Spectator Analysis in Norway

The impact of live football broadcasting on stadium attendance

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Abstract

This research paper was conducted to find out more about the determinants of professional sports attendance in Norway, especially whether the increase in live television coverage have had a significant impact on match-day stadium attendance. Prior research has yielded contrasting findings on this matter, but the general notion is that games which are broadcasted live on television have been subject to a decrease in match-day attendance. Most prior research on this matter have been concerned about the most popular sports in large countries such as Great Britain and the United States, while smaller countries like Norway have been largely neglected. One important aspect of this paper is to examine the impact of live broadcasting on attendance in the context of a smaller European country. As to the best of our knowledge this paper is the first of its kind in Norway and only the second in Europe (after a Swiss study) to look at professional sports attendance in relation live broadcasting.

To find out more about this topic a multiple regression analysis was conducted using match data from the Norwegian premier division (Tippeligaen) looking at games broadcasted from seasons 2008 to 2010. Several aspects of live broadcasting were tested in different model and all these reached significant estimation results. The results show that live television broadcasting of Norwegian league games have led to a decline in match-day attendance, mainly due to the impact of pay-to-view channels. Games televised live on public channels did, quite surprisingly have a positive impact on attendance. In addition to live broadcasting the general determinants of Norwegian football attendance was tested. The estimation results tell us that team form, squad quality, recently promoted teams, rivalry and social economics among other factors did have a significant impact on stadium attendance.

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Acknowledgement

This research paper is written as master's thesis in economics with a special emphasis on consumer marketing. The focus of this paper is to look at the impact of live football broadcasting on match-day attendance. The idea behind doing a research paper on sports attendance came to life because sports is one of the researcher's favorite areas of interest, with football being by far the most popular sport, both in terms of entertainment value and personal exercise. Attendance in Norwegian football games have decreased in the last seasons, and the researcher thought it would be interesting to examine football attendance, to find out if live broadcasting was responsible for this decrease.

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Chapter 1 - Introduction

The attendance at sporting venues is normally one of the most important factors in creating revenue for professional sport clubs and event holders and in many cases ultimately, the *biggest* contributing factor, with other important sources coming from; sponsoring, player sales and media coverage. Therefore it is very important for club management, for both sporting and commercialreasons to know the motivation behind*why* people attend games.The current pool of research on sports attendance is mainly focused on North American sports such as major league baseball, American football, basketball, ice hockey and popular British sports likeEuropean professional football (soccer), cricket and rugby. In addition there have been some studies regarding various Australian sports, which primarily have been about Australian Rules football and rugby.

One of the more popular areas of attendance research the latest years has been to look at attendance in the context of TV broadcasting. With the emergence of large sports networks such as SkySports and ESPN, buying the commercial broadcasting rights to the world's biggest sporting events (Major League Baseball, NFL, English Premier League, etc.) have made these sports more accessible to the general population. From only being able of broadcasting one league game per week, English football fans can now watch every single league match during the domestic season. This trend is now spreading all over Europe, Northern America and Asia, and has led to criticism among some experts. They argue that the increase in TV broadcasting of live matches will lead to a decline in stadium attendance, and ultimately a decrease in club revenue. Several studies on TV broadcasting and attendance have been conducted to investigate this accusation.

Since the two largest sports networks in the world are located in Great Britain and the United States (SKY and ESPN respectively) mostsports attendance research concerned with live broadcasting originates from these two countries. (Allan, 2004; Baimbridge & Cameron, 1995; Baimbridge, Cameron, & Dawson, 1996; Buraimo, 2008; Buraimo, Paramio, & Campos, 2010; Carmichael, Millington, & Simmons, 1999; Fizel & Bennett, 1989; Kaempfer & Pacey, 1986; Tainsky, 2010; Williams, 1994; James J. Zhang & Smith, 1997). Although the literature on this subject has grown in recent years, most of the literature is concerned about studying the most popular sports in large countries, while smaller countries such as Norway has been largely overlooked. There have only been one published study on professional sports attendance in Norwaypreviously(Mehus, 2005), examining the attendance of football and ski-jumping events in the city of Trondheim. The purpose of this study is somewhat more general

by looking at attendance by mainly focusing on the social motives behind attending professional sporting events. This paper is to the best of our knowledge the first Norwegian studyto look at professional sports attendancein relation to live television broadcasting. It is also the first paper ever to study multiple team data, since Mehus' (2005) study only examined the attendance of one single football team.

The purpose of this paper is to analyze the impact of broadcasting on the attendance of professional football games in Norway. Since attendance in Norway has decreased in recent years, we hypothesize thatlive broadcasting have been one of the reasons behind this decline and therefore has a negative influence on match-day stadium attendance. The study period is between the seasons 2008 and 2010, which are consistent with the number of years the Norwegian TV2 and Altibox have been exclusively in charge-and co-owners of the TV broadcasting rights of professional football in Norway (Data from the 2007 season has beenincluded in one of the models to answera specific hypothesis).

The reason behind choosing football as a basis sport for the research paper is mainly its vast popularity, some even argue it is the most popular sport in the world (Dunning, 1999). Association football which is the proper term, originates from the UK when they founded The Football Association (FA) back in 1863. Since then its popularity have grown largely, and today football is played in almost every country in the world (FIFA recognizes 208 national football associations). In Norway football is the most popular sport in terms of active memberships (Flem, 2009). In 2010 there were 1,941 registered football clubs and 27,320 different teams. In terms of players there are 367,142 registered football players, which mean that about 8.5 % of the country's population plays organized football(NFF, 2010).

The Norwegian Premier League (highest division in Norway) is called Tippeligaen. The name of Norwegian football's top league division has been subject for sponsoring since 1991 and Norsk Tipping has been the main sponsor of the League since then - hence the official name of the league. The league first started back in 1937 and has been played every year since then. According to NIFS (2010) a total of 1,945,997 spectators attended soccer matches played by the 16 teams in Tippeligaen during the 2010-season. With a mean of 16,905 and a total of 253,377 spectators throughout the season, RosenborgBallklub (RBK) was the team attracting the most spectators at their home matches. RBK is also the most successful team in Norway having won 22 league titles. VålerengaIdrettsforening (VIF) currently plays at the largest stadium (UllevaalStadion) with a capacity of 25,572. UllevaalStadion is also used asvenue for the Norwegian national team.

For this study, data from all games in Tippeligaen were obtained from years 2007 to

2010. All teams included in the analysis have played at least one season in Tippeligaen during thistime period. The main research question for this study is;

"Does live broadcasting of football games impact match-day stadium attendance?"

This question will be answered through analyzing thefollowing hypotheses;

H_1: Broadcasting of TV matches lead to a decline in match-day stadium attendance.

H_2: Matches sent on public channels (NRK, TV2 and TV2 Zebra) will experience greater decline in match-day attendance than matches which are televised on per-to-view channels and IPTV (TV2 Sport, Altibox, VG Live) only.

H_3: Matches televised on TV2 Zebra (usually Monday evening at 19.00) will experience thegreatest decline in overall match-day attendance.

The effect of live television broadcasting on match-day stadium attendance is examined by multivariate regression analysis by simultaneously accounting for other factors which could influence match-day attendance. These determining factors are found in the existing body of literature on this subject, all thought to affect professional football attendance in Norway. This study will provide insight on the determinants of attendance in smaller European countries, and if these are similar or different in comparison to attendance factors in the bigger European countries.

This paper is organized in eight chapters. Chapter 1 is the introduction, which you just have read. Here we have talked about the purpose of this paper and explained our hypotheses. In chapter 2 the existing body of literature concerning spectator analysis will be reviewed, followed by the theoretical framework in chapter 3, whereall factors thought to have aninfluence on our model of Norwegian football attendance are explained. Next is chapter 4, which is the methodology section. Here we provide a brief discussion on how to conduct a regression analysis.In chapter 5 there will be a data description section, where the reasons behind choosing which variables to include in the model are explained.Chapter 6 is the estimation results, where the results from the analysis will be described.In chapter 7 we will discuss the results from the analysis. At lastwe have chapter 8, where conclusions will be made regarding our initial hypotheses.

Chapter 2 - Literature review

Over a number of years professional sports attendance has been a popular research topic. Some of the areas which frequently have been studying this matterare sports marketing, sports sociology and economics. People first started to studying attendance the early 1980s, since then several studies regarding this has been conducted, mainly aimed at identifying the determinants of professional sports attendance. Most of these studies has been concerned about measuring attendance in different North American based sports; major league baseball (Baade & Tiehen, 1990; Greenstein & Marcum, 1981; Hill, Madura, & Zuber, 1982; Marcum & Greenstein, 1985; Schmidt, 2001; Zygmont & Leadley, 2005), ice hockey (Jones, 1984; Leadley & Zygmont, 2006), American college football (DeSchriver & Jensen, 2002; Fizel & Bennett, 1989; Kaempfer & Pacey, 1986; Leonard, 2005; Pan & Baker, 2005), professional American football (Tainsky, 2010; Welki & Zlatoper, 1994), basketball (Leadley & Zygmont, 2005; J. J. Zhang, Pease, Hui, & Michaud, 1995; James J. Zhang & Smith, 1997).

The other popular study area is British based sports; cricket (Hynds & Smith, 1994; Schofield, 1983a), football (Allan, 2004; Audas, Dobson, & Goddard, 1997; Baimbridge et al., 1996; Buraimo, 2008; S. M. Dobson & Goddard, 1995; Forrest & Simmons, 2006; Simmons, 1996; Williams, 1994), rugby (Baimbridge & Cameron, 1995; Burkitt & Cameron, 1992; Carmichael et al., 1999; S. Dobson, Goddard, & Wilson, 2001). Additionally there have been some studies from other European countries (Barajas & Urrutia, 2007; Baranzini, Ramirez, & Weber, 2008; Bauer, Sauer, & Exler, 2005; Garcia & Rodriguez, 2002; Mehus, 2005) in addition to Australian based sports (Borland & Lye, 1992; Neale & Funk, 2006; Shaw & McDonald, 2006).

In an independent study of Chilean football attendance Ferreira and Bravo (2007) states that one of the most important objectives of sports attendance research is "to understand the relative importance of managerial, demographic and socio-economic factors that are hypothesized to influence attendance in a particular context." Following they argue that "analyzing sports attendance provides insight on how demand shifts as a result of these previously mentioned conditions". This information is therefore invaluable for club management responsible for maximizing revenue from ticket sales.

One of the most interesting determinants of professional football attendance to study has been the impact of live television broadcasting on match-day attendance. This is partly because the studies on this matter have very contradicting findings in the past. In one of the first studies on broadcasting and stadium attendance in America, Kaempferand Pacey

(1986)conducted a study to examine the impact of match-day attendance on the large increase in college football live broadcasts resulting from the 1984 US Supreme Court ruling granting the individual schools the property rights to college football telecasts. The results from their study reported broadcasting and attendance ascomplementary goods, which mean that a rise in college football live broadcasts following the Supreme Court ruling would lead to an increase in match-day attendance.

This rather surprising result came under criticism from Fizeland Bennett for only using pre-deregulation data, stating that KaempferandPacey's findings "can only be accurate if the structural conditions of the market are stable" (Fizel & Bennett, 1989). To study the impact of broadcasting on college football attendance further Fizeland Bennett (1989) conducted their own study on the matter using both pre- and post-deregulation data. Contrasting to Kaempferand Pacey (1986), the findings of Fizeland Bennett (1989) show that general increase in telecasts reduces overall attendance, although there is an exception for the traditionally"big" schools who receive an increase in attendance.In another study of attendance on American sports, Hill et al. (1982)generally examined the short run demand for major league baseball. One of the factors predicted to determine fan attendance was if the game was televised in the home team's city. This factor was deemed as not significant by the researchers implying that game attendance is not influenced by local television broadcasts.

As mentioned previously, research on the issue yield fairly different results. The early studies from North America have found live broadcasting to have both a positive and negative impact on attendance, as well as being considered to have no significant impact at all. One of the reasons for the variety in the results could be that the live television coverage at this point in time was fairly limited by technology –with TV stations only being able to broadcastone or two games a weeknationally in the US. The relatively poor picture quality at that point in time could be another possible reason in explaining the mixed results.

One of the biggest "revolutions" in public live sports broadcasting happened in British football when the 22 wealthiest teams in 1992 broke out of the English Football League (EFL) to form the commercially backed English Premier League (EPL), with Barclays Bank as the league's main sponsor. The newly formed league then signed a joint contract with BBC and BSkyBgiving them exclusive rights to televise English Premier League matches. This meant that everyone who had sufficient money to buy a satellite dish could now watch Premier League football if they wanted to. This was a huge leap from previous years, when only a limited selection of games were broadcasted nationally on public television, while a few other matches were solelybroadcasted on local television.

Soon after this broadcasting agreement Williams (1994) wrote a paper on English football and the rise of theBSkyB satellite television network in Britain, stating that "football's community of fans will gather around TV sets more often than in soccer stadia" due to the increase in live satellite TV coverage. The same should be the case for rugby, as BSkyBalso bought the rugby televising rights around the same time. Williams (1994) was the first, in the context of European professional sports, who questioned the relationship between live TV broadcasting and match-day stadium attendance, nearly a decade after the first American study on this matter.

Only a year later one of the first study from Great Britain aimed at examining the relationship between live satellitebroadcasting and match-day attendance was conducted (Baimbridge & Cameron, 1995). Declaring the influence of television on the demand for tickets as one of the major, but largely overlooked, issues of sports attendance Baimbridgeand Cameron (1995) examined the entrance of the BSkyB satellite network into the coverage of first division rugby games over the 1993-94 season. In accordance with Fizeland Bennett's study, Baimbridgeand Cameron (1995)found evidence that satellite television has a significant net negative effect on attendances. The results from their estimation show that if a match is broadcasted live on TV it generally leads to an estimated 25.1 % reduction in ticket sales. However, as clubs are given TV broadcasting compensation this will counteract the loss in ticket sales so that an average club will see a net gain in revenue.

Shortly after, Baimbridge et al. (1996) conducted a new study, this time on satellite television and the demand for football, to examine the relationship between broadcasting and football in relation to the previously mentioned broadcasting contract between BBC, BSkyB and EPL. In relation to Baimbridgeand Cameron's first study from 1995 (where only one aspect concerning live broadcasting was included in the model),Baimbridge et al. (1996) made amore extensive model by dividing TV coverage into two variables to specify whether a match was sent on Sunday afternoon or Monday evening. In addition, several other possible new determinants of attendance were added to the model. The results from this study are somewhat similar to theirprevious findings (Baimbridge & Cameron, 1995) in that estimated Monday coverage reduced attendances by 15.2 %. However, this was not the case for televised Sunday matches where no significant evidence of declining attendance was found. Baimbridge et al. (1996) explained this result with Mondays being a less traditional match-day, confirming the general opinion in Britain that Monday night football would have a greater negative impact on attendance. Regarding Sunday games Baimbridge et al. (1996) questions whether these will remain impervious to declining attendance in the future given the

increasing number of substitutes on Sunday afternoon from other European leagues such as*Italian Serie A* and *Spanish Primera Division*, as well as local Sunday League broadcasts (ex. Ryman League).

Given that Baimbridgeand Cameron (1995) first study of rugby did not part between the different TV matches, Carmichael et al. (1999) did a paper partially aimed at refining Baimbridgeand Cameron's (1995) initial specification on this issue. Carmichael et al. (1999) divided TV coverage into three variables; *FRIDAYSKY*, matches broadcasted by BSkyB on a Friday evening; *OTHERSKY*, matches broadcasted by BskyB at other times; and *FRINOSKY*, matched played on Friday but not broadcasted by BSkyB. Carmichael et al. (1999) predicted that matches broadcasted by BSkyB will deter match-day attendance, since watching games at the stadium or on TV may potentially act as substitutes. This classification is somewhat finer than what Baimbridge et al. (1996) used in their football study. This is because the researchers wanted to separate the influences of televising and scheduling of matches at different times. The results from the analysis show that Friday matches televised by BSkyB reduce attendance by 20.7%, but both the other variables are insignificant showing that attendances are unaffected by BSkyB broadcasts at other times or when broadcasting of Friday matchesis absent. This finding is somewhat similar to Baimbridge et al. (1996) in that televised matches on working days such as Fridays and Mondays tend to be negatively affected by attendance, while matches scheduled on weekends (Saturday, Sunday) are unaffected by BSkyB broadcasts. Another interesting fact is that when looking at the coefficients from both studies (-15.2% as opposed to -20.7%) it looks like the rugby coefficient is larger than the football coefficient. This could indicate that rugby matches for some reason are more affected by TV broadcasting than football.

In a more recent study, Zhang and Smith (1997) looks at the impact of broadcasting on the attendance of professional basketball games using aggregate spectator survey data instead of individual match data, which is used in all previously mentioned studies. In addition, they included a new aspect by looking at TV and match-day attendance in relation to both home and away games. No distinction was made between public TV and cable outlets. Zhang and Smith (1997) made two predictions; (1) "TV broadcasting of home games would negatively affect game attendance of an NBA team" and (2) "TV broadcasting of away games would *not* affect home games attendance of an NBA team". The findings regarding the first prediction indicate that public TV broadcasting of home games would affect game attendance negatively. In terms of watching away games on TV, the findings from the analysis indicate that the more one watches away games, the more one attends home games. NBA teams may

therefore consider using televised away games to promote home games.

In most of the previous studies the chosen attendance data has been for whole league seasons over one or two seasons. To look at satellite television and football attendance over longer time span Allen (2004) used attendance data from Aston Villa FC's home matches in the English Premier League from the 1995/96 season to the 2000/01 season. Allan (2004) argues that the reason for choosing only one club in the study is due to peoples' loyalty to their *own* club. Moving support from on club to another is very unlikely, making televised matches one of the main substitutes of attending a football match. Because of this, there are few reasons to expect the effects of satellite television coverage to be any different for the other EPL clubs, despite the effect is only tested on one club (Allan, 2004). The results from the analysis show that a match televised live on satellite television in general will have a 7.75% lower attendance than those games not televised live, which means that there is a significant negative impact of television coverage on attendance at football matches.

One of the most recent available research studies on live broadcasting and stadium attendance was conducted by BabatundeBuraimo(2008). Earlier English football studies have used data from the EPL, where match attendance in several cases were constrained by the stadium capacity due to sell-outs. According Buraimo (2008) this could have led to ambiguous results, due to several signs of heteroscedasticity in previous studies. In this study attendance data from the Coca-Cola Championship (tier-two in England) is used, this because league matches in the Championship are much less susceptible to stadium capacity constraints (Buraimo, 2008). In addition to previous research, this study also tests attendance on live telecasts on satellite television versus public TV as well as European cup competitions. All these variables are significant and the coefficients show that both satellite- and public broadcasts and European cup telecasts has a negative influence on attendance. The results also show that public television showings lead to a much larger decline in attendance than what is the case with satellite broadcasts (-4.1% and -17.7% respectively).

Theory implicates that broadcasting of football matches on satellite television (or pay-to-view channels) could will be the best economic solution for both clubs and TV stations for a number of reasons; partly because this leads to a smaller decline in match-day revenue and partly because making football exclusive by going for all-out pay-to-view football channels will probably lead to larger revenue to the TV stations, which again will lead to an increase in revenue for the club. Additionally by broadcasting all league games each round, the TV revenue stream should be more evenly distributed among the different clubs as every club has the same amount of games televised giving clubs a possibility of getting equal TV revenue

from live broadcasting each round.

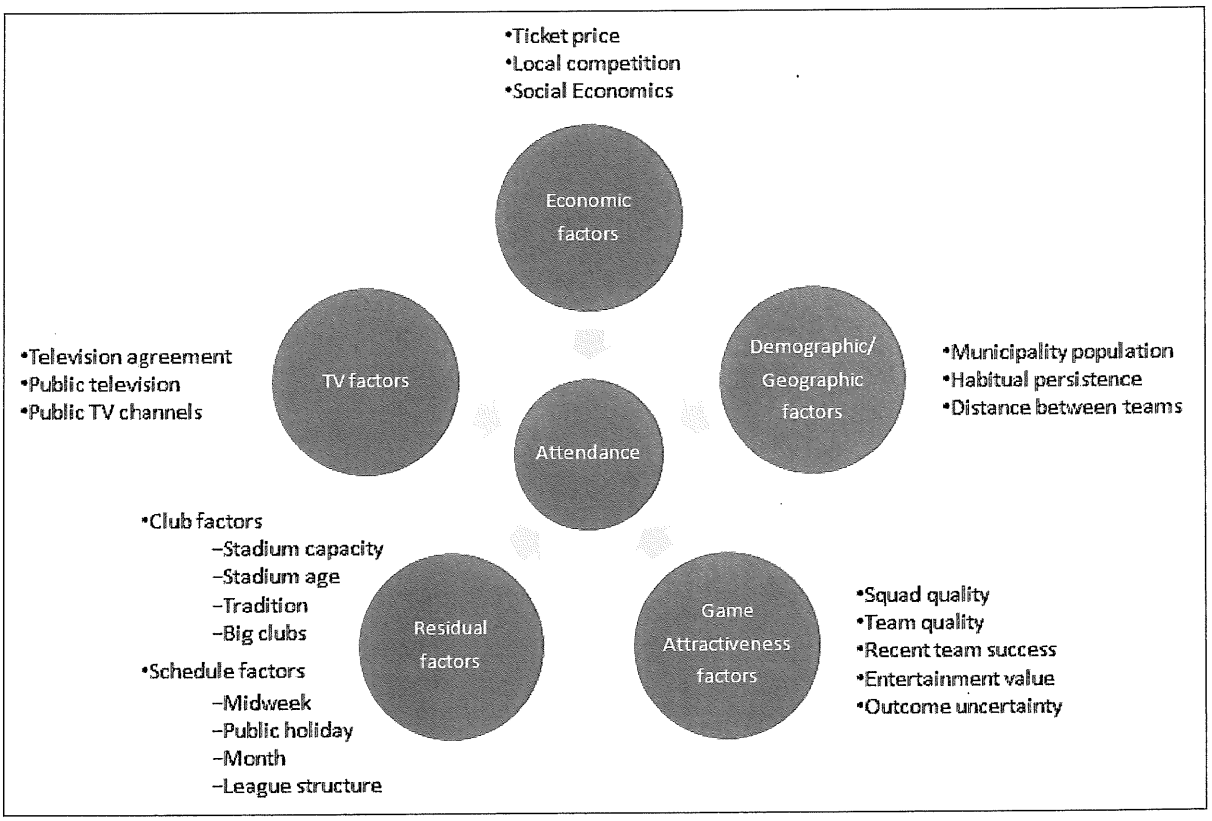
Although there is one available study on football attendance in Norway (Mehus, 2005), this is not very useful in term of thispaper because it focuses more on the social motives of attending sports events. A better comparison to this paper study, is a studybyBaranzini et al. (2008) studying football attendance in Switzerland. There are many similarities between Norwegian and Swiss football. The population in both countries is relatively similar and football is the most popular sport in both countries. The quality of the national teams is also similar, due to the composition of the squads in relation to number of foreign professionals playing international matches for both countries. Given these similarities both countries should have about the same determinants of football attendance. In their paper Baranzini et al. (2008)look at televised matches in relation to attendance as part of their analysis. They observe live telecasts as having a negative but not significant impact on attendance. According to Baranzini(2008) this mainly due to skewed numbers in terms of public broadcasts, with the three big teams together appearing in 85% of the televised matches. Another reason for the results being not significant could be because Swiss football at that time did not have any pay TV broadcasts. However, Baranzini et al. (2008) argues that the emergence of pay TVs broadcasts could lead to a new change regarding the influence of TV on attendance.

In this section, the existing body of literature concerning live broadcasting and match-day attendance has been extensively discussed. Given the fact that there have not been any studies regarding this matter in Norway, we had to compare with studies from other countries, mostly from USA and England. The studiesreport contradicting results. TV attendance has been deemed as both significant and not significant on attendance as well as having both a negative and positive impact. In general the results support broadcasting to have a significant negative impact on match-day attendance. Games played outside the weekend seems to suffer the most from TV broadcasting, mainly to the lack of leisure time during weekdays. In the case of broadcasting games on public TV versus pay-TV, evidence support public TV leading to the biggest decrease in match-day attendance. In the next part of this paper, we look at the factors most frequently used in determining match-day attendance.

Chapter 3 - Theoretical framework

Previous research has identified several factors that could have a possible influence on professional sports attendance. Some of these factors are used very often; others are more specific to each study. Based on the insights from previous literature, a theoretical framework concerning attendance has been constructed. In this framework, the stadium attendance is influenced by 19 general factors. These factors have been measured quite differently by different researchers which have led to mixed results in the various studies. Schofield (1983b) classifies these factors into four broad groups; *(1) economic variables, (2) demographic/geographic variables, (3) game attractiveness variables*, and *(4) residual variables*. In addition to these general factors there is a group of TV factors all set to describe different aspects of our research question. There may be several ways to measure each of these factors. A general overview of all factors determining the attendance can be seen in Figure 1. Each of these factorsis discussed in a more detailed manner in subsequent sections. All discussed factors will have an impact on attendance in some way, either directly or indirectly. TV variables will not be included in this section as they have been discussed in the previous chapter. Because the focus of this study is professional football league games, only factors which could fit into the Norwegian football context will be explained.

Figure 1 – Theoretical framework



3.1 Economic factors

3.1.1 Ticket price

One of the most frequently used variables in attendance studies is the ticket price for admission at professional sporting events (Baimbridge & Cameron, 1995; Baimbridge et al., 1996; Baranzini et al., 2008; Carmichael et al., 1999; S. M. Dobson & Goddard, 1995; Ferreira & Bravo, 2007; Fizel & Bennett, 1989; Kaempfer & Pacey, 1986; Leadley & Zygmont, 2006; Tainsky & Winfree, 2010). According to microeconomic theory, admission price should exert a negative influence on attendance. However, studies on attendance in the past have shown mixed results in regard to the signs of price coefficients. The price elasticity has generally been regarded as negative, although some studies have revealed positive and significant coefficients on price elasticity (Baimbridge & Cameron, 1995; Baimbridge et al., 1996; Fizel & Bennett, 1989; Kaempfer & Pacey, 1986).

These mixed results might be the result of only looking at ticket price instead of the total cost of attendance. Dobson and Goddard (1995) says that it is more likely that total cost is what matters to sports fans. However, due to the difficulty of obtaining this kind of data, total costs are rarely included in studies. Notwithstanding the mixed results regarding the influence of price on attendance, Dobson and Goddard (1995) have found evidence of extremely low price elasticity, leading them to think that the demand for professional sports matches could be inelastic. Supporting results have also been found by Carmichael et al. (1999). The reason behind the price being inelastic may me due to the factthat clubs tend to price tickets in the inelastic demand region.

3.1.2 Local competition

Previous studies show that competition from rival sporting teams/events or other entertainment alternatives in the same area have a significant negative impact in professional sports attendance and ticket revenue (Baimbridge & Cameron, 1995; Baimbridge et al., 1996; Baranzini et al., 2008; Baade & Tiehen, 1990; S. Dobson et al., 2001; Ferreira & Bravo, 2007; James J. Zhang & Smith, 1997). The number of sport teams in the area has previously been used to measure competition for both NFL and MLB teams. It is also important to note that where rivalry exists between two teams in the same locality, attendance may actually rise, especially for those games where rivals play against each other. Based on the results from a study investigating football attendance (Baimbridge et al., 1996), competition between English Premier League clubs located in the same vicinity was found to exert a positive and

significant influence on attendance. The positive influence was interpreted as the impact of close rivalry, which acted as a catalyst for increased attendance.

3.1.3 Social economics

Social economics could also be an important factor in determining professional football attendance. The two most frequently ways to measure the impact on social economics is to look at local *unemployment rate* and *average income level* among home team supporters. The influence of local unemployment has been used as a determinant on professional sports attendance in several studies (Baimbridge & Cameron, 1995; Baimbridge et al., 1996; Baranzini et al., 2008; S. M. Dobson & Goddard, 1995; Leadley & Zygmont, 2006). The purpose behind using unemployment is to measure the differences in economic activity between areas. It is expected that high unemployment should lead to a decline in attendance, but recent studies have shown unemployment to have mixed influence on attendance. Baranzini et al. (2008) found that unemployment rate has a negative impact on attendance, but is negligible in terms of statistical significance. These results are supported by Dobson and Goddard (1995). In contrast, results from Baimbridge et al. (1996) report unemployment to have a positive impact on attendance. This may be due to the fact that many English football clubs are located in former industrial inner-city areas where unemployment has risen disproportionally over the last three decades. Indeed, the psychological importance of the club may increase with unemployment as it becomes a remaining point of stability and focus for the unemployed.

Baimbridge et al. (1996), LeadleyandZygmont(2006) and TainskyandWinfree(2010)all have found evidence that average local income level has impact on attendance. One would expect local income level to have a positive impact on attendance because wealthy people have more money to spend for leisure time activities. Results from Baimbridge et al. (1996) surprisingly show the opposite effect, namely that earnings have a negative impact on attendance. This finding supports football as traditionally being a working-class sport, especially in England and that wealthy people prefer to watch other sports. This is also the case for US Major League Baseball (Tainsky & Winfree, 2010).

3.2 Demographic/geographic factors

3.2.1 Municipality population

Moving over to the demographic/geographic factors there is overwhelming in previous research evidence that attendance can be a function of the market size in which the team is

located (Baimbridge & Cameron, 1995; Baimbridge et al., 1996; S. M. Dobson & Goddard, 1995; Ferreira & Bravo, 2007; Fizel & Bennett, 1989; Hill et al., 1982; Leadley & Zygmont, 2006; Tainsky & Winfree, 2010). Teams from highly populated areas tend to get greater attendances than teams from smaller places, which is fairly natural given that a larger fan base will lead to higher support from the terraces. In terms for relative size, the population of the municipalities hosting Norwegian top division teams range from Kongsvinger with 17 377 residents to Oslo with 586 860 residents. In a European context Norway is a relatively small country with only 4 920 305 residents, which means that the population in each municipality are small compared to most European countries. In Norway the four most successful clubs historically, with the four largest stadiums are located in the four biggest cities. Because of this fact, there is reason to believe that these four clubs will have significantly higher attendances than all other top division teams.

3.2.2 Habitual persistence

Results from previous research have identified the presence of structural state dependence in attendance behavior. (S. M. Dobson & Goddard, 1995; Ferreira & Bravo, 2007; Tainsky & Winfree, 2010). According to Ferreira and Bravo (2007) structural state dependence is defined as "the influence of prior attendance on future attendance after account for the aforementioned observed economic, demographic, attractiveness and residual factors that also influence attendance." Marketing literature studies from Erdem(1996) and Seetharaman(2004) on branding choices show that state dependence is explained by loyalty, habit, states of inertia (ex. when past purchases of a specific product are positively linked to future purchases of the same product) or variety seeking (the opposite of states if inertia). The most popular way to measure state dependence is to use a "lagged" attendance variable, which measure the impact of prior attendance on future attendance. This variable was positive and significant for both Ferreira and Bravo (2007) and Borland and Lye (1992).

3.2.3 Distance between teams

The distance between the home and away teams has also been an important factor in prior research (Baimbridge & Cameron, 1995; Baimbridge et al., 1996; Baranzini et al., 2008; Buraimo, 2008; Carmichael et al., 1999; Forrest & Simmons, 2006). The results shows that the further two teams are from each other, the smaller the attendance and vice versa. When the two teams are in close vicinity attendance seems to rise with the excitement of playing a rival team. In addition the travel time is low, givingaway supporters to bigger opportunity to attend these games. In Norway a total of four teams are located within the same county and

another six teams are located in bordering counties, which means that half of the top division teams are located within 200 km (equal to a 3 hour drive). The rest of the top division teams are spread all over the country, with Tromsø and Stavanger being the two teams furthest apart with a distance of 1,996 km between them (equal to a 26 hour drive or a 3.5 hour flight), which is about the same time it takes to travel from Norway to Italy.

3.3 Game attractiveness factors

3.3.1 Squad quality

Squad quality is important in determining attendance because a good squad with exciting players is more fun to watch than average quality players with limited ability. For some reason, measuring squad quality have been largely neglected in previous research, although there have been some research on this factor. These studies have measured squad quality in two different ways; either by counting the number of star players in the squad (Baimbridge & Cameron, 1995; Baimbridge et al., 1996; Tainsky & Winfree, 2010) or by rating teams after the size of their wage bill (Buraimo, 2008; Tainsky & Winfree, 2010). A star player has normally been defined either as a big money signing, highly attractive local player and/or internationally capped player. The number of star players in a team is documented to have a positive and significant impact on attendance, this goes for both home and away squads. Squads with a high wage bill have in both the mentioned studies exerted a positive impact on attendance, which was significant in all cases except in Buraimo's(2008) study where only the away team wage bill was found to be a significant factor.

3.3.2 Team quality

Team quality has been one of the most extensively studied factors having a potential influence on attendance. Several variables have been used in the past to measure this effect. The most popular way has been to measure the teams winning percentage in the current season (Carmichael et al., 1999; S. M. Dobson & Goddard, 1995; Ferreira & Bravo, 2007; Fizel & Bennett, 1989; Leadley & Zygmont, 2006; Tainsky & Winfree, 2010). These studies support the notion that games won in a season have a positive influence on attendance within the same season. Other variables being used to measure team quality has been; team form (Marcum & Greenstein, 1985) and points taken (Allan, 2004; Buraimo, 2008; Forrest & Simmons, 2006). In addition some studies have included a dummy variable indicating the league leader (Buraimo, 2008; S. M. Dobson & Goddard, 1995; Hill et al., 1982). All coefficients of for these variables have been found to be both positive and significant.

3.3.3 Recent team success

The current team performance as documented previously has a big impact on attendance. What about the team performance last year? Variables measuring lagged team performance have also been used in some extent in earlier research, although only in a few studies. TainskyandWinfree(2010) found last seasons winning percentage to have a positive and significant impact on attendance. Hill et al. (1982) and Baimbridgeand Cameron(1995) both used last seasons league standings as a variable to measure attendance. Measuring standings for both home and away team, Hill et al. (1982) only last seasons performance of the away team proved to been significant. This variable showed the expected effect, namely that a high league position last year led to an increase in next season's attendance. Baimbridgeand Cameron (1995) found no such effect in their study. Some of the previous studies have included dummy variables measuring recent team success. Ferreira and Bravo (2007) constructed a variable to measure whether the team had won a trophy last season while Baimbridge et al. (1996) and Carmichael et al. (1999) included a dummy variable to indicate if the team was newly promoted. The results show that winning a trophy and/or getting promoted both lead to an increase in attendance the following season.

3.3.4 Entertainment value

For some people it is important that the team you support not only win matches, but also entertain their fans, especially at home games. Recent studies have tried to measure this by looking at the number of goals scored (Baranzini et al., 2008; S. M. Dobson & Goddard, 1995) as a predictor for the level of entertainment. Although both studies show this variable to be positive on attendance and significant, goal scoring does not necessarily reflect playing style, which may be a better determinant of whether a particular team is regarded as entertaining. The way a team likes to play can vary all from free-flowing attacking football played on the ground to a more physical approach with long balls and lots of tackles. However, no one has yet found a way to measure this effect.

3.3.5 Outcome uncertainty

Another factor which makes a game more attractive is when the outcome of a match is uncertain. Several studies have examined this factor in the past (Baranzini et al., 2008; Buraimo, 2008; Forrest & Simmons, 2006). They all predicted that when there is a high outcome uncertainty more people tend to attendance games. The results from the studies are very contrasting with one (Forrest & Simmons, 2006) showing the predicted coefficients,

while another (Baranzini et al., 2008) showed the opposite effect. The last study did not find any significant effect for outcome uncertainty.

3.4 Residual factors

3.4.1 Club factors

3.4.1.1 Stadium factors

The stadium where the match is played can affect attendance in mainly in two ways. The stadium capacity can influence attendance through perceived crowdedness in the stadium (Borland & Lye, 1992). It is believed that is more fun to attend games when the stadium is packed, as this often leads to a good atmosphere among the supporters in the stands. (Baranzini et al., 2008; Ferreira & Bravo, 2007; Marcum & Greenstein, 1985). An issue regarding stadium capacity is when a match is a sellout. This may skew the attendance, because when a stadium is full there are more people wanting to watch the game than there are tickets available. In Norway this is not a huge problem because the stadiums are only full on very rare occasions (one or two games a season in average).

The age of the stadium also have can also have a big impact on attendance. New stadiums have better facilities than old stadiums and are often built in way which gives fans a better line of sight to the pitch. Although getting a new stadium mainly is seen as positive, there is a potential threat that the crowd atmosphere changes at new stadiums. For reasons unknown some clubs experience a decline in atmosphere when moving to a new stadium. Results from Baranzini et al. (2008) show that new stadiums get higher attendances than old stadiums, which supports findings from earlier studies by Hill et al. (1982) and Kaempferand Pacey (1986). All these results were significant.

3.4.1.2 Tradition

Historically some clubs have been more successful than others. After the league started in 1949 six teams have shared 50 of 62 league titles. These teams are Rosenborg, Viking, Fredrikstad, Lillestrøm, Vålerenga and Brann. The same teams are also the top six teams of the Norwegian Marathon Table (measuring total number of points after the leagues formation). Five of these clubs are located in large cities, while the last one (Lillestrøm) is located right outside the capital. These clubs also have historically had very high attendances in the past. Club age is also important in getting a large fan base. Old clubs generally receive a higher level of support than newer clubs, especially if two clubs are located in the same area. Tradition can therefore be seen as a product of previous titles, location and club age.

Most previous research have tried measuring attendance by club age (Baimbridge & Cameron, 1995; Ferreira & Bravo, 2007; Tainsky & Winfree, 2010), although other measurements have been tested; number of years in the top division (Baimbridge et al., 1996) and historic winning percentage (Kaempfer & Pacey, 1986). The results show tradition to have a positive and significant impact on attendance, suggesting that history and tradition is a very important factor for supporters. Clubs with a good tradition have acquired a permanent advantage by building up loyalty ties with supporters, which have been passed down through the generations.

3.4.1.3 Big clubs

Some clubs have a better possibility of performing well and getting high attendances than other clubs for a number of reasons. Some clubs are significantly better suited than other clubs because of large transfer/wage budgets;high quality backroom staff;large fan base and great historic tradition.The clubs whopossess all thesequalities are given a special emphasis in attendance studies. In previous research these type of clubs have be labeled as "power clubs" both by Fizeland Bennett (1989) and Kaempferand Pacey (1986), but is this study we just call them "big clubs".In Norway the big clubs have traditionally been Brann, Rosenborg, Viking and Vålerenga. For reasons mentioned abovethese clubs should have significantly higher attendances than other Norwegian clubs.

3.4.2 Schedule variables

When a match is played is of great importance to supporters. In Norway the best time to watch football is in the weekend. In the annual supporter survey, conducted on the behalf of NorskToppfotball (NTF) 38.4 % chose Sunday at 18.00 CET as the preferred kick-off time (NTF, 2010), with Saturday at 16.00 CET as the second most popular time (9.7 %). In total only 4 % of the respondents preferred to watch a game in the midweek. This is also the case in several other countries, which have all former attendance studies to include a dummy variable for games played during weekdays (Baimbridge & Cameron, 1995; Baimbridge et al., 1996; Buraimo, 2008; Carmichael et al., 1999). Results show that games played during the midweek have significantly lower attendances than matches played during the weekend.

Another thing that could have an effect on attendance is when a match is played during a public holiday. It is expected that games played during public holidays will lead to a decline in attendance, mainly due to the fact that Norwegians tend to travel away from home during the holidays. Studies from England (Baimbridge & Cameron, 1995; Baimbridge et al., 1996; Buraimo, 2008; Carmichael et al., 1999) show the opposite, with games played during public

holidays getting higher attendances than normal games. This may be due to wage and cultural differences between Norway and England. While Norwegians normally travel to their cabins during the holidays, English people use their extra leisure time to watch football, especially during Christmas and New Years. On that time, football is off-season in Norway, which means that Norwegians have no chance of watching football during this time period. In Norway the football season starts in spring and ends in the late fall, in contrast to England and most other European countries. This means that football is played during the summer when most people are away on vacation, and football attendance should decrease during this period.

Another variable which could influence attendance is *when* the match is played. The weather and temperature vary a lot during the season and sometimes football is played when the temperature is below zero. Baimbridge et al. (1996) tried to account for this by creating weather variables, but none of these proved to be significant. Similar results also was found by Carmichael et al. (1999). In addition to weather variables, Carmichael et al. (1999) also included a date code variable where each day was assigned one number. It was observed that attendances was relatively high at the start of the season, reflecting early enthusiasm and high expectations of fans for their teams, but tended to wane during the season for all but the most successful teams.

The last variable in the literature regarding attendance is related to league structure. In the 2007 season 14 teams played in Tippeligaen. One became champion, numbers two to four got European qualification, bottom two teams were relegated and one team had to play play-off games against number three from tier two. During this season it was decided a league expansion to 16 teams should happen in 2009. The following year (2008) only one team got relegated and one more team got promoted. In 2009, two more teams were added to Tippeligaen which now consisted of 16 teams. Of the bottom three two got relegated and one went to play-off, first a semi against 5th place in tier two and if they won, a final against the winner of 3rd and 4th from tier two. Since then, the league structure has not changed. Literature show that changes in league structure can influence attendance; these can either be successful or unsuccessful. In Norway there is a general assumption that the league expansion have led to lower average attendances due to the league being more predictable in the top and bottom end. However, when they changed the league structure in Switzerland this lead to an increase in attendance (Baranzini et al., 2008), but when Fizel and Bennett (1989) looked at structure changes in college football, attendance did not change significantly.

Chapter 4 - Methodology

In this study weuse linear regression analysis as our research method, which is a technique used to determine the relationship between one dependent interval- or ratio-scaled variable (the explained variable) and one or more independent interval- or ratio-scaled variables (the explanatory variables)(Janssens, Wijnen, Pelsmacher, & Kenhove, 2008). When conducting a regression analysis one tries to explain the variation in one dependent variable as much as possible on the basis of the variation in a number of relevant independent variables. We use the term "simple regression" if there is only one independent variable, whilethe termis called "multiple regression" when we examine multiple independent variables. A regression model in its general form is expressed in the following manner:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_n X_n + \varepsilon$$

Y is the dependent variable which is the thingwe want to examine (attendance), while X_i ($i = 1, 2, \ldots, n$) is the independent variables. These are the factors which determine the variance in the dependent variable. To each independent variable there is a coefficient (β_i), which is the parameter to be estimated in the regression analysis. The coefficient measures theslope of the independent variable, which could be either positive or negative. The other elements that complete the model are the constant (α) and the disturbance item (ε).

When conducting a regression analysis, one always does this on the basis of a dataset. A dataset may be structured in three ways:time series data, cross-section data and panel data. *Time seriesdata*is present when one subject is observed at several (consecutive) moments in time.We use c*ross-section data*when there are observations for a single point in time for several subjects. The combination of thesetwo terms is called *panel data*, whichlets us see observations at multiple (consecutive) points in time for several subjects.

A regression analysis will estimate the parameters for the variables (β_i) in such a manner that the best possible fit is obtained between the actual and the predicted values for the dependent variable(Janssens et al., 2008). Traditionally these coefficients are determined by using "the least squares method".This method makes sure thatall parameters of the equation are defined in such a way that the sum of the square of each of the residuals is as small as possible, wherea residual is the deviation between the actual and predicted value.

A model should only consist of variables which each have a significant contribution to the dependent variable. There are four ways to determine which variables to include in the model: enter, forward, backward and stepwise. One ways to do this is by using the *enter*method. When using this method all of the variables specified by the researcher are

included in an initial model. After running the first analysis one has to examine the analysis output, to identify which of the variables not contributing significantly to the explanation of the model.Then a second analysis on the basis of the "Enter" method, with only significant variables is performed.

When using the *forward*approach we essentially start by first looking at a model with only one variable, and then afterwards adding one and one variable until weend up with a multiple variables model. This technique is preferred when wewant to determine in a step-by-step manner which of the variables provides a significant explanation for the dependent variable. The most significant variable after each step is included in themodel, until there are no variables left, which in a certain step can contributesignificantly to the explanation of the dependent variable. The *Backward*approach locates the significant variables byessentially starting with a multiple model containing all independent variables, and ends up with a model with fewer variables. The procedure is to removing the variables one by one until we end up with a model only containing variables which make a significant contribution to the explanation of the dependent variable.

A shortcoming of the "forward" method is the following: suppose that the researcher has already included two significant variables in the model and that, by adding a third variable, one of those two will no longer be significant, meaning that the final model will contain a non-significant variable, which makes the model incorrect. This problem could be solved by applying the *stepwise* procedure, which is a combination of the "forward" and the "backward" methods. When using the "stepwise" approach each step involves the addition of a new variable to the model. The variable which at that point explains most of thevariation in the dependent variable is added to the model, while those variables which no longer make a significant contribution are simultaneously removed from the model. After performing this procedure on all variables we are left with afinalmodel,which only consists of significant variables.

There are a number of assumptions which lie at the basis of the performance of a regression analysis. If these assumptions, are not satisfied it makes the outcome of the analysis become either less valid or invalidates it entirely and/or makes it unreliable. In total there are nine assumptions. Janssens et al. (2008,p.140-141)explains them in the following manner:

1. There must be a *causality* present, whereby the dependent variable is explained by the independent variable(s).

2. *All of the relevant* (independent) *variables* must be taken into consideration.
3. The dependent and independent variables must be at least *interval* scaled. If the dependent variable is dichotomous in nature, then logistic regression is the preferred technique. Nominal independent variables may be converted into dummy variables, which could constitute part of the regression-equation.
4. There must be a *linear relationship* between the dependent and the independent variables. In the event there is a non-linear relationship present, the researcher may employ the transformation of the variables previously added to the model (e.g. by taking the square root or the logarithm) or by adding extra variables (e.g. a quadratic term).
5. An *additive relationship* is assumedbetween the dependent and the independent variables, which means that there is no interaction between the different variables.
6. The *residuals* must satisfy the following characteristics:
    a. They are independent from one another;
    b. They are normally distributed;
    c. They have the same variance for each value of the independent variable (homoscedasticity assumption, and if not satisfied, then this is referred to as heteroscedasticity);
    d. No relationship may exist between the subsequent residuals (if this does occur, then this is referred to as autocorrelation). This is particularly important the context of time series.
7. The must be a *sufficient number of observations* in order to be able to provide a good indication of the "fit". The rule of thumb is: at least five times as many observations as variables.
8. *No multicollinearity:*meaning that a high degree of correlation between the independent variables is not permitted.
9. *Attention for outliers.* Outliers are exceptionally high or low values. Although the presence of outliers may not be seen as a violation of the assumptions, it is still important to pay attention to them. Two different approaches may be adopted. One must definitely be included in the estimation of the model. Or, one could reason that this outlier biases the model too sharply and it would be better to leave it out of the dataset. This last solution must be accompanied by the necessary caution and foundation because one might otherwise risk criticism for having manipulated the analysis. It is therefore advisable to first try to estimate the model as accurately as possible, for example by finding out

whether a very important variable was not omitted inadvertently, a factor which might explain the outliers.

The procedure on how to perform a linear regression analysis is essentially fixed. It all starts with *checking the assumptions*mentioned above. Ifnot all of these assumptions are satisfied, one must take appropriate action to find out how to fix this/these broken assumptions. How to fix a broken assumption depends on which assumptionis violated, this is explained more thoroughly in the estimation results chapter.

The next step is to *check the meaningfulness of the model.* The null hypothesis in all regression models is that the slope for all of the coefficients (β_i) is equal to zero. The designed model is only meaningful if one is able to reject this null hypothesis.After the overall significance of the model is established, one can assess the "fit" of the model by examining the R Square (R^2). This measure indicates how much of the variation of the dependent are explained by the variation in the independent variables in the model.An even better way to assess the "fit" of the model is looking at the Adjusted R Square (Add R^2), as this statistic (unlike R^2) corrects for the number of independent variables in the regression model.

Finally, *the coefficients from the model are interpreted.* In order to do this, one have to examine the estimated parameters (β_i) for each of the independent variables to find out whether or not the variable in question have made a significant contribution to the model and whether the sign for the coefficient is like one predicted. The relative importance of the variables in their influence on the dependent variable is also an important point of interest.

Chapter 5 - Data section

5.1Design and procedure

Data for this study was collected by using secondary sources, mainly online databases and other websites. The data consist of single match observations for a total of 20 teams that participated in Tippeligaen between 2007 and 2010. All of the 20 teams included in the analysis played *at least* one season in Tippeligaen during the current time period. Most of the data was collected from the online football database *altomfotball.no*, while additional information was found on various websites. A complete list of the different data sources is showcased in Appendix 1.

5.2Model specification

The demand for Norwegian professional football between 2008 and 2010 was specified as a single equation relationship between the match attendance and the explanatory variables selected based on existing literature. To account for the presence of panel data, a fixed-effect model approach has been used. A fixed-effect model is able to address the influence of variables which are fixed across seasons and specific to each home team. Several factors such as the population in each home team's municipality, ticket price and team tradition is fairly fixed across the entire study period, these variables are therefore omitted from the model. The 2010-season is used as base category for the season variables and the club Viking is chosen as the base team. Sixteen variables are believed to have an impact on attendance, in addition to seasonal and team dummies.Different TV dummy variables will also be added to the base model to examine the posed hypothesis.

Since the number of spectators is obviously constrained by the stadium capacity, the stadium utilization (attendance divided by stadium capacity) is used as a dependant variable rather than the actual attendance,following the previous studies fromKaempferand Pacey (1986) and Fizeland Bennett(1989).This variable will be used to conduct three analyses to determine the hypothesized effects of the different TV variables. Model 1 includes the variable TVAGR, which is used to test if the new broadcasting agreement from 2008 has had an impact on match-day attendance. In Model 2, the variable PUBTV is included to determine whether public TV or Pay TV leads to the biggest decline in attendance. Model 3 examines the scheduling of live television broadcasts on the different TV channels. A normal weekly television broadcasting schedule consists of 3 public televised games (only 2 public TV games during the 2008 season), with the remaining games televised only on per-to-view channels and IPTV. In Norway there are three public TV channels broadcasting live football NRK, TV2 and TV2 Zebra. Dummies are assigned to each of these three to capture any channel specific impact on attendance.

A full summary of stadium attendance is provided in Table 1 on the next page.The average attendance of all the games included in this model was 9,235 spectators, with Rosenborg having the highest attendance with an average of 18,275 spectators and Kongsvinger having the lowest with an average of 2,774 spectators. The average stadium utilization was 67.74 %, with Aalesund having the highest (95.49 %) and Lyn having the lowest (23.77 %). Lyn was also the team with the greatest variance in attendance, with a standard deviation of 4,106 spectators, which equals a stadium utilization of 16.06 %.

Table 1 – Attendance summary by team

Club	Average attendance	Highest attendance	Lowest attendance	Stadium utilization
Aalesund	10,292	10,780	9,409	95.49 %
Bodø/Glimt	4,820	7,400	3,090	65.13 %
Brann	15,882	17,896	12,052	91.71 %
Fredrikstad	11,122	12,800	9,107	85.79 %
Ham-Kam	5,057	6,865	3,562	62.68 %
Haugesund	4,661	5,000	4,056	89.63 %
Hønefoss	3,313	4,489	2,438	77.84 %
Kongsvinger	2,774	4,850	1,542	53.33 %
Lillestrøm	7,959	11,464	5,117	63.67 %
Lyn	6,079	20,152	2,092	23.77 %
Molde	8,198	11,400	5,741	69.47 %
Odd Grenland	6,617	11,295	4,182	47.46 %
Rosenborg	18,275	21,921	13,903	83.64 %
Sandefjord	5,400	8,103	1,142	62.84 %
Strømsgodset	5,921	8,198	3,897	69.66 %
Start	9,188	14,448	6,412	64.26 %
Stabæk	7,355	13,409	3,917	69.12 %
Tromsø	5,322	7,764	3,650	70.96 %
Vålerenga	12,706	24,302	6,250	49.69 %
Viking	13,837	16,600	9,939	83.35 %

5.2.1 Control variables

To analyze the factors influencing attendance the explanatory variables have previously been grouped into four categories; economic, demographic/geographic, game attractiveness, and residual variables.The first group consists of*economic variables*. In prior research ticket price has been largely used as a determinant for attendance, but as mentioned above price is already included in the team variables, as price has been fairly constant during the actual time period. Other studies normally include a social economic factor to account for local purchasing power. A factor which is frequently utilized as a proxy for activity between

areas is unemployment. Social economics could also be an important factor in determining attendance. In this study we only use the home teams regional unemployment rate (UNEMP), since most of the attendance consists of people from the home town population. Data on this factor the best measured by assigning the annual rate in a specific county to all teams located in that county. A negative coefficient is hypothesized for this factor, because people with low purchasing power will probably not prioritize spending their money on watching football games.

The second category of variables is those related to *demographic and geographic factors*. To account for habitual persistence we include the lagged variable ATT_{t-1}, measuring the impact of last season's average attendance on the match in question divided by stadium capacity. Habitual persistence is based on factors unknown to the researcher, such as culture, community influence and other unobserved factors. It is expected that this factor will lead to an increase in match-day attendance. A further geographic factor is the logarithm of distance, measured by using the road distance (in kilometers) between the home and away teamstadiums (lnDIST).It is included to account for potential variation in away support in relation to attendance. The reason behind using logarithm is to remove the presence of a skew in variance, which should be present because most teams are located in Eastern Norway (low distances in between). We expect attendance to be higher when teams in close proximity play against each other, and lower for teams located far apart geographically.

The next set of explanatory variables focuses upon the relative *game attractiveness*, in terms of both quality and overall importance of the match. Team form is likely to be important, both for home and away team. HFORM measures the average number of points taken from the five last games for the home team put together. A win is worth 3 points, a draw 1 point and 0 points for a loss. If the home team is in good form, this should lead to high attendances. We also include a similar variable for the away team (AFORM). We believe an away team in good form also will be more attractive to watch for the home supporters. To measure squad quality, two variables concerning the number of quality or star players in the home (HSTARS) and away (ASTARS) team present at each team in a specific season are included the model. Variables for both home and away team are used, as the number of stars in the away side also has proved to be an important factor in determining attendance in the past.A star player is either a big-money signing or a highly attractive player. A player is defined as highly attractive if he has appeared in an international match during the last three seasons. A team with lots of star players will be seen as a high quality team, and is expected to be attractive to watch. To get a more normally distributed measurement, the number of the

star players is divided on the average number of star players in the league in a specific season.

Another factor which could determine game attractiveness is outcome uncertainty (UNCERT). This variable should account for the winning possibility for both teams. As the uncertainty associated with the outcome of a match increases, attendance is often hypothesized to increase. This study uses an adopted version of a variable initially used by Forrest and Simmons (2006). UNCERT is the absolute value of: *home advantage* + *HFORM* – *AFORM*, with home advantage being the difference in points per games won by all home teams, and points per game won by away team in the previous season.

Newly promoted clubs may encounter a boost in interest amongst their supporters and this may in turn increase attendance. To account for this effect we include the variable PROMTL. Entertainment value is important in determining attendance. The best way to measure this is to create a variable for playing style, however no one have yet found a way to measure this effect. However, we will try to measure the level of entertainment created by each team, by including the variable STYLE in the model. To measure playing style we look at theteam coaches,as they determine the playing style. All coaches have been grouped into four groups depending on playing style; attacking, physical, possession and tactical. This variable examines if a specific playing style creates higher overall attendances than other playing styles. As this has not been done in previous studies on attendance, we do not know the order of each variable in terms of entertainment. The different playing styles will most certainly be mixed in a random order and this variablewill for this reason probablynot be significant. However, this does not really matter much as the point with including this variable in the modelis to find out in which order the different playing styles should be aligned.By finding the correct alignment of the styles, this variable could possibly be used in future research.

Another aspect of entertainment value is derby games. As the literature has shown, derby games will most certainly impact attendance. A derby match is classified as either a game between two clubs in the same area or a game between two of the four historically big clubs in Norway (BRA, RBK, VIK and VIF). These kinds of games are subjected to a lot of rivalry and tension, which usually leads to significantly higher attendances than normal league games.A dummy variable is therefore included in the model to account for this effect.

The remaining variables, which do not fit into a specific group, are labeled as *residual variables*. BIGCLUB is used to test the hypothesis if the four historically big clubs with the largest annual budgets and biggest fan base (BRA, RBK, VIK and VIF) actually have significantly higher attendances that other clubs. This variable is expected to have a positive

coefficient. As mentioned in the literature review Norwegian football changed their league structure before the 2009 season. To confirm if this structural change has impacted the match-day attendance, the variable LEAGUE_XP has been incorporated in the model. According to the people behind this decision, a league expansion should among other things lead to more attractive matches and higher attendances. Games played during a holiday, should be subject toa fall attendance due to previously mentioned reasons. The dummy variable PUBHOL indicate if a game was played during a public holiday.

Games played during midweek (Mon-Fri) have traditionally gotten lower attendances than weekend games. To account for this we include a dummy variable measuring games played during midweek (MIDWEEK). During the course of a season attendance has a habit of gradually declining. At the beginning of the season all teams start with high expectations (on equal terms with zero points), with every team thriving of having the opportunity of winning the league. When the season closes, only a few teams have something left on play for, a title race at the top of the table and a relegation battle in the bottom. The supporters of the remaining teams may have lost interest, feeling there is no reason to attend the remaining gamesas there is nothing left to play for. To determine this possible effect, a MONTH variable is added to the model. The months are ranged from March to November only, as football is off-season during the remaining months. A summary of descriptive statistics for the variables used in all three stadium attendance models are reported in Table 2.

Table 2 – Descriptive statistics

Variable	Description	Mean	Standard Deviation	Min	Max
ATT	Capacity utilization	0.6974	0.21231	0.08	1.07
ATT_{t-1}	Habitual persistence	0.6691	0.20360	0.19	0.99
HFORM	Home team form	1.4441	0.63354	0.00	3.00
AFORM	Away team form	1.5258	0.65439	0.00	3.00
HSTARS	Number of stars in the home team	1.0007	0.31866	0.37	1.91
ASTARS	Number of stars in the away team	1.0007	0.31866	0.37	1.91
LnDIST	Distance between home and away team	5.8946	1.15400	2.20	7.60
UNCERT	Outcome uncertainty	0.6342	0.91933	-1.96	3.83
STYLE	Team playing style	2.6600	1.16600	1.00	4.00
UNEMP	Regional unemployment rate	2.3160	0.60968	1.00	3.60
MONTH	Month when the match is played	6.7600	2.27200	3.00	11.00
DERBY	Game between two rivals	0.1600	0.36600	0.00	1.00
BIGCLUB	Traditionally big clubs in Norway	0.2700	0.44200	0.00	1.00
PROMTL	Team promoted to Tippeligaen last season	0.1800	0.38700	0.00	1.00
PUBHOL	Game is played during a public holiday	0.1400	0.34300	0.00	1.00
MIDWEEK	Game is played on a working day	0.1600	0.36600	0.00	1.00
LEAGUE_XP	Game is played before/after league expansion	0.5700	0.49600	0.00	1.00
NRK	Game is live broadcasted on NRK	0.0900	0.28100	0.00	1.00
TV2	Game is live broadcasted on TV2	0.1300	0.33600	0.00	1.00
ZEBRA	Game is live broadcasted on TV2 Zebra	0.1300	0.33300	0.00	1.00
PUBTV	Game is live broadcasted on public television	0.3400	0.47600	0.00	1.00
TVAGR	Game is played before/after the last broadcasting agreement started	0.7800	0.41200	0.00	1.00

Notes: Sample period 2007-2010 (20 teams, 21 stadiums, 844 observations)

Chapter 6 - Estimation results

To analyze TV broadcasting in relation to stadium attendance and determine other factors explaining stadium attendance, a multiple regression analysis have been conducted in the statistical program SPSS. Three different models were tested. A description of each of the models is coming up next.

Model 1 – the impact of the last TV agreement

$$ATT_{git} = \alpha + \beta_1 ATT_{t-1} + \beta_2 HFORM + \beta_3 AFORM + \beta_4 HSTARS + \beta_5 ASTARS + \beta_6 lnDIST + \beta_7 STYLE + \beta_8 UNEMP + \beta_9 MONTH + \beta_{10} DERBY + \beta_{11} BIGCLUB + \beta_{12} PROMTL + \beta_{13} MIDWEEK + \beta_{14} PUBHOL + \beta_{15} LEAGUE\_XP + \beta_{16} TVAGR + SEASONAL\ DUMMIES + TEAM\ DUMMIES + \varepsilon$$

Model 1 is set to measure the impact the last TV broadcasting agreement have on stadium attendance. The dependent variable is $ATT_{git}$where attendance is measured for a specific game *g* for team *i* in season *t*. TVAGR measures the impact of the last TV agreement. We hypothesize this variable to be negatively signed, meaning that we believe that the last TV agreement have lead to a decline in overall stadium attendance.

Model 2 – the impact of public television versus pay TV

$$ATT_{git} = \alpha + \beta_1 ATT_{t-1} + \beta_2 HFORM + \beta_3 AFORM + \beta_4 HSTARS + \beta_5 ASTARS + \beta_6 lnDIST + \beta_7 STYLE + \beta_8 UNEMP + \beta_9 MONTH + \beta_{10} DERBY + \beta_{11} BIGCLUB + \beta_{12} PROMTL + \beta_{13} MIDWEEK + \beta_{14} PUBHOL + \beta_{15} LEAGUE\_XP + \beta_{16} PUBTV + SEASONAL\ DUMMIES + TEAM\ DUMMIES + \varepsilon$$

Model 2 is set to measure the impact of games broadcasted live onpublic television in relation to Pay TV.As in the last model the dependent variable is $ATT_{git}$where attendance is measured for a specific game *g* for team *i* in season *t*. PUBTV will measure this effect. We hypothesize this variable to have a negatively signed coefficient, meaning that games broadcasted on public TV will also lead to decline in overall stadium attendance.

Model 3 – the impact of public television channels

$$ATT_{git} = \alpha + \beta_1 ATT_{t-1} + \beta_2 HFORM + \beta_3 AFORM + \beta_4 HSTARS + \beta_5 ASTARS + \beta_6 lnDIST + \beta_7 STYLE + \beta_8 UNEMP + \beta_9 MONTH + \beta_{10} DERBY + \beta_{11} BIGCLUB + \beta_{12} PROMTL + \beta_{13} MIDWEEK + \beta_{14} PUBHOL + \beta_{15} LEAGUE\_XP + \beta_{16} NRK + \beta_{17} TV2 + \beta_{18} ZEBRA + SEASONAL\ DUMMIES + \ TEAM\ DUMMIES + \varepsilon$$

Model 3 is set to measure the specific impact each public TV channel have on stadium attendance. As in the two previous models the dependent variable is $ATT_{git}$where attendance

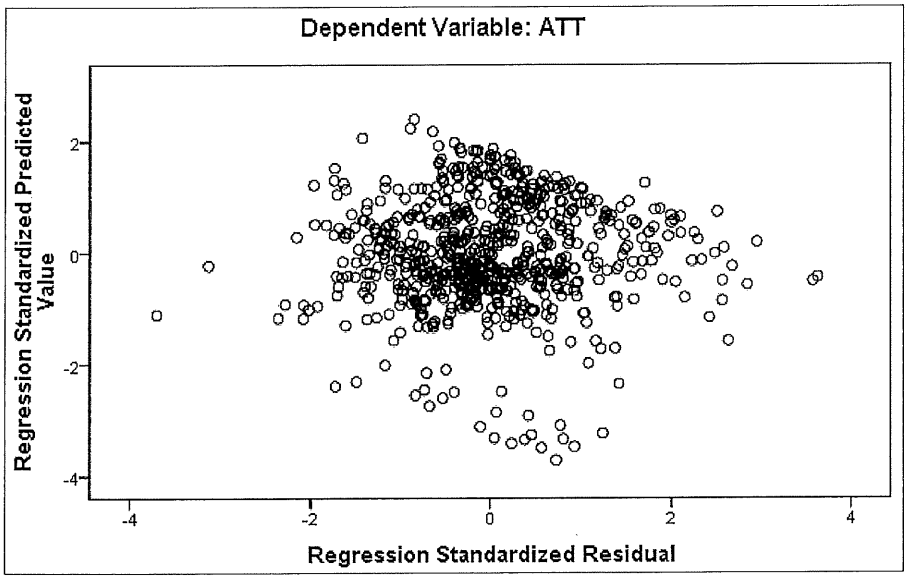
is measured for a specific game *g* for team *i* in season *t*. The three variables NRK, TV2 and ZEBRA will measure this channel specific effect. We hypothesize all thesevariables to have a negatively signed coefficient, with ZEBRA having the most negative impact. This means that we believe that all public television channels make stadium attendance to decrease.

When conducting a multiple regression analysis in SPSS,one has to make sure the model meet all OLS assumptions as discussed in the methodology section. Then we look at the meaningfulness of the model and finally weinterpret the results from this analysis to find out if our hypotheses are correct. We examine the variables to see which are significant and which are not, and if the variables have the expected signs on their coefficients.A full interpretation of the results from the analysis will now be presented.

6.1 Checking the OLS assumptions

When conducting a multiple regression analysis in SPSS, one has to make the model meet all OLS assumptions as discussed in the methodology section. *Assumption 1* is that causality must be present. Since the purpose of this analysis is to determine the impact various factors (independent variables) have on match-day attendance (dependent variable) there is causality present, hence we find this assumption to be met. *Assumption 2* is to check that all the variables have been taken into consideration. To find out if this assumption is broken, we look for the presence of a pattern in the scatterplot between the predicted values (ZPRED) and the residuals (ZRESID), for example if the points are grouped in different clusters (see Figure 2). Such a pattern is not present in our scatterplot meaning that all relevant variables should be included in the model.

Figure 2 – Scatterplot (ZPRED, ZRESID)



Assumption 3 is that the dependant and independent variables must be *at least* interval scaled. In all models attendance in the form of capacity utilization have been used as the dependent variable. This is measured in percentage, which is an interval scaled measurement. When looking at the independent variables are interval scaled, except the dummy variables which are ordinal scaled. However, we assume "equal appearing intervals" giving us the ability to treat dummies as interval scaled variables.

Assumption 4 is that there exists a linear relationship between the dependant and the independent variables. A bias of the regression results will be the result of using a linear regression model when the proper form of the model is not linear in nature (e.g. square or logarithmic). To check this, we once again have to look at the (ZPRED, ZRESID) graph (Figure 2). As we can see the graph does not display a pattern that would indicate a non-linear relationship (e.g. a parabola).

Assumption 5 is that an additive relationship exists between the dependent and the independent variables. To check this assumption a test is performed to determine whether an interaction between the variables HFORM and HSTARS exists. The test concludes the introduction of an interaction between HFORM and HSTARS does not lead to a significant improvement in the model, thus the additive model is chosen as the preferred model.

Assumption 6 is that the residuals must satisfy the following three characteristics: interdependence, normality, and homoscedasticity.*Interdependence* means that each observation must be made independently of the others. Since the data used in the study is only collected from online databases, we believe this information to not be corrupted (i.e. interdependence is present). To check the *normality* we look at the histogram and the normality plot of the standardized residuals.

Figure 3 - Residual histogram and normal probability plot

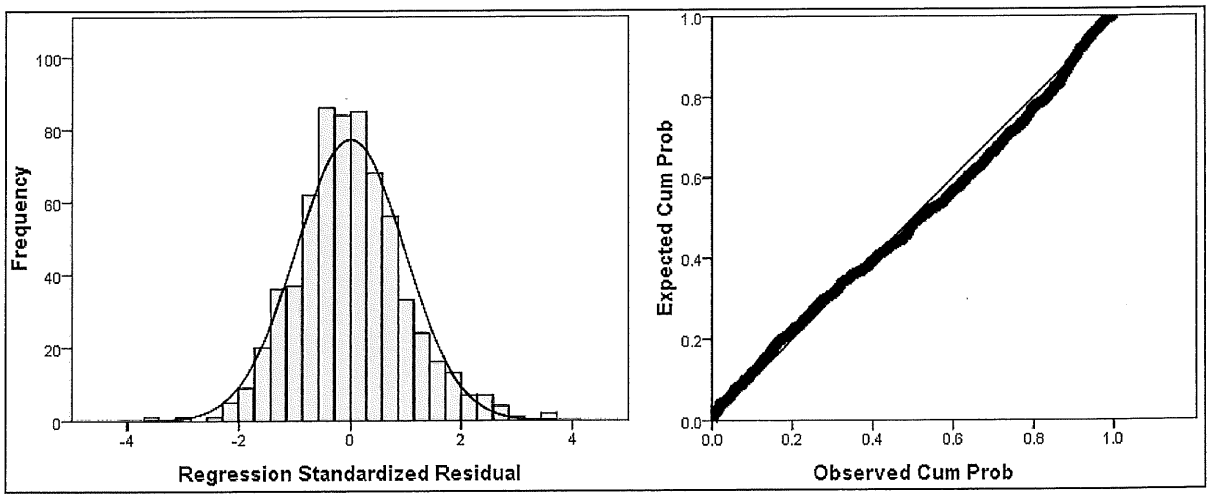


Figure 3 displays a histogram of the standardized residuals. One may observe that the residuals more or less follow the normal curve; hence the residuals look normally distributed. This also seems to be the case for the "normal probability plot", as there is a close fit between the dotted line and the 45 degree-curve. To confirm the *homoscedasticity*, one must once again look at Figure 2. This assumption is broken if a diamond- or triangle shaped pattern exists. None of these patterns seems to exist in the current figure making the homoscedasticity assumption met.

Assumption 7 is that there exist a sufficient number of observations. The rule of thumb is at least five times as many observations as there are parameters to be estimated. The model with the largest number of parameters is Model 3 (40 parameters). The number of observations is sufficient as we only need 200 (5 x 40) whereas there are 662 observations. Model 1 and Model 2 will also have the sufficient number of observations as they both need fewer observations than Model 3.

Assumption 8 is that there is no multicollinearity present. This is checked by looking at the correlation between the bivariate coefficients. A correlation between two variables of 0.6 or more indicates a (multi) collinearity problem. When examining the correlations a high correlation (> 0.7) between the outcome uncertainty and home and away form is found. UNCERT is therefore removed from the models.

To satisfy *Assumption 9* we have to look for influential outliers. In the casewise diagnostics there are found several outliers (outside two standard deviations). To find out if these are significant we will look at Leverage, in addition to Cook's Distance. These variables are combined in a scatterplot to analyze the significance of the outliers. Observations that have both have high Leverage and Cook's Distance will be deemed influential. The graph shows no significant outliers which possess any danger for the estimation results and all outliers is therefore included in the model.

6.2Model interpretations

A summary of all the results from the regression analysis are presented in Table 3.

Table 3 – Estimation results

Base Variables	Model 1	Model 2	Model 3
ATT_{t-1}	0.204***	0.243***	0.208***
UNEMP	-	-0.056***	-0.036***
LnDIST	-0.008**	-0.008**	-
HFORM	0.026***	0.026***	0.030***
AFORM	0.018***	0.020***	0.019***
HSTARS	0.137***	0.134***	0.119***
ASTARS	0.073***	0.050***	0.046***
PROMTL	0.025*	0.054***	0.042***
STYLE	-	-	-
DERBY	0.047***	0.049***	0.061***
BIGCLUB	0.055***	-	-
LEAGUE_XP	-	-	-
PUBHOL	0.043***	0.047***	0.044***
MIDWEEK	-	-	-
MONTH	-	-	-
TV Variables			
TVAGR	-0.151***	N/A	N/A
PUBTV	N/A	0.036***	N/A
NRK	N/A	N/A	0.040***
TV2	N/A	N/A	0.036***
ZEBRA	N/A	N/A	N/A
Model Summary			
Observations	844	662	662
Add R^2	0.776***	0.772***	0.775***

Notes: All models were estimated by regression analysis (stepwise method) on SPSS. */**/*** indicates a coefficient significant at the 0.1/0.05/0.01 level. Variables marked with (-) are not significant. Variables marked with N/A were not included in the model.

When we examined the OLS assumptions we did not find any violations ofthe assumptions. The final models are therefore exactly the same as the initial models, with all games played by 20 teams in 21 different stadiums (Lyn and Vålerenga share the same stadium, while Sandefjord and Stabæk have built new stadiums during the sample period). The attendance ATT is measured for specific game (*g*) for a specific team (*i*)in specific season (*t*). We will next look at the meaningfulness of all three models and interpret the coefficients estimated from the independent variables.

Model 1 is significant at 1%-level and has an adjusted R^2 of 0.776, which indicates a good overall fit of the model.A total of 844 games from four seasons were included in this

analysis. In total 16variables were included in the model, while 11 of these were found to be significant. The variable ATT_{t-1} is significant at 1%-level and has a positive coefficient just like expected. The same is the case for HFORM, AFORM, HSTARS, ASTARS, DERBY, BIGCLUB and PUBHOL. LnDIST was also significant, but only at 5%-level, and had a negative coefficient just like expected. PROMTL had a positive coefficient, but was only significant at 10%-level. The TV variable TVAGR had a negative impact on attendance and was significant at 1%-level. The rest of the variables in the model were not significant.

Just like the first model, Model 2 is also significant at 1%-level and has about the same overall goodness of fit (Add $R^2 = 0.772$). This model includes 662 league games from three seasons.Several of the significant variables from Model 1 are also significant in Model 2. ATT_{t-1}, HFORM, AFORM, HSTARS, ASTARS, PROMTL, DERBY and PUBHOL are all significant at 1%-level and have the expected coefficients.LnDIST is also significant at 5%-level having exactly the same coefficients as in Model 1. Contrasting to the first model UNEMPis significant at 1%-level and has the predicted sign. Regarding the TV variable in this model, PUBTV is significant at 1%-level with a positive coefficient. The remaining variables in this model did not have a significant impact on attendance.

Model 3 examines the impact different public television channels have on match-day attendance. The model has a high overall goodness of fit with an Add R^2 of 0.775, which is significant at 1%-level. Just as Model 2 this model includes 662 games from three seasons. In general Model 2 and Model 3 are very similar having exactly the same significant base variables at exactly the same level of significance. All these variables have similarly signed coefficients as in Model 3.The exception is lnDIST which do not have significant on attendance in this model. As for the TV channel variables, only two of these are significant. NRK is significant at 1%-level and have a positive coefficient. The same is the case with the variable TV2, while ZEBRA do not show a significant effect. The results from the estimation will be thoroughly discussed in the following chapter.

Chapter 7 - Discussion

7.1 Implications on attendance

Starting with the economic variables, unemployment (UNEMP) seems to have a negative impact on match-day attendance, just like we predicted. This means that watching football matches is most popular among people with low purchasing power, although this effect was not significant for Model 1. The second group of variables is the demographic and geographic variables. Habitual persistence proves to be significant, emphasizing that each team has its level of core "support". The coefficient is positive, meaning that high attendances from the previous season lead to high attendances in the following season. The distance between teams also has the expected effect. The variable lnDIST is significant and have the expected signs for Models 1 and 2, meaning that attendance is low when teams with large distances between them play against each other and vice versa for teams in close proximity. This variable is however not significant for Models 3.

When looking at the game attractiveness variables, several of these prove to be significant. In all modelsboth variables measuring the teams' form (HFORM and AFORM) are significant and have positive coefficientsjust as expected, with that of the home team being higher. Coefficients on the home and away teams' number of star players in the squad (relative to season average), measured by the variables HSTARS and ASTARS are both significantly different from zero. It looks like the supporters find watching the best players in live action at their home ground very attractive, regardless of what team they play on.However, the number of stars playing for the home teams seems to create the highest level of excitement among supporters.

Another expected effect is that newly promoted teams get significantly higher attendances than other teams in the league. The estimation results support this view, finding the PROMTL variable to be both significant and positive, although only at 10%-level for Model 1 and 1%-level for Models 2 and 3. We also included the variable STYLE to examine if some playing styles are more attractive than others. The results show that attacking football seems to be the most favorable style of play, followed by physical football and tactical football, with possession football being the least favorable alternative generating the lowest percentage of filled seats in the stadiums among the four styles. DERBY, the last variable in this group, is significant and positively signed as expected. When two rivals play against each other overall attendance is improved by at least 4.7 %.

The remaining factors have all been previously grouped as residual variables. The first

of these variables, BIGCLUB is significant and have a positive beta-value for Model 1. This proves that the highest wagered teams get rewarded for spending money on their team in terms of getting significantly higher match-day attendances compared to other clubs. The LEAGUE_XP variable was not significant, explaining than attendance has not changed significantly after the structural changes, first adopted in the 2009 season. Contrasting to what was expected, the dummy variable PUBHOL have positively signed coefficients. Despite several people travelling away from their hometown during holidays, people still seem to find their way to the stadium during the holidays. Games played during public holidays lead to an increase in attendance by 4.3 %. Games played during the weekdays (MIDWEEK) have no significant impact on match-day attendance. In the literature review we mentioned that previous studies have found evidence that attendance seems to decline during the season. This was however not the case in this study, because the MONTH variable was found to be not significant. Next the coefficients of the different television variables will be discussed.

Hypothesis 1 – Broadcasting of TV matches lead to a decline in "live" attendance.

It would seem from the results of Model 1 that televising matches have a negative effect on match-day stadium attendance. As hypothesized the coefficient on TVAGR is negative and significant, indicating the new broadcasting agreement of Norwegian live league matches co-bought of Norwegian TV2 and Altibox have the effect of reducing attendance by 15.1 %. This effect is not very surprising given the fact that several previous studies from England have reached the same conclusion (Allan, 2004; Baimbridge et al., 1996; Buraimo, 2008). A team-specific list of economic losses due to the new broadcasting agreement is showcased in Table 4.

Hypothesis 2 - Matches sent on public channels (NRK, TV2 and TV2 Zebra) will experience greater decline in "live" attendance than matches which only are televised on pay-to-view channels and IPTV (TV2 Sport, Altibox, VG Live).

In our second model, we look at games televised live on public TV versus games only televised on pay-to-view channels and IPTV. We predicted that matches sent on public TV should lead to a higher decrease in match-day attendance than pay-to-view channels and IPTV. The results from the analysis of Model 2 show the opposite effect, with the PUBTV variablesurprisingly enough havingpositively signed coefficients.As we have seen from the results in the first model, TV broadcasting is responsible for an absolute decrease in match-

day attendance. Since games televised on public TV actually increases attendance, this implies that pay-to-view channels and IPTV are the ones responsible fortheoverall decline.

Hypothesis 3 - Matches televised on TV2 Zebra will lead to the greatest decline in "live" attendance".

The results from the regression analysis of Model 3 show that some public television channels have a significant impact on attendance. The NRK and TV2 dummy variables are both significant, and are surprisingly enough signed with positive coefficients. When a game is live broadcasted on NRK this leads attendance to increase by 4.1 %, while a game broadcasted on TV2 increases attendance by 3.6%. The matches televised on TV2 Zebra did not have any significant impact on attendance. We predicted that all television broadcasting would decrease match-day attendance; however the results show the opposite for games broadcasted on either NRK or TV 2. The reason behind this may be due to the increased publicity a game gets when it is broadcasted on public TV, as the public channels try to promote the game to get a high number of viewers themselves. It could also be because the supporters rally when a match is sent on public TV to promote their club in the best possible manner by creating a good atmosphere in the stadium for the TV audience. Regarding the hypothesis, we believed that TV2 Zebra led to the greatest decline in attendance. According to the results is actually kind of true since matches on TV2 Zebra do not change attendance significantly, while matches televised on NRK and TV2 both lead to increased match-day attendance and TV2 Zebra is therefore the only public TV channels which do not lead to an increase in match-day attendance.

7.2 Economic implications

When we analyzed Model 1, we found out that broadcasting in general decreases stadium attendance by 15.1%. This means that all clubs incur an economic cost due to live broadcasting. An estimation of the exact economic lossesexperienced by each team can be seen in Table 4.The estimation from the table shows that the economic losses for each club range from Kongsvinger with NOK 942,467 to Rosenborg with NOK 7,036,789. In average each club suffers a loss of NOK 3 million per season.

Table 4 – Estimation of economic losses per team

Club	Average price*	Loss in ticket sales (per game)	Loss in ticket sales (season)
Aalesund	163.33	253,835	3,807,525
Bodø/Glimt	160.00	116,451	1,746,768
Brann	156.67	375,715	5,635,728
Fredrikstad	190.00	319,090	4,786,353
Ham-Kam	170.00	129,813	1,947,198
Haugesund	140.00	98,534	1,478,003
Hønefoss	200.00	100,053	1,500,789
Kongsvinger	150.00	62,831	942,467
Lillestrøm	170.00	204,308	3,064,613
Lyn	150.00	137,689	2,065,340
Molde	150.00	185,685	2,785,271
Odd Grenland	170.00	169,858	2,547,876
Rosenborg	170.00	469,119	7,036,789
Sandefjord	100.00	81,540	1,223,100
Strømsgodset	210.00	187,755	2,816,324
Start	170.00	235,856	3,537,839
Stabæk	163.33	181,399	2,720,982
Tromsø	163.33	131,258	1,968,874
Vålerenga	163.33	313,372	4,700,585
Viking	150.00	313,408	4,701,121

Notes: * Lowest available ticket price each season is used as basis for the average price.

The best thing the clubs can do to get rid of these economic losses would be to abandon pay-to-view broadcasting and IPTV, with games only being televised on the public television channels NRK and TV2. This would be good for them because games sent on these channels actually increases match-day attendance, while games televised on pay-to-view channels and IPTV leads to a decrease in attendance. However, this is not very popular among the TV stations, as they have paid a lot of money for the broadcasting rights. Removing the pay-to-view and IPTV broadcasts would therefore lead to huge economic losses for them.

The way that both clubs and the owners of the broadcasting agreement (TV2 and Altibox) deal with this problem today is that the TV stations distribute an economic compensation for each club to account for their losses in ticket sales because of the decline in attendance due to live broadcasting. According to the estimation in Table 4 the average compensation should be at least NOK 3 million. If the figure is less than this, the clubs should make sure to increase the compensation when they start negotiating the new broadcasting agreement, which starts in the 2012 season.

However, the current TV broadcasting agreement provides Tippeligaen clubs with a

combined NOK 500 mill over a four year period (Anfinsen, 2008). This sum is distributed in a way that 50% of the sum is divided equally among the different clubs, while 25% is divided after league position at the end of the season. The last 25% is concerned with how often each team is televised on public television. This means that each club receives a base amount of NOK 3,906,250 per season, which is higher than the sum we calculated from the estimation (NOK 3 mill). As we can see from Table 4 some clubs need more money than this to cover their losses. To outweigh their losses due to live broadcasting these clubs mustthese clubs either end up high on the tables and/or get a lot of matches televised on public TV. Of these two factors, live television coverage is the easiest for club management to manipulate. Club who receive good promotion from their marketing department and other local sources have a larger chance of getting their games televised, and will therefore be better off than other clubs.

Chapter 8 - Conclusion

The purpose of this study was to determine the influence of live TV broadcasting on match-day attendance at the Norwegian Premier League (Tippeligaen). Three hypotheses were created by the researchers, with each of them getting their own model in order to examine if the hypothesis should be rejected or not. All of the models estimated accounted for a number of factors which could have a potential impact on attendance. Variables measuring habitual persistence, team form, number of stars, derby games, newly promoted teams, and games played during the holiday were found to have a significant impact on attendance in all models. In Model 1 the BIGCLUB dummy variable also was found to be significant For Models 1 and 2 the distance between home and away team found to inflict attendance, while unemployment rate was found to be significant for models 2 and 3. In addition dummy variables for seasons and teams were included in all models to account for fixed season and team effects.

If the club management wants to improve match-day attendance and/or the revenue stream there are four factors which the management can manipulate. Getting star players to play for your club will as the regression results have shown definitely increase attendance. However, star players cost money so the club management should make an overall economic assessment before they decide to bring a new star player to the club. Another way to get higher attendances is to adapt to a more offensive style by playing attacking football, as this kind of football creates the highest attendances. The estimation results also show that derbies and games played during the holidays have significantly higher attendances than other games. To benefit from this, club management should increase the ticket price for these games, as

attendance would be exceptionally high and increasing the price should therefore not have any negative impact on attendance.

Five different TV variables were also created to measure the impact of broadcasting on attendance. In Model 1 we measured the potential impact the last Norwegian broadcasting agreement, which started up before the 2008 season. The dummy variable TVAGR was created to examine this effect, using the 2007 season was used as reference measure. Model 2 was supposed to measure whether matches broadcasted live on public TV channels or pay-to-view channels had the biggest impact on match-day attendance. The last model was used to find out if any of the public TV channels broadcasting live football matches had a significant on attendance. We found out that live television broadcasting of Norwegian football games have led to an overall decline in match-day stadium attendance by about 15%.

As we have seenfrom the coefficient of the PUBTV variable, games that are televised on public TV actually *increases* attendance. The estimation results also show both games broadcasted on NRK and TV2 to have a positive impact on attendance, while games broadcasted on TV2 Zebra did have a negative but not significant impact on attendance. This means that games broadcasted on pay-to-view channels and IPTV must be the ones responsible for the general decline in attendance. This means that clubs in average suffers a loss in ticket sales due to the broadcasting of live football games.

Thus, we havefound out that broadcasting of live games lead to a decline of match-day attendance, which makes the clubs suffer economic losses. However, the amount of compensation they receive from the TV stations at the moment seems to greatly outweigh the losses due to live broadcasting. In general this puts clubs in an economically better situation now than what was the case before the broadcasting agreement started. Even though the clubs earn more money from broadcasting than what they lose in ticket sales, the decrease in attendance could also affect some of the clubs other revenue sources. For example; if stadium attendance decreases this could make sponsorsthink of the club less as less attractive, and reduce their financial contribution because of this.In further research, one could therefore look at what impact the decline in attendance has on the clubs other sources ofrevenue.

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Appendix

Appendix 1 – Data source list

Variable	Reference articles	Data Source(s)
ATT	Baranzini, Buraimo, Fizel (AR), Kaempfer (AR), Dobson, Marcum, Baimbridge95, Ferreira, Leadley, Tainsky2010	http://www.altomfotball.no
ATT (*t*-1)	Baimbridge96, Dobson (1), Ferreira, Tainsky2010 (trend)	http://www.altomfotball.no
DISTANCE(KM)	Baranzini, Buraimo, Baimbridge96, Baimbridge95, Carmichael, Forrest	http://visveg.vegvesen.no
HFORM	Baranzini (goalHF)*, Buraimo (PERF HOME)*, Hill (HDSDW)*, Marcum (last 10), Forrest (HPOINTS)	http://www.altomfotball.no
AFORM	Baranzini (goalAF)*, Buraimo (PERF AWAY)*, Hill (VDSDW)*, Marcum (last 10), Forrest (APOINTS)	http://www.altomfotball.no
PROMTL	Baimbridge96, Carmichael	http://www.altomfotball.no
PUBHOL	Buraimo (BANK HOL), Baimbridge96, Baimbridge95, Carmichael	http://www.timeanddate.com/norsk/
MIDWEEK	Buraimo, Baimbridge96, Baimbridge95 (EVENING), Carmichael	http://www.timeanddate.com/norsk/
TV VARIABLES	Baranzini, Buraimo, Hill,Marcum (p.316), Baimbridge95, Carmichael	http://www.altomfotball.no
MONTH	Carmichael (DATECODE), Forrest (dummy)	http://www.timeanddate.com/norsk/
STYLE	Dobson (ENTERTAIMENT, p.265), Leadley (style of play)	http://www.altomfotball.no
HSTARS	Baimbridge96, Baimbridge95, Tainsky2010 (foreign players)	http://www.altomfotball.no
ASTARS	Baimbridge96, Baimbridge95, Tainsky2010 (foreign players)	http://www.altomfotball.no
STADCAP	Baranzini, Marcum, Ferreira	Official club websites found at: http://www.altomfotball.no
UNEMP	Baranzini, Baimbridge96, Dobson, Baimbridge95, Leadley	http://www.ssb.no/
DERBY	Baranzini, Buraimo, Baimbridge96, Baimbridge95	Own calculations
LEAGUE_XP	Baranzini (New formula)*, Fizel (DEREG), Kaempfer (POST), Dobson (# of clubs)	Own calculations
UNCERT	Baranzini, Buraimo, Forrest	http://www.altomfotball.no http://www.nifs.no
BIGCLUB	Fizel (POWER), Kaempfer (POWER)	Own calculations

*Similar variables with other names. (1) Inverse of loyalty if this variable is significant.

Appendix 2 - Price list for Tippeligaen 2008-2010

Club #	Identifier	Complete Name	Population	County	Price 2008*	Price 2009*	Price 2010*
1	AAFK	Aalesunds FK	42 982	Møre og Romsdal	150	170	170
2	B/G	Bodø/Glimt	47 282	Nordland	160	160	-
3	BRA	SK Brann	256 600	Hordaland	150	160	160
4	FFK	Fredrikstad	73 638	Østfold	190	190	-
5	FKH	FK Haugesund	34 049	Rogaland	-	-	170
6	HAM	Ham-Kam	28 344	Hedmark	140	-	-
7	HFK	Hønefoss	28 806	Buskerud	-	-	200
8	LSK	Lillestrøm	47 723	Akershus	170	170	170
9	KIL	Kongsvinger	17 377	Hedmark	-	-	150
10	LYN	SK Lyn	586 860	Oslo	150	150	-
11	MFK	Molde FK	24 795	Møre og Romsdal	150	150	150
12	ODD	Odd Grenland	51 668	Telemark	-	-	170
13	RBK	Rosenborg	170 936	Sør-Trøndelag	170	170	170
14	SAN	Sandefjord Fotball	43 126	Vestfold	-	100	100
15	SIF	Strømsgodset	62 566	Buskerud	150	240	240
16	STA	IK Start	81 295	Vest-Agder	-	170	170
17	STB	Stabæk IF	111 213	Akershus	150	170	170
18	TIL	Tromsø	67 305	Troms	150	170	170
19	VIF	Vålerenga	586 860	Oslo	150	170	170
20	VIK	Viking	123 850	Rogaland	150	150	150

*Price is lowest available ticket price at each stadium

Appendix 3 – Stadium capacity

Club	Arena	Capacity
AAFK	Color Line Stadion	10778
B/G	Aspmyra Stadion	7400
BRA	Brann Stadion	17967
FFK	Fredrikstad Stadion	12800
FKH	Haugesund Stadion	5200
HAM	Briskeby Gressbane	8068
HFK	AKA Arena	4256
LSK	Åråsen Stadion	12500
KIL	Gjemselund	5202
LYN	Ullevaal Stadion	25972
MFK	Aker Stadion	11800
ODD	Skagerak Arena	13500
RBK	Lerkendal Stadion	21850
SAN	Komplett.no Arena	9000
SIF	Marienlyst Stadion	8500
STA	Sør Arena	14300
STB	Nadderud Telenor Arena	7000 (08) 15000 (09/10)
TIL	Alfheim Stadion	7500
VIF	Ullevaal Stadion	25972
VIK	Viking Stadion	16600

Appendix 4 –Playing styles

Playing style	Coach name	Club(s)
(1) ATTACKING	Kåre Ingebrigtsen	B/G
	Mons Ivar Mjelde	BRA
	Tom Nordlie	LSK/FFK
	Kjell Jonevret	MFK
	Ronny Deila	SIF
	Jostein Grindhaug	FKH
	Trond Henriksen	RBK
	Nils Arne Eggen	RBK
(2) PHYSICAL	Frode Grodås	HAM
	Steinar Nilsen	TIL/BRA
	Dag-Eilev Fagermo	ODD
	Reidar Vågnes	HFK
(3) POSSESION	Søren Åkeby	AAFK
	Anders Grönhagen	FFK
	Kent Bergersen	LYN
	Janne Jönsson	STB
	Tor Ole Skullerud	VIF
	Knut Tørum	STA
	Martin Andresen	VIF
	Ole Bjørn Sundgot	HFK
	Trond Amundsen	KIL
	Åge Hareide	VIK
(4) TACTICAL	Tony Gustavsson	KIL
	Kjetil Rekdal	AAFK
	Henning Berg	LYN/LSK
	Erik Hamrén	RBK
	Uwe Rösler	VIK/MFK
	Gunnar Halle	LYN
	Patrick Walker	SAN
	Per-Mathias Høgmo	TIL