

# **ADVERTISING AS A SIGNAL OF QUALITY IN THE POPULAR MUSIC INDUSTRY:**

## **A GAME THEORETICAL APPROACH**

**by**

**Timo Kuosmanen**  
Address: Helsinki School of Economics  
and Business Administration  
P.O. BOX 1210  
FIN-00101 HELSINKI  
FINLAND  
E-mail: kuosmane@hkkk.fi  
Tel: +358 9 4313 8537  
Fax: +358 9 4313 8535

**Jari Viitanen**  
University of Joensuu  
Department of Economics  
P.O. BOX 111  
FIN-80101 JOENSUU  
FINLAND  
Jari.Viitanen@joensuu.fi  
+358 13 251 4227  
+358 13 251 3290

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## **Abstract**

This paper models the popular music industry as a signaling game between record companies and consumers. In this model, consumers are not able to identify the quality of recordings before buying decision. Instead, they associate observed advertising with good quality of albums. The purpose of this paper is to give a simple game theoretical perspective to understand advertising strategies of the record company, and their influence on consumer's buying decision. We assume that the consumers behave rationally, and are not affected by any subconscious influences. Still, under certain reasonable assumptions, in the equilibrium of the game, the record company can use advertising to increase record sales. The best strategy for the record company is to advertise the artist more or less randomly regardless of the artist's musical ability. Furthermore, if the artist is good enough, the record company should not waste resources on unnecessary advertising campaign.

**Key Words:** *advertising, game theory, signaling games, popular music, cultural economics*

JEL classification: Z10, C73

# 1. INTRODUCTION

Popular music has nowadays become a billion-dollar international leisure industry. Originally, music had all the characteristics of a service, but modern technology has enabled the transformation of music into a product: an album that is sold in compact disc, tape, and vinyl formats. Once the songs have been written, performed, and produced the albums are relatively cheap to reproduce, transport, and retail to consumers. It is natural that the more albums are produced and sold, the smaller the average costs are. Thus, selling masses of albums is what keeps the business going - other activities such as live concerts, singles and videos can be seen as mere sales promotion for albums. This is why we speak of record sales hereafter, although the same framework applies as well, for example, to concert ticket sales.

Unfortunately, we do not know precisely what factors determine the record sales of artists. Despite its cultural and economic significance, pop music has received remarkably little attention in the academic world. Previous studies have had a strong sociological orientation,<sup>1</sup> and only a few papers on the economics of popular music have been published<sup>2</sup>. However, this topic should not be of minor interest for economists, not only because of the huge sums of money present in the worldwide pop music business, but also because this business heavily influences the styles, and the consumption of clothing, hair-styles, and other suchlike commodities.

The effect of advertising on consumers' expectations on the artistic quality of recordings is a particularly interesting issue. Since consumers are not able to check the quality of albums before the buying decision<sup>3</sup>, they have to rely on the information they get from record companies through advertising and the media. And indeed, record companies control very carefully what kind of information is given to the public, which gives them an informational advantage. Thus, media attention towards artists can also be seen as one type of advertising.

Nelson has argued in a series of articles (1970, 1974, 1978) that advertising can act as an indirect signal of quality for the consumer. If advertising expands the initial sales for all brands equally but increases repeat purchases of high quality brands relatively more, the market mechanism can produce a positive relationship between product quality and advertising

expenditures. Kihlstrom and Riordan (1984) and Milgrom and Roberts (1986) among others have tried to formalize Nelson's ideas into a theoretical model. However, their main conclusion of a strong positive correlation between advertising and good quality is a contradiction of later empirical findings by Caves and Greene (1996).

In this paper, we accept Nelson's signaling hypothesis. However, our modeling differs from previous formalizations in that we also take the consumer's choice explicitly into the model. We limit the analysis to a certain special market, the recording business, which allows us to make some more specific assumptions about the payoffs of the game than in a general case. However, this specific model offers an example of weak empirical correlation between advertising and quality on the market where consumers believe (perhaps for a good reason) that advertising is a signal of good quality.

The objective is to present a simple game theoretical perspective together with a formal definition to understand why sales of some albums are promoted using large advertising campaigns while others are not. In this paper we, make some effort to show that, under certain reasonable assumptions, record companies can trigger sales by advertising. The best strategy for the record company is to advertise an artist more or less randomly, regardless of the artist's musical ability. Furthermore, if the artist is good enough the record company should not waste money on unnecessary advertising campaigns.

The paper is organized as follows. In the next Section we use a standard signaling game to describe the behavior of record companies and consumers. A similar type of game has been used in many interesting applications in economics, accounting, finance, marketing, law, political science, and sociology. We recognize the influence of Haaparanta and Puhakka (1997), who use this type of game to explain the impact of the Soviet Union's threat in Finland's domestic politics during president Kekkonen's presidency.

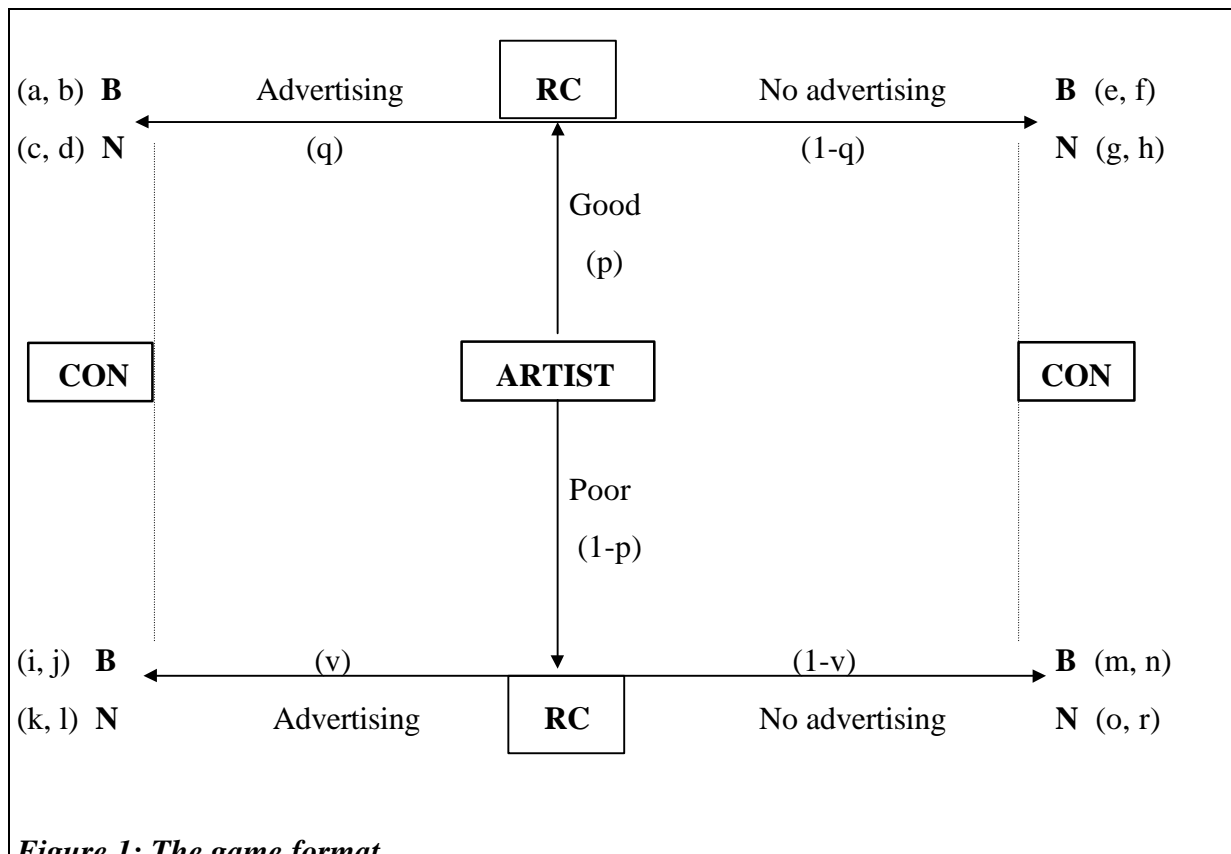
Rational behavior of the "players" in this game leads to a so called *perfect Bayesian equilibrium* defined in Section 3. The properties of the resulting equilibrium are discussed in Section 4. We show that record sales do not only depend on the expected quality of the album, but rather on the relation of quality to certain critical quality requirements of the consumer. Furthermore, record companies can exploit the uncertainty prevailing in the market to sell

more albums than in a full information case, although consumers are assumed to behave rationally. Thus, we cannot use album sales figures as a reliable measure of artistic success. Finally, in Section 5 we draw our conclusions, point out the limits of our model, and discuss its appropriateness in describing the popular music industry.

## 2. GAME FORMAT

The game theory analyzes abstract games played between certain *players* under certain rules defining payoffs, accessible information, and feasible actions for each player. In this paper, the interaction in the music business is described by a simplified game involving three representative players: the artist, the record company, and the consumer. For convenience, we ignore all other possible players that often play an important role in the real life, such as agents and managers of the artist, radio, TV, and other media. This simplification can be justified by the following interpretation: Artists and their agents have similar interests towards record companies and the public, so they can therefore be seen as the same player (team) in this game. Similarly, the media can be linked together with record companies.<sup>4</sup>

The game format is graphically displayed in figure 1. The game begins from the node of the artist in the middle: The artist creates the music recorded on the album, whatever the motives for doing that might be. The consumer *a priori* expects the album to be good with probability  $p$ ,  $0 < p < 1$ , and poor with  $(1-p)$ , respectively. This expectation may be based for example on earlier experience of record purchases, on public information concerning the artist, or just on neat album cover<sup>5</sup>. In this analysis, it does not matter if the expectation is actually correct. The probability  $p$  is a consumer's characteristic, so the artist is not able to affect it within the framework of this game<sup>6</sup>. Thus, the artist is merely an inactive player that starts the game.



Assume the record company is only concerned of its' profit. The record company makes a deal with the artist, and commits itself to produce, and publish the album by the artist. The production cost must be paid before the realization of the album, so at this moment, the album quality is unknown. The record company observes the album quality only after the recording is finished, so whatever the quality, the record company tries to sell the album to the consumer in order to realize the initial investment.

At this point, the consumer does not know the album quality, but the record company does. It has two possible *actions* to undertake<sup>7</sup>: advertising and not advertising. The record company knows its action affects the consumer's expectations about the album. As in standard signaling games, we assume that the initially expected probability  $p$  is a common information to all players.

The consumer observes the action of the record company (advertising or no advertising) without knowing which decision node in the information set has been reached. The dashed line between the decision nodes of the consumer reflects this uncertainty of the artist type. In each decision node the consumer must choose between two possible *actions*: either to buy the record (B) or not to buy (N). The choice of action is based on the expected prior probability  $p$ . However, the observed advertising decision of the record company may indirectly reveal something about the album type to the consumer. By using posterior probabilities conditional on the record company's action, a rational consumer takes this additional information into account when making his purchasing decision.

The payoffs of each option are shown in parenthesis; on the left for the record company (measured in profit), and on the right for the consumer (measured in utility). The payoffs are reported in the general parametric form, but we can use simple reasoning to make some plausible assumptions on the payoffs. Clearly, the profit for the record company is always higher if the consumer buys the album. Thus, the following inequalities hold for its' payoffs:

$$a > c, e > g, i > k, \text{ and } m > o. \quad (2.1)$$

Moreover, due to the advertising costs, the profit is always higher if the consumer is willing to buy the album without any advertising<sup>8</sup>. Formally this is expressed as

$$e > a, g > c, m > i, \text{ and } o > k. \quad (2.2)$$

Since we assume that the record company does not care about the consumer's utility, we can set:

$$a = i, c = k, e = m, \text{ and } g = o. \quad (2.3)$$

Finally, all the previous assumptions can be conveniently summarized as:

$$e = m > a = i > g = o > c = k. \quad (2.4)$$

Furthermore, we assume that the profits of the record company are negative when the album is not sold, implying

$$g, o, c, k < 0. \tag{2.5}$$

For the consumer, we define *good* album as an album worth buying, and *poor* album as an album not worth buying. Formally, this means that

$$b > d, f > h, l > j, \text{ and } r > n. \tag{2.6}$$

Furthermore, we assume that the consumer is better off after buying a good album that is advertised, than after buying a good album that is not advertised, implying

$$b - d > f - h. \tag{2.7}$$

This assumption is based on the observation that people seem to enjoy consumption of pop music in the company of others more than in the privacy (see, e.g. DeSerpa and Faith, 1996). This assumption simply states that the albums advertised are more likely to turn out to be popular, but not necessarily good. We do not make any initial assumptions concerning the effect of advertising to the consumer's payoffs when the album turns out to be a poor one.

### **3. EQUILIBRIUM STRATEGIES**

#### **3.1. Definition of Perfect Bayesian Equilibrium**

This section shortly characterized the so-called Perfect Bayesian Equilibrium, which is the most appropriate equilibrium concept in this type of games.<sup>9</sup> In the game theory, the concept of equilibrium can be interpreted as the outcome of the game when all the players behave rationally and react according to their best feasible response to the other players' strategies. In addition, every player's strategy is a complete plan of action conditional on the optimal strategies of the other players. In the signaling games, the player in move has a belief about

which node in the information set has been reached during the course of the game. These beliefs are determined using the Bayes' rule given the expected strategies of the other players. Thus, an equilibrium of a signaling game is called a *perfect Bayesian equilibrium*, and it is a set of strategies and beliefs that maximizes the utility (payoffs) of the players. In the equilibrium, no player has an incentive to deviate from the equilibrium strategy.

Signaling games are classified as dynamic games of incomplete information (Gibbons 1992). To be more precise, this reflects only the dynamics *within* a game: Nature's move for a type in the first step, the sender observing the type and transmitting a signal in the second step, and the receiver's action in the third step. The continuity of the game is usually ignored without any notice and the game as a whole is treated as if it was a one-shot game without any dynamic nature *between* different games.

The dynamics of this game can also be logically extended to the context of repeated games, involving signaling dynamics *within* each game, and intertemporal dynamics *between* repeated games. However, this does not necessarily change the nature of the periodical one-shot games. For instance, after playing a one-shot game, the consumer observes whether the album was advertised or not, and whether it was of good or poor quality. Based on these observations he updates his prior beliefs on probabilities for the next purchasing decision. Respectively, the record company will update its own beliefs before the next round. The nature of the resulting new one-shot game is alike the first one except for the updated probabilities together with updated actions.<sup>10</sup>

### **3.2. Pure Strategies**

In principle, there are four alternative *pure strategies* the record company can choose of. They are pure in the sense that the record company follows a certain rule in which the type of the artist determines the signal that it sends. The pure strategies are:

- i) Separating strategy of advertising if the album is good, and no advertising if the album is poor (probabilities are set as:  $q = 1$ ,  $v = 0$ ).
- ii) Separating strategy of not advertising if the album is good, and advertising

if the album is poor ( $q = 0, v = 1$ ).

iii) Pooling strategy of advertising both album types ( $q = 1, v = 1$ ).

iv) Pooling strategy of advertising neither album types ( $q = 0, v = 0$ ).

Compare the separating strategies i) and ii). These two strategies approach the complete information case in a sense that the type of the album is revealed to the consumer through advertising. In this case, the consumer buys the album if, and only if, it is known to be good given the initial assumptions. Thus, the expected payoff for the record company is  $[pa + (1 - p)g]$  in the first strategy, and  $[pe + (1 - p)c]$  in the second one.<sup>11</sup> Since  $e > a$ , and  $g > c$ , it is straightforward to see that the first strategy is more beneficial for the record company, if

$$p \geq \frac{c - g}{(c - g) + (a - e)} . \quad (3.1)$$

Otherwise the second one is better.

Consider then the pooling strategies iii) and iv). We assume that the utility function of the consumer satisfies the axioms of expected utility theory by von Neumann and Morgenstern (1944). Intuitively, this means that the consumer buys an album, if the expected utility of buying is higher than the expected utility of not buying. After observing advertising, the consumer chooses to buy if

$$pb + (1 - p)j \geq pd + (1 - p)l , \quad (3.2)$$

or equivalently

$$p \geq \frac{l - j}{(l - j) + (b - d)} \equiv u^* , \quad (3.3)$$

where  $u^*$  is defined as the critical probability for the consumer's buying decision. He purchases the album, if  $p$  is sufficiently high. Similarly, we can calculate the corresponding critical probability for the consumer in the case that no advertising is used. The only difference is now that the primary probability  $p$  must satisfy

$$p \geq \frac{r - n}{(r - n) + (f - h)} \equiv z^* . \quad (3.4)$$

Assume that  $z^* > u^*$ . This is true, for example, if  $b - d > f - h$ , but  $l - j = r - n$ . This can be interpreted as follows: The consumer is better off, if he buys a good album that is advertised than if he buys a good album that is not advertised (see Section 2.). But when the album is poor, the advertising has no effect.

When  $p > z^*$ , the strategy iv) is always more beneficial for the record company than the strategy iii), because unnecessary advertising costs are saved. Naturally, when  $u^* < p < z^*$ , strategy iii) must be chosen; otherwise no albums would be sold.

Compare now the outcomes of the pure strategies. Obviously the strategy iv) is the most eligible for the record company if the primary probability  $p$  and the preferences of the consumer satisfy the condition (3.4). It is straightforward to see that there can not exist any hybrid strategy (see next section), that would dominate strategy iv) in this case.

When  $u^* < p < z^*$ , the pooling strategy iii) clearly dominates the separating strategy i) expected payoffs being  $a$ , and  $pa + (1 - p)g$ , respectively (it was assumed that  $a > g$ ). However, nothing can be said about whether the pooling strategy iii) or the separating strategy ii) is chosen, because  $a \underset{>}{\leq} pe + (1 - p)c$ . The result depends on payoff values (assumed that  $e > a > c$ ) and primary probability  $p$ . If neither of the inequalities (3.3) and (3.4) hold, then either of the separating strategies i) and ii) is the optimal policy, depending on the condition (3.1) as discussed earlier. However, we ask, whether there exists any hybrid strategy that dominates the separating strategies, or the pooling strategy iii)?

### **3.3. Hybrid Strategies**

The concept of hybrid strategies refers to the fact that it can be interpreted as a linear combination of two or more pure strategies. It is used in signaling games analogous to the

concept of mixed strategy in static games. In addition to the pure strategies, the record company can also use

- v) a hybrid strategy of advertising randomly; the good album type with probability  $q$ , and the poor album type with probability  $v$ . ( $0 < q < 1$  and/or  $0 < v < 1$ )

In other words, the record company chooses *randomly* a share  $q$  of the good albums, and a share  $v$  of the poor albums to be advertised.

After observing the action of the record company, the consumer updates his beliefs according to the Bayes' rule. For instance, the posterior belief on probability of a good album after observing advertising is

$$\text{Prob. (Good | Advertising)} = \frac{qp}{qp + v(1-p)} \equiv u. \quad (3.5)$$

Respectively, the other posterior probabilities are

$$\text{Prob. (Poor | Advertising)} = \frac{v(1-p)}{qp + v(1-p)} \equiv 1-u, \quad (3.6)$$

$$\text{Prob. (Good | No advertising)} = \frac{p(1-q)}{(1-q)p + (1-v)(1-p)} \equiv z, \text{ and} \quad (3.7)$$

$$\text{Prob. (Poor | No advertising)} = \frac{(1-p)(1-v)}{(1-q)p + (1-v)(1-p)} \equiv 1-z. \quad (3.8)$$

Notice that  $u > p$ , if  $q > v$ . This means that the consumer associates advertising to the good album type more often than not advertising. Clearly, when advertising is observed, the consumer expects the probability of the good albums to be higher than the prior belief on probability  $p$ , and the record company can take advantage of this.

When an album is advertised, the purchasing condition for the consumer, is

$$ub + (1 - u)j \geq ud + (1 - u)l \quad , \quad (3.9)$$

which can equivalently be written as

$$u \geq \frac{l - j}{(l - j) + (b - d)} \equiv u^* \quad . \quad (3.10)$$

Notice that  $u = 1 > u^*$ , if the record company sets  $q = 1$  and  $v = 0$ . This special case of the hybrid strategies is equivalent to the separating strategy iii). Consider next an arbitrary hybrid strategy, with  $q = 1$ , and  $v = \varepsilon > 0$ , where  $\varepsilon$  is a small arbitrary constant. Since  $u^* < 1$ , we can choose  $\varepsilon$  in such a fashion that  $u$  still satisfies inequality (3.10). Now, the expected payoffs for the record company can be calculated in both cases using the Bayes' rule. It turns out that the payoffs are higher in the hybrid strategy than in separating strategy; formally

$$pa + (1 - p)va + (1 - p)(1 - v)g > pa + (1 - p)g \quad . \quad (3.11)$$

The explanation is straightforward: In addition to all the good albums, also a tiny fraction  $v = \varepsilon$  of the poor albums is sold in a hybrid strategy equilibrium, which yields higher profits. Thus, we have proved that there always exists a hybrid strategy that dominates the separating strategy iii).

Similarly, when advertising is not used, the purchasing condition is

$$zf + (1 - z)n \geq zh + (1 - z)r \quad , \quad (3.12)$$

which can be written as

$$z \geq \frac{r - n}{(r - n) + (f - h)} \equiv z^* \quad . \quad (3.13)$$

The separating strategy iv) can be seen as the special case  $q = 0$ , and  $v = 1$ , in which advertising signals poor quality. Notice that  $z = 1 > z^*$ , if the record company uses such a

strategy. Assume next that some poor albums are not advertised in order to make the consumer believe these to be good ones. Probabilities are set as  $q = 0$ , and  $v = (1 - \varepsilon)$ ,  $\varepsilon > 0$ , where  $\varepsilon$  is an arbitrary constant chosen in such a fashion that  $z$  satisfies (3.13) as inequality. Again, the payoffs for the record company are higher in the hybrid strategy than in the separating strategy, because

$$pe + (1 - p)(1 - v)e + (1 - p)vc > pe + (1 - p)c \quad (3.14).$$

Thus, we have also proved that there always exists a hybrid strategy that dominates the separating strategy iv).

Consider next such values of  $q$  and  $v$  that satisfy the conditions (3.10) and (3.13) as equalities. These values are sufficient to guarantee that the consumer always buys the album. The solutions are

$$q = \frac{-u^*(p - z^*)}{(z^* - u^*)p}, \quad v = \frac{-(1 - u^*)(p - z^*)}{(z^* - u^*)(1 - p)}. \quad (3.15)$$

The solutions  $q$  and  $v$  coincide between 0 and 1, if

$$u^* < p < z^*, \quad (3.16)$$

which is necessary, as  $q$  and  $v$  are probabilities.

In these cases the consumer buys the album for sure, as was also the case in the pooling strategy iii). However, when using any separating strategy, the record company does not need to advertise all the albums, which saves advertising costs yielding higher payoff. We can show this also formally: The expected payoffs for the record company are  $[a]$  of each album when the albums are always advertised and sold. When the separating strategy is used, the expected payoffs are

$$\begin{aligned} & pq a + p(1 - q)e + (1 - p)va + (1 - p)(1 - v)e \\ & = [pq + (1 - p)v]a + [p(1 - q) + (1 - p)(1 - v)]e > a \end{aligned} \quad (3.17)$$

Thus, we have shown that there always exists a separating strategy that dominates the pooling strategy iii). It is never optimal for the record company to advertise all the albums it publishes.

As a conclusion, we found two possible equilibrium strategy types: The record company adopts either the pooling strategy iii), or some kind of hybrid strategy. Which one is chosen depends on the level of the good album probability  $p$  relative to the consumer's preferences. If the risk of buying a poor album is low from the consumer's point of view, implying that

$$p \geq \frac{r - n}{(r - n) + (f - h)} \equiv z^*, \quad (3.18)$$

the pooling strategy in which no advertising is used is the equilibrium. If this condition is not met, then the optimal policy for the record company is a hybrid strategy: advertising good albums, and advertising poor albums, but not systematically. The record company has informational advantage, and it has strong incentive to keep it and exploit it.

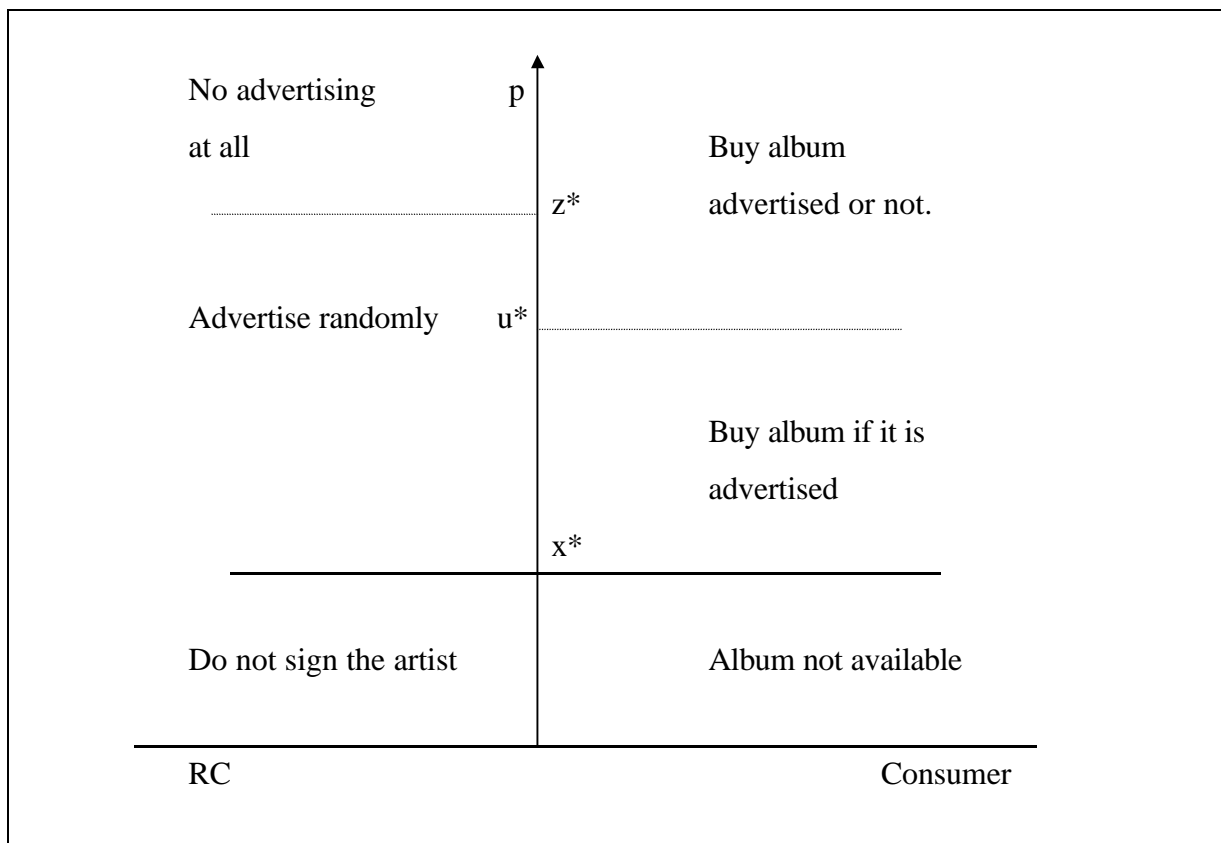
#### **4. PROPERTIES OF THE EQUILIBRIUM**

In the previous section we showed that there exist only two possible equilibrium strategy types: the pooling strategy iii), or some kind of a hybrid strategy. This section explains intuition behind this result. Moreover, we give a more practical interpretation, and discuss the implications of these findings.

The optimal solution for the record company would be the case in which it did not need to give any information at all, if it still could sell all the albums (pooling strategy iv)). In real world, there are several examples of pop musicians whose albums sell platinum without expensive advertising campaigns, say the Beatles or Creedence Clearwater Revival. We can also think of classical music as an example of this. Those consumers who enjoy classical music can usually take the good quality of performance as granted, so no advertising is needed.

If consumers require information in order to buy, the second best solution for the record company is to give some, but at the same time, keep the consumers uncertain to some extent. It is possible that the consumer would not be willing to buy any album without advertising, but he always buys when the optimal hybrid advertising strategy is executed. This implies that the advertising strategy of the record company can be more important factor in buying decision than the primary expectation of the quality of music. The quality can be seen as a necessary, but not sufficient requirement of success. In general, we cannot draw a strict conclusion that people like an artist more than another just because the first one has sold more records.

Figure 2 summarizes the properties of the equilibrium as the prior probability  $p$  changes in the vertical axis. The actions of the record company are described on the left and the actions of the consumer on the right. When the probability  $p$  is higher than the critical probability  $z^*$ , the record company never advertises any type of artists, because the consumer is willing to buy anyway.



**Figure 2: The properties of the equilibrium with different levels of  $p$  (growing upwards).**

*The optimal action is represented at the vertical axis; on the left for the record company, and on the right for the consumer. For the consumer,  $u^*$  is a critical probability level where he changes his action. Similarly,  $z^*$  is a critical probability level for the RC. If  $p < x^*$ , artist is not signed and album is not published. It is assumed that  $x^* < u^* < z^*$ .*

When  $p$  is between critical values  $u^*$  and  $z^*$ , the record company can use such an advertising strategy that the consumer buys the album, advertised or not. There is, however, a problem of dynamic inconsistency in this case. The record company knows the consumer's beliefs, so there is a temptation to cut down the advertising expenditures. Yet, dynamically this is not a credible policy, given the assumption that the consumer has rational expectations. The consumer takes the preferences of the record company into account in the first place, and he can also observe the actions. As a result, he can change his own behavior. If the record company does not advertise frequently enough, no albums are sold (see Section 3.2.), which is certainly a worse option for the record company than the starting case.

When  $p$  is lower than  $u^*$ , the consumer buys the record only if it is advertised. Now, the record company can "cheat" by advertising, in addition to the good albums, also some poor albums.

The consumer knows this perfectly well, but he just has to accept it, if the record company does not get too greedy and increase the fraction of poor albums too much.

Thus far, we have ignored totally the issue of how and which artists the record company selects from the masses to give an opportunity to publish. It is easy to see from figure 2 that the more talented and well known the artist (the higher the probability  $p$ ), the more confident the record company can be of the sales. However, we see also that the absolute level of  $p$  does not matter as much as it's relation to the consumer's critical levels determined by the consumer's payoffs. The consumer treats all the artists whose probability of recording good album coincides to certain range the same way, because he has only two options to choose from: to buy or not to buy.

The strategy and the profit of the record company depend on the probability  $p$ . Since we assumed negative profits when no albums are sold, there exists a critical probability  $x^*$ :

$$x^* = \frac{va + (1-v)g}{va + (1-v)g - qa - (1-q)g}, \quad (4.1)$$

at which the optimal strategy, feasible for the record company, gives zero expected profit. The record company does not sign any artist with  $p$  less than this critical level  $x^*$ . Notice that  $x^*$  depends on the payoff parameters as well as on the strategy possibilities of the record company, so it has no exact explicit value comparable to  $u^*$  or  $z^*$ . Figure 2 represents the case when  $x^* < u^* < z^*$ . However, in general, we cannot draw such a conclusion. Naturally, it is possible that  $x^* > z^*$ , when it is profitable to publish only extremely talented artists, and no advertising exists. In classical music this might be the reality.

In pop music a successful hit can earn lots of money both for the artist and for the record company, so the critical probability might be lower. In this case, also an artist with a low prior probability of good music can be sold if advertising is done properly. Naturally, the record companies are willing to sign the best artists first. When super talents are not available anymore, also less talented ones will do. While music business has grown fast (or rather exploded) during the last decades, more and more new talents have appeared to the market. Still, it is impossible that the number of talented musicians grows at the same pace with ever

increasing record sales. The history of popular music is closely connected to history of modern advertising as a whole. Our results suggest that one of the most important factors behind the huge growth of popular music industry may have been the development of effective advertising concepts that have enabled selling also some less talented artists.

Finally, some remarks on competition between record companies should be noted. In this current model, the record company was a monopoly producer of a unique product, giving the privilege to determine the volume of total advertising on the market. However, under keen competition the effectiveness of advertising strategies would depend also on actions of other companies. In perfect competition, no firm could control the total advertising volume, so hybrid strategies would not be effective. The only possible equilibrium strategies would then be the pooling strategies discussed in Section 3.2. Our exercise shows that this would leave industry as a whole worse off than in a pure monopoly. However, few major companies dominate the international popular music industry, which gives each a considerable monopoly power<sup>12</sup>. In addition to economies of scale, the advertising capability can be an important factor that has directed music industry towards monopolistic competition.

## **5. CONCLUSIVE REMARKS**

We have analyzed the markets for popular music using a simple game theoretical framework. We believe the standard signaling game format describes reasonably well the actual signaling and buying patterns in the music market. We hope that this short exercise has given a new viewpoint from which to look at the markets for popular music.

Our main result was that advertising could trigger sales even when consumers behave perfectly rationally, but under incomplete information. This result is achieved when record companies also advertise, in addition to good albums, some not so good ones as good albums. Because consumers can not see the difference between the two, they buy more albums than they would do in a full information case, even though they know perfectly well that they are being cheated at times.

This current paper gives a warning of how we can all be manipulated by advertising; not only in the music business, but in every market where the actual quality of the good is revealed to the consumer only after the buying decision. We have spoken exclusively of advertising and buying of albums, but we still want to emphasize that the same theoretical model as well as the results also hold for markets of other forms of performing music, such as singles, concert tickets, music videos, CD-ROM's, and other suchlike products.

We showed that generally the best strategy for the record company is to advertise artists randomly regardless of the artist's musical ability. There is only one exception. If the artist is good enough, no advertising campaign is needed. However, artistic success can not be measured by record sales, because poor albums can also be sold as well when effectively marketed. On the other hand, relatively good artists can sell poorly without appropriate advertising.

In reality, record companies are not restricted to choose between two advertising alternatives (advertising or no advertising). Actual variety of different advertising strategies is unlimited. Also the actions of other companies affect the outcome of advertising campaigns. However, in real life consumers actually have to choose (consciously or not) between two options: to buy or not to buy. If we define the type "good" as "the album worth buying", and the type "poor" as "the album not worth buying", limiting analysis on only two alternatives makes perfectly sense, and no other classes are needed. We could add more options for the record company as well, but while making the analysis much more complicated, it would not change the main results.

Furthermore, we have made several assumptions that, we believe, are generally realistic, but this is not necessarily always the case. We wanted to minimize the number of assumptions concerning the payoffs to keep the analysis on a general level. However, there is a trade-off between the complexity of the model and assumptions required. Increasing the number of alternatives for artist type and advertising strategies would necessarily require more assumptions on payoffs, which in turn would lead us from the general level towards a case study.

## Notes

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<sup>1</sup> see Frith (1978, and 1983), for example

<sup>2</sup> There are few rare exceptions, such as DeSerpa and Faith (1996); Crain and Tollison (1997); and Cameron (1997).

<sup>3</sup> We recognize the fact that in some record stores people are allowed to listen to albums freely. Yet, the number of albums available is so enormous that it is impossible to go through all of them. Frequently, the buying decision is based entirely on one successful hit song played on TV and radio, but certainly this guarantees nothing of the quality of the album as a whole.

<sup>4</sup> Coase (1979) argued that the rock and roll revolution in the late 1950s was facilitated by payola, which is an undisclosed payment or other inducement to a radio DJ by a record company to receive more playtime for a song.

<sup>5</sup> As Cameron, and Collins (1997) point out, there are often two or more songwriters in the same band, each inclined to publish his/her own songs, so the ratio of good songs to poor songs may depend on who's songs are chosen. In democratic groups, the general quality level of an album may have to be lowered in order to maintain workable relationships between the band members.

<sup>6</sup> Naturally, we can think of direct signaling from the artist to the consumer. However, this is beyond the scope of this paper.

<sup>7</sup> As in the case of the artist's talent, this simplification to binary scale is only for convenience. One possible extension could be to allow continuous scale of advertising expenditure. However, we leave this note only as a remark.

<sup>8</sup> Conversely, if the record company makes losses when albums are not sold, the loss is smaller if no advertising is used.

<sup>9</sup> For formal, and more precise definition, see e.g. Gibbons (1992, p. 187 - 188) or Rasmusen (1989, p. 110).

<sup>10</sup> Although this new one-shot game is intuitively between the same record company and the same consumer, with updated beliefs and actions, this dynamic context is easily extended to cover cases with a new artist and/or different record company.

<sup>11</sup> It was assumed that  $c = k$ , and  $g = o$ . See Section 2.

<sup>10</sup> In the UK, the music markets have recently been investigated by the Monopolies and Mergers Commission (MMC), the government body that makes recommendations on actions to be taken where a company has a market share over 25 per cent. The MMC found that there were monopoly situations, but the prices of CDs and other recordings were not unreasonably higher than elsewhere. (Towse, 1997)

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