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Hafner, Mathias; Neunzig, Alexander R.

Working Paper

Regulating Television and the Case of Football World Cup

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Regulating Television
and the Case of Football World Cup

by

MATHIAS HAFNER and **ALEXANDER R. NEUNZIG**

Center for the Study of Law and Economics*

Universität des Saarlandes

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This paper deals with EU-Directive 89/552/EEC „Television Without Frontiers", which enables each EU-country to set up a list of major events that are not allowed to be transmitted in Pay-TV.
We analyze this kind of regulation using instruments of game-theory and monopoly-theory. We compare the market results of the EU-Regulation with two alternative arrangements, namely with a general ban of Pay-TV and with a 'laisser-faire'-solution. Our model shows that a selective ban may be welfare-superior to both other forms of Pay-TV treatment. Finally we show that there are good arguments to forbid Pay-TV-broadcasting of major football events.

Content

1 INTRODUCTION

There is a European-wide debate on the appropriate handling of large sport events; the pivotal question is in which way major events should be transmitted in TV. The following comment reflects the core of the debate: 'Television entrepreneur Leo Kirch wants football fans to watch the World Cup only if they pay a special fee. Politicians try to prevent this. Is there a human right to television football? Does the nation fall apart, if football games are only to be seen on Pay-TV?' (DIE ZEIT October, 30 1997).

The reason for the debate is a contract between the ISL/Kirch group and the FIFA, organizer of the football World Cup. The contract treats the world-wide marketing of World Cups 2002 and 2006. To refinance the paid price (and to optimize their profits) ISL/Kirch consider transmitting World Cup games in Pay-TV channels, instead of transmitting them in Free (of charge) TV financed via advertisement.

Public opinion and numerous politicians fear that 'Laisser-faire' on the football transmission market results in Pay-TV transmissions, i.e. they fear to pay in future for something they have been provided with for free so far. They demand a ban of the exclusive transmission in Pay-TV arguing that football is of such a great interest for the public, that nobody should be excluded from it.

On the other hand, there exists a need of financing the transmission and the organization of World Cups and similar events. Without receiving enough money the FIFA is not able to provide the event or to provide it in an acceptable quality.

The European union already took measures. In a revision of European Union Directive 89/552/EEC ('Television without frontiers') on November, 12 1996 it requests its member states to specify in a 'protection list' events not to be transmitted on Pay-TV. These protection lists should specify events that are considered of special interest for the public in the member state.[1]

The decision of the EU is fundamental for the way the television market is regulated.[2] The Directive states that Pay-TV remains permitted in principle, but there are exceptions, which are to be determined by the individual member states. Thus the member states represent a kind of 'regulatory institution' that has to select events that are not allowed to be transmitted in Pay-TV channels. In our paper, we will refer to this kind of regulation as 'selective ban'.

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[1] Cp. Oreja (1997), p.1, p.8.

[2] A basic economic analysis of the television market is to be found in Owen, Beebe and Manning (1974).

In the actual debate there is also a call for a radical change of the regulatory policy, such that all programs should be transmitted in free of charge channels. That is, all Pay-TV channels are prohibited. To this kind of regulation we will refer as 'general ban'.

In this paper we compare the three discussed regulation options, i.e. the 'laisser-faire' solution, the 'selective ban' and the 'general ban', with regard to the welfare effects they induce on the television market.[3]

To analyze the regulation problem it is useful to take a look at the time path of the considered situation, see Figure 1.

Legislator decides on	*Regulator applies*	Transmission-rights-owner and broadcaster negociate on	Broadcaster decides on
Regulation-regime (laisser-faire, general ban, selective ban)	*Regulation-regime (forbid Pay-TV, allow Pay-TV)*	License fee	Transmission form (Pay TV or Free TV)
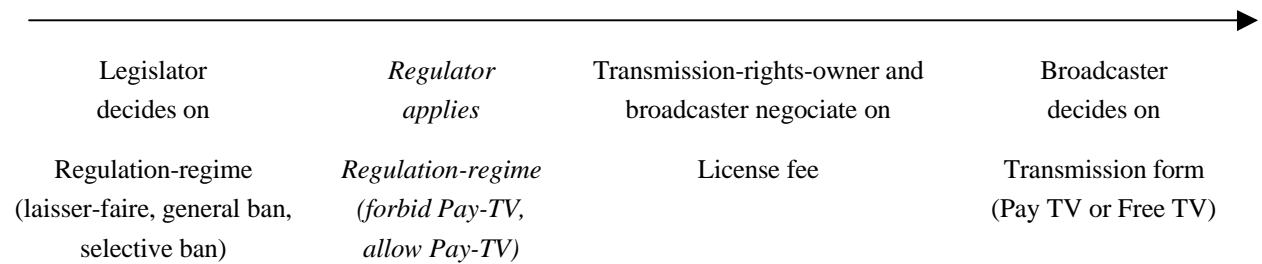
Figure 1: Time Path

At the first stage there is a constitutional decision by the legislator (e.g., the European Union) whether and how the television market is regulated. Then, a regulatory institution (e.g., a specific member state) may act, i.e. specify the events for the protection lists. Thirdly, potential broadcasters (e.g., Kirch) and the initial owner of the transmission rights (e.g., the FIFA) bargain on the transmission rights. Finally the broadcaster decides on the kind of transmission, subject to the regulation.

We will analyze the problem using 'backward induction'. We start in section 2 deriving the market results of a 'laisser-faire' regime. Laisser-faire allows the broadcaster to obtain either fees on the spectator market (Pay-TV) or obtain revenues by selling advertising time (Free-TV). Our analysis supplies in addition the license fee to expect and the welfare generated by this arrangement. We show that profit-maximizing behavior of the broadcaster may result in sub-optimal decisions for the society. Section 3 regards the effects of regulating the market applying a 'general ban' policy, section 4 derives the market results from applying a 'selective ban' policy. In section 5 we compare the market results under the welfare criterion. We derive the optimal regulation regime a legislator should choose. It is shown that the selective ban gen-

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[3] The basic analysis of Free-TV and Pay-TV is to be found in Spence and Owen (1977). They analyse the welfare effects induced by a pure Free-TV system compared with a market where Free-TV and Pay-TV are competing. Our Paper deals with the question, whether i an mixed system there are incentives to regulate the television market.

erates welfare superior results, both in relation to a 'laisser faire' solution, and to the 'general ban' of Pay-TV. In section 6 we analyze the regulation problem of the World Cup transmission and finally we draw some conclusions in section 7.

2 THE LAISSER-FAIRE REGIME

2.1 Introductory remarks

In this section we look at the market results induced by a laisser faire regime. We determine the decisions of the initial owner of the transmission rights and those of a potential broadcaster. Furthermore we derive the impact of the decisions on social welfare. However, it is important to notice some special features of the television market first.

A transmission of an event in TV is costly, but the transmission costs have a special structure, they are composed of a very large fixed cost block and minimal or absent variable costs. The reason is that the transmission costs consist mainly of putting the program-waves on the air or in the cable, i.e. the costs of cameras, satellite use, presentation, etc., and not of reaching additional spectators.

Another special feature of TV-transmissions is that two goods are produced. Firstly, 'television consumption' has the properties of an impure public good,[4] since first an additional spectator's reception of a transmission does not impair the transmission quality for other spectators, i.e. the transmission is non-rivaling, and second exclusion is easily achieved.[5] The second good produced is the possibility to supply consumers with commercials, this good we will call 'advertising time'. This is a private good, where many companies of the advertising industry are competing to position their commercials on TV.

The different transmission forms, i.e. Pay-TV and Free-TV are used to create revenues in the two discussed markets. With Pay-TV the broadcaster sells the right to watch a certain channel, containing different events, for example the right to watch football games during the World Cup in a 'sports-channel'. After paying the fee, the spectator is allowed to watch as many hours as he wants without paying additional charges. Revenues are created on the 'television

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[4] Compare for the analysis of impure public goods in general, see e.g. Varian (1992), p.415f or Samuelson (1954,1958). The characterization of television as impure public good and the impact of its financing on the provided program are discussed in the Samuelson-Minasian-Buchanan debate (Samuelson 1964, 1967, Minasian, 1964, 1967, Buchanan, 1967).

[5] Today, because of an advanced decoder-technology, exclusion by codifying the programs is easy. In former times an exclusion was really difficult. Public channels, like the ARD/ZDF in Germany, have heavy problems excluding non paying consumers, since they adopt a non decoder based kind of exclusion, namely a legal norm.

consumption' market.[6] In case of Free-TV, the spectator is allowed to watch certain events free of charge. Since the provision of the transmission is not costless, it is the advertising industry that pays for reaching the spectators, therefore revenues are created on the market for 'advertising time'.[7] The decision which form of transmission is chosen depends on the revenues obtainable.

The next section presents the formal game tree, reflecting the decision process as discussed herein. Subsequently the two relevant markets are analyzed, the optimal decision is derived and we determine the resulting welfare.

2.2 The Laisser-faire game

We assume that the transmission rights of X in the beginning are in possession of a initial rights owner F who maximizes profits. In addition, there is a potential broadcaster K who wants to acquire a transmission license for X. Figure 2 presents the structure of this game Γ_1.
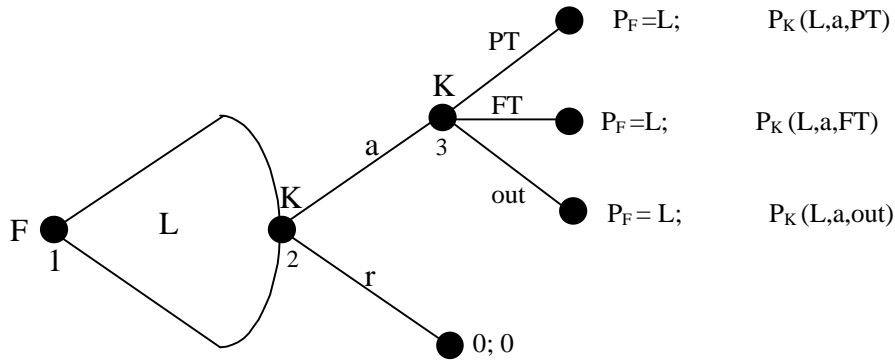
Figure 2: Game G_1 - The 'Laisser faire' solution

We assume that F and K are playing an ultimatum game, in which the initial rights owner F makes a 'take it or leave it offer' at price L for the license, with L> 0. Broadcaster K is allowed to accept the offer ('a') or reject it ('r'). That is, the negotiations last only one round.[8]

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[6] The non-pricing of the marginal event is the main difference between the so-called Pay-TV and Pay-per-View. In case of Pay-per-View, the spectator has to pay a monthly fee for the general right to receive the programs and has to pay in addition charges for watching the events. Economically, Pay-per-View is a reflection of the two-part-tariff (cp. Oi, 1967)

[7] Notice that financing by advertising is a possibility to finance public goods, having the feature, that under certain assumptions efficiency is reached on the public good market. This method stands in a row with Hotelling's (1938) financing by subsidies, Ramsey's (1927) average cost pricing rules and Oi's (1971) Two-Part-Tarif (where the fix cost block is financed by average cost pricing), but all these methods imply a dead-weight loss (Cp., e.g., Coase, 1970), whereas financing by advertising may result in a first best solution. We thank Roland Kirstein for putting our attention on this point.

[8] The ultimatum game can simulate the auction of a transmission license (for this, however, some further assumptions are necessary). K have to be interpreted as the winners of an auction, the license-fee in the ultimatum game would correspond to the highest bid of the auction.

The assumption of an ultimatum game is chosen for ease of exposition and is not relevant for our propositions.[9]

If K chooses at knot 1 to reject the offer, both will receive 0 as pay-off. If K accepts the offer, the licenser F receives a pay-off P_F equal to the license fee. The broadcaster's pay-off P_K depends on the license fee and his revenues from commercializing the license.

Without any regulation, the broadcaster has three alternatives at decision knot 2: First, he can transmit the event in free of charge television (Free-TV). Alternatively he can transmit the event in a Pay-TV channel, i.e. the transmission is codified and the broadcaster charges a fee for the decodification (code). Finally, the broadcaster may renounce to transmit: even though he has paid for the license he goes 'out' of the market.

Since we are interested in deriving the subgame perfect equilibrium, we have to find the optimal strategy combination of the players. As we have seen a strategy of licenser F in game Γ_1, s_F^1, consists in making a license-fee offer. The broadcaster's strategy set, s_K^1, consists in accepting or rejecting the offer and in deciding on the transmission form. Since the obtainable revenues are very important for the resulting pay-offs and thus for the solution of the game we will continue by analyzing the relevant markets.

2.2.1 Television consumption - selling programs in Pay-TV

Assume that a broadcaster K sells decryption codes for an event 'X'. For ease of exposition we assume the transmission in Pay-TV not to be interrupted by commercials. In order to be able to determine an optimal fee g^*, we have to think about the relevant demand function N. We assume that there are n potential spectators, who gain satisfaction from television consumption. In particular X is of great interest for the spectators, such that each spectator z_i has a nonnegative willingness to pay for having X in his opportunity set. We order the potential spectators $z_i \in [0,n]$ such that their willingness to pay decreases with a rising index. We derive a demand curve N(z), and assume that N has a normal (monotonous falling) shape, see Figure 3. N(z) is in turn the price function the broadcaster is confronted with, i.e. N(z)=g(z). [10]

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[9]   The exact operational sequence of the negotiations concerning the royalty is of great importance for the distribution of the profits, but of no relevance for the allocation and welfare effects.

[10]   The identity is contingent to the fact that decoder-renting costs are assumed to be negligible. For positive decoder-costs, the relevant price-function lies below of the demand curve, since each spectator has to pay for the decoder.
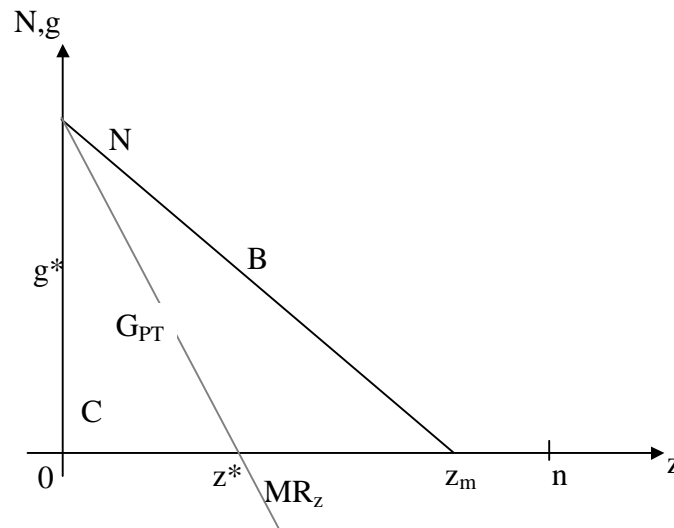
Figure 3: Television consumption market

All spectators at the left of z_m have a positive willingness to pay, all spectators between z_m and n have 0 willingness to pay for X. Assuming that there are only fixed transmission costs C, the profit-maximizing number of consumers is z^*, i.e. if the marginal revenues (MR_z) are equal to 0 (the marginal costs). The optimal fee g^* per consumer determines the gross profits G_{PT} of a transmission in Pay-TV. The number of consumers z^* results from the profit- maximization condition:

$$\underset{z}{Max}!\ G_{PT}\ =\ N(z) \cdot z\ -\ C \qquad\qquad (1)$$

and the first-order-condition

$$\frac{\partial N(z)}{\partial z} \cdot z\ +\ N(z)\ =\ 0 \qquad\qquad (2)$$

whose maximizing argument $z^* = argmax\ \{\,N(z) \cdot z\ -\ C\,\}$ determines the optimal fee g^*. The broadcaster receives:

as total revenue: $E_{PT}\ =\ g^* \cdot z^{*\,[11]}$

as gross profit (without consideration of the license fee): $G_{PT} = E_{PT}\ - C$

and as net profit (after consideration of the license-fee L): $\Pi_{PT} = E_{PT}\ - C - L.$

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[11] E_{PT} corresponds in the figure, where a linear demand function is assumed, to the area (g^*Bz^*0)

2.2.2 Advertisement market – selling commercials in Free-TV

If the broadcaster K decides to transmit X in Free-TV, he can obtain revenues by selling advertising time ('t') to the advertising industry during the transmission of World Cup games. The (marginal) willingness to pay for advertising time depends basically on three factors:

- the supplied advertising time

- the number of reached spectators

- and their purchasing power.

We assume a typical demand function $D(t)$ with $D'(t) < 0$. This is plausible for two reasons: On the one hand, different enterprises have different willingnesses to pay for advertising time. On the other hand, placing a commercial spot in a large advertising block will diminish the advertising message.[12] Furthermore, it is plausible to assume that the more spectators are reached by a program and/or the higher is their purchasing power, the higher is in turn the industry's marginal willingness to pay for an additional commercial spot.

The most important factor determining the demand function for advertising time seems to be the number of reached spectators. We assume that each spectator's utility derived from watching the event X on TV does not depend on the way the event is transmitted. In addition, we assume that watching X on Free-TV implies no additional costs of reception and consumption for the consumer. This implies in particular that advertisement during the transmission of X does not have an influence on the utility of the spectators.[13] On the other hand we abstract from the fact that the quality of the program may be influenced by the transmission way. Under these conditions transmitting X in Free-TV implies that z_m consumers will regard the event (where z_m corresponds to the number of spectators at Pay-TV with a fee g=0).

Furthermore assume that the transmission of advertisements does not produce any costs. The advertisement market is represented in the following figure.

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[12] Take as an example the 'lange Kulmbacher –Filmnacht' emitted by the German Free-TV channel SAT 1. Here a brewer is the only advertiser during the whole evening session and reaches therefore a great audience. It is to be expected, that Kulmbacher's willingness to pay for being the exclusive advertiser exceeds that of advertising in a large commercial block.

[13] In a recent paper Hansen and Kyhl (1997) look at the case, in which advertisement produces disutility for the spectator. Their assumption is not very convincing in general, since spectators may view commercials as provider of information. Furthermore, the spectators have the possibility to 'zap' to other programs during the advertisement interval.
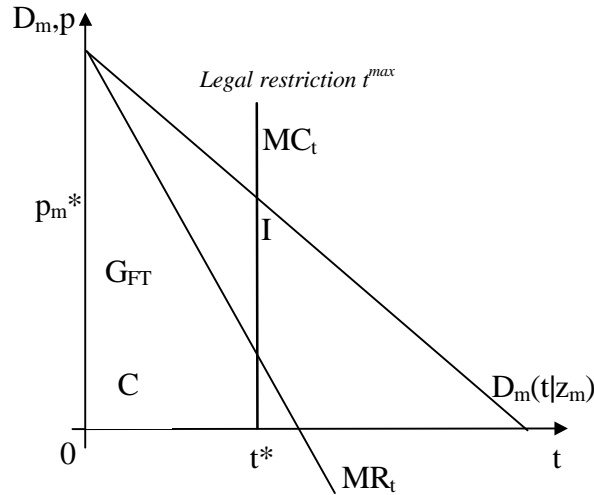
Figure 4: Advertisement market

Figure 4 shows the demand for advertising time $D_m(t|z_m)$. D_m is the demand function assuming z_m spectators, i.e. the maximum number of spectators, interested in X. Figure 4 considers without loss of generality that the sale of advertising time may be legally restricted, such that the channels are not allowed to sell more than t^{max} advertising time. In Germany the advertising time is restricted to 12 minutes per hour (in case of private channels).

The broadcaster K is a monopolist on the X -advertising market, since he possesses an exclusive license. Therefore it offers this quantity of advertising time for which the marginal revenue of additional advertising time (MR_t) corresponds to marginal costs. Thus the profit maximizing price is p_m^* per advertising time unit and the optimal supply is t*. The optimal time is the solution of the profit maximization problem:

$$\text{Max!}_w\, G_{FT} = D_m(t) \cdot t - C \qquad (3)$$
$$\text{s.t.} \quad t \le t^{max}$$

resulting in the first-order-condition

$$\frac{\partial D_m(t)}{\partial t} \cdot t + t = 0 \, , \qquad (4)$$

whose maximizing argument t* = min {argmax $D_m(t)$·t –C; t^{max}} determines the optimal advertising time t*. The broadcaster receives:

as total revenue: $\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad E_{FT} = p_m^* \cdot t^*$ [14]

as gross profit (without consideration of the license fee): $\qquad\qquad G_{FT} = E_{FT} - C$

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[14] Which corresponds to area p_m*It*0 in figure 4.

and as net profit (after considering the license-fee L): $\Pi_{FT} = E_{FT} - C - L$.

2.2.3 Broadcaster's decision on the transmission form

The optimal decision of the broadcaster K at knot 3 of game Γ^1 depends on the market structure. We can distinguish three cases:

Case 1: Max $\{D_m(t^*) \cdot t^* - C \text{ and } N(z^*) \cdot z^* - C\} < 0$

K chooses not to transmit X, since there is no profitable way of doing so.

Case 2: Max $\{D_m(t^*) \cdot t^* - C; N(z^*) \cdot z^* - C\} \geq 0$ and $D_m(t^*) \cdot t^* - C \geq N(z^*) \cdot z^* - C$

K chooses to transmit X in Free-TV, since this maximizes his profits.[15]

Case 3: Max $\{D_m(t^*) \cdot t^* - C; N(z^*) \cdot z^* - C\} \geq 0$ and $D_m(t^*) \cdot w^* - C < N(z^*) \cdot z^* - C$

K chooses to transmit X in Pay-TV.

Rearranging this leads to:

$$\textit{Broadcaster K chooses}: \begin{cases} PT & \text{if } G_{PT} > G_{FT} \wedge G_{PT} \geq 0 \\ FT & \text{if } G_{FT} \geq G_{PT} \wedge G_{FT} \geq 0 \\ \text{out} & \text{if } G_{PT}, G_{FT} < 0 \end{cases}$$

Thus, K chooses the profit-maximizing transmission form, unless neither Pay-TV nor Free-TV cover the transmission costs. In this case he refrains from transmitting the event.

2.2.4 Broadcaster's decision to accept a license offer

The broadcasters will only accept a license offer if after having paid for the license he will make nonnegative net profits, since the pay-off after rejecting the offer is 0, i.e. P≥0. This implies for the decision at knot 2 of game Γ^1:

$$\text{Broadcaster K chooses}: \begin{cases} a & \text{if } \max\{G_{PT}, G_{FT}\} \geq L \\ r & \text{else} \end{cases}$$

2.2.5 Licenser's decision on the optimal license fee

Anticipating the decision and the revenues of broadcaster K, the licenser chooses his optimal offer. Since we have assumed an ultimatum game and perfect information F is able to obtain the whole market profits. We get the following optimal strategy for F:

---

[15] We assume, that in case that the profits of a Pay-TV transmission are equal to those of a Free-TV transmission, the broadcaster prefer Free-TV.

$$
\text{Licenser F chooses:} \quad
\begin{cases}
L = G_{PT} & \text{if } G_{PT} > G_{FT} \wedge G_{PT} \geq 0 \\
L = G_{FT} & \text{if } G_{FT} > G_{PT} \wedge G_{FT} \geq 0 \\
\text{any } L & \text{if } G_{PT}, G_{FT} < 0
\end{cases}
$$

2.2.6 Summary - Equilibria of the laisser-faire game

The subgame perfect equilibrium, s^1*, is to be derived by analyzing the optimal strategies in game Γ^1. The optimal strategy of licenser F, s_F^1*, consists of the optimal decision on the license fee; the optimal strategy of broadcaster K, s_K^1*, consists of the acceptance decision and the transmission decision. It is:

$$
s^1* = \left\{ s_F^1*; s_K^1* \right\} =
\begin{cases}
\{(G_{PT}); (a, PT)\} & \text{if } G_{PT} > G_{FT} \wedge G_{PT} \geq 0 \\
\{(G_{FT}); (a, FT)\} & \text{if } G_{FT} > G_{PT} \wedge G_{FT} \geq 0 \\
\{(L); (r, out)\} & \text{if } G_{PT}, G_{FT} < 0
\end{cases}
$$

Thus, the licenser will always try to acquire the whole market profits. If the profit maximizing transmission form is Pay-TV, the licenser anticipates this and sells the license exactly at the amount the broadcaster will make profits. The same holds true, if Free-TV is the profit maximizing transmission form.

In the next section we take a short look on the welfare effects generated, before concluding this section with a summary of the market results of the laisser faire game.

2.3 Welfare effects of the laisser-faire regime

In this section we derive the welfare induced by the different transmission arrangements. Figure 5 presents the relevant markets.
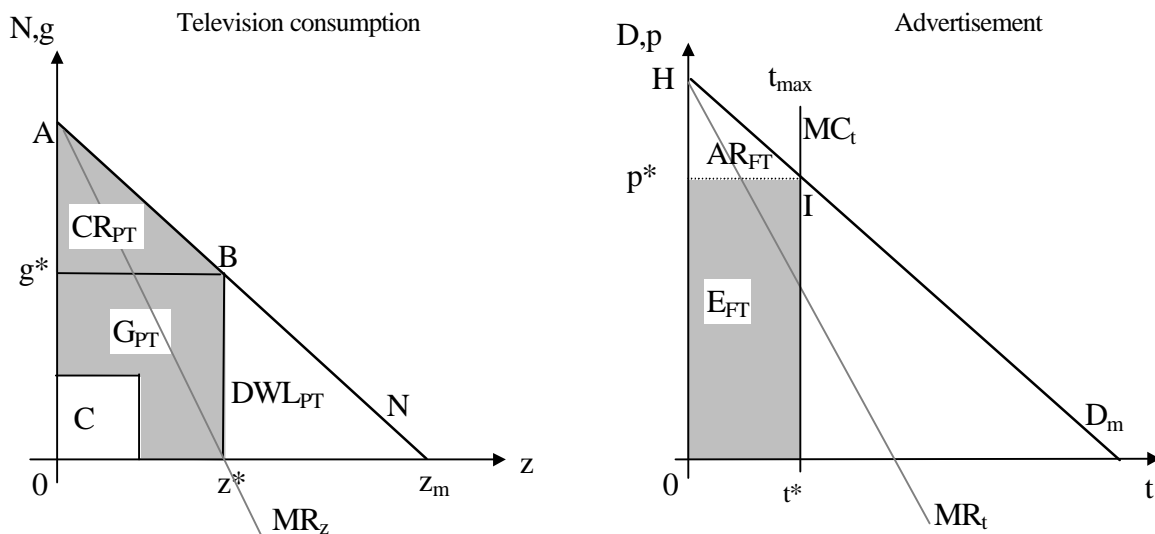

Figure 5: Welfare on the markets

We know that a transmission of X in Pay-TV results in z^* spectators watching. The welfare induced, measured as social surplus (producer's rent plus consumer's rent), sums to:

$$W_{PT} = ABz^*0 - C = E_{PT} - C + CR_{PT} = \int_0^{z^*} N(x)dx - C \qquad (5)$$

However, a transmission on Free-TV will not exclude spectators. All interested spectators, i.e. z_m, can benefit of watching X inducing a consumers rent on the television consumption market that amounts to Az_m0; beyond that welfare is created by the willingness to pay for advertising time of the industry, resulting in revenues for the broadcaster (E_{FT}) and rents of the advertising industry (AR_{FT}). We get as total Free-TV welfare:

$$W_{FT} = Az_m0 + HIw^*0 - C = E_{PT} - C + CR_{PT} + DWL_{PT} + E_{FT} + AR_{FT} \qquad (6)$$

$$= \int_0^{z_m} N(x)dx - C \quad + \quad \int_0^{t^*} D(y)dy$$

As Figure 5 shows the transmission of program X in Free-TV provides a higher welfare than the transmission in Pay-TV. Formally we have:

$$\mathbf{W_{FT}} = \int_0^{z_m} N(x)dx - C + \int_0^{t^*} D(y)dy \quad > \quad \int_0^{z^*} N(x)dx - C = \mathbf{W_{PT},} \qquad (7)$$

$$\text{since} \int_0^{z^*} N(x)dx < \int_0^{z_m} N(x)dx \quad \text{and} \quad \int_0^{t^*} D(y)dy > 0 \text{ is met.}[16]$$

The welfare difference amounts to:

$$\Delta W = DWL_{PT} + E_{FT} + AR_{FT} = \int_{z^*}^{z_m} N(x)dx \quad + \quad \int_0^{t^*} D(y)dy \qquad (8)$$

2.4 Conclusion – market results with laisser faire

Table 1 summarizes the market results and welfare effects induced by a laisser faire regime.

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[16] Notice that this is a prudent estimation. E.g. positive decoder costs would decrease the Pay-TV welfare even more, since additional resources would be bound at the decoder production.

Table 1: 'Laisser-faire'- Transmission form, pay-offs and welfare

parameter	*form of transmission*	*license fee*	*broadcaster's net profits*	*welfare*
$G_{PT} < 0 \ \wedge G_{FT} < 0$	none	0	0	0
$G_{PT} > G_{FT} \wedge G_{PT} \geq 0$	Pay-TV	$G_{PT} \ (=E_{PT} - C)$	0	$W_{PT} = E_{PT} - C + CR_{PT}$
$G_{FT} \geq G_{PT} \wedge G_{FT} \geq 0$	Free-TV	G_{FT}	0	$W_{FT} = W_{PT} + DWL_{PT} + E_{FT} + AR_{FT}$

In Table 1 it is shown under which conditions the broadcaster chooses a transmission form and the resulting pay-offs are stated. His decision depends only on private profits G, i.e. a profit-maximizing enterprise does not consider social welfare effects. The last column of Table 1 reflects a basic fact: The welfare of a Free-TV transmission always exceeds the welfare induced by a Pay-TV transmission.

Row 1 states that if neither the profits of Free-TV nor the profits of Pay-TV are enough to cover the transmission costs, the event will not be transmitted. Note, that this may imply a welfare loss, since, e.g. the Free-TV transmission of X is in social interest up to transmission costs that amount to W_{FT}, much higher than the revenues obtainable by Free-TV.[17]

Row 2 of Table 1 is the most interesting one for our purposes. It is shown that broadcasters will offer certain programs in Pay-TV, even if it was better from a social perspective to transmit these events in Free-TV. This will be the case if the revenues of Pay-TV exceed those of Free-TV and the revenues of Free-TV exceed the costs. The free market does not lead to the optimal allocation. This seems to suggest that the state should forbid Pay-TV generally.

Row 3 states that the broadcaster decides to transmit the event in Free-TV if the obtainable profits exceed the gains which can be achieved by a Pay-TV-transmission. The broadcasters decision is also the most desired choice from a social point of view.

3 REGULATING PAY-TV - A 'GENERAL BAN'

In this section we analyze the influence of the 'general ban' regulation regime with regard to two aspects: Firstly, the influence on the negotiations between the initial owner of the transmission rights and a potential broadcaster and secondly, their influence on the transmission decision taken by the broadcaster.

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[17] This may be a reason for subsidizing the transmission of certain events or the existence of public television.

If the regulator (for instance the EU in the current context) applies a 'general ban' regulation, the game of section 2.2 changes, such that K has fewer options in the sub game beginning in knot 2 of game Γ^1. The broadcaster does not anymore have the option to transmit the event in Pay-TV. The following game Γ_2 results:
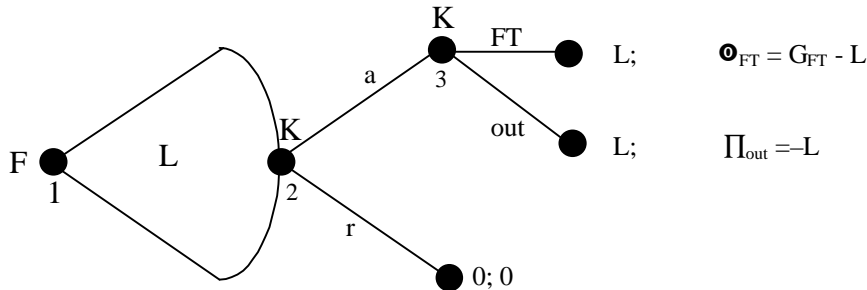

Figure 6: Game $\mathbf{G}_2$ – the 'general ban' regulation

Again, this game can be solved and we get the following sub-game perfect equilibria: for all $(G_{FT}=)$ E_{FT} –C<0 the broadcaster will reject any licenser's offer and for E_{FT} –C≥0, the licenser will propose a fee that amounts to E_{FT}–C, the broadcaster will accept and transmit in Free-TV. Formally we have as optimal strategies in game Γ_2:

$$s^2* = \{s_F^2*; s_K^2*\} = \begin{cases} \{(G_{FT}); (a, FT)\} & \text{if } G_{FT} \geq 0 \\ \{(L); (r, out)\} & \text{if } G_{FT} < 0 \end{cases}$$

For ease of exposition we will summarize the market results of the 'general ban' regulation in the following Table:

Table 2: 'General ban'- Transmission form, pay-offs and welfare

parameter	form of transmission	license fee	broadcaster's net profits	welfare
$G_{FT} < 0$	none	0	0	0
$G_{FT} \geq 0$	Free-TV	G_{FT}	0	W_{FT}

Table 2 shows, that the decision of the broadcaster on the transmission form does not depend on Pay-TV profits, since this option is forbidden. The difference between the 'general ban' and the laisser faire solution is twofold:

There is a welfare increase, since programs, that formerly are emitted in Pay-TV are now to be seen in Free-TV channels, namely those programs whose Pay-TV revenues exceed the Free-TV revenues and whose Free-TV revenues exceed the costs. On the other hand, this regulation impedes the transmission of events that are profitable if transmitted by Pay-TV, but whose

revenues from Free-TV are not sufficient to cover the costs. The net welfare effect can not be determined without additional information.

4 REGULATING PAY-TV – A 'SELECTIVE BAN'

We define, the regime "selective ban of Pay-TV" such that there is a regulator R deciding for every event individually if a Pay-TV transmission is forbidden or not. In the current context R corresponds to a European Union member country, who has the task to provide a national protection list. The question is, whether the program X should be on this list. We assume that R has the option to forbid a transmission in Pay-TV ('V') or to allow it ('Z'). We assume, that the regulator's interest is to maximize welfare, i.e. we assume that his pay-offs correspond to the resulting welfare. The 'selective ban' game is represented in game Γ_3.
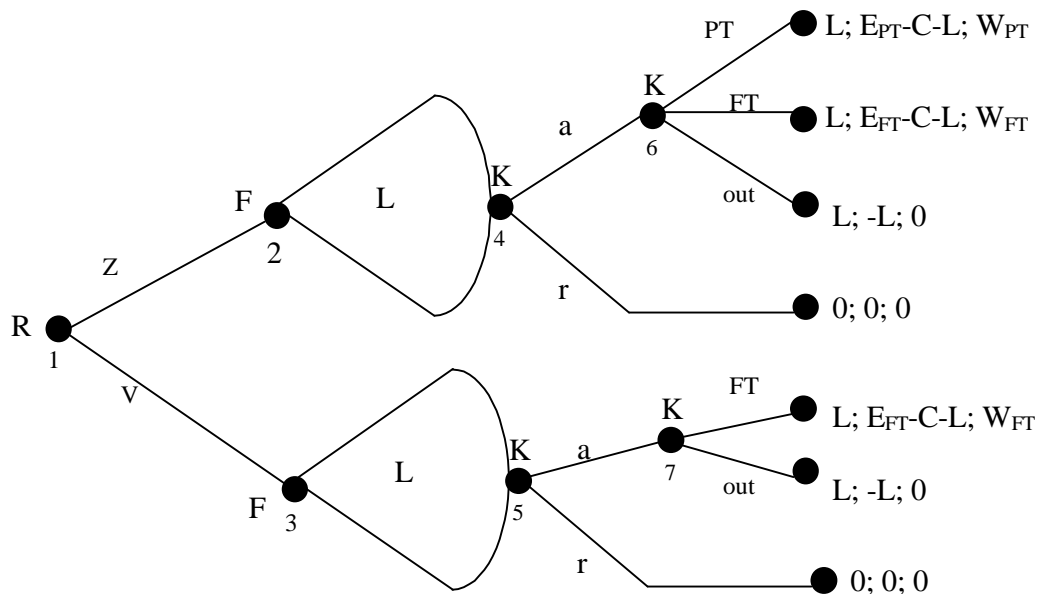
Figure 7: Game G_3 – the 'selective ban' regulation

Figure 7 shows the game in extensive form; the sequence of the pay-offs is (Licenser F; Broadcaster K; Regulator R). The subgame beginning at knot 2 has the same structure as game Γ_1, that is, if R decides that the transmission in Pay-TV of a specific event is not forbidden, the laisser-faire game is appropriate to represent the market situation. The broadcaster K has the option to choose Pay-TV at knot 6. The subgame beginning at knot 3 has the same structure as Γ_2, that is, if R decides that the transmission in Pay-TV of a specific event is forbidden, the general ban game is to be applied. The difference between the subgames is, that in

the subgame beginning at knot 3, K hasn't the option to choose Pay-TV after accepting the offer of F, i.e. he can select only between a Free-TV transmission and the non-transmission.[18]

A strategy s_R^3 of the regulator R (knot 1) consists of the decision over the ban of a Pay-TV-transmission, a strategy s_F^3 of the licenser (knots 2 and 3) consists in choosing a license fee and finally, the strategy of the broadcaster s_K^3 consists of a decision over the acceptance of the take it or leave it offer (knots 4, 5) and the decision on the transmission form (knots 6 and 7). The following sub game perfect equilibrium $s^{3*} = \{ s_R^{3*}; \ s_F^{3*}; \ s_K^{3*} \}$ arises [19]:

$$s^{3*} = \begin{cases} \{(V);(G_{PT},G_{FT});(a,a,PT,FT)\} & \text{for } G_{PT} > G_{FT} \geq 0 \\ \{(Z);(G_{FT},G_{FT});(a,a,FT,FT)\} & \text{for } G_{FT} \geq G_{PT} \text{ and } G_{FT} \geq 0 \\ \{(Z);(G_{PT},L);(a,r,PT,out)\} & \text{for } G_{PT} \geq 0 > G_{FT} \\ \{(Z);(L,L);(r,r,out,out)\} & \text{for } G_{PT} < 0 \text{ and } G_{FT} < 0 \end{cases}$$

Table 3 summarizes the market results of a 'selective ban' regulation.

Table 3: 'Selective ban'- Transmission form, pay-offs and welfare

parameter	*form of transmission*	*license fee*	*broadcaster's net profits*	*welfare*
$G_{PT} < 0 \ \wedge G_{FT} < 0$	None	0	0	0
$G_{PT} \geq 0 \ \wedge G_{FT} < 0$	Pay-TV	G_{PT}	0	W_{PT}
$G_{FT} \geq 0$	Free-TV	G_{FT}	0	W_{FT}

5 OPTIMAL REGULATION-REGIME

5.1 Legislator's decision

In this section we compare the welfare effects of the three regimes in discussion, namely the unregulated 'laisser-faire' market solution, the 'general ban' of Pay-TV and the 'selective ban' proposed by the European Union. We will see, that the welfare-maximizing regulation strategy, could be interpreted as a translation of 'selective ban' into economic terms. The welfare-

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[18] In a recent paper, we have analyzed the same problem using another game structure, at which the regulator decides on the permission of a Pay-TV transmission after the negotiations of F and K. Since we have assumed perfect information, the results and propositions do not differ in principle. See HAFNER, M./NEUNZIG, A. (1997), pp. 17-19, 21f.

[19] It is to be noted that according to section 2 the welfare induced by a Free-TV transmission exceed that of a Pay-TV transmission. In addition we assume, that the regulator prefers to permit Pay-TV, in case that allowing or permitting Pay-TV does not change the market results.

maximizing strategy of such an authority can be interpreted as an optimal protection list in the sense of the European Union Directive.

The games presented in the last sections allow us to draw some conclusions concerning the welfare effects of the different regulation regimes. Table 4 shows the transmission decision of the broadcaster and the resulting pay-offs (order: initial rights owner, regulator, broadcaster). These market results depend on costs and revenue parameters (in the rows), and on the applied regulation-regime (in the columns). The table allows us to derive the optimal decision for a welfare maximizing legislator, i.e. the decision on the regulation-regime (cp. Figure 1, p.4). [20]

Table 4: Market results depending on the regulation regime

	Regulation-regime	Laisser-faire (Figure 2)	General ban (Figure 6)	Selective ban (Figure 7)
	Condition			
1)	$G_{PT} < 0 \ \wedge\ G_{FT} < 0$	No transmission	No transmission 0	No transmission 0
2)	$G_{FT} \geq G_{PT} \wedge G_{FT} \geq 0$	Free-TV W_{FT}	Free-TV W_{FT}	Free-TV W_{FT}
3)	$G_{PT} > G_{FT} \geq 0$	***Pay-TV*** W_{PT}	***Free-TV*** W_{FT}	***Free-TV*** W_{FT}
4)	$G_{PT} \geq 0 \ \wedge\ G_{FT} < 0$	***Pay-TV*** W_{PT}	***No transmission*** 0	***Pay-TV*** W_{PT}

Firstly, it is interesting that given the conditions of rows 1) and 2) of Table 4 the market results and the pay-offs are independent of the chosen regulation regime, the transmission decision remains uninfluenced by a state intervention. The reason is that, under the given conditions, the alternative Pay-TV is not relevant for the broadcaster's decision, since he would with or without the alternative Pay-TV renounce to transmit the event (row 1) or transmit in Free-TV (row 2).

Secondly, rows 3 and 4 show, that a selective intervention from a welfare economic view is superior to the general ban and to the laisser faire–regime. Under the condition of row 3 the event is transmitted in a Free-TV channel under the selective ban rule, instead of being transmitted on a Pay-TV channel under the laisser-faire rule. In all other cases there is no difference between these two rules, therefore the selective ban implies a **higher** welfare than a laisser-faire rule.

A comparison between the selective ban rule and the general ban rule shows that there is a difference between the effects of the rules only under the condition of row 4. A general ban would impede the transmission of the event, while the selective ban would allow the only profitable transmission form, namely Pay-TV. That is, the selective ban dominates the general ban.

In summary table 4 shows that the selective ban is the best decision a legislator can take[21]. It supplies welfare superior results both in relation to a general Pay-TV ban, and in relation to laisser faire.

5.2 Distributional effects on Licenser and Broadcaster

Table 5 shows the resulting pay-offs under the different regulation regimes.

Table 5: Pay-offs depending on the regulation regime

	regulation-regime condition	laisser-faire (Figure 2)	general ban (Figure 6)	selective ban (Figure 7)
1)	$G_{PT} \geq 0 \ \wedge \ G_{FT} < 0$	Pay-TV G_{PT};0	No transmission 0;0	Pay-TV G_{PT};0
2)	$G_{PT} > G_{FT} \geq 0$	Pay-TV G_{PT};0	Free-TV G_{FT}; 0	Free-TV G_{FT}; 0

Comparing row 1 and 2 of table 5 allows us to draw some conclusions on the distributive implications of the regulation-regimes. Our model leads to the result that the broadcaster's pay-off equals zero independently of the regulation regime. Note, that this is a consequence of the assumed ultimatum game.

Under the condition of row 1, where only the revenues of a Pay-TV transmission would exceed the costs, the initial rights owner is indifferent between the laisser-faire and the selective ban, since both rules would allow him to offer the event in Pay-TV, whereas the general ban would forbid the transmission. Thus, the initial rights owner prefer the laisser-faire rule to the selective ban, and the selective ban to the general ban.

Furthermore, it is to be recognized that under the condition of row 2, i.e. the revenues of a Pay-TV transmission exceed those of a Free-TV transmission and both exceed the costs, the

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[20] We derive the optimal regulation assuming implicitly that there are many potential events with different parameters, and that all have to be regulated by the same regime.

[21] Given the assumption that his option set consists only of the compared institutions.

initial rights owner prefers the laisser–faire rule. By applying the selective ban rule (or the general ban) the profits of the initial rights owner F would diminish by $\Delta G^F = (E_{PT} - E_{FT})$[22].

Finally, consumers and the advertising industry profit from an application of the selective ban rule. The advertising industry profits, since under the selective ban rule there are more events transmitted in commercial Free-TV. Consumers also profit, since events that are only profitable at Pay-TV come to be transmitted.

6 THE CASE OF FOOTBALL WORLD CUP

Our analyses turns now to the question whether a national ban of a Pay-TV transmission of Football World Cup should be declared or not., i.e. whether World Cup Games should be included in the 'protection list' or not.

We can supply a clear statement here: If the revenues of television financed by advertisements would cover the transmission costs ($E_{FT} \geq C$), then the inclusion on the list would increase welfare. And the latter condition is very likely to be fulfilled. The past showed that large football events are very popular and therefore high revenues from advertising are possible. If the transmission costs of an event could be financed by advertisement, it is the football World Cup! That is, the equilibrium of the third row of Table 4 is relevant, therefore Football World Cup should be included on the list.

The ISL/Kirch group bought the transmission rights of Football World Cups 2002 and 2006 by signing a contract with the FIFA over 3,4 billion DM, before the regulation regime was well defined, and this changes the actual decision problem slightly. ISL/Kirch could argue that they paid more than the gains possible by transmitting the event in Free-TV, since they expected to transmit the event in Pay-TV channels. This argument is not very convincing. Such an ex-post regulation could be represented by Figure 8.

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[22] Assuming games, where the collective gains of commercializing the transmission rights are distributed otherwise, ΔG^F represents the collective loss the initial owner and the broadcaster will suffer jointly by applying the selective regime.
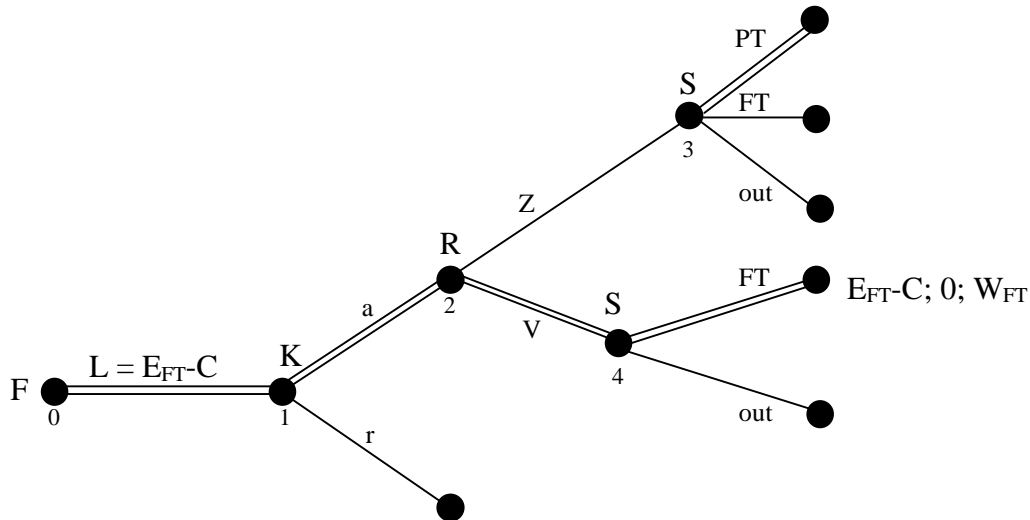
Figure 8: Equilibrium path for ex-post regulations

The difference between this game and the game presented in Figure 7 is that the regulator acts now after the negotiations between licenser and broadcaster at knot 2 and decides on prohibiting Pay-TV or not.

Never the less, assuming that the revenues of advertising financed TV exceed costs, the interdiction of the Pay-TV-financed transmission increases welfare, since at the time the broadcaster decides on the transmission form the license fee is sunk and the fee represents only a transfer from Kirch to FIFA.

In addition, because of the subjective importance for the public, it was very likely that a Pay-TV transmission of the World-Cups would be heavily criticized. This is, there are strong incentives for politicians to take measures against this transmission form. Therefore, it was very likely that a Pay-TV transmission will be forbidden.[23] Anticipating this, Kirch would not have paid more than the profits obtainable by a Free-TV transmission for the transmission rights.

Secondly, the statements of FIFA and ISL/Kirch group members directly after signing the contract indicate that a Pay-TV transmission was not planed at that time.[24] Taking the statements seriously, it is not very likely that ISL/Kirch paid more than the profits from Free-TV transmission.

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[23] Only if $G_{PT} > G_{FT}$ the Kirch group has an incentive to transmit the World Cup in Pay-TV-channels. With $G_{FT} \geq G_{PT}$ the decision to ban Pay-TV would not alter Kirch's decision.

[24] The FIFA secretary-general BLATTER (1996) stated briefly after the sales of the transmission rights: „Pay-TV and Pay-by view are impossible ". Also the buyer of the license, the ISL/Kirch group expressed itself similarly. Christoph MALTS (1996), chairmen of the ISL: „All games of the world championship 2002 are shown at the television free of charge". Still recently Keith COOPER (1997) speaker of the FIFA said: „I guarantee: Pay-by view is impossible. Perhaps it will give some repetitions in normal Pay-TV."

In summary, ISL/Kirch should not have paid more than the profits obtainable from Free-TV transmission. Nevertheless, a prohibition of Pay-TV prevents the profit-maximizing use of the acquired property right, and from a legal perspective this implies a significant risk for the state that ISL/Kirch has a claim for damages (BENDA, 1998).

7 CONCLUSIONS

7.1 Interpreting the model results

We have interpreted the transmission of (sport) events on television as the supply of a impure public good. In an unregulated market profit-maximizing broadcasters transmit too frequently events in Pay-TV. It was shown that monopolistic behavior leads to the exclusion of consumers, having a positive willingness to pay and having marginal provision costs equal to zero. In addition Pay-TV prevents the generation of welfare in the advertisement market. Regulation can in principle achieve higher welfare.

A general ban of Pay-TV implies that events that otherwise would have been transmitted in Pay-TV are made freely accessible to the spectators. This ban would lead to positive welfare effects both in the spectator market and in the advertisement market. A problem can arise however, if the revenues from advertising are not sufficient, to cover the transmission costs. A general ban of Pay-TV would make these transmissions completely unprofitable and would impede the broadcasters to transmit certain events. Therefor the net welfare effects of a general Pay-TV ban is in comparison to a laisser faire regime ambiguous.

A selective ban of Pay-TV is superior to a general ban and a laisser faire rule. We showed that the state should forbid Pay-TV, if and only if the revenues from advertising-financed television cover production costs, while broadcasters prefer to transmit this event in Pay-TV, due to higher profit expectations. Therefore, in the context of this model the current Directive 89/552/EEC, interpreted as constitutional choice of a selective ban regime, seems to represent a socially desirable regulation of the television market, since it plans a straight individual case-referred ban of Pay-TV-transmission of selected events. Nevertheless, before drawing policy-conclusions it is important to note, that the results depend on the assumptions. A condition for an unambiguously positive evaluation is that the protection lists corresponds to the derived optimal regulation strategy.

Without exact knowledge of the parameters in every individual case, consequences for the list composition can be already drawn from the model results. Events addressing a large public (e.g. Football World Cups, Formula 1-Races), can be expected to be financed without problems by advertisement. This is „blockbuster" should be offered on the freely accessible television. On the other hand, section programs, i.e. events, that address a small (however, very in-

terested) group of spectators (opera transmissions, documentary films, foreign football), are hardly to be financed only by advertisement. This is the result of the fact that a higher willingness to pay of spectators to view the event does not increase the willingness to pay for commercials of the advertising industry. Such minority programs are therefore predisposed for the transmission in Pay-TV.[25]

A further result concerns the distributive effects of a Pay-TV regulation. Given the very strict assumption concerning the situation in the license market (ultimatum game) the pay-off for the transferring broadcaster is always zero independent from the regulation regime. For the initial right owner the situation is substantially different, however. If the state intervenes with a ban, he does not receive the monopoly profits in the spectator market, but only the profits attainable in the advertising market. Spectators benefit from this. Beyond that welfare gains are generated in the spectator and advertising market. Thus the state intervention is of disadvantage for the initial rights owner, but favors spectators and the advertising industry.

In our case study we analyzed the application of such an selective ban regulation on Football World Cup. We derived that as transmission of this event can easily be financed by commercials, it should be offered to the public in Free-TV and should be included in the 'protection list'.

7.2 The limits of the model

Our analysis supplies a clear welfare economic evaluation. Applying the results of the model to reality we have, however, to consider its relatively strict information requirements. It was assumed that the regulator anticipates the costs and revenues of advertisement financed TV and Pay-TV perfectly. Imperfect information on side of the state (e.g. an underestimation of the transmission costs) can lead to false interventions, with the consequence that the state declares a ban, while Pay-TV represents the only profitable form of transmission.

A central problem area, which is frequently of importance in the literature on bureaucratic acting, concerns the incentives and the costs of state intervention.[26] This aspect was neglected in the model-theoretical presentation, but must be considered in applying the model results to reality. In particular, it is questionable whether welfare-maximizing behavior would be really a goal and result of state intervention. This question may be of particular importance if there are

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[25] A similar result is derived by SPENCE und OWEN (1977, S.122): They argue, that 'minory taste programs' are more probable to be provided by Pay-TV-channels.

[26] Cp. for example, Mueller, D.C. (1989)

public broadcasting channels (as in Germany), that also bid for transmission rights.[27] A political economy analysis might supply further valuable insights.

Beyond that, it may be useful to analyze the effects of softening some of the relatively strict assumptions concerning the transmission and consumption of television:

- transmission with commercials could induce ceteris paribus a lower utility level than a transmission without commercials. This would be the case if spectators regard commercials as a bad. Spectators' disutility from commercials, have an influence upon the welfare-economic evaluation of the Pay-TV regulation.

- the introduction of a further parameter „quality of the program" (better comments, more camera positions...) could likewise affect the welfare-economic evaluation. Possibly the optimal program quality is higher with Pay-TV than with Free-TV; a view on the German television market makes this conclusion plausible.

Both effects would work toward a higher attractiveness of Pay-TV. However a model-theoretical analysis of this problem area is necessary to determine size and relevance of the mentioned effects. This is an interesting field, which should be in the focus of future research.

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[27] Thus for instance the public TV organizations could be quite seized under a widely interpreted term of Pay-TV, a fact, the lump sum character of the GEZ fees lets which step every now and then to something into the background of the discussion.

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