin, D. C., & Mancini, P. (2004). Comparing Media Systems: Three Models of Media and Politics. Cambridge University Press.
14. Katz, E., & Wedell, G. (1978). Broadcasting in the Third World: Promise and Performance. Harvard University Press.
15. Lee, Y., Nagler, J., & Wang, A. (2015). Television advertising and online engagement: The role of online synergies in TV advertising campaigns. Journal of Interactive Marketing, 30(1), 48-58.
16. Litman, B. R., & Kohl, A. (1989). Predicting television program success with regression models. Journal of Media Economics, 2(2), 35-50.
17. Min, J., Zang, Q., Liu, Y. (2015) The influence of social media engagement on TV program ratings, *Systems and Information Engineering Design Symposium*, Charlottesville, VA, USA, 283-288, doi: 10.1109/SIEDS.2015.7116990.
18. Napoli, P. M. (2011). Audience Evolution: New Technologies and the Transformation of Media Audiences. Columbia University Press.

19. Năstase, M., Croitoru, G., Florea, N. V., Cristache, N., & Lile, R. (2024). The perceptions of employees from Romanian companies on adoption of artificial intelligence in recruitment and selection processes. *Amfiteatru Economic*, *26*(66), 421-439.
20. Pătruț, B., & Pătruț, M. (2013). Analysis Componentsof the Digital Consumer Behavior in Romania.
21. Schulz, W. (2014). Major sports events and their impact on television ratings: An analysis of the Olympic Games and FIFA World Cup. International Journal of Sports Marketing and Sponsorship, 15(3), 175-189.
22. Stipp, H. (2013). The impact of multi-platform viewing on television ratings. Journal of Advertising Research, 53(4), 417-423.
23. Wakamiya, S., Lee, R., & Sumiya, K. (2011). Towards better TV viewing rates: Extracting TV show preferences using real-time analysis of microblogging streams. Proceedings of the 2011 ACM SIGWEB International Conference on Web Science, 103-112.
24. Webster, J. G., & Phalen, P. F. (1994). The Mass Audience: Rediscovering the Dominant Model. Lawrence Erlbaum Associates.
25. Webster, J. G., Phalen, P. F., & Lichty, L. W. (2006). Ratings Analysis: The Theory and Practice of Audience Research. Lawrence Erlbaum Associates.