BROADCASTING RIGHTS IN FOOTBALL LEAGUES AND TV COMPETITION

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Master Thesis CEMFI No. 1202

December 2012

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This paper is a revised version of the Master's Thesis in partial fulfillment of the 2010-2012 Master in Economics and Finance at the Centro de Estudios Monetarios y Financieros (CEMFI). I am very grateful to Gerard Llobet for his personal interest in the project, his continuous support and his careful and tedious supervision. I also want to thank Fundación La Caixa for its financial support during the Master. Errors and omissions are of my own responsibility.

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Abstract

I present a model of bargaining TV rights in European football Leagues in which there can be both competitive and monopolistic TV markets. I take into account two possible bargaining schemes: team-individual and collective bargaining. By assuming complementarity between watching football on TV and consuming other football goods (merchandising), I construct a model in which teams internalize the effect of selling their TV rights when maximizing revenues. I find that for teams to choose a collective bargaining scheme, the positive externality generated has to be high enough and the relative size between clubs relatively low. The welfare analysis of the model suggests that the EC recommendation of collective bargaining does not take into account the negative effects for consumers when proposing this scheme under a monopolistic TV market.

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1 Introduction

In the last 15 years, the sale of the broadcasting rights in major sport leagues has become a fundamental issue. In the case of football clubs, the proportion of TV rights revenues with respect to the total revenues has increased dramatically in this period: in the case of the major national European football leagues, it has increased from an average 22% in 1996 to 45% in 2010. With counted exceptions, football games are not freely broadcasted anymore and this has generated a considerable amount transfer of revenues from TV consumers to football clubs. Football Pay Per View rights are a strategic device for TV broadcasters in order to use football as an instrument to gain share in other TV markets. Powered by globalization and media, European football has become a global business. As an example, the Premier League, national football competition in England, sold in 2010 its broadcasting rights for a total revenue of 1.27 billion euros, while the Liga de Fútbol Profesional, the national Spanish league, obtained 612 million euros. It is therefore an important topic that needs an economic understanding.

A key aspect of how the TV broadcasting rights are sold is the system of bargaining used. In some cases (Spain), teams own the TV rights and negotiate them individually with the TV platform. In the other system, teams create a cartel (normally run by the league itself) to bargain collectively with the TV platform. An interesting exercise is to compare the league distribution of team revenues in the Spanish LFP and the English Premier League. This comparison is reasonable, given that they have been the top european leagues in the last decade. The differences in revenue payments are considerably higher in the Spanish LFP than in the Premier League: in particular, in the 2009-2010 season the ratio first-last in TV revenues was 12.5 for the Spanish case and 1.53 for the English case.

Figure 1 illustrates these different TV revenues of teams (represented by each dot) of the two leagues in the 2009-2010 season. We use average stadium attendance as a proxy for the dimension and size of each team. The Spanish LFP was organized as an individual bargaining system of TV rights while the English Premier League bargained its rights collectively. We observe a positive correlation between

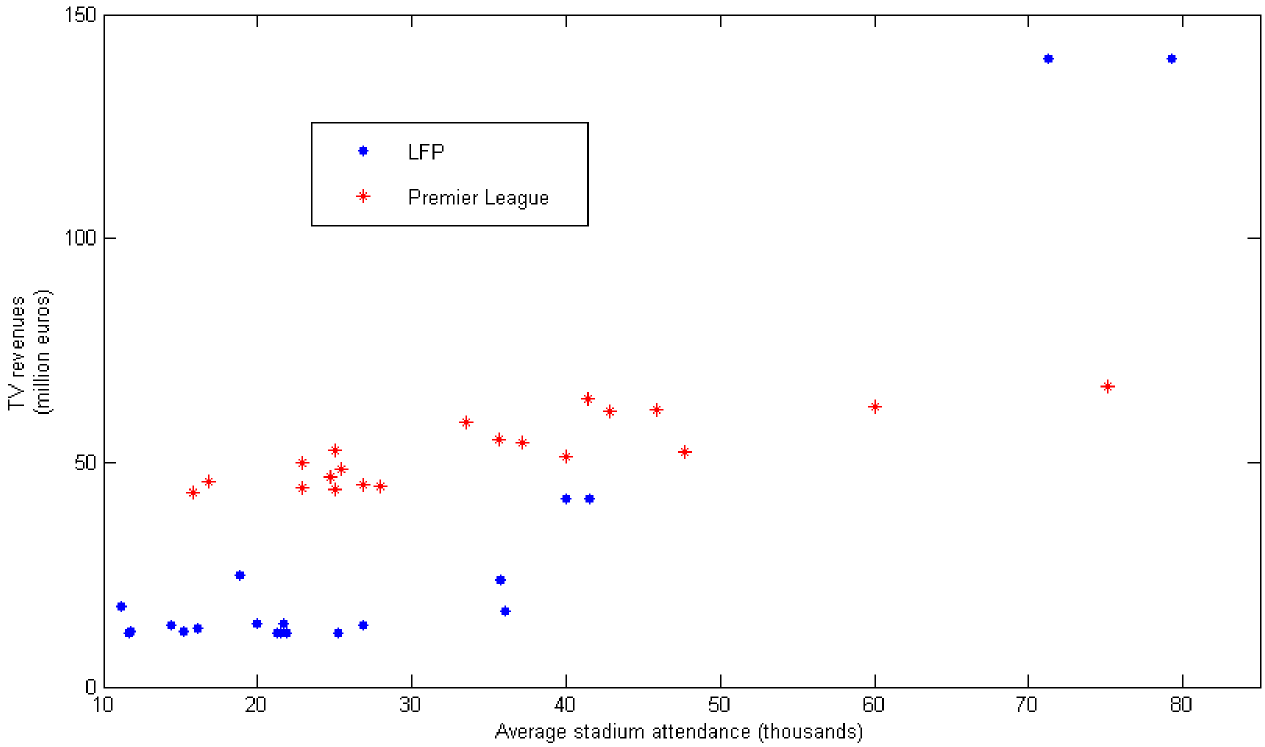


Figure 1: TV revenues and average stadium attendance

these the size of teams and the TV revenues. Moreover, it is important to point out the differences in the distribution of revenues between one league and the other. This of course is related to the bargaining system chosen by the teams and the league.

Some people have discussed that the option of collective sale to a unique broadcaster could be in contradiction to competition in the TV market, as it limits price competition. However, the European Commission has argued that the efficiency advantages of having a unique TV operator overcome the aforementioned costs. The benefits are several:

1. A more attractive competition, in which teams compete in a framework with equal opportunities.

2. A better coordination between the teams, which increases the output when bargaining TV rights, both at a national level and abroad.

3. A better organized competition by the unique TV broadcaster, which generates a more stable context for consumers, both in TV Pay Per View and in stadium attendance.

4. A financial stability among the football teams due to the higher redistribution of revenues.

The EC stated that there was a sufficient compatibility with Competition Law. In particular, from the decisions taken referred to the “UEFA case” (2003) and the “Bundesliga case” (2005), it could be deduced that the centralized sale of broadcasting rights is not contrary to Competition Law. In order to limit the market power of the unique broadcaster in this type of agreements, the EC established a reference point in which the rights are divided in different packages and sold in auctions to different TV platforms. This allows them to hold exclusively the rights on these packages for a maximum period of three years.

After these EC resolutions, all the major national football leagues (including Italy after 2010) and the UEFA Champions League bargain their TV rights collectively. There is only one exception of sufficient importance that must be taken into consideration: the Spanish LFP still operates with a system of individual sale. Moreover, the TV broadcasting market in the Spanish league has has been quite volatile. There has been periods of a unique TV platform with all market power and periods of two TV platforms that were competing for prices and TV rights.

Individual or Collective?

What does it mean to have an individual bargaining system between teams? In an individual bargaining system, teams manage their own TV rights. They sell them individually to a TV broadcaster, which pays a quantity in order to freely broadcast the signal of the team’s games. This signal is sold to different TV channels, which will finally show the match to final consumers. The TV market structure, however, is unrestricted: it can be competitive or monopolistic. In the case of a monopolistic TV market, it is clear, teams will sell their rights to a unique broadcaster. In the case of a competitive TV market, say with two TV broadcasters, each broadcaster will own at least the rights of one team of the league. This means that when two teams whose rights are owned by different broadcasters play each other, the broadcasters will have to reach an agreement on which of the two will broadcast the signal. In Spain, the match must by law be broadcasted by the TV broadcaster that owns the rights of the team playing at home.

A collective bargaining scheme has a more simple structure. Teams gather together and, represented by a supra-entity (which is normally the football league itself), bargain with the TV broadcaster. The revenues obtained are shared according to a ex-ante predetermined rule which normally tries to promote both competition and equality between teams. For example, clubs in England receive broadcast income in the following way: 50% is shared equally between the 20 clubs; 25% is paid in Facility Fees each time a club's matches are shown on TV in the UK (with each club guaranteed a minimum of 10 Facility Fees); and the final 25% is paid in Merit Payments which are dependent on the club's final position in the League Table. Apart from England, this redistribution rule is more or less similar across the different european competitions in Germany, Italy, France and also the European UEFA Champions League.

The aim of this paper is to understand the structure and distribution of TV revenues in football leagues in a theoretical framework relying in two different dimensions:

1. The way revenues are bargained between TVs and clubs: they can be centralized by a single part representing all the teams or it can be done individually by each team.

2. The degree of competition in the TV market, which will have an impact on final prices and team revenues.

I will also take into special consideration how merchandising (an important part of the football club's revenues) can affect team's budgets, considering that merchandising and TV matches are complementary goods in the consumer demand.

Related Literature and Findings

The literature related to the topic is scarce. The only paper related to this particular field of broadcasting rights in sport leagues is one by Falconieri, Palomino and Sákovics (2004) [4]. The authors present a model investigating the differences of the two bargaining systems by introducing competition between clubs of a sport league. They find that individual sale is more appropriate in a league that is large in terms of number of teams, which has relative heterogeneous teams and which has a larger exogenous performance-related revenues. However, they assume that there is only one TV platform- and therefore they do not take into account that when there is individual sale, more than one TV platform can arise in equilibrium- and do not use merchandising profits as part of the revenues of teams.

However, there is a more extensive literature on complementary goods which can be related. Choi and Stefanidis (2001)[1] create a model in which an incumbent supplier may tie two complementary products to fend off potential entrants by investing and innovating. Another example is Haucap and Klein (2009) [6], which analyses the effects of regulation of network infrastructure, denoted as an upstream market, on complementary downstream service markets.

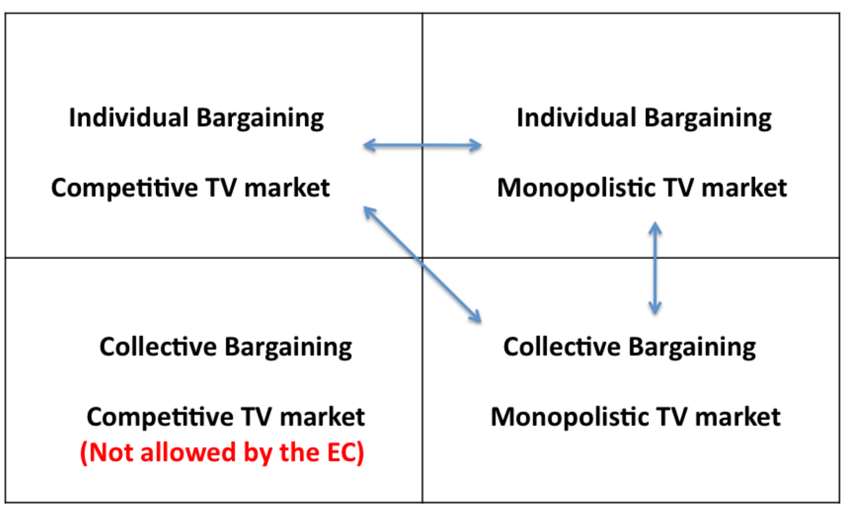


Figure 2: Framework for different equilibria

I create a model of complementary goods (TV and merchandising) for football leagues: one good (TV broadcast) is produced in the upstream market and the other (merchandising) in the downstream market. The model helps to understand the different contractual situations that occur in the sale of TV broadcasting rights in European football leagues by endogenizing TV competition. I take into account the three most plausible different scenarios, according to the bidimensional description of the project above mentioned and summarized in Figure 2. I consider an individual bargaining system both with monopolistic and competitive TV market and a collective bargaining only with a monopolistic TV market, following the EC recommendation. As key questions, I try to answer under which conditions each system will be preferred by teams in a maximization of revenues perspective and which system will be preferred from a socially optimal point of view.

As major results, I find that merchandising profits are higher when there is TV competition, as teams have a higher market power on consumer's demand. These merchandising profits are dependent on two crucial factors: what is the difference between teams size and how the fixed costs function of entering a new merchandising market benefits the highest teams. When comparing the different bargaining systems, I find that in an individual bargaining framework, a competitive TV market is more likely to occur when the differences between teams are higher. Following the EC recommendation, I finally consider a collective bargaining system with a monopolistic TV market system. Assuming a positive externality in TV revenues generated by the cooperation and coordination between teams, I compare this bargaining system with an individual bargaining system with competitive TV market. I find that the higher is the difference between clubs, the harder will be to implement a collective agreement.

The rest of the paper is organized as follows: section 2 presents the model which will help us to understand the topic, section 3 states the equilibrium analysis, section 4 presents a welfare comparison between different equilibria and section 5 concludes. Section 6 provides relevant proofs of the different results as part of a mathematical appendix.

2 The Model

In this section I present a sequential model with four different types of agents. Two TV broadcasters $B1$ and $B2$, two football teams A and B, the football league organizing the competition and a continuum of consumers, divided into supporters of team A (of size λ) and team B (size $1-\lambda$). Without loss of generality, I will assume that $\lambda \geqslant \frac{1}{2}$.

2.1 Consumers

Consumers can buy TV matches and merchandising. The demand of each good will depend on both prices. I will assume that these goods will be complements. The most passionate fans will want to consume TV games altogether with football t-shirts and other merchandising goods of their own team. Regarding the consumer demand, I assume a functional form of the demand such as:

$$D_{TV}(p_{TV}, p_M) = 1 - p_{TV} + \alpha p_M$$

$$D_M(p_{TV}, p_M) = 1 - p_M + \alpha p_{TV}$$

where for having complementarity of goods, α must be negative and close to -1.

2.2 TV market

TV broadcasters buy the broadcasting rights to football teams and sell the signal to different channels in the TV market. In this sense, note that there are two different TV markets, the market for broadcasters and the market for TV channels. Let us assume that there is a continuum of channels that sell a homogeneous good and compete a la Bertrand. Therefore in equilibrium the final price is equal to the price that the broadcasters charge to the channels (the wholesale price will be equal to the final price). The presence of the TV channels is irrelevant in this model, given that they act as efficient intermediaries between TV broadcasters and consumers. Hence, the TV broadcasters will decide what price to charge to the consumers when they sell the football games on TV.

The prices that are set can be the result of a competitive or a monopolistic environment. In the case of a competitive TV market (two TV broadcasters that hold the rights of the two different teams), I assume that they are forced to reach an agreement and pay each other a fixed price which will be independent on the amount of TV consumed by the football fans. I will take into account the net payment r^* that broadcaster $B1$ will pay to $B2$ so that if they pay each other the same amount we will have that $r^* = 0$.

2.3 Football League

Although it has no power at all in an individual bargaining system, the football league plays a central role in the collective bargaining system. It is the one bargaining as a representative of the football teams. Let us then assume that the league represents the interest of all the teams and gives a weight to teams dependent on their size in a way that there is a very high concern to promote budget equality between teams. Smaller teams will be better considered in the league's utility function. With this in mind, I introduce the utility of the league, which will try to maximize the total team profits without forgetting to promote equality in profits. Let Π_A^C and Π_B^C the total profits of teams under a collective agreement. Then the utility function of the league is:

$$U(\Pi_A^C, \Pi_B^C) = \Pi_A^C + \Pi_B^C - \beta(\Pi_A^C - \Pi_B^C)^2$$

where $\beta > 0$ denotes a preference for redistribution and equality.

2.4 Football teams

When operating individually, the football teams will have all the bargaining power in the bargaining process with TVs. They will appropriate all the surplus generated by the TV broadcasters and will share it depending on their size λ and $1 - \lambda$.

Also, we set that the teams will sell merchandising in order to balance their budget. We assume that there is a continuum of markets x where teams can sell their products. All teams are different in their behaviour and enter a different number of markets: this will depend on their size λ. Bigger teams will be able to enter in more markets than small teams due to a fixed cost $F(x)$ of entering each market x. I choose $F(x) = x^n$, so that:

1. $F'(x) > 0$.

2. The fixed cost of the first market $x = 0$ is normalized to zero: $F(0) = 0$.

3. $n > 1$, where n denotes the degree of benefits given to the biggest teams.

The fixed cost can be interpreted in different ways. For example, x can be the distance from the city where the team is based to the market it has decided to sell, with each market having a fixed cost of entering increasing in the distance to the club's city. A more simple interpretation could be that $F(x)$ captures that the size of each market is decreasing in x and only larger teams will be able to enter in these markets. Note that the relevant issue is that the team with a higher number of supporters will be able to sell in more markets.

The bargaining system that the teams endogenously choose can be an individual or a collective system and in the case of an individual bargaining system, teams will choose either a monopolistic or a competitive TV market.

3 Equilibrium

3.1 Individual Bargaining

In an individual system, the teams bargain separatedly with the TV broadcasters, so that the timing of the game is as follows:

1. Teams bargain with TV platforms the amount they receive for their TV rights. In the case of monopoly, we assume that team A bargains first and this gives him all the bargaining power with respect to team B.

2. If $B1$ and $B2$ are broadcasting, they must reach an agreement of a fixed price r^*.

3. Prices for TV games are set. We will have either competitive prices or monopolistic prices depending on the number of TV broadcasters.

4. Teams will set a price for the merchandising.

The second step of the model is not relevant in practice. This would only be relevant if the price was paid per unit or if there was not reciprocity in the agreement (i.e. if in this agreement, one TV can broadcast but the other cannot). I assume that both of the TV broadcasters are allowed to broadcast and that both pay each other a fixed quantity.

3.1.1 Competitive environment

We solve the game by backwards induction, starting in step 4. Given the prices for TV, the last step of the game is one in which teams maximize merchandising revenues. But due to the existence of two competitors in the TV market, teams will already internalize that $p_{TV} = c_{TV}$ and the quantity $r^* = 0$. Of course we will have that profits from TV will be zero so that $\Pi^I_{TV,2} = 0$. The price for merchandising will come from the following problem:

$$\begin{aligned} \underset{p_M}{\text{Max}} \quad & D_M(p_{TV}, p_M)(p_M - c_M) \\ \text{s.t} \quad & p_{TV} = c_{TV} \\ & r^* = 0 \end{aligned} \tag{1}$$

so that we obtain that

$$p_M = \frac{1 + \alpha c_{TV} + c_M}{2} \quad \text{and} \quad \Pi^I_{M,2} = \left(\frac{1 + \alpha c_{TV} - c_M}{2} \right)^2$$

where $\Pi^I_{M,2}$ denotes the merchandising profits net of fixed costs that would be obtained in each market (with $\lambda = 1$) in an individual bargaining scheme with two TVs (competition). Note that this price will be high as a result of the market power that teams acquire given that TV prices are low due to competition.

Total merchandising profits will depend on the previous expression, subject to the size of the teams and on the total fixed costs, which will also depend on the size λ through the number of markets where teams enter $x^*(\lambda)$. This yields:

$$\Pi^I_{M,2}(\lambda) = \int_0^{x^*(\lambda)} \left(\lambda \Pi^I_{M,2} - F(x) \right) dx \tag{2}$$

where $x^*(\lambda)$ is the last market in which a team with size λ will sell their products

$$\lambda\Pi^I_{M,2} - F(x^*(\lambda)) = 0$$

so that

$$x^*(\lambda) = F^{-1}(\lambda\Pi^I_{M,2})$$

Choosing prices to maximize (2) is equivalent to choose prices in (1), as only $\Pi^I_{M,2}$ depends on p_M. Therefore the solution for (2) will be:

$$\Pi^I_{M,2}(\lambda) = \left(\frac{n}{n+1}\right)(\lambda\Pi^I_{M,2})^{\frac{n+1}{n}} \tag{3}$$

Lemma 1. *From the function of the merchandising profits $\Pi^I_{M,2}(\lambda)$ we have the following characterization:*

1. $x^*(\lambda) < 1$
2. $\frac{\partial\Pi^I_{M,2}(\lambda)}{\partial\lambda} > 0$
3. $\frac{\partial\Pi^I_{M,2}(\lambda)}{\partial n} > 0$
4. $\frac{\partial\Pi^I_{M,2}(\lambda)}{\partial n\partial\lambda} > 0$

The merchandising profits are increasing in λ. Hence the bigger is a team, the more markets it will be able to enter so that that the profits will increase. On the other side, note that if the cost of entry is lower (n is higher), given that $\lambda\Pi^I_{M,2} < 1$, the higher will be the merchandising profits and hence $\frac{\partial\Pi^I_{M,2}}{\partial n} > 0$. As we can see in Figure 3, a very high n implies low fixed costs for values lower than 1. In this situation (n high) it is profitable to increase the number of markets x^* and so the profits are higher. The final consequence is that the higher is n, the higher are the profits of being a big team. This comes directly from assumption (3) of the fixed costs function $F(x) = x^n$, with $n > 1$.

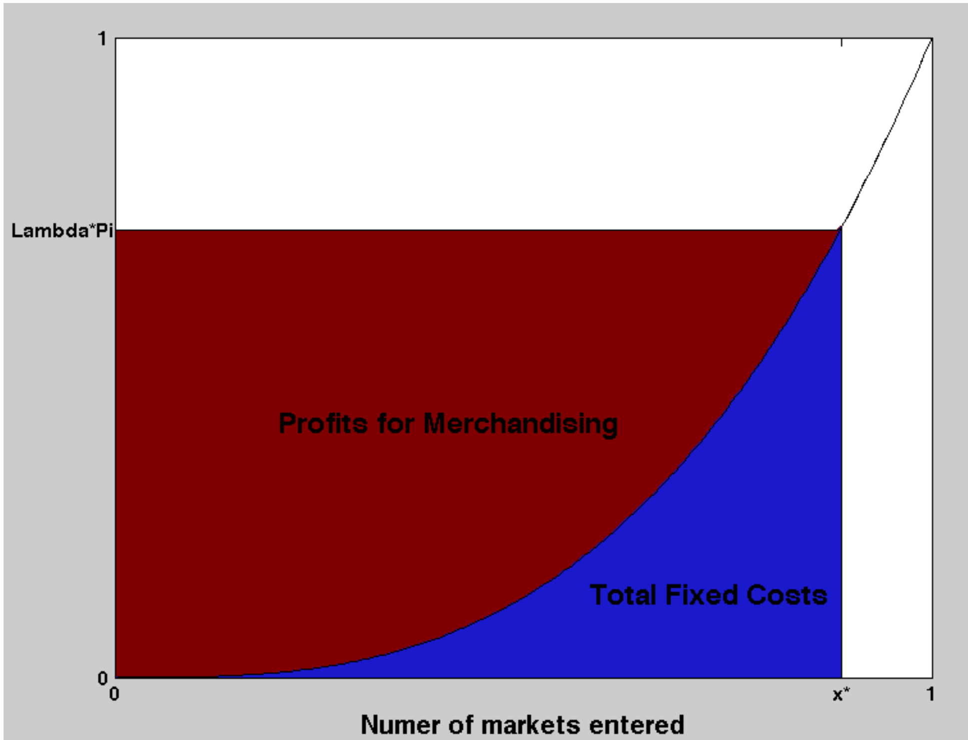


Figure 3: Structure of merchandising profits

3.1.2 Monopolistic environment

In this case, given that there is a single TV broadcasting, there is no step 2 in the game. By backwards induction, we start solving the game in the last step, in which teams maximize their merchandising revenues net of fixed costs for a given price p_{TV}. Therefore the maximization program for the teams is:

$$\underset{p_M}{\text{Max}}(p_M - c_M)(1 - p_M + \alpha p_{TV}) \tag{4}$$

This yields $p_M = \frac{1+\alpha p_{TV}+c_M}{2}$. TVs take this price as given and maximize:

$$\underset{p_{TV}}{\text{Max}}(p_{TV} - c_{TV})(1 - p_{TV} + \alpha p_M) \tag{5}$$

$$\text{s.t} \quad p_M = \frac{1 + \alpha p_{TV} + c_M}{2}$$

We obtain the following prices:

$$p_{TV} = \frac{c_{TV}}{2} + \frac{2 + \alpha(1 + c_M)}{2(2 - \alpha^2)}$$

$$p_M = \frac{(4 - \alpha^2)(1 + c_M) + \alpha(2 - \alpha^2)c_{TV} + 2\alpha}{4(2 - \alpha^2)}$$

so that:

$$\Pi^I_{M,1} = \left(\frac{(2 - 2c_M + \alpha c_{TV})(2 - \alpha^2) + (2\alpha + \alpha^2(1 + c_M))}{4(2 - \alpha^2)} \right)^2$$

and

$$\Pi^I_{TV,1} = \frac{(2 + \alpha(1 + c_M) - (2 - \alpha^2)c_{TV})}{8(2 - \alpha^2)}$$

where similar to the previous environment, $\Pi^I_{M,1}$ denotes the profits net of fixed costs that would be obtained per market with $\lambda = 1$ in an individual bargaining scheme with one TV (monopoly). As in (3), the number of fans λ and the fixed costs of each market x lead to a similar expression for total merchandising profits under monopoly:

$$\Pi^I_{M,1}(\lambda) = \left(\frac{n}{n+1} \right) (\lambda \Pi^I_{M,1})^{\frac{n+1}{n}}$$

for which the results found for Lemma 1 can be applied similarly. Given that teams lose some market power in this case, the profits from merchandising will be lower than in the competitive TV market case but now there will be positive profits from TV.

The question arising after presenting these two different environments is under which conditions will one dominate the other. This will of course depend on the strategic decision taken by both teams. In order to have a monopolistic TV market, we need both teams willing to participate, so that if only one deviates from the decision, then it will go to a potential new TV to bargain for its rights and a competitive TV market will automatically arise. [1] . Team A bargains first so that in order to make B accept it will leave the amount for which B will be indifferent between going to a second TV or stay in a single TV scheme.

[1]Note the implicit assumption that the TV's are in the market ready to respond to the teams strategic decisions.

Proposition 1. *Under individual bargaining, a competitive TV market is preferred by teams if* $G(\lambda, \alpha, n, c_{TV}, c_M) \geqslant 0$*, where:*

$$G(\lambda, \alpha, n, c_{TV}, c_M) = \Pi^I_{M,2}(\lambda) + \Pi^I_{M,2}(1-\lambda) - \left(\Pi_{TV,1} + \Pi^I_{M,1}(\lambda) + \Pi^I_{M,1}(1-\lambda)\right)$$

Else, if $G < 0$*, a monopolistic TV market will arise.*

Rearranging terms, the condition $G \geqslant 0$ is equivalent to:

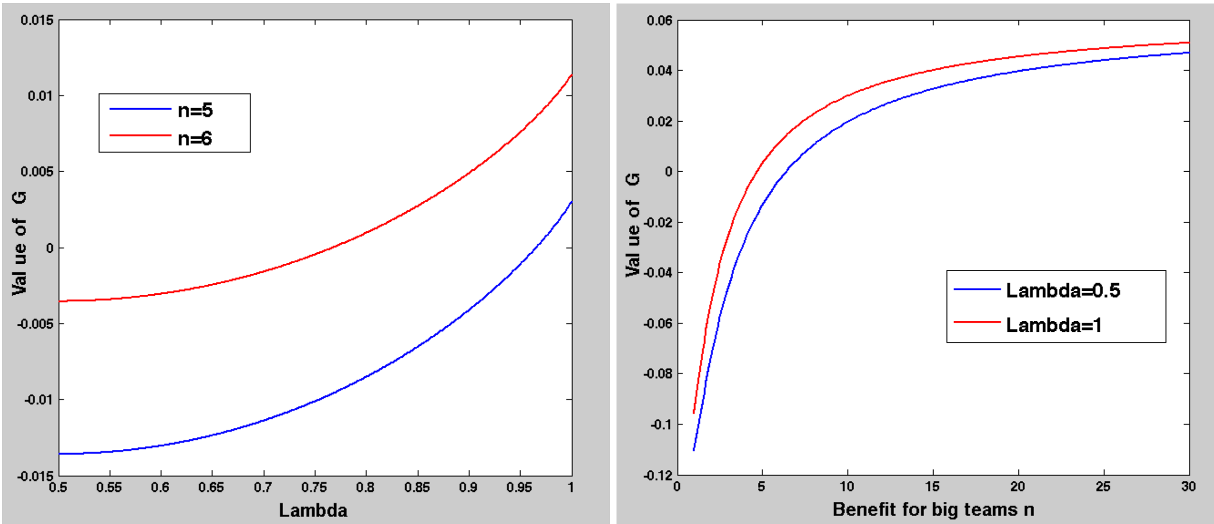
$$\Pi^I_{M,2}(\lambda) + \Pi^I_{M,2}(1-\lambda) \geqslant \Pi_{TV,1} + \Pi^I_{M,1}(\lambda) + \Pi^I_{M,1}(1-\lambda) \tag{6}$$

This means that the TV market outcome will depend in the end on the total revenues generated by both teams. The left hand side of the expression will be the total revenues generated under competition and the right hand side will be the revenues under TV monopoly. Summarizing, a positive G means that the market power that the teams have in the merchandising market is so high that the subsequent profits surpass the profits under a monopolistic TV market. If merchandising profits are higher under a competitive equilibrium, any variable that will make the merchandising profits increase will increase the probabilities of a competitive TV market.

Corollary 1. *In a neighborhood of* $\alpha = -1$*, a competitive TV market is more likely when n is higher,* λ *is higher and the marginal costs* c_M *and* c_{TV} *are lower. Moreover, when the benefits n of being a big club are higher, a higher difference between clubs will make a competitive TV market more likely to occur.*

The previous results are direct consequences of taking partial derivatives of the function G at $\alpha = -1$. A few things must be commented. If n is sufficiently high and the marginal costs low enough, we have that the competitive outcome will arise. In this line, note that a high relative size between teams λ will imply a higher probability of a competitive market. In terms of merchandising, it is more profitable to have a very strong team and a weak one because the strong will enter in many markets and given that $F(x) = x^n$ is convex, this will not affect too much the weak one.

Figure 4 illustrates an example of parametrization of the function G applying Corollary 1 by assuming perfect complementarity $\alpha = -1$. We evaluate the function



(a) $\alpha = -1$, $n_1 = 5$ and $n_2 = 6$ ($c_{TV} = c_M = 0$) (b) $\alpha = -1$, $\lambda = 0.5$ and $\lambda = 1$ ($c_{TV} = c_M = 0$)

Figure 4: Values of G at $\alpha = -1$

G at $c_{TV} = c_M = 0$ for different values of λ and n. As we see, higher values of λ and n will imply a more likely competitive TV market, given that the profits from merchandising increase.

Lastly, I evaluate the option that teams have to gather and bargaining the broadcasting rights collectively.

3.2 Collective Bargaining

In an collective system, the teams decide to join to maximize the surplus generated from TV rights. A supra-entity, which will be the one organizing the league, will want to promote competition between clubs and will be the one deciding how much will each team be getting as TV revenues after the bargaining process. We only evaluate the outcome of a monopolistic TV market, following the EC recommendation. In order to promote competition, we assume a preference for equality in the league's utility function. The timing of the game is as follows:

1. The league bargains with a single TV broadcaster the total amount received.

2. The league shares the TV revenues with teams according to a redistributional

rule.

3. Prices for TV matches are set by the unique broadcaster.

4. Teams will set a price for the merchandising.

In practice, there are important advantages of a collective bargaining scheme in terms of coordination, cooperation and the avoidance of financial problems. Some of these were given by the EC in order to promote a collective bargaining scheme. Moreover, compared to individual bargaining leagues, competitions that sell their rights collectively generate an extra total revenue, for example, when going abroad to sell their rights in other countries. I assume a positive externality $\delta > 1$ that will generate an extra TV surplus $(\delta - 1)\Pi^{I}_{TV,1}$ when the bargaining is centralized. Therefore, given that the league has no access to the merchandising revenues, it will use the TV revenues as a redistributional device between clubs in order to promote a more equal share of the total revenues. This argument is in line with the EC recommendation, given that a competitive TV market gives no option for redistribution through TV revenues. Merchandising and TV revenues are strategic devices used by teams and league in order to maximize their utility.

The league will maximize its utility subject to the budget constraint and the participation constraints of both teams in the collective bargaining system. Depending on the conditions for Proposition 1, the outside option for the participation constraint of both teams will vary. Teams have these outside options if they want to break the collective bargaining agreement and go to an individual bargaining system. We will have two cases:

3.2.1 Monopolistic TV outside option

Suppose we have a monopolistic TV market that dominates the competitive TV market in the individual bargaining system. In this trivial case, a collective bargaining system will arise given that $\delta > 1$ and therefore it will be for sure an advantage to move to a bargaining system where the participation constraints will be satisfied. At worst, teams will be as good as in the individual system and given that the total revenues are increased by the externality δ, none on the teams will be worse off, so that a collective bargaining system will dominate the individual one.

3.2.2 Competitive TV outside option

The interesting case as an outside option for the teams, which is the one we will study more deeply, is when in the individual bargaining system we have a competitive TV market. We denote Π_A^C and Π_B^C the total revenues obtained under a collective bargaining scheme by each team for the relevant case of an outside option of a competitive TV market. The maximization program of the league is:

$$\underset{\Pi_A^C,\Pi_B^C}{\text{Max}}\ \Pi_A^C + \Pi_B^C - \beta(\Pi_A^C - \Pi_B^C)^2 \tag{7}$$

$$\text{s.t.} \qquad \Pi_A^C + \Pi_B^C \leqslant \delta\Pi_{TV}^I + \Pi_{M,1}^I(\lambda) + \Pi_{M,1}^I(1-\lambda) \tag{BC}$$

$$\Pi_A^C \geqslant \Pi_{A,2}^I \tag{PC A}$$

$$\Pi_B^C \geqslant \Pi_{B,2}^I = \Pi_{B,1}^I \tag{PC B}$$

where the fact that $\beta > 0$ indicates a preference for equality.

The interior solution from the FOC for the unconstrained maximization problem is to set $\Pi_A^C = \Pi_B^C = \frac{\delta\Pi_{TV}^I + \Pi_{M,1}^I(\lambda) + \Pi_{M,1}^I(1-\lambda)}{2}$ but of course this will not be implementable always given that we have two participation constraints, one for each team. Therefore we will have three scenarios that will depend on how big can δ be. The larger δ is, the easier will be to have more redistribution among teams using the TV revenues as a redistributional device.

Proposition 2. *Characterization of equilibria with different values of δ:*

1. *If $\delta < \delta_1^*$, we have a collective bargaining system with full redistribution.*

2. *If $\delta_2^* \leqslant \delta < \delta_1^*$, we have a collective bargaining system with partial redistribution.*

3. If $\delta \leqslant \delta_2^*$, teams choose individual bargaining.

where

$$\delta_1^* = \frac{2(\frac{n}{n+1})\lambda^{\frac{n+1}{n}}(\Pi^I_{M,2})^{\frac{n+1}{n}} - (\lambda^{\frac{n+1}{n}} + (1-\lambda)^{\frac{n+1}{n}})(\frac{n}{n+1})(\Pi^I_{M,1})^{\frac{n+1}{n}}}{\Pi^I_{TV}} \tag{8}$$

and

$$\delta_2^* = \frac{\left(\lambda^{\frac{n+1}{n}} + (1-\lambda)^{\frac{n+1}{n}}\right)\left(\frac{n}{n+1}\right)\left((\Pi^I_{M,2})^{\frac{n+1}{n}} - (\Pi^I_{M,1})^{\frac{n+1}{n}}\right)}{\Pi^I_{TV}} \tag{9}$$

Individual Bargaining	***Collective Bargaining***	***Collective Bargaining***
	δ_2^* *Partial redistribution*	δ_1^* *Full redistribution*

We now characterize the values of δ_1^* and δ_2^* from the previous result:

Corollary 2. *The redistribution through a collective bargaining system is harder to implement the higher is the difference between teams λ and the convexity of the fixed costs n. The higher are λ and n, the higher will be the threshold values δ_1^* and δ_2^*.*

The threshold value δ_2^* is the central parameter of the model and helps us understand the differences between individual and collective bargaining systems. Clearly for $\lambda > \frac{1}{2}$ we have that $\frac{\partial \delta_2^*}{\partial \lambda} > 0$ [2]. Therefore the higher the inequality between clubs is, the harder it will be to implement a collective bargaining. If λ is higher, then the sum for merchandising of both teams is higher due to the convexity of $F(x)$. What the big team gets is more than what the small team loses. Then this will imply that the advantages of having two TV's against a single TV increase due to the extra profits of merchandising. In this case, it is harder to implement a system (collective

[2]The previous result is a direct consequence of taking partial derivates of δ_1^* and δ_2^* with respect to λ and n.

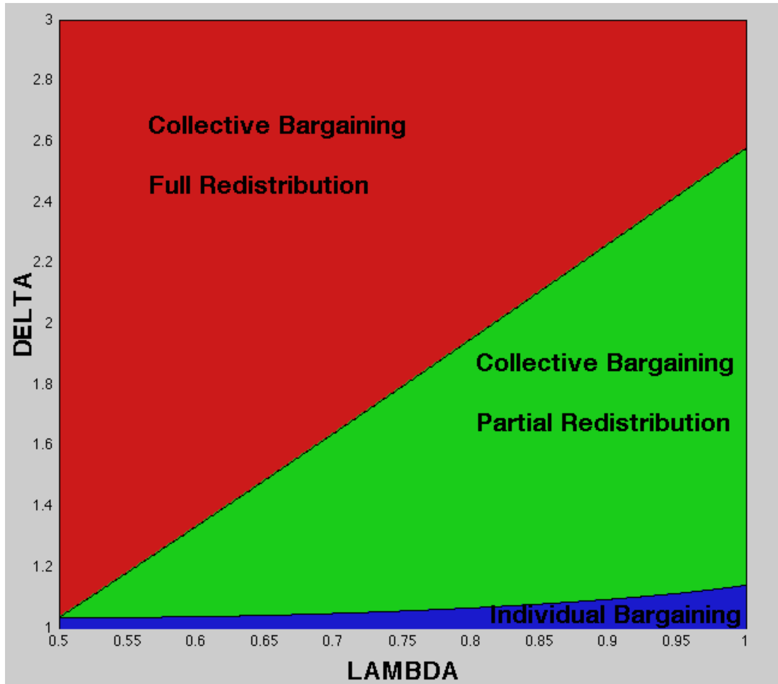


Figure 5: $n = 7$ and $c_{TV} = c_M = 0$

or individual) with a single TV broadcaster. In particular this will happen for a collective bargaining system, where we will have by definition a monopolist in the TV market. The big team would be in such a profitable position under competition in an individual bargaining system that the profits to move to a collective bargaining system have to be sufficiently large (high externality δ).

Figure 5 shows the different regions determined by the previous result depending on the size λ of teams. Consider two different leagues with the same value for the externality δ (say $\delta \simeq 1.1$ in the figure) different values of λ. It may be the case that one stays in an individual bargaining system (the one with high λ) and the other moves to a collective bargaining system (low λ). So leaving all the rest the same, the inequality of a league is a determinant factor of the system chosen by teams.

The previous argument can be used to explain that if fixed costs are more beneficial for bigger teams (higher n), this will imply a harder implementation of a collective bargaining agreement ($\frac{\partial \delta_2^*}{\partial n} > 0$). As we have already said, a higher n increases the

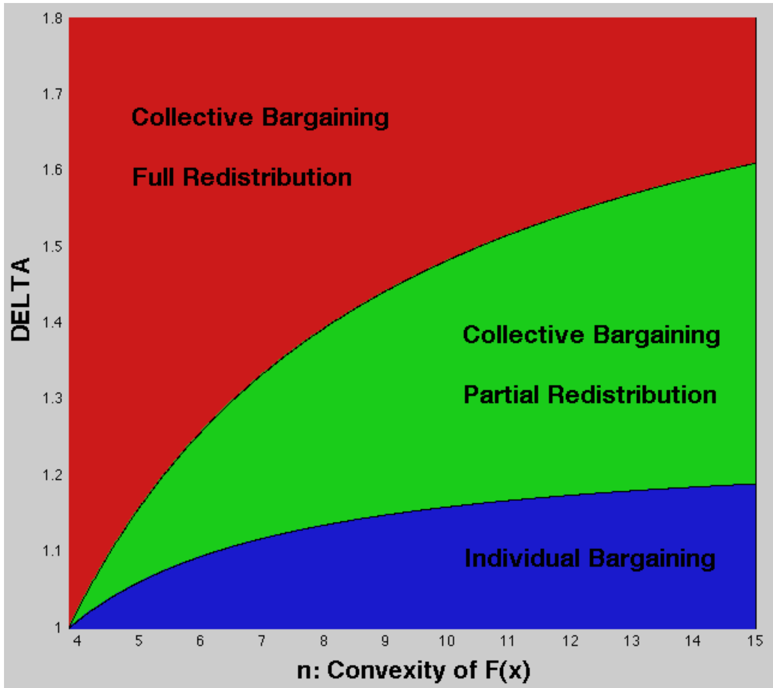


Figure 6: $\lambda = 0.6$ and $c_{TV} = c_M = 0$

total merchandising profits of both teams so that the advantages of having two TV's against a single TV grow. Consequently, the externality needed for the collective bargaining must be higher [3] .

A similar argument to Figure 5 can be done in Figure 6, but this time with two leagues with different fixed costs. It may be the case that the league with lower n stays under a collective bargaining system and the other under an individual bargaining (higher n). As we have said, the convexity of the fixed costs affects the merchandising profits positively, creating differences in revenues in the outside option for teams.

[3]The interpretation given to δ_2^* can also be used to understand the change from partial redistribution to full redistribution δ_1^* inside the collective bargaining system.

4 Welfare Analysis

An essential issue in this problem is to see which outcome maximizes social welfare. This analysis inherits the arguments launched by the EC in the recommendations provided in the different Competition Cases related to the topic. The Commission is concerned to provide a high-quality service at a reasonable price. But as it has been said, there are remarks against this position insisting in the fact that a competitive TV market will definitely make consumers better off. The model is capturing these trade-offs that there are between choosing a collective bargaining equilibrium with monopolistic TV market (higher TV prices and higher quality) and an individual bargaining scheme with TV competition (lower TV prices and lower quality).

In order to compute the social welfare function, we need the functional form of the consumer's utility in order to compute the indirect utility. The demand for goods presented in the model is consistent with the following quadratic utility function:

$$U(q_{TV}, q_M) = K + \left(\frac{1}{1-\alpha}\right)(q_{TV} + q_M) + \left(\frac{\alpha}{\alpha^2 - 1}\right) q_{TV} q_M + \frac{1}{2(\alpha^2 - 1)}(q_{TV}^2 + q_M^2)$$

where the constant term is

$$K = -\beta(\Pi_A - \Pi_B)^2$$

so that I assume that consumers are concerned with equality in the football league in order to have a more attractive competition between clubs. Given that K is independent on the demand for goods, we are implicitly assuming that consumers are atomistic in their demand, so that they do not internalize that their preference for equality can affect the final profits' outcome. It will only be the league the one that internalizes this preference for equality. This utility function cannot be well defined when $\alpha = -1$ so that in the case of welfare analysis we use values of $\alpha \neq -1$ but in a neighborhood of -1. Given that there is a measure 1 of consumers, the social welfare function is:

$$W = U(q_{TV}^*, q_M^*) - p_{TV} q_{TV}^* - p_M q_M^* + \Pi_A + \Pi_B$$

In order to capture the previously mentioned trade-offs, we use this function to compare a collective bargaining system with monopolistic TV market with an individual bargaining system with competitive TV market. We perform a graphic analysis, in which we take into account the parameters δ, β and λ an plot the decisions by both teams and society with respect to this parameters. We do this analysis with two purposes:

1. Analyze which bargaining system is optimal from a social welfare point of view.
2. Evaluate if the decision taken by teams when deciding which bargaining system to choose is optimal from a social welfare perspective.

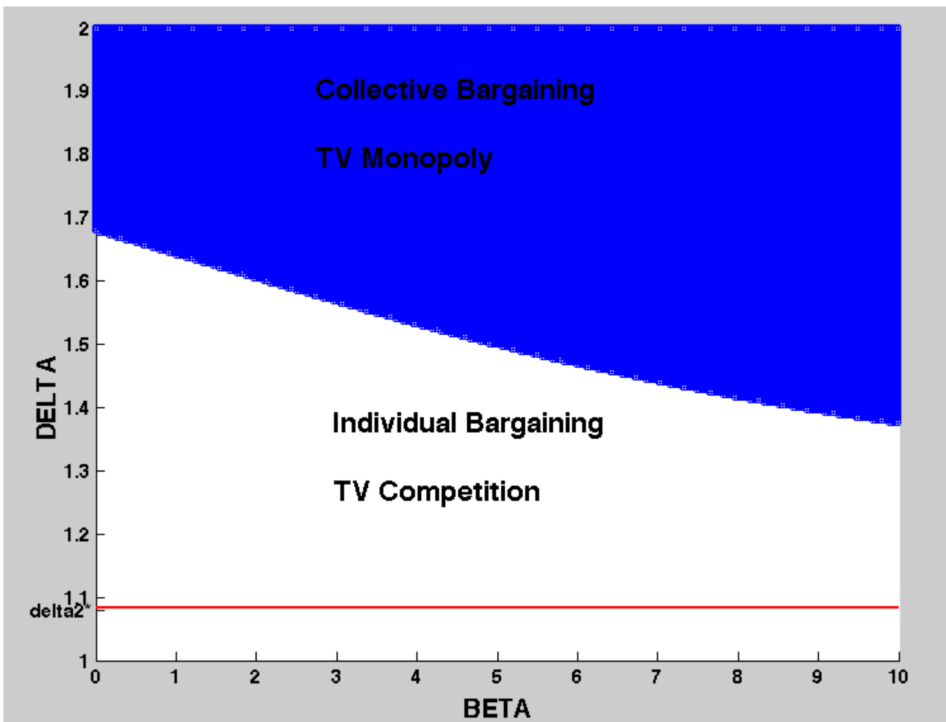


Figure 7: $n = 8$, $\lambda = 0.69$ and $c_{TV} = c_M = 0$

Figure 7 analyzes the teams decision and the social optimal decision with the parameters δ and β. If the preference for equality β is higher, the externality δ needed to implement a collective bargaining will be lower. It will be more efficient in terms of δ to compensate consumers with a collective bargaining system. It can be seen that the decision taken by teams (that do not internalize a preference for equality) when changing from individual bargaining to collective bargaining does not depend on β:

the red line δ_2^* is flat. On the other hand, it can be seen that δ_2^* is quite below the edge in which the social optimal changes. Hence, the negative effect of a monopolistic TV market on prices is not internalized by teams. Even if the preference for equality is higher ($\beta \to \infty$), it is socially optimal to implement an individual bargaining scheme. These results are qualitatively robust to changes in n and λ.

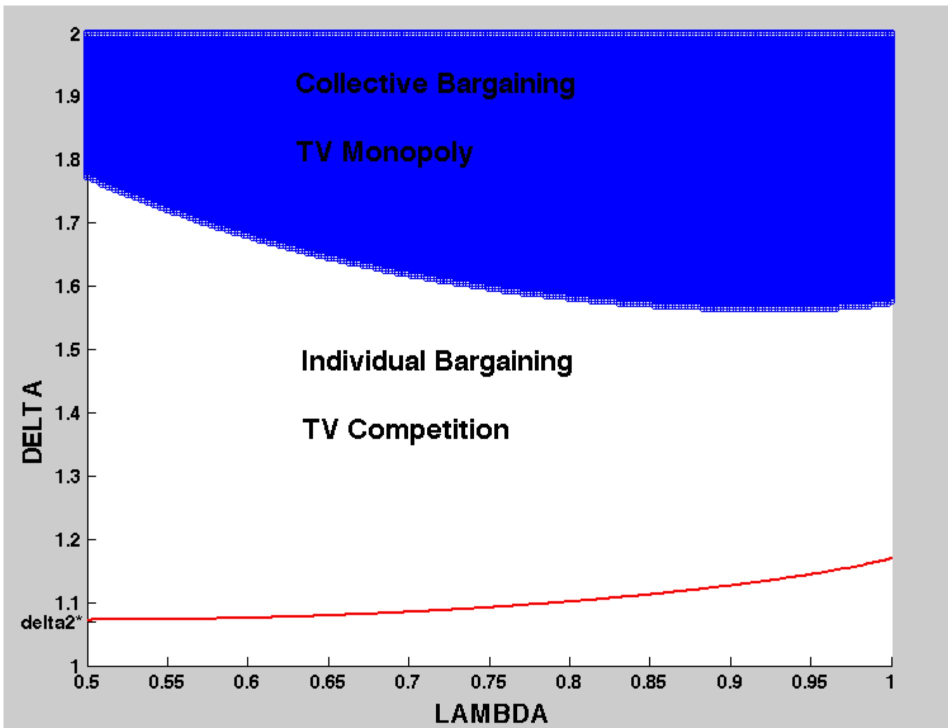


Figure 8: $n = 8$, $\beta = 1.5$ and $c_{TV} = c_M = 0$

In Figure 8 we reproduce the same exercise by comparing the social optimal decision and the teams' decision using the parameters λ and δ. Regarding the social optimal decision, the externality δ is slightly decreasing in the low values of λ and then stabilizes as λ tends to 1: two opposite forces are driving this behaviour.

For $\lambda \simeq \frac{1}{2}$, inequality is low and therefore the concern for an equal share is irrelevant. It is more efficient in social welfare terms to stay in an individual bargaining, where prices are lower and consumers are better off. Only a large externality δ may change this to a collective bargaining. Now if λ grows and tends to 1, there is more inequality in the profits so that a collective bargaining system, through redistribution, helps more to implement a social optimum and therefore the externality needed is lower. This pattern tends to stabilize when $\lambda \to 1$, given that it is more complicated to convince teams to move to a collective bargaining system. As in figure 7, these results are qualitatively robust to changes in n and β. Similar to the previous case, we find that the decision of teams to move from an individual bargaining system to a collective one is not efficient from a social welfare perspective.

Note that the previous discussion on Figure 8 is only possible if the preference for equality is strictly positive ($\beta > 0$). If $\beta = 0$, then the boundary from an individual to a collective follows the same pattern as the parameter δ_2^*. Given that society does not care about inequality, the social optimal change from individual to collective bargaining will be increasing in λ, just similarly as what the teams do. This can be see this in Figure 9.

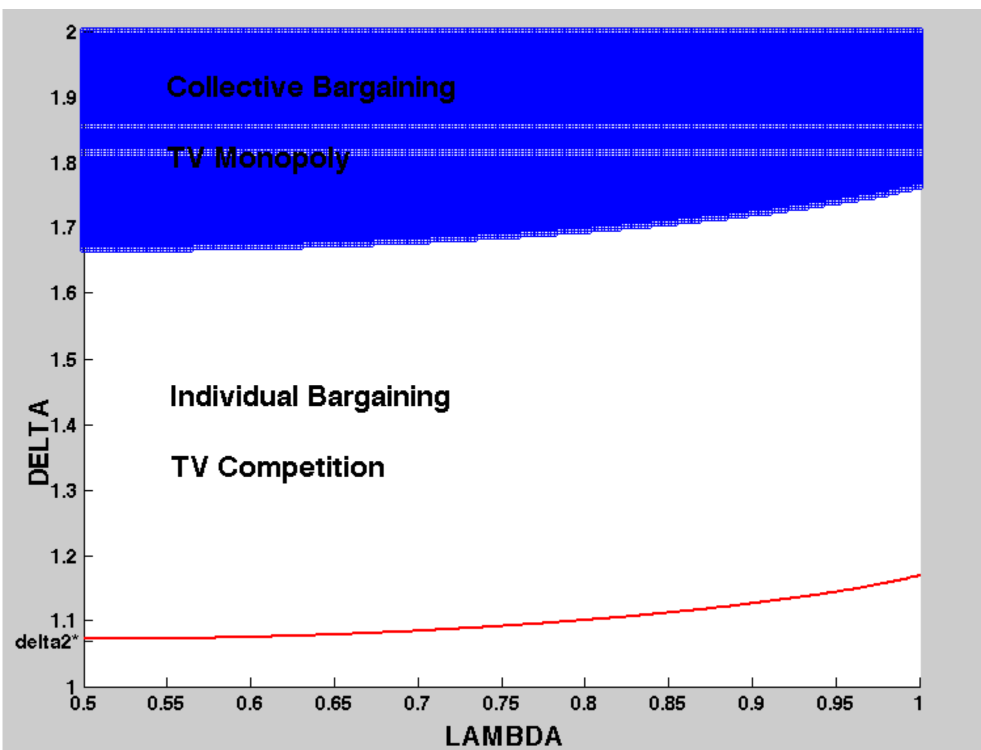


Figure 9: $n = 8$, $\beta = 0$ and $c_{TV} = c_M = 0$

What is the lesson?

The three previous figures show that, through the consumer surplus, the social welfare under an individual bargaining is considerably higher because TV prices are limited by competition in the TV market. I find that the gains from a consumer perspective in an individual bargaining are higher than the losses that come from not having a more equal share of revenues, no matter the values of λ and β. This suggests that either the EC recommendation does not take too much into consideration the consumer surplus or that the model does capture the importance of the advantages of the collective bargaining through the parameter δ.

5 Conclusion

In this paper I have presented a model that brings a new perspective of the determinants of the bargaining system chosen by teams in European football leagues. The model tries to find the factors that explain the contractual differences of football leagues in two different dimensions: what type of bargaining system and the degree of competition in the TV market. Teams have two different sources of profits: TV revenues and merchandising profits. By assuming complementarity of these goods for consumers, teams strategically use merchandising profits in order to maximize revenues. I find that merchandising profits are higher when there is TV competition, as teams can exert a higher market power. These merchandising profits are dependent on two crucial factors: what is the difference between team's size and how the fixed costs function benefits the highest teams. Teams will make more merchandising profits the bigger they are and the more convex are fixed costs.

Once I compare the different bargaining systems, I find that in an individual bargaining framework, a competitive TV market is more likely when the differences between teams are higher. Following the EC recommendation, I finally consider a collective bargaining system with a monopolistic TV market system. I assume in this a positive externality in TV revenues generated by the cooperation and coordination between teams. I compare this bargaining system with an individual bargaining system with competitive TV market. I find that the higher is the difference between clubs, the harder will be to implement a collective agreement.

This result captures the idea of what happens in practice in the examples provided for Spain and England in the introduction. The Spanish LFP still stays under an individual system with TV competition and the power of the two biggest is very large: their TV revenues and merchandising profits have grown substantially. In the English Premier League, under a collective bargaining system, the differences between teams are lower.

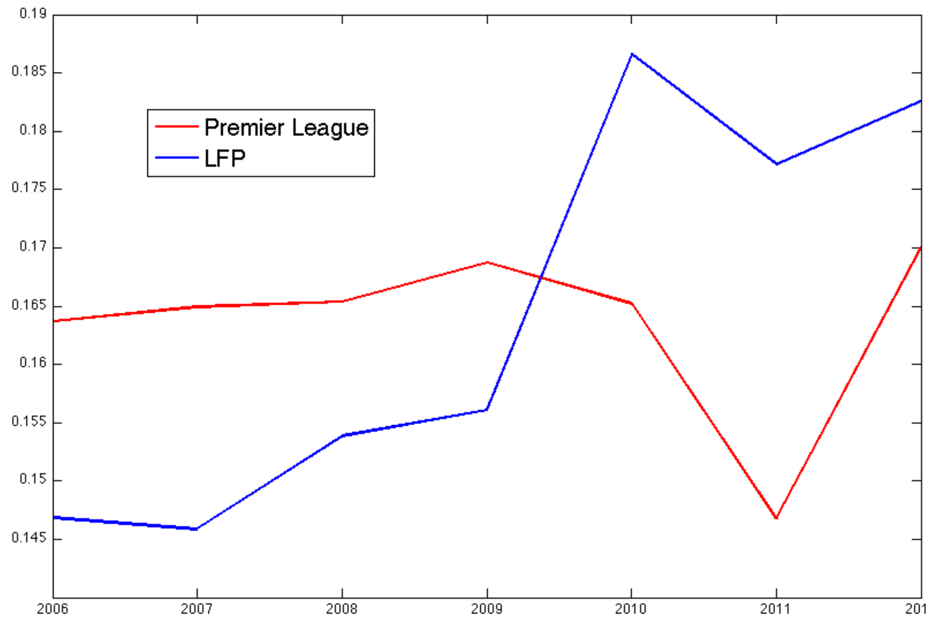


Figure 10: Ratio of points of two best teams against total points

Figure 10 illustrates how these differences between clubs have changed in Spain and have stayed more constant in the case of the English clubs. I show a graph of the ratio of points of the two biggest teams against total points. This ratio has increased considerably for the case of Spain, which suggest the idea that equilibria in each bargaining system seem to be absorbing. Once you enter in a bargaining system, the probability of staying in this bargaining system increases. This is an important result that could be evaluated using a dynamic model or a structural estimation with data of yearly team revenues. We leave thes for future research. Nevertheless, the idea behind is fundamental for policy recommendations of the European Commission. In words of its Competition Commissioner Joaquín Almunia and referring to the Spanish case *"we're definitely moving to a collective bargaining system of football rights"*

However, the model suggests that the effects of monopolistic TV market is very harmful for consumers. Considering a mass of consumers concerned with equality between teams, I find that implementing a collective bargaining system that maximizes social welfare requires higher values of δ than the ones that make the teams change from individual to collective bargain. That is, either the EC does not consider the negative effects on prices of the monopolistic TV market in the collective bargaining system, or either the model does not capture well the benefits of the externality of the collective agreement.

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6 Mathematical Appendix

Proof to **Lemma 1** is as follows given that $\Pi^I_{M,2}(\lambda) = \left(\frac{n}{n+1}\right)(\lambda \Pi^I_{M,2})^{\frac{n+1}{n}}$:

Proof. We take the derivative of the expression and analyze its sign:

1. We have that $x^*(\lambda) = F^{-1}(\lambda \Pi^I_{M,2}) < 1$ given that $\lambda \Pi^I_{M,2} < 1$
2. $\frac{\partial \Pi^I_{M,2}(\lambda)}{\partial \lambda} > 0$ is trivial given that the power $\frac{n+1}{n}$ is positive.
3. $\frac{\partial \Pi^I_{M,2}(\lambda)}{\partial n} = \frac{1}{(n+1)^2}(\lambda \Pi^I_{M,2})^{\frac{n+1}{n}} - \frac{1}{n(n+1)}(\lambda \Pi^I_{M,2})^{\frac{n+1}{n}} \ln(\lambda \Pi^I_{M,2}) = (\lambda \Pi^I_{M,2})^{\frac{n+1}{n}} \left(\frac{1}{(n+1)^2} - \frac{\ln \lambda \Pi^I_{M,2}}{n(n+1)}\right)$. This last expression is strictly positive given that $\lambda \Pi^I_{M,2} < 1$ which shows that the partial derivative is positive.
4. Finally $\frac{\partial \Pi^I_{M,2}(\lambda)}{\partial n \partial \lambda} > 0$ comes from taking the partial derivative of $\frac{\partial \Pi^I_{M,2}(\lambda)}{\partial n}$ w.r.t λ.

□

Here is proof to **Proposition 1**.

Proof. Let $\Pi^I_{J,1}$ and $\Pi^I_{J,2}$ the profits obtained by team J under a monopolistic and competitive TV market respectively. Given that the TV profits under competition are zero, the bargaining process is relevant only for a one TV market. Team A bargains first so that in order to make B accept it will leave the amount for which B will be indifferent between going to a second TV or stay in a one-TV scheme. It is clear that under competition:

$$\Pi^I_{A,2} = \Pi^I_{M,2}(\lambda) \quad \text{and} \quad \Pi^I_{B,2} = \Pi^I_{M,2}(1-\lambda)$$

Team A will strategically leave the quantity $\Pi^I_{B,2}$ to team B when starting bargaining so that:

$$\Pi^I_{B,1} = \Pi^I_{B,2}$$

which will imply that it will leave an amount from the TV revenues to team B $\Pi^I_{TV,B}$ such that

$$\Pi^I_{TV,1,B} + \Pi^I_{M,1}(1-\lambda) = \Pi^I_{M,2}(1-\lambda)$$

and hence

$$\Pi^I_{TV,1,B} = \Pi^I_{M,2}(1-\lambda) - \Pi^I_{M,1}(1-\lambda)$$

Team A will take the rest of the TV revenues from Π_{TV} so that:

$$\Pi^I_{A,1} = \Pi^I_{M,1}(\lambda) + \Pi_{TV,1} - \Pi_{TV,1,B} = \Pi^I_{M,1}(\lambda) + \Pi_{TV,1} - (\Pi^I_{M,2}(1-\lambda) - \Pi^I_{M,1}(1-\lambda))$$
$$\Pi^I_{A,1} = \Pi^I_{M,1}(\lambda) + \Pi_{TV,1} - \Pi^I_{M,2}(1-\lambda) + \Pi^I_{M,1}(1-\lambda)$$

Then the final outcome will depend on the participation decision of team A, given that B is indifferent. Team A will decide a competitive TV market if:

$$\Pi^I_{A,2} \geqslant \Pi^I_{A,1}$$

which using the previous expressions for both parts and rearranging, this condition turns to be:

$$\Pi^I_{M,2}(\lambda) + \Pi^I_{M,2}(1-\lambda) \geqslant \Pi_{TV,1} + \Pi^I_{M,1}(\lambda) + \Pi^I_{M,1}(1-\lambda) \tag{10}$$

□

Finally here is proof to **Proposition 2**:

Proof. Depending on the value of δ, different outcomes of the maximization program will be implementable.

$$\underset{\Pi^C_A,\Pi^C_B}{\text{Max}}\ \Pi^C_A + \Pi^C_B - \beta(\Pi^C_A - \Pi^C_B)^2 \tag{11}$$

$$\begin{aligned}
\text{s.t.} \qquad & \Pi^C_A + \Pi^C_B \leqslant \delta\Pi^I_{TV} + \Pi^I_{M,1}(\lambda) + \Pi^I_{M,1}(1-\lambda) && \text{(BC)}\\
& \Pi^C_A \geqslant \Pi^I_{A,2} && \text{(PC A)}\\
& \Pi^C_B \geqslant \Pi^I_{B,2} = \Pi^I_{B,1} && \text{(PC B)}
\end{aligned}$$

1. δ **sufficiently high for perfect redistribution**. If the size the externality δ is so high that the optimal choice of the league is implementable, then we would have that:

$$\Pi_A^C = \Pi_B^C = \frac{\delta \Pi_{TV}^I + \Pi_{M,1}^I(\lambda) + \Pi_{M,1}^I(1-\lambda)}{2} = \frac{\delta \Pi_{TV}^I + \left(\lambda^{\frac{n+1}{n}} + (1-\lambda)^{\frac{n+1}{n}}\right)(\frac{n}{n+1})\Pi_{M,1}^I}{2}$$

This is only possible if team A agrees (if A participates, then for sure B will). Therefore we need that $\Pi_A^C \geqslant \Pi_{A,2}^I$ and this will occur if $\delta \geqslant \delta_1^*$, where

$$\delta_1^* = \frac{2(\frac{n}{n+1})\lambda^{\frac{n+1}{n}}(\Pi_{M,2}^I)^{\frac{n+1}{n}} - (\lambda^{\frac{n+1}{n}} + (1-\lambda)^{\frac{n+1}{n}})(\frac{n}{n+1})(\Pi_{M,1}^I)^{\frac{n+1}{n}}}{\Pi_{TV}^I}$$

From inequality (10) in the proof of the Proposition 1 in the Appendix, we can prove that $\delta_1^* > 1$.

2. δ **is sufficiently high for partial redistribution**, in the case that $\delta < \delta_1^*$, it is not possible to implement an equal sharing of the total revenues between teams A and B. Then the league will still want to narrow the gap between A and B revenues given its preference for equality. Therefore the league will implement a corner solution so that:

$$\Pi_A^C = \Pi_{A,2}^I = \Pi_{M,2}^I(\lambda) = \left(\frac{n}{n+1}\right)(\lambda \Pi_{M,2})^{\frac{n+1}{n}}$$

and it will give to team B the rest of the total surplus:

$$\Pi_B^C = \delta \Pi_{TV}^I + (\lambda^{\frac{n+1}{n}} + (1-\lambda)^{\frac{n+1}{n}})\left(\frac{n}{n+1}\right)(\Pi_{M,1}^I)^{\frac{n+1}{n}} - \lambda^{\frac{n+1}{n}}\left(\frac{n}{n+1}\right)(\Pi_{M,2}^I)^{\frac{n+1}{n}}$$

which of course will have to satisfy the participation constraint for B so $\Pi_B^C \geqslant \Pi_{B,2}^I$ and this will occur if $\delta \geqslant \delta_2^*$, where:

$$\delta_2^* = \frac{\left(\lambda^{\frac{n+1}{n}} + (1-\lambda)^{\frac{n+1}{n}}\right)\left(\frac{n}{n+1}\right)\left((\Pi_{M,2}^I)^{\frac{n+1}{n}} - (\Pi_{M,1}^I)^{\frac{n+1}{n}}\right)}{\Pi_{TV}^I}$$

where $1 < \delta_2^* \leqslant \delta_1^*$.

3. δ **is not high enough for any redistribution**, in the case that $\delta < \delta_2^*$, so that finally a collective bargaining system cannot arise, and under these circumstances we will have a individual bargaining scheme.

The resulting timeline for the different values of δ is:

Individual Bargaining	**Collective Bargaining**	**Collective Bargaining**
	δ_2^* Partial redistribution	δ_1^* Full redistribution

Note that for Proposition 2, we need $G(\alpha, \lambda, n, c_{TV}, c_M) > 0$ from Proposition 1. If $G > 0$ is satisfied, this implies that $1 < \delta_2^*$ and $\delta_2^* \leqslant \delta_1^*$ for $\lambda \geqslant \frac{1}{2}$ with equality if $\lambda = \frac{1}{2}$.

$\square$

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