스포츠매니지먼트학 석사학위 논문

Determinants of Television Ratings of CBA Matches in China

**- Based on the analysis of the matches
from 2016 to 2021**

중국에서 프로 농구 경기에 대한 티비

시청 수요의 결정 요소

- 2016-2021 년 시즌 경기에
대한 분석을 중심으로 -

2022 년 01 월

서울대학교 대학원

체육교육과 글로벌스포츠매니지먼트 전공

왕원호

Determinants of Television Ratings of CBA Matches in China
– Based on the analysis of the matches from 2016 to 2021

지도 교수 김 기 한

이 논문을 스포츠 매니지먼트
석사 학위논문으로 제출함
2022 년 2 월

서울대학교 대학원
체육교육과 글로벌스포츠매니지먼트 전공
왕 원 호

왕원호의 석사 학위논문을 인준함
2022 년 2 월

위 원 장 _____ 임 충 훈 _____

부위원장 _____ 이 충 근 _____

위   원 _____ 김 기 한 _____

Abstract

This paper is intended to assess the determinants of the live game China Central Television 5 (CCTV-5) ratings in Chinese Basketball Association (CBA). Four basic categories of determinants are identified: Sporting Contest, Consumer Preferance, Quality of Viewing, and Economic.

Linear conceptual models are constructed based on detailed dataset comprising of all live CBA playoffs CCTV-5 broadcasts from 2016 to 2021 for a total of 12 independent variables in this study: Match significance, Ranking, Outcome uncertainty, Match intensity, Competition system reform, Players popularity, Market competition, Epidemic situation, Day of week, Match time, Match season controls and City tier, controlling for all the four basic categories listed above.

Through the quantitative analysis of the factors influencing the audience rating of basketball TV broadcast market, this study can provide guidance for the subsequent investment of basketball broadcast market, and also provide reference for the subsequent academic research of related sports broadcast industry.

Key Words: Professional Basketball, CBA, TV Audience Rating, Consumer Motivations.

Student Number: 2019-25458

Table of Contents

List of Tables

Chapter 1. Introduction

1.1. Research Background

Even with the rapid development of the current Internet technology, live TV sports content still dominates the broadcast industry in China's sports market. Even though watching sports on live television means a lot more today, it is still the most accustomed and accepted way of watching sports events in China. Many TV broadcasters, sport-leagues, teams, players, advertisers，agencies.etc are very interested in TV ratings for live sports (Foster, G., O'Reilly, N., Shimizu, C., Khosla, N., & Murray, R., 2014). By focusing on TV ratings, people hope to find out the key factors affecting consumers in the sports market, so as to seize the lead in market investment. But research on this area is rare.

Big amount of money is being invested in the sports media industry everyday including the field of live TV broadcasting industry. The process of investment and construction requires guidance and advice from sports managers, therefore, we need to explore the consumption intention and influencing factors on people who watching live sports events on TV, so as to predict consumers' consumption habits and behaviors, and then put forward suggestions that can guide the development and construction of the market.

At the same time, we also hope to meet the consumption needs of consumers through the study of their motivations to realize consumers' continuous consumption. The intention of re-consumption is an important factor in the study of sports media, which also has an very important respomsibility in the competitive sports broadcasting industry.

The traditional idea is that the audience rating of a live sports event is determined by the quality of the sports event itself. This study hopes to expand the decisive factors affecting the audience rating of live sports events to a wider range through data statistics and hypothesis verification to make the research of sports market more universal and more widely applied.

On the other hand, the advertising industry, sports product industry and we-media industry, which are closely related to the competitive sports industry, are all playing a vital role in the

live broadcasting of competitive sports. These industries are mutually beneficial to the competitive sports industry. This relationship is especially reflected in the live sports matches. Successful live TV broadcastings can expand the publicity power of advertising and the influence and recognition of relevant industries. In turn, these industries will also play a positive role in the audio-visual experiences of the audience group of the sport events, thus realizing the improvement of the market value of the industries and the growth of the consumer group.

Among Chinese sports leagues, CBA is one of the commercial leagues with the most perfect development, the most extensive audience and the highest public recognition in the Chinese sports market.

1.2. Research Context:China Basketball Association

The China Basketball Association, or CBA for short, is a multi-year home and away basketball league hosted by the Chinese Basketball Association, the highest-level basketball league in China.

Similar to the NBA, the CBA season can be divided into two stages, the regular season and the playoffs, with the home and the visiting games. The significance of the different stages of the game is obviously different and this difference will certainly affect the TVaudience rating of the CBA matches especially in the playoffs.

When it comes to the game time, the game has a fixed time between 19:30 and 22:30. CBA is roughly held from October to April of the following year. The winning team in the CBA finals wins the CBA championship of the season.

As one of the two major professional sports leagues in China, the Chinese Men's Professional Basketball League (CBA League) is an important yardstick for measuring the achievements of China's sports professional reform. Its reforming methods and impact have attracted the attention from society and academia. In February 2017, Yao was elected president of the CBA, then the Chinese basketball management represented by Yao Ming has implemented a series of policy reforms (Yao Ming's New Reform) to the CBA league,

including rule changes, game system adjustments, and incentive systems. Both the ornamental value and commercial value are seen to have changed obviously.

As of the 2019-2020 season, some of the game rules and operation system of CBA are not exactly the same as those of other international basketball leagues. Based on the specific situations of CBA described in next section, some conjecture verification are put forward.

Among Chinese sports leagues, CBA is one of the commercial leagues with the most perfect development, the most extensive audience and the highest public recognition in the Chinese sports market. Many TV broadcasters, sport-leagues, teams, players, advertisers.etc are very interested in TV ratings for live sports.

On Oct. 5th, as the Rockets arrived in Japan for their preseason game against the Clippers, Morey posted a tweet on social media which says: Fight for Freedom, Stand with HK. He expressed his opinion on the Hong Kong issue, which was the trigger for all the incidents. Wojnarowski, a well-known ESPN journalist, "liked" this post and Morey deleted it an hour later, but it has already caused an uproar in China. Most fans in China saw it as a flouting of China's sovereignty and condoning the rioters in Hong Kong.

In response to Morey's unreasonable remarks, the Rockets' and the NBA's apathy, many Chinese media and enterprises, including the NBA broadcaster Tencent, have completely or partially terminated their cooperation with the NBA. Morey's personal partner in China also announced the end of all cooperation with Morey.

At 8 am on October 7th, Morey posted his first response on social media, explaining that he did not mean to offend China and that his opinions do not represent those of the team or the NBA.

Meanwhile, China's CBA issued a statement canceling all four games with the NBA's Development League, including two against the Rockets' development league team, the Vipers, scheduled for Sunday and Sunday in Suzhou. Then CCTV5 announced that it would temporarily stop broadcasting NBA games.

Basketball is the most popular sport among teenagers in China. Since NBA entered the Chinese market, its influence in China has been expanding, and it has built a broad basketball

mass base. As a result, ending NBA TV coverage will inevitably lead to a mass migration of fans to online platforms or switch their attention to other events and sports. At the same time, due to the extremely negative reaction of NBA among Chinese fans, many fans chose to give up following NBA games and related information after "Morey incident". As a sports league of the same type, the impact of NBA in the Chinese market is bound to directly affect the attention and influence of CBA.

1.3. Purpose of Research

The basic aim of this study is to discuss the decisive factors and influencing mechanism of CBA TV live viewing ratings.

In recent years, China's sports market has been developing at a high speed with a positive attitude and has been learning from and approaching the high-level sports markets of European and American countries. Since Yao Ming took over as president, the Chinese Basketball Association has been communicating with other high-level leagues in the West, including the NBA. In the competitive sports industry, it is undeniable that live TV broadcasting has the largest audience drawing power and the most powerful market appeal, so the research and analysis of the consumer groups in the TV broadcasting market is of vital importance. But the theoretical research and analysis related to this field is relatively rare.

In addition, this research realized that even though the current Chinese sports broadcast market is still in the early period of the development, because of the huge population base and consumer groups, live sport events including CBA, will bring huge flow peak, followed is not only the development of sports market opportunity, there are a variety of test, not only from the huge number of users, but also the fast rise in number of users. Therefore, it is particularly important to grasp the overall consumer market. Any minor market decision-making mistakes are likely to be magnified by the huge consumer group into a major market crisis.

Based on the above considerations, this study plans to conduct modeling and analysis on the influencing factors of CBA audience rating through the statistics of 2016-2020 CBA live

audience rating data, and hopes to play a guiding role in the future research and investment of Chinese sports market by taking the study on the decisive factors of CBA live audience rating as an example.

Chapter 2. Theoretical Background

As a branch of a more macro consumer market, the academic research on sports market in the west is relatively extensive and comprehensive. There are also a large number of available literatures or research articles of the determinants on the ratings of major commercial leagues such as NBA, NFL, MLB and NHL. In mainland China, there are also many dissertational literatures on commercial sports broadcasting, but generally, there is a lack of qualitative analysis literatures based on a large number of data. We should recognize that this kind of research-based analysis based on market data has significant guiding value for markets and investment.

With the rapid development of streaming media technology and social media, the traditional sports broadcast market (televised sports events) is gradually being broken by newcomers. Facebook, YouTube, Amazon, and other social media have crossed over into the sports broadcasting business. In China, many new media platforms for sports broadcasting have also emerged, including Tencent Sports, Sina Sports, Hupu Sports and so on. Compared with traditional broadcasters, these platforms have not only accumulated enough target audiences, but also simplified the previous sports broadcasting process through technical means.

2.1. Super-Star Effect

Superstar athletes can boost TV ratings because of the outstanding performance which increases the entertainment value of sports events(Rosen, 1981). Another reason is that many fans have a soft spot for celebrities (Thomson, 2006). Past studies have revealed that both approaches contribute to increased viewership of the games of these star players (Lewis & Yoon, 2018). And star players are known to drive sports consumption (Berri et al., 2004; Jane, 2016; Lewis & Yoon, 2018). The entertainment value of a sporting event, reflected in the number of spectators at the games, depends largely on the performance of the super stars.

By integrating widely available player statistics into the model, we were able to study the effect of short-term increases in the performance levels of superstar players on ratings for All-

Star games. This result supports the idea that super-star players can obviously drive audiences' interest by their entertainment experience, not just through the celebrity mechanics that accompanied their rise to stardom (Grimshaw, S. D., & Larson, J. S., 2021).

2.2. Match Quality

Rottenberg (2000) defined the "quality of games" as follows: "The higher the quality of the game, the more elegance and skill will be produced, the more extraordinary physical achievements will occur and the more uncertain the outcome will be." The TV sport spectator ratings for any game increases with the degree of competition intensity.

A term " playing strength " is often used to describe a team's ability to produce "extraordinary physical achievement," and also the other qualities mentioned earlier. The most macroscopic manifestation of the strength of a team is the ranking of the team. The more games are won, the higher the ranking is. It is the most intuitive and fairest way. Among them, comparing the data between teams, we can also use the team's average points per game and the number of championships won as a reference. Of course, basketball is a team event, and everyone who constitutes a team has an impact on the team's performance and strength and plays a decisive factor. From the CBA data center, we can also clearly see that the statistics of a player are multi-dimensional, including the number of appearances, the number of starts, the playing time, the hit rate, the number of three-pointers, serve points, rebounds, assists, steals, turnovers, fouls and the total number of points, etc. With so many dimensions mentioned, if we want to quantify the research, we need to identify some representative variables. In order to define this "playing strength", in this study, we can set four independent variables as follows: Ranking, Match Significance, Outcome Uncertaincy and Player Quality.

2.3. Competition System Reform

As one of the two major professional sports leagues in China, the Chinese Men's Professional Basketball League (CBA League) is an important yardstick for measuring the

achievements of China's sports professional reform. Its reform methods and impact have attracted the attention of society and academia. Since Yao Ming was elected as the chairman of the Chinese Basketball Association in February 2017, the Chinese basketball management represented by Yao Ming has implemented a series of policy reforms (Yao Ming's New Reform) to the CBA league, including rule changes, game system adjustments, and incentive systems. Both the ornamental value and the commercial value have seen obvious changes.

By changing the rules, the competition will become more intense, the result of the game will be more uncertain, the suspense of the game will be enhanced, and more spectators will pay attention to the game. Generally by changing the venue, factors such as facilities, time and space can affect the effect of the game. After Yao Ming's New Reform, several CBA competition rules have also been adjusted.

Such as the modification of the attack time of 24 seconds and 14 seconds. Specifically, when an offensive team is fouled or suspended in the last 2 minutes of the game, the defense can have two options. The first option is to serve in the backcourt and get 24 offensive time. The second option is before the time.

Serving the field, get 14 seconds of offensive time. Such a setting can effectively shorten the attack time, improve the accuracy of pitching, affect the speed and rhythm of the attack, increase the speed of the game, enhance the exchange of offensive defense, and increase the viewing value of the game.

In terms of foul penalties, "one penalty and one throw" is no longer implemented to reduce the interruption of the game, improve the continuity of the game, speed up the game and enhance the legal confrontation of the game. Other referees can view real-time retrospective review. This increases the game conditions that referees can use the real-time preview system to review, which enhances the fairness of the game and at the same time enhances the suspense of the game. The uncertainty of the game result increases and the viewing value increases.

Based on the above reform measures, we can think that it will bring changes to the viewing experience of future CBA competitions, even if it may not be realized in the short term. And

the level of competition for CBA players will also continue to improve, especially for local Chinese players.

In Yao Ming's Reform, the adjustment of the CBA league competition system is more prominent. First, the number of playoff teams has increased. In the 2017-2018 season, there were 10 playoff teams, an increase of two teams compared to the previous season. In 2018-2022, the number of playoff teams in the 4 seasons increased to 12. The increase in playoff teams has enhanced the suspense of the game. More attractive to the audience. Second, increase group competitions. The 20 participating teams in the 2018-2019 season will be divided into 4 groups in the regular season according to the final ranking of the 2017-2018 season. The home and away four rounds will be carried out between the same groups, and the home and away double rounds will be carried out between different groups. Third, the regular season rounds increase. The 2018-2019 season and 2019-2020 season increased to 46 rounds, and the 2020-2022 season increased to 56 rounds.

In the 2018-2019 season, the CBA regular season game days have been adjusted from three per week in the previous season to six per week, and the game covers a wider range of time. Increase the playoffs between the 7th and 10th teams in the regular season to allow more teams to enter the playoffs, increase the suspense of the game, and increase the uncertainty of the result of the game.

After the reform, the number of regular season games has increased significantly, which means that teams have more opportunities to display, which is conducive to the team's training of young players. The number of match days has increased significantly to meet the needs of fans for watching matches. The increase in teams participating in the playoffs gives the teams in the middle of the rankings more opportunities and at the same time increases the suspense of the game.

2.4. Market Competition

As Diana Moss(2008) wroted in the airticle that the answer'to this query, of course, largely depends on whether individual team programming competes for the viewership of local fans or, in the alternative, whether the RSN performs a valuable economic integration function for a series of individual team "monopolies," each with no good substitutes. The programs compete the viewership, which affect directly on the TV ratings.

Professional sports leagues now generate income from television and other media revenues (Bellamy, 1988; Chandler, 1991; Harris, 1986; Horowitz, 1978; Rowe, 1995). This wider competition will be extended to television viewers who can choose from professional sports or other types of programming from different regions. In turn, these viewing preferences would affect the revenues generated by networks which bid for the right to televise league games(Daniel S. Mason,1999).

Since NBA is a popular game in China, NBA and CBA have a market competition relationship in China market.

2.5. External Factor

The so-called external factors refer to the factors that have no direct correlation with the CBA event itself, but such factors will have a significant impact on the TV ratings of the CBA event indirectly. Between 2016 and 2021, the biggest impact on the CBA, and indeed the world, will be the epidemic.

With the spread of the COVID-19 pneumonia epidemic in early 2020, the domestic epidemic prevention work has been fully launched. The CBA officially announced the postponement of the regular season, and the league has been in a state of indefinite delay. After multiple applications and multiple extensions, the much-anticipated CBA league will finally be held in June 2020 The official rematch on the 20th. Different from the previous home and away system, in the first stage of the rematch, the 20 teams will be played in an empty field, and they will be divided into groups according to the current record. Each group will have 10 teams in

Shandong. Qingdao and Dongguan, Guangdong are held in two competition areas. The competitions are all included in the 31st to 46th rounds of the regular season and make-up matches in the 2019-2020 season CBA league competition schedule. July 7-27 In the second stage of the rematch, 20 teams played the remaining games of the regular season at 2 venues in Qingdao, and finally 12 teams were selected to advance to the playoffs. From July 31 to August 15 the CBA playoffs continue to be played. Qingdao will be played. The playoffs will adopt a single-elimination-elimination system with 12 in 8 and 8 in 4, and the semi-finals and finals will adopt a three-match two-win system.

The selection of Qingdao and Dongguan for the CBA semi-finals is the best choice based on the needs of epidemic prevention and control and multiple factors. Although each club has only half a month of preparation time from proposing the semi-final plan to determining the time for the semi-final, most of the clubs are in during the epidemic period, they maintained restorative and regular training, whether they were athletes, coaches or CBA companies (China Basketball Association (Beijing) Sports Co., Ltd., established by the CBA League reform in 2016, responsible for the independent operation of the CBA League, called CBA Company)) Are open to the CBA semi-finals. At the same time, time factors, income impact, sponsor pressure, fans' expectations and other factors and motivations of different groups all promote the completion of the semi-finals.

After the rematch, the clubs basically maintained and continued their competitive state before the suspension. The overall arrangement of the event was very close. From June 20 to July 4, the first stage of the rematch, a total of 19 teams played back-to-back (continuous competition). In the competition, from July 1st to July 2nd, there are 5 teams participating in the game consecutively. Because it is completely different from the previous home and away system, and the CBA league has not implemented the game system for many years, many teams are not adapted to the new schedule. Many teams In the same day, it is necessary to participate in the high-intensity formal competition in the evening, and to analyze, summarize and arrange the next day's game overnight after the game, coupled with the closed management of the competition area, and strictly control the schedule of work and rest, resulting in athletes,

11

coaches and teams staff are often in a state of continuous fatigue. Under this kind of physical and psychological pressure, the competition area is often full of negative emotions. Teams and coaches need to arrange training time reasonably, pay attention to training efficiency, and make full use of each game. Data analysis, at the same time, pay attention to the physical and psychological load of athletes in time, adjust the players on the field in a targeted manner, and adopt a variety of effective recovery methods to ensure that the athletes are in a good competitive state.

At the same time, because of the epidemic, the CBA league supersed attending matches into no-attendence matches. So this situation may affect the audience demand, especially, TV ratings.

Chapter 3. Hypothesis

Based on the above literatures and discussions, this paper aims to study the key factors that can influence and determine the CBA TV live viewer rating in the Chinese market.

As many previous studies have shown, the factors that influence sports events viewing are complex and varied, both from the events themselves and from off-field factors. Therefore, this paper hopes to build a mathematical model between the CBA TV live broadcasting audience rating and various influencing factors through hypothesis and verification, so as to show the factors that can affect the consumer behavior of the CBA TV live broadcasting market in a more intuitive way, and provide guidance for the construction and investment of the CBA broadcasting market in the future.

H1: The quality of viewing will affect The audience rating of CBA matches.

There are several reasons why recent surveys of the drivers of sports consumption have increasingly relied on television audience data rather than live game audience data. First, broadcasting is one of the biggest revenue streams for most professional sports (Gough, 2009), so understanding the drivers of sports television viewership is important in itself.

Much less attention has been paid to the impact of superstar-effects on ratings (Gooding, C., & Stephenson, E. F., 2017); while, Hausman and Leonard (1997) show that professional basketball has a higher TV ratings for the matches which superstars are engaged, and Feddersen and Rott (2011) find that German national football team ratings are higher in matches with star players.

Talented performers attract more audiences than less talented ones, and the marginal return on talent outweighs the fundamental difference in talent between performers. The few athletes who are above their peers in talent or ability will have more fans who are willing to pay to watch their games, and they will also be paid much more than their peers.

The model is extended by Adler(1985) to show that there were significant differences in the number of fans following a particular performer, and the associated revenues, the rise

occurred even when there was no discernible difference in acting talent or ability. The model emphasizes that following star performers comes at a high cost in acquiring knowledge about performers, and that such knowledge has spillover benefits in relation to other people's social interactions, since many people have common knowledge about star performers. In this case, fans will gravitate toward performers with star effect, even if they have the same level of talent. This implies that popularity, rather than differences between skills, explains the star effect that can be seen (Humphreys, B. R., & Johnson, C., 2020).

H2: The audience rating of CBA games will be affected by the quality of the games.

As Rottenberg defined the quality of games, the higher the quality of the game, the more elegance and skill will be produced, the more extraordinary physical achievements will occur and the more uncertain the outcome will be. The TV audience for any sport increases with the degree of competition.

Because a game is at least the product of two teams, not only the absolute match strength of the two teams, but also the comparison between the two teams may affect fans' interest. The uncertainty of-outcome hypothesis (Neale, 1964; Rottenberg, 1956) postulates that for close, unpredictable matches, fan interest increases. Although the empirical evidence for the benefits of competitive balance is far from clear (see the reviews of Borland & MacDonald, 2003; Szymanski, 2003b), the hypothesis of outcome uncertainty still plays a very important role in sports economics.

One of the most important factors to show how exciting a game is the suspense of the game. Suspense for many media entertainment, is crucial, which is also at the core of the position. As far as sports events are concerned, the key of media broadcasting lies in the uncertainty of the outcome of the game. This kind of uncertain suspense will attract high audience rating, which is also a crucial point for media broadcasting of sports compared with watching the games on the spot.

Obviously, the suspense of media broadcasting sports events is closely related to sports itself. In other words, the nature of sports closely affects the degree of suspense. Of course, the

level of suspense will be influenced by other factors in the sports broadcasting process. We generally compare the suspense of an sports event with that of fictional drama.

Another question is, how do you measure suspense, or how do you describe the concept of suspense? It is a well-known fact that the score of two teams is often used to determine the win or lose of the game. Therefore, we can associate the suspense of sports events with the final score. We regard the suspense as a function related to the final score. This function should have the property that the closer the difference between the final score of two teams is, the greater the suspense is, which is obviously consistent with the reality.

We can also look at suspense from the perspective of the audience. As we all know, a successful sports broadcast should ensure the uncertainty of the output of sports events. As for the audience, they themselves are also uncertain about the output of the games, and the audience's uncertain attitude will also increase the suspense of the games.

In general, the complexity of suspense is an important factor affecting the entertainment of sports, and the repetition and emphasis of such uncertainty will improve the suspense and entertainment of the sports events. Moreover, we need to understand that suspense does not exist in isolation, and people's attitudes toward competition and so on affect the entertainment and enjoyment of games.

Suspense is an emotional state that can stimulate the viewer's interest and behavior to experience specific content, such as sports. KnoblochWesterwick et al. (2009) note that suspense is based on two aspects: 1) outcome uncertainty and 2) a rooting interest. With the increase of the uncertainty of the outcome and the dimension of fundamental interests, the suspense also increases. These dimensions exist in combination with one another where if one dimension is decreased, so too is the level of suspense (KnoblochWesterwick et al., 2009).

The suspense dimension of the uncertainty of the outcome and the fundamental interest are consistent with the emotional characteristics that motivate the spectators to watch sports games (Knobloch-Westerwick et al., 2009; Raney, 2006; Wann, Royalty, & Roberts, 2000; Wenner&Gantz, 1998). Kwak and Kim (2013) simply state that, "being a fan of a team means that one has to cope with continuous distress caused by outcome uncertainty". Wenner and

Gantz (1998) claim that the unknown outcome of the game is the motivation that generates the most interest and drives the behavior of witnessing sports.

They add the dimension of a rooting interest as an audience motivation in their analysis to explain, "focusing on 'who won' and how one's favorite player performed was the strongest personal motivation to watch sports." This is combined with the pleasure of experiencing 'drama and tension' and the thrill of 'supporting' a player or team to win." Knobloch-Westerwick et al. (2009) similarly contend that failure is a realistic possibility, which may further stimulate excitement and lead to suspense. Thus, one can think of watching sports as a risky entertainment choice, as satisfaction is certainly not guaranteed, but may be more intense if the desired victory is achieved.

In reporting about audience behavior of witnessing sports motivated by the emotional experience of suspense, (Paul and Weinbach., 2007) showed that outcome uncertainty, measured by the score of the game at halftime, had a significant impact on audience size for the second half of the game. Berkowitz, Depken, and Wilson (2011) also found that fan interest positively correlates with outcome uncertainty. Knobloch-Westerwick et al. (2009) explain that an unknown outcome produces suspense until the point where there is certainty of outcome, at which time suspense no longer exists(Fortunato, J. A., 2020).

Similar to the NBA, the CBA is divided into two stages, the regular season and the playoffs, with the home and the visiting games.The significance of the different stages of the game is obviously different and this difference will certainly affect the TVaudience rating of the CBA matches especially in the playoffs.

The regular season:

In the regular season, the total ranking of the regular season is determined by the ratio of the number of wins to the number of negative games, and those with the highest winning rate will be ranked first.

If two teams have the same winning percentage, the ranking will be determined by the number of wins and losses between the two teams, and the one with more wins will be ranked first.

If they are the same again, the ranking will be arranged according to the rate of points lost between the two teams. The one with the highest rate of points lost will be ranked first.

If they are the same again, the ranking will be arranged according to the total points allowed in all the regular season games, and the one with the highest points allowed will be ranked first.

If three or more teams have the same winning rate, the ranking will be arranged according to the number of wins and losses between them, and the team with more wins will be ranked first.

If the number of winning and losing games between each other is the same, the ranking will be arranged according to the rate of scoring and losing between each other, and the one with the highest rate of scoring and losing will be ranked first.

If they are the same again, the ranking will be based on the total points allowed in all games during the regular season, and the one with the highest points allowed will be ranked first.

The post season:

The top eight in the regular season make the playoffs; Cross elimination rounds are used in the playoffs; The best-of-five series (1-2-1-1) will be played in the quarterfinals and semifinals, and the best-of-seven series (1-2-2-2) will be played in the championship final. Regular season ranking before the team more than a home.

Under the current format, different games in the regular season will have different impacts on the future of each team. In the playoffs and finals, the game will directly affect whether the team can win the championship season or not. And the championship is often the most important element that defines the value and success of a team, including its players, coaching staff, and team management. As a result, different games are given different importance. In addition, the importance of such games will directly affect the fans' enthusiasm and inclination for watching a game. In general, we can assume that more important games will have higher fan drawing power, which will play a positive role in promoting the audience rating of CBA matches.

The system reform measures were put forward after Yao Ming became the president of the Chinese Basketball Association. The measures are specifically reflected in the CBA regular season cycle, the cultivation of players and referees, the power of the club and many other aspects.

Yao said: " We know the level and direction of the world's advanced basketball and the pattern of the world, we must be more determined to deepen the basketball system from professional league, youth training, sports and education, and never give up halfway."

Even if there is no obvious change in CBA in the short term, in the long run, if these measures can be implemented all the time, it will have a far-reaching impact on CBA. Therefore, we can expect that this kind of reform will inevitably bring changes to CBA's TV ratings for sure.

Even the subsequent development of other Chinese sports industry will gain experience and development direction and motivation on the basis of the Yao's reform.

H3: The form of consumer preferences will obviously affect The audience rating.

From the above, Star-effect obviously attracts viewers. Audience are more likely to watch the games with star players participate.

And fans' enthusiasm also attracts audiences to watch live televised games and obviously have a positive effect on the live TV ratings.

Besides, as a same sport event, NBA and CBA shares a huge amount of basketball audience group. Since the Morey event affected the broadcasting and business cooperation of NBA in China, we can expect that the live TV ratings of CBA games can be promoted after the event.

In addition, as the covid19 spread through worldwide, most of the sport leagues have eliminated the live viewing option , forcing many people to stay at home. So we predict that those viewers will be more likely to watch live sport games at home, compared with the normal

time. But because COVID-19 has seriously affected all aspects of society, even if people spend more time at home, TV ratings may also decline.

Chapter 4. Research Design

4.1. Sample and Data Source

For the empirical analysis, the post season of CBA matches broadcasted live on CCTV-5 from 2016 to 2021 were selected.

Professional basketball can be seen as part of the entertainment industry where multiple variables supposedly matter simultaneously. The researchers analyzed the effects of these variables on athlete compensation outcomes, consumption habits, athlete brand building and gender presentation in the sports media business complex. The personal attractiveness of certain basketball players or star players can be an important factor in the audio-visual experience and sports media selection conventions favor the charismatic (Harris & Clayton, 2002).

Similar to other investigations on discrimination in sports consumption (Kanazawa & Funk, 2001; Aldrich et al., 2005; Tainsky& Winfree, 2010) and demand for mediated sports, this study plans to use TV rating data for estimating demand functions.

The situation is that CCTV-5 is a professional sports channel of the official Chinese national broadcaster CCTV that mainly broadcasts sports events and sports reports. CCTV-5 is the only national sports channel in China that covers all regions in China. It has the exclusive rights to broadcast many top international sports events and occupies more than 80% of the TV sports market share in China.

And the TV ratings data was collected from KUYUN, a leading multi-media big data service company in the field of real-time TV ratings monitoring in China. KUYUN data comes from the live data return of the terminal. Terminals include smart TV and set-top box that basically cover all types of terminals related to TV in Chinese households. 90% of newly shipped TVs in the domestic market are smart TV and set-top box include traditional set-top box and IPTV set-top box. KUYUN's real-time TV viewership monitoring is considered to be clean data that can truly reflect the true status of Chinese TV at the moment, and has been widely recognized by TV agencies, television content production companies, advertisers and TV viewers.

The broadcast strategy adopted by the carriers can also affect the preferences of viewers (Johnsen &Solvoll, 2007). On the supply side, disruptions can affect distribution channels and affect what sports content is provided to viewers (Turner, 2007). This procedure implies that certain samples are biased towards certain teams, because TV show producers prefer competitions with a higher level of athletic quality and attractiveness, or they mainly have a larger audience. Since we could not find detailed information about the CCTV-5 program strategy, according to the Heckman test results conducted by multiple related studies, we can know that variables such as household bias and matching quality will affect the decision-making of broadcasters and the consumer behavior of TV viewers. Therefore, in this study, the broadcaster's program selection strategy will not be considered separately.

The data in this paper are obtained from analyzing and reconstructing the raw data to form a new indicator system, and the data index of the final modeling is also obtained, this part of the work is completed with Excel. In this paper, the index data of a total of 368 games in five seasons from 2016 to 2021 are selected as samples for research.

4.2. Measurement of variables

The variables are divided into five big categories and ten specific categories in this study. Each variable is proposed based on prior theoretical research and objective facts.

4.2.1. Players Popularity

It's easy for consumers to get attached to star players (Lewis & Yoon, 2018). If spectators watch a basketball game on TV between two teams, they are more likely to continue to watch the match if they have an attachment to one or more of the team's superstar players, in addition to an attachment to the game itself.

An independent variable for the super-star effect is constructed in the model as: Players Popularity (STAR). STAR value is set to be the total number of both teams' all-star players.

We can use how many players on this team have played in the All-Star Game to evaluate this variable.

4.2.2. Match Significance

A widely accepted fact is that basketball audiences tend to pay more attention to the games with higher significance.Those are the games that can directly influence a team's future,even determine whether a team will win the championship or not. It can be assumed that this kind of games are more attractive to the CBA audience and the match significance is a variable related to the stage of the CBA match during the playoffs.

Besides, every season's opening game is topical and compelling. After the months-long off-season, the CBA will be filled with anticipation and curiosity for the first opening game of the season, which will also be a topic of conversation.

Therefore, a dummy variable for the match significance is constructed in the model as STAGE. The value of STAGE is set as 1 for Opening Game, 2 for Regular season, 3 for Eighth final, 4 for Quarter-Final, 5 for Semi-Final and 6 for Final.

4.2.3. Ranking

Whether it is in CBA or NBA, during the season, one of the most important standards to measure the overall level of a team's competition is known as the team's ranking in the whole league.

It can be assumed that the higher the team's ranking is, the higher the overall level of the team is. And more audience will expect to see a higher level of competition between two teams.

So, in this study, a variable for the two sides' ranking (SUMRANK) was identified which is the sum of rankings of regular season of the two teams.

4.2.4. Outcome Uncertainty

The outcome uncertainty is a performance based metric. Previous studies on individual sports have applied uncertainty indicators based on performance (i.e. Larson &Maxcy, 2014; Schreyer &Torgler, 2018).

Regarding the relevance of uncertainty of outcomes for consumers, empirical findings have remained ambiguous although the question has been intensely studied (cf. Szymanski, 2003). Uncertainty can, however, refer to different aspects of competitions, such as uncertainty of an individual match, of an entire season, or the championship race or long-term dominance of an individual team (Lee & Fort, 2008). Uncertainty can therefore be manipulated in many ways, such as head-to-head comparisons, rankings, or betting odds.

This measurement relies on each team's preceding performances and is the absolute difference in rankings provided by the official website of CBA. It can be assumed that the higher the match uncertainty is, the lower the difference between their rankings is. Increasing variance suggests a higher probability of success for a given team and a lower level of outcome uncertainty. A negative relationship is expected between the ranking's difference and TV audience rating.

Outcome uncertaincy is coded as RANKGAP, which is the the difference between the rankings of both teams. For example, if the two teams' ranking is 1 and 8, and the other two teams is 4,5, their sum of ranking are the same. However, their strength and level may be different. So the subtract of two teams ranking here could also measure the match quality and whether this game is a close game or not in a way.

4.2.5. Match Intensity

More games, even though not all of them, are broadcasted on free-to-air terrestrial or cable or satellite television. It shows that consumers can often have the choice to decide to watch games at the stadium or on television. Spectators in stadium are likely to be core supporters, mostly of the home team. Most domestic fans buy season tickets for the entire season. Television viewers, by contrast, tend to be less loyal fans, and many are not particularly

committed to any of the teams involved. Given these characteristics, it is likely that stadium and TV fans may have different preferences, especially in their reactions to the suspense of the game outcomes. The home fans in the stadium want their team to win, and they want a big win, not a narrow one. Fans watching TV are likely to prefer a close game to one that is effectively over because one side has an early lead. Therefore, in this paper, an independent variable is set as SCOREGAP to define the intensity based on the score subtraction between the two teams' score(Ascari, G., &Gagnepain, P., 2006).

These in contention variables (CHAMPION CONTENTION, EUROPE CONTENTION, and RELEGATION CONTENTION) capturing the long-term nature of competition is expected to have a positive impact on television viewers, and so on (Babatunde Buraimo & Rob Simmons, 2015).

Therefore, in this paper, an independent variable is set as SCOREGAP to define the intensity based on the score subtraction between the two teams' score.

4.2.6. Competition System Reform

After Yao Ming became the president of the CBA, he introduced a series of reform measures to the CBA, including :1. Extend the time of the season, shorten the training time of the Chinese national team; 2. Gradually limit the number and playing time of foreign aid players; 3. Promote the professionalization of referees and strengthen the management and supervision of referees; 4. Call on clubs to have more discourse power and more business development rights and management rights.

In this study, competition system reform is taken as a time node and defined before and after this time node to control the impact of competition system reform on audience rating. So, a dummy variable is set as REFORM to identify Yao Ming's competition system reform, the value of REFORM is 1 for the time period After the reform and 0 for the time period before the reform.

4.2.7. Morey Event

After the MOREY EVENT, a part of NBA fans may change their interest into CBA, which is a kind of

The first 30 rounds of the 2019-2010 season have been completed according to the normal schedule. Due to the impact of the COVID-19 epidemic, the games was suspended from February 1st until the resume on June 20th.

4.2.8. Epidemic Situation Influence

The impact of COVID-19 epidemic on CBA is reflected in many aspects, including: the start time of the new CBA season has been delayed for a long time due to the epidemic, many foreign players have terminated their contracts with CBA, or cannot return to China for training on time; Many local players have had their wages cut as a result of fewer games and a serious drop in club income; After the reduction of the epidemic in China, the competition system has undergone great changes and the competition schedule has been severely shortened. The first 30 rounds of the 2019-2010 season have been completed according to the normal schedule. Due to the impact of the COVID-19 epidemic, the games was suspended from February 1st until the resume on June 20th.

Concerned about the risk of contagion, many clubs have decided to limit the number of live spectators or even not allow live matches at all, only broadcasting CBA events.To identify the theEpidemic Situation Influence, variable is set as COVID. when the event took place during epidemic situation, COVID=1; when the event took place before epidemic situation, COVID=0.

4.2.9. Broadcast Day of the Week

Quality of viewing affecting viewership (opportunity costs) are considered by taking Broadcast Day of the Week into account. To identify the the Broadcast Day of the Week, variable is set as WEEK. WEEK represents the days of the week from 1-7.

Table 1 Presents the operational definitions of each variables.

	Variable	Code	Operational Definition
	Match Significance	STAGE	1=Opening game; 2=Regular season; 3=Eighth final; 4=Quarter-Final; 5=Semi-Final; 6=Final
Sporting Contest	Ranking	SUMRANK	The sum of rankings of regular season
	Outcome Uncertainty	RANKGAP	The difference between the rankings of both teams
	Match Intensity	SCOREGAP	The score subtraction between the two teams' score
	Competition System Reform	REFORM	1=After the reform; 0=Before the reform
	Players Popularity	STAR	The total number of both teams' all-star players
Consumer Preference	Market Competition	NBA	1=Games after October 2019; 0= Games before October 2019
	Epidemic Situation	EPIDEMIC	1=During epidemic situation; 0=Before epidemic situation
Quality Of Viewing	Day of Week	WEEK	1-7: From Monday to Sunday
	Match Time	TIME	Divide the minutes by 60 to get a specific value after the decimal point as a continuous variable
Season	Match Season Controls	SEASON	Season16-17=1;Season17-18=2;Season18-19=3;Season19-20=4;Season20-21=5
		RATING	National live broadcast ratings
		RATING1	First-tier city live broadcast ratings
Economic	City Tier	RATING2	Second-tier city live broadcast ratings
		RATING3	Third-tier city live broadcast ratings

Table1

4.3. Method

This study first provide some descriptive statistical data, and then use ordinary least squares (OLS) regression including all independent data for multivariate analysis. Subsequntly, use the interaction term to perform regression analysis to test the interaction between the specified variables.

To test if the ratings of the CBA live TV matches broadcast by CCTV5 are affected by the five types of determinants listed in the hypothesis, this research plans to perform a regression of TV ratings on a set of control variables. Here estimates the model, using OLS, as follows:

Statistical Model:

Television ratings(Ratings1/Ratings2/Ratings3)= $\beta 0$ + $\beta 1$STAGE + $\beta 2$SUMRANK + $\beta 3$RANKGAP + $\beta 4$SCOREGAP + $\beta 5$REFORM + $\beta 6$STAR + $\beta 7$NBA + $\beta 8$EPIDEMIC + $\beta 9$WEEK + $\beta 10$TIME + $\beta 11$SEASON + ε

The description of each variable is shown in Table 1, ε is a random disturbance term.

Chapter 5. Results

5.1. Descriptive statistics

Before the analysis and modeling, descriptive statistics were conducted on the variables studied to grasp the overall macro situation of the variables and describe the statistical results as follows:

Table2 shows the descriptive statistics of the key variables.

Explanatory factors	Mean	Std. Dev.	Min.	Max.
DVs				
Televasion rating	0.729	0.279	0.303	2.229
Rating1	0.860	0.416	0.235	2.954
Rating2	0.751	0.300	0.326	2.271
Rating3	0.728	0.274	0.291	2.190
IVs				
Sporting Contest				
Match significance	2.563	1.198	1	6
Ranking	13.101	7.611	3	36
Outcome uncertainty	4.742	3.808	1	18
Match Intensity	12.394	8.832	1	48
Competition system reform	0.856	0.352	0	1
Consumer Preferences				
Players Popularity	1.883	1.639	0	8
Market competition	0.220	0.415	0	1
Epidemic Situation	0.370	0.483	0	1
Quality Of Viewing				
Day of week	4.516	1.801	1	7
Match time	0.158	0.365	0	1
Match season	3.250	1.398	1	5

<div align="center">Table2</div>

As can be seen from Table 2, the mean value of CCTV5 live TV Rating (RATING) is 0.729%, the minimum value is 0.303%, and the maximum value is 2.229%, indicating that there are significant differences in the live attention level of different games. The mean values of live broadcasting rating in first-tier cities (RATING1), second-tier cities (RATING2) and third-tier cities (RATING3) are 0.860%, 0.751% and 0.728% respectively. With the decrease of urban development level, live broadcast attention is gradually decreasing. This shows that cities with more developed economy pay more attention to live broadcasting.

The mean value of the sum of star players (STAR) was 1.883, the minimum value was 0, and the maximum value was 8, indicating that the number of star players in each game had a great difference, and in general, the number of star players was relatively small. The average

size of fans was 5.101, the minimum was 3.682, and the maximum was 6.298. There were

significant differences in the analysis numbers of different games.

5.2. Pearson Correlation Anaylsis

Pearson correlation test was carried out on the variables for the correlation between each

ratio variable and the explained variable, and the test results are shown in Table 3.

Table3 Pearson correlation test

	Rating	Season	Stage	Week	Time	Scoregap	Ranking
Rating	1						
Season	0.036	1					
Stage	0.728***	-0.172***	1				
Week	0.002	-0.046	-0.078	1			
Time	0.044	0.251***	0.02	0.074	1		
Scoregap	-0.231***	0.097*	-0.100*	-0.043	0.044	1	
Ranking	-0.505***	0.184***	-0.452***	0.053	-0.023	0.057	1
Rankgap	-0.330***	0.137***	-0.324***	0.031	-0.034	0.251***	0.412***
Star	0.461***	0.029	0.254***	0.003	0.102*	-0.017	-0.576***
Reform	-0.016	0.661***	-0.053	-0.072	0.168***	0.037	0.143***
NBA	0.152***	0.285***	-0.074	0.037	0.231***	0.103**	0.034
Epidemic	0.043	0.791***	-0.082	-0.051	0.296***	0.088*	0.102**

Notes:*p<0.1; **p<0.05; ***p<0.01.

Continued Table3

	Rankgap	Star	Reform	NBA	Epidemic
Rating					
Season					
Stage					
Week					
Time					
Scoregap					
Ranking					
Rankgap	1				
Star	-0.107**	1			
Reform	0.080	-0.02	1		
NBA	0.050	0.086*	0.218***	1	
Epidemic	0.096*	0.055	0.314***	0.164***	1

Notes:*p<0.1; **p<0.05; ***p<0.01.

As can be seen from Table 3, stage, number of star players (STAR), and Morey event

(NBA) are all significantly positively correlated with the TV rating, Score-gap, Ranking and

Rank Gap were significantly negatively correlated with TV rating. The other variables are not

significantly correlated with TV broadcasting rating. Further, the relationship between each explanatory variable and the attention of live broadcast is analyzed by regression.

5.3. Multivariate collinearity test

If multicollinearity exists between variables, it will affect the accuracy of the model. Therefore, multicollinearity test of variables is required before regression, and the test results are shown in Table 4.

Table4. Multicollinearity Test

Variable	VIF	1/VIF
Season	5.930	0.169
Epidemic	3.620	0.277
Star	2.330	0.430
Ranking	2.090	0.478
Reform	1.610	0.621
Rankgap	1.360	0.733
Stage	1.350	0.740
Time	1.170	0.853
NBA	1.160	0.862
Scoregap	1.090	0.917
Week	1.030	0.969

A value of 1 indicates that there is no correlation between this independent variable and any others. VIFs between 1 and 10 suggest that there is a moderate correlation, but it is not severe enough to warrant corrective measures. VIFs greater than 10 represent critical levels of multicollinearity where the coefficients are poorly estimated, and the p-values are questionable.

The value of VIF is greater than 1, and the closer the VIF value is to 1, the lighter the multicollinearity, and vice versa. Usually 10 is used as the judgment boundary. When VIF<10, there is no multicollinearity; when 10<=VIF<100 or 1/VIF<0.1, there is strong multicollinearity; when VIF>=100, there is severe multicollinearity.

If VIF is greater than 10 or 1/VIF is less than 0.1, multicollinearity exists between variables. As can be seen from Table 4, all VIFs are less than 10 and 1/VIF is greater than 0.1, so there is no multicollinearity between variables.

5.4. Regression analysis

Conduct regression analysis of variables, and the live broadcast attention of tier-1 cities, tier-2 cities and tier-3 cities are respectively regressive. The regression results are shown in Table 5.

Table5. Liner regression results

	Variable	National Rating(R^2=0.717)		Rating1(R^2=0.694)		Rating2(R^2=0.717)		Rating3(R^2=0.721)	
		Coef.	RSE	Coef.	RSE	Coef.	RSE	Coef.	RSE
	Stage	0.154***	(0.008)	0.226***	(0.012)	0.170***	(0.008)	0.149***	(0.007)
	Ranking	-0.00338**	(0.001)	-0.004	(0.002)	-0.00390**	(0.002)	-0.00385***	(0.001)
Sporting Contest	Rankgap	-0.003	(0.002)	-0.006	(0.004)	-0.004	(0.003)	-0.004	(0.002)
	Scoregap	-0.00554***	(0.001)	-0.00671***	(0.001)	-0.00581***	(0.001)	-0.00517***	(0.001)
	Reform	-0.152***	(0.034)	-0.151***	(0.053)	-0.139***	(0.037)	-0.174***	(0.033)
Consumer Preferences	Star	0.0365***	(0.006)	0.0508***	(0.009)	0.0349***	(0.007)	0.0318***	(0.006)
	NBA	0.115***	(0.020)	0.234***	(0.032)	0.0820***	(0.022)	0.149***	(0.020)
	Epidemic	-0.0829***	(0.031)	-0.0794*	(0.048)	-0.126***	(0.033)	-0.129***	(0.030)
Quality of Viewing	Week	0.007	(0.004)	0.009	(0.007)	0.007	(0.005)	0.00714*	(0.004)
	Time	-0.648*	(0.038)	-0.065	(0.058)	-0.061	(0.040)	-0.059	(0.037)
	Season	0.0778***	(0.014)	0.112***	(0.021)	0.0720***	(0.015)	0.0901***	(0.013)

Notes: n=368. Dependent variable is TV rating. *p<0.1; **p<0.05; ***p<0.01.

The model explains 71% of the variance.

Regarding quality of view factors, broadcast day of the week(1-7) seems to be the most significant predictor of the TV ratings. Nevertheless, the starting of the game time between 7:30p.m and 8:00p.m did not significantly influence the TV ratings. However, the regression coefficient of game time to ratings is 0.648, which is significant at the level of 10%, and has a negative correlation. Particularly, day of the week (1-7) were not significant associated with an increase of 0.0714% in the City tier3 TV ratings (Coef.=0.0714, RSE=0.004, ns).

Table3 shows that most of the sporting contest quality factors were discovered to be significant predictor of TV ratings. In terms of the match significance, the stage of matches was associated with 0.154% higher TV ratings (Coef.=0.154, RSE=0.008, p<0.01). That means that viewers will tune in more as the game progresses gradually. The match intensity (SCOREGAP)

is another significant sporting contest quality predictor of television ratings. However, It has a negative effect on TV ratings: the smaller the score difference and the more stalemate the game, which can related to a 0.00554% increase in the TV ratings (Coef.=-0.00554, RSE=0.001, p<0.01). Similarly, the sum of rankings of both teams plays a negative effect on TV ratings, which related to a 0.00338 decrease in the TV ratings(Coef.=-0.00338, RSE=0.001,p<0.05). And system reform,unexpectly, was also found to be the negative-going predictor of the TV ratings (Coef.=-0.152, RSE=0.034, p<0.01). The RANKGAP is not significant predictors of television ratings (Coef.=-0.003, RSE=0.002, ns).

Similarly, the sum of rankings of both teams plays a negative effect on TV ratings, which related to a 0.00338 decrease in the TV ratings(Coef.=-0.00338, RSE=0.02, p<0.05). And system reform,unexpectly, was also found to be the negative-going predictor of the TV ratings (Coef.=-0.152, RSE=0.034, p<0.01). The RANKGAP is not significant predictors of television ratings (Coef.=-0.003, RSE=0.02, ns).

Finally, according to the findings, forms of consumer preferences plays a strong favorable influence in ratings. The players popularity factor is a significant predictor of television ratings, which related to a 0.0365% increase in the TV ratings(Coef.=0.0365, RSE=0.006, p<0.01). As the Morey event's effect, the consumer preferences were associated with 0.307% higher TV ratings(Coef.=0.115, RSE=0.020, p<0.01). The epidemic effects were associated with 0.0829 percentage points lower TV ratings (Coef.=-0.0829, RSE=0.031, p<0.01).

Chapter 6. Discussion

Through the definition and analysis of the factors affecting the AUDIENCE rating of CBA games, we can find that the determinants of the audience rating of CBA games broadcast by CCTV5 are multiple and complex. In general, as the season progresses, the audience's attention to the game gradually increases. This can be interpreted as fans tend to focus on more important, as the season progressed, means that the race for the team into the playoffs or degree of decision could have a chance to win a championship is increasing gradually.

Psychologically, fans will pay more attention to matches that are more attractive to them. From previous research, we can draw the following conclusio: The smaller the score gap between the two sides of the game, the higher the intensity of the game. This is also very consistent with our research conclusion: Competitions with smaller scoring gaps tend to have higher ratings. We can speculate that the higher ratings most likely increased with the gradual stalemate of the game.

Another factor that determines the attractiveness of the game to fans is the level of the competition itself. An intuitive factor that can reflect this level of competition is the ranking of the opponents in the season. Therefore, we use the final ranking of the regular season as a measure of a ball. The decisive factor of the team's economic level in the current season, our research shows that fans are more inclined to watch the games of higher-ranked teams, which is also in line with our speculation. Another possible explanation for this phenomenon is that most of the higher-ranked teams have better historical records, or have won more championships or division championships. This kind of teams with a glorious history tends to have more High-fan appeal.

But we can see that, another variable related to the ranking of the team in the season shows no correlation with the ratings in the model, and that is the ranking gap between the teams. The purpose of defining this variable is to establish a way and a way of judging the differences in the team's own competitive level. This irrelevance can be explained by the fact that, first of all, the differences in the level of competition between teams are difficult to reflect from the ranking

gap, or that the ranking of each team at the end of the season is often not determined by a single factor. Secondly, the setting of this ranking gap variable has certain limitations. For example, most fans may prefer to watch the game between the first and third place (rank gap=2) instead of the tenth place. And the eleventh place (rank gap=1). In addition, a potential speculation is that fans often do not simply judge a team's competitive level through the current season's rankings, but will comprehensively consider the team's history, coaching team, players and other factors. Their subjective conclusions, and these subjective impressions often directly drive them to watch a game.

In addition, we also take into account the star effect in the analysis of the ratings of the events. That is, fans are more inclined to watch games where stars participate. Through our model, it can be found that the ratings of games with more stars participating will be higher, and the ratings will show a positive correlation with the increase in the number of stars. And the correlation here is particularly significant. This totally matches our guess.

We also considered several important off-court factors, including the Morey Event, COVID-19 and CBA reform.

Since The Morey incident, the TV audience rating of live CBA games has shown an increasing trend, which can be explained as: after the Morey incident, on the one hand, CCTV5 stopped broadcasting NBA games, so a large number of basketball fans began to watch CBA games; on the other hand, as the cooperation between NBA games and many Chinese partners has been terminated, the CBA gained a larger market share. In other words, the weakening of its competitors allowed the CBA to increase its influence in the Chinese basketball market. In addition, some fans increased their interest in the domestic basketball career out of patriotism to show their attitude and support on this issue.

There is a negative correlation between the outbreak of corona virus and live TV rating of CBA matches. After the outbreak, the audience rating of CBA TV decreased, which is in line with the expectation of this study. There are various reasons for this phenomenon. First, after the COVID-19 outbreak, the CBA suspended the season for a period of time and shortened the season schedule after the match, which would reduce fans' attention to the game. On the other

hand, due to the economic slowdown during the COVID-19 pandemic, many spectators will pay more attention to job opportunities and market livelihood.

It can be seen from the results that the factor of day of week is not significant for the ratings of national and first- and second-tier cities, but it is significant at 10% for third-tier cities. It can be inferred from this that urban audiences with higher economic levels can choose more entertainment methods, and among the many entertainment methods, the possibility of choosing to watch games is diluted, while cities with lower economic levels have better entertainment methods. Less, the audience may be more inclined to choose to watch the game to relax.

Time factor is not significant predictor of television ratings in nationwide and city tier1,2,3. However, it is discovered to be a positive influencer of the TV ratings.

From the regression results of city tier1,2,3 in the table, the regression coefficients of first-tier cities are greater than those of second- and third-tier cities, indicating that economically developed regions have a greater impact on ratings than relatively undeveloped regions.

From an overall point of view, we can draw a conclusion that the lower the economic level of the city, the higher the degree of attention to CBA.

Chapter 7. Implications and Limitations

7.1. Implications

This research helps to promote the academic and practical development of sports management and marketing. First of all, this study is one of the few that attempts to investigate the determinants of audience demand for CBA. As mentioned earlier, the unique characteristics of each professional sport, event, and nation play a distinct role in determining which factors affect the spectator's needs for a particular sport. One element may be an important predictor of a professional event, but not the other. Therefore, it is critical to conduct empirical research on the influencing factors of live sports audience demand in each situation. The results of this study provide insights directly suitable for Chinese scholars and media practitioners, and also provide useful benchmarks and references for researchers and practitioners in other sports.

Second, this research provides useful insights to professional sports event marketers. Selling media rights and sponsorships are the two major sources of revenue for professional sport-industry. The size of these two streams is directly proportional to the audience's demand for TV and other forms of media. As a result, it is critical for league or event marketers to comprehend the key factors of broadcast sports audience demand. The conclusions of the study help determine which specific factors have led to spectators' demand for CBA in China. These findings enable CBA organizers to make evidence-based decisions on how to allocate broadcast rights in China. Due to China's vast territory,large population, and significant geographic characteristics, this study not only examines the national factors, but also examines the determinants of the ratings in tier1, tier2 and tier3 cities, and found out the different factors affecting the ratings of cities in each tier. This dicovery can provide a reference for the organizers of CBA to sell media broadcasting rights. For example, in addition to the long-term cooperation with CCTV, the organizing committee may consider cooperating with local TV broadcasters in cities of different levels according to the needs of viewers in cities of different levels, and sell part of the game broadcast rights to local sports TV channels.

Third, this research adds market competition, epidemic situation and competition system reform variable under the traditional sports audience demand framework, which supplements the theoretical framework to a certain extent. The study results shows that thers is a direct link between market competition, the epidemic, the reform of the competition system, and TV ratings. While the main function of a public broadcaster is to serve the public, it should be cautious to use consumer discrimination and avoid publicizing non-sports discrimination types. Since this study uses statistics from the China national television station CCTV to test TV ratings, the results should be treated with caution. The national television broadcaster, CCTV, has a public service function, so it is keen to broadcast high-quality games. However, the situation may be different for broadcasters that maximize profits and media companies that maximize advertising revenue. They will almost certainly use the perception of attractiveness as a demand factor to assess the possibility of additional revenue generation.

7.2. Limitations

Time factor is not significant predictor of television ratings in nationwide and city tier1,2,3. However, it is discovered to be a positive influencer of the TV ratings.

From the regression results of city tier1,2,3 in the table, the regression coefficients of first-tier cities are greater than those of second- and third-tier cities, indicating that economically developed regions have a greater impact on ratings than relatively undeveloped regions.

However, this study still has some limitations, which come from many aspects.

Firstly, the specified research context is limited to CBA, which cannot fully represent all kinds of basketball markets or other kinds of sports industries to a certain extent. Therefore, the factors that affect the demand of CBA TV audiences should not be directly applied to other different event backgrounds, and the results of this research should not be promoted beyond the background of the local CBA events.

Secondly, the assumptions and analysis of the factors affecting ratings are not comprehensive or complete and the interaction between various factors can also be analyzed at

a deeper level. Though the variables examined in this study were identified through a thorough review of the literature and analysis of the background of the competition, this study may lack investigation of some potential influencing factors. Although it would be meaningful to study the needs of online audiences, the lack of reliable historical data on online audiences makes it impossible to estimate the demand for online broadcasting. Future research should use more advanced measurements to study the impact of uncertainty in results.

Finally, due to the limited number of samples, the conclusions are bound to have certain limitations. A small sample size may lead to inaccurate results, and the demographic factors of the audience are not considered, so the conclusions drawn may not be comprehensive.

Bibliography

Adler, M. (1985). Stardom and talent. *The American economic review*, 75(1), 208-212.

Babatunde Buraimo & Rob Simmons.(2009). A tale of two audiences: Spectators, television viewers and outcome uncertainty in Spanish football. *Journal of Economics and Business*, 61(4), 326–338.

Babatunde Buraimo & Rob Simmons.(2015). Uncertainty of Outcome or Star Quality? Television Audience Demand for English Premier League Football. *International Journal of the Economics of Business,* 22(3), 449-469.

Bergmann, A., & Schreyer, D. (2019). Factors that shape the demand for international football games across different age groups. *International Journal of Sport Finance*, 14(1), 13-23.

Berkowitz, J. P., Depken, C. A., & Wilson, D. P. (2011). When going in circles is going backward: Outcome uncertainty in NASCAR. *Journal of Sports Economics*, 12(3), 253-283.

Borland, J., & MacDonald, R. (2003). Demand for sport. *Oxford review of economic policy*, 19(4), 478-502.

Feddersen, A., &Rott, A. (2011). Determinants of demand for televised live football: Features of the German national football team. *Journal of Sports Economics*, 12(3), 352-369.

Foster, G., O'Reilly, N., Shimizu, C., Khosla, N., & Murray, R. (2014). Determinants of regional sport network television ratings in MLB, NBA, and NHL. *Journal of Sport Management*, 28(3), 356-375.

Fortunato, J. A. (2020). Producing And Promoting the Sports Gambling Industry Since the 2018 United States Supreme Court Ruling: A Review of Organizational Action Through Suspense Theory. *Journal of Gambling Business & Economics*, 13(1).

Fujak, H., Frawley, S., Lock, D., & Adair, D. (2020). Consumer behaviour toward a new league and teams: television audiences as a measure of market acceptance. *European Sport Management Quarterly*, 1-21.

Gooding, C., & Stephenson, E. F. (2017). Superstars, uncertainty of outcome, and PGA Tour television ratings. *Journal of Sports Economics*, 18(8), 867-875.

Grimshaw, S. D., Sabin, R. P., & Willes, K. M. (2013). Analysis of the NCAA men's final four TV audience. *Journal of Quantitative Analysis in Sports*, 9(2), 115-126.

Grimshaw, S. D., & Larson, J. S. (2021). Effect of Star Power on NBA All-Star Game TV Audience. *Journal of Sports Economics*, 22(2), 139-163.

Harris, J., & Clayton, B. (2002). Femininity, masculinity, physicality and the English tabloid press: The case of Anna Kournikova. *International review for the sociology of sport*, 37(3-4), 397-413.

Hausman, J. A., & Leonard, G. K. (1997). Superstars in the National Basketball Association: Economic value and policy. *Journal of Labor Economics*, 15(4), 586-624.

Humphreys, B. R., & Johnson, C. (2020). The effect of superstars on game attendance: evidence from the NBA. *Journal of Sports Economics*, 21(2), 152-175.

Kanazawa, M. T., & Funk, J. P. (2001). Racial discrimination in professional basketball: Evidence from Nielsen ratings. *Economic Inquiry*, 39(4), 599-608.

Kevin Mongeon, Jason Winfree. (2012). Comparison of television and gate demand in the National Basketball Association, *Sport Management Review*, 15(1),72-79.

Knobloch-Westerwick, S., David, P., Eastin, M. S., Tamborini, R., & Greenwood, D. (2009). Sports spectators' suspense: Affect and uncertainty in sports entertainment. *Journal of Communication*, 59(4), 750-767.

Kreeger, J. C., Parsa, H. G., Smith, S. J., &Kubickova, M. (2018). Calendar effect and the role of seasonality in consumer comment behavior: A longitudinal study in the restaurant industry. *Journal of foodservice business research*, 21(3), 342-357.

Kwak, D. H., & Kim, Y. K. (2013). The impact of sport publicity on fans' emotion, future prediction, and behavioral response. Routledge handbook of sport communication, 178-187.

Mongeon, K., & Winfree, J. (2012). Comparison of television and gate demand in the National Basketball Association. *Sport Management Review*, 15(1), 72-79.

Neale, W. C. (1964). The peculiar economics of professional sports. *The quarterly journal of economics*, 78(1), 1-14.

Paul, R. J., &Weinbach, A. P. (2007). The uncertainty of outcome and scoring effects on Nielsen ratings for Monday Night Football. Journal of Economics and Business, 59(3), 199-211.

Raney, A. A. (2006). Why we watch and enjoy mediated sports. *Handbook of sports and media*, 2006, 313-329.

Rodríguez, C., Pérez, L., Puente, V., & Rodríguez, P. (2015). The determinants of television audience for professional cycling: The case of Spain. *Journal of Sports Economics*, 16(1), 26-58.

Rottenberg, S. (1956). The baseball players' labor market. *Journal of political economy*, 64(3), 242-258.

Rottenberg, S. (2000). Resource allocation and income distribution in professional team sports. *Journal of Sports Economics*, 1(1), 11-20.

Ryu, Y., Kim, K., Paik, J. W., & Cheong, Y. (2019). Determinants of audience demand for the televised professional baseball matches in Korea: An analysis of the post-season matches from 2008 to 2016. *International Journal of Sports Marketing and Sponsorship.*

Szymanski, S. (2003). The economic design of sporting contests. *Journal of economic literature*, 41(4), 1137-1187.

Uribe, R., Buzeta, C., Manzur, E., & Alvarez, I. (2021). Determinants of football TV audience: The straight and ancillary effects of the presence of the local team on the FIFA world cup. *Journal of Business Research*, 127, 454-463.

Wenner, L. A., &Gantz, W. (1998). Watching sports on television: Audience experience, gender, fanship, and marriage. MediaSport, 233-251.

국 문 초 록

중국에서 프로 농구 경기에 대한 티비 시청률 결정 요인 분석

– 2016 년부터 2021 년 시즌 경기에 대한 분석을 중심으로

왕 원 호

서울대학교 대학원

체 육 교 육 과

글로벌스포츠매니지먼트 전공

본 연구는 중국 농구 리그전(CBA)의 중계된 라이브 경기에 대한 시청률에 영향을 미칠 수 있는 결정 요인을 탐색하기 위한 것이다. 결정 요인의 네 가지 기본 차원은 스포츠 경기, 소비자 선호도, 시청 품질 및 경제로 식별된다.

본 연구에서 구축한 선형 개념 모델을 기반으로, 2016 년부터 2021 년까지 CCTV-5 에서 방송한 라이브 CBA 플레이오프로 구성된 상세한 데이터를 근거하여, 본 연구는 인기도, 시장 경쟁, 코로나 상황, 요일, 경기 시간, 경기 시즌및 도시 티어 총 12 개의 독립 변수로 위에 언급한 네 가지 차원을 제어한다.

본 연구는 농구 TV 중계 시장의 시청률에 영향을 미치는 요인에 대한 양적연구를 통해 농구 중계 시장의 후속 투자에 대한 지침을 제공하며 관련 스포츠 방송 산업의 후속 학술 연구에 참고 자료가 될 수 있다.

주요어: 프로 농구, 중국 농구 리그전, 티비 시청률, 소비자 동기

학번:2019-25458

Determinants of Television Ratings of

CBA Matches in China

- Based on the analysis of the matches

from 2016 to 2021

지도 교수 김 기 한

이 논문을 스포츠 매니지먼트
석사 학위논문으로 제출함
2022 년 2 월

서울대학교 대학원
체육교육과 글로벌스포츠매니지먼트 전공
왕 원 호

왕원호의 석사 학위논문을 인준함
2022 년 2 월

위 원 장 _____ 임 충 훈 (인)

부위원장 _____ 이 충 근 (인)

위 원 _____ 김 기 한 (인)