

Does the Japanese Rental System of Music CDs Adversely Affect Their Sale?

By Sumiko ASAI*

Introduction

Digitalization and broadband Internet have enabled the distribution of content through additional channels. In the case of movies, box office revenues are considered as a touchstone for sequential revenues such as digital versatile discs (DVDs) and broadcasting, which often exceed initial box office revenues.

With regard to music, listeners can access content via live concerts, compact discs (CDs), radio and TV music programs, distribution through the Internet. In Japan, the rental system for audio recordings is another legal way of listening to music. However, many Japanese record companies have claimed that the rental system has had an adverse impact on their sales, and therefore they have resisted the rental business since its inception. In contrast, the motion picture industry has considered the DVD rental business as an important income channel. Thus, the motion picture and music industries have markedly different attitudes toward the rental of packaged media.

Although the Japanese rental system for audio recordings is based on the amended Copyright Law of 1985, it has not been subjected to a scientific analysis, and so the claim made by record companies has not been tested up to the present. If rentals were a perfect substitute for purchase, the rental system would have a negative effect on CD sales, thereby the assertion by record companies would be confirmed. On the other hand, if consumers have come to know an artist by renting a CD and have become fans of the artist, they might purchase CDs that feature the artist and are released later. In addition, if music users are segmented into CD purchasers and rental users, the two markets are considered to be independent and do not have a substitute relationship. Thus, regarding the impact of the rental system on CD sales, two opposite effects are assumed. It remains unknown which assumption should be adopted or which one effect outweighs the other effect until an empirical investigation is conducted.

The amendment to the Copyright Law of 2004 made the rental of publications subject to the same legal requirements as audio recordings although a legal

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framework had not been applied to the rental of books and magazines until 2004. Thus, the rental system for music is a precedent for that of publishing. In consideration of the 2004 amendment to the Copyright Law regarding to the rental system of publishing, this study focuses on the Japanese rental system for audio recordings that has operated for more than 20 years, and examines the effect of the legal rental system on the music market empirically.

The rest of this paper is organized as follows. The next section gives an overview of the Japanese rental system. The subsequent section surveys related literature. Following the survey, a model and data are described. The next sections present empirical results and the implications. The final section offers some concluding remarks.

Overview of the Japanese Rental System

In Japan, the rental of audio recordings was started by some university students in 1980.¹ They rented audio recordings to consumers for about 10 percent of the list price of each audio recording. After that pioneering effort, rental services rapidly penetrated the Japanese music market. However, many record companies did not welcome the rental business because they thought it would become an alternative to the sale of audio recordings. Nevertheless, record companies could not prevent rental stores from lending audio recordings to consumers because there was no provision regarding lending rights that protected record companies under the Japanese Copyright Law at that time. Rental stores operated freely without legal control, and their number surpassed 2000 by the mid 1980s.

As the rental business grew, record companies became more concerned about its impact on their sales. They strongly urged the government and the Diet to introduce a lending right i.e., the exclusive right to offer audio recordings for the purpose of lending, into the Law. As a consequence of their fierce lobbying, the amended Copyright Law of 1985 gave exclusive lending rights to record companies and performers for one year from the date of first release.² Furthermore, they have the right to receive a reasonable amount of remuneration from rental stores for an additional 49 years³ although they legally lose this exclusive right after one year.

Record companies can prohibit rental stores from renting CDs for a period of up to one year from the date of first release, based on the Copyright Law of 1985. However, in fact, consumers can rent most CDs from almost the same time of release. The reason is that some Diet members urged Japanese record companies to offer audio recordings to rental stores immediately upon release at the time of the amendment to the Copyright Law in 1985, considering that a large number of rental stores already existed and that a long term prohibition on rentals would have a negative impact on their viability. Consequently, Japanese record companies

reluctantly accepted this request of the Diet members. They have considered the gap between the literal provision and actual implementation of the law as a typical example of ambiguous policy decisions often seen in Japan (Kimura 1994). Thus, the rental system established in 1985 as a compromise has continued up to the present.

Related Literature

Rental systems for music are not common worldwide,⁴ and we could not find any economic studies on the subject. However, the relationship between rentals and sales in the video market has already been analyzed. Weinberg (2005) reported that there was virtually no overlap between the top 10 rentals and the top selling 10 videos in 2002 in the U.S. This finding implies that consumers decide whether they purchase or rent an individual video, based on separate criteria. Asai (2009) conducted an empirical study of the relationship between rentals and sales in the Japanese video market. Asai found that the growth of video's retail market led to the expansion of its rental market, and the latter did not constrain the former.

With regard to CD rentals, the Recording Industry Association of Japan (RIAJ) has asserted that most rental users copy rented CDs onto their own digital media to enjoy music themselves,⁵ and therefore the development of the rental market adversely affects the retail market. This argument coincides with studies conducted by Novas and Waldman (1984), Johnson (1985), Besen (1986), and Besen and Kirby (1989) which examined the economic impact of reproduction for private use on originals. These studies used theoretical models and analyzed the effects of private copying on producer and consumer welfare. The conclusions derived from these studies vary depending on the assumptions of their respective models. One critical assumption leading to variability is whether or not the studies assume indirect appropriability in which the value placed on the original is determined not only by direct purchasers but also by all those who use originals indirectly through copying. Another assumption is the extent to which originals and copies are regarded as substitutes from the viewpoint of technical equality of reproduction. Regarding the effects of private copying on social welfare, the difference in theoretical conclusions suggests that an empirical study is needed.

While the Japanese rental system is legal, based on the Copyright Law, file sharing that enables consumers to acquire music illegally has developed recently. The record industry has claimed that the penetration of peer-to-peer usage is a major factor in the recent decrease in CD sales. This assertion is reminiscent of earlier claim by Japanese record companies that rentals adversely affect their sales, except for the fact that the rental system is legal. Liebowitz (2006) analyzed the music market using aggregated time series data and reported that file sharing was one factor in the decline in sales of packaged music. Zentner (2006) estimated the

effect of music downloads on CD sales using European individual cross section data and reported that peer-to-peer usage reduced the probability of purchasing a CD by 30 percent. On the other hand, Obertholzer-Gee and Strumpf (2007) estimated CD sales by title using instrument variables and found that the effect of downloads on CD sales was statistically indistinguishable from zero. Furthermore, using the survival model, Bhattacharjee *et al.* (2007) found that file sharing did not hurt the survival of U.S. top-ranked albums while it had a negative impact on low-ranked albums. Contradictory conclusions were derived from several empirical studies and consensus on the issue has not been reached.

Music recorded on CDs is an experience good that is horizontally differentiated. Peitz and Waelbroeck (2006) noted that music is sometimes downloaded through file sharing for the purpose of sampling, and analyzed the effect of file sharing on the profits of record companies in this light. They found that if there was sufficient taste heterogeneity and sufficient product variety, the positive effect on profits outweighed the negative effect. Gopal *et al.* (2006) classified consumers' CD purchasing decisions into three patterns; direct purchase, purchase after sampling, and no purchase, and then examined the impact of file sharing on CD sales. They found that lowering the sampling cost motivated more consumers to purchase music and eroded the superstar phenomenon, wherein relatively small numbers of people earn enormous amounts of money, presented by Rosen (1981). If consumers use the rental system to find favorite artists, the system plays the role of sampling and is not a mere substitute for sale.

Most economic analyses on copyright consider songwriters, artists and record companies as copyright owners. However, while the primary source of revenue for record companies is the sale of audio recordings, artists can make money through other channels such as live performances, appearances on television and CD rentals,⁶ in addition to copyright fee gained from the sales of audio recordings. Gayer and Shy (2006) formulated the actions of artists and distributors separately, and identified the conditions under which artists and distributors have different incentives regarding the pursuit of copyright enforcement. In fact, while many record companies vigorously opposed the introduction of the rental system in Japan, opposition from artists and songwriters was not so strong. Thus, copyright owners have diverse positions about rentals.

Model and Data

This paper constructs a simultaneous equation model to investigate the relationship between CD sales and rental. The model is established as follows.

CD sales = f (rental occurrences, previous performance of artist, CD prices, attributes of CD and artist)

rental occurrences = f (CD sales, previous performance of artist, rental prices, attributes of CD and artist)

Estimated equations are specified by equations (1) and (2).

$$\begin{aligned} \ln(\text{Sale}) = & \alpha_0 + \alpha_1 \ln(\text{Rental}) + \alpha_2 \ln(\text{Artist}) + \alpha_3 \ln(\text{Artist})^2 \\ & + \alpha_4 \ln(\text{CD price}) + \alpha_5 \ln(\text{CD price}) \times \text{album dummy} \\ & + \alpha_6 \text{Genre} + \alpha_7 \text{Male} + \alpha_8 \text{Female} + \alpha_9 \text{Company} \end{aligned} \quad (1)$$

$$\begin{aligned} \ln(\text{Rental}) = & \beta_0 + \beta_1 \ln(\text{Sale}) + \beta_2 \ln(\text{Artist}) + \beta_3 \text{Rental price} \\ & + \beta_4 \text{Genre} + \beta_5 \text{Male} + \beta_6 \text{Female} + \beta_7 \text{Company} \end{aligned} \quad (2)$$

When the value of α_1 is negative, the rental system adversely affects CD sales. When the value is positive, the growth of rentals contributes to an increase in CD sales. Since Throsby (1990) investigated demand for the performing arts, the inclusion of variables representing quality and attributes of artists into arts demand studies has become common. The variables Artist, Genre, Male, Female and Company representing attributes of artists and CDs are also used in this study.

The subjects of this study are the top 300 rental CDs for which rental started in 2005. One dependent variable Sale is retail units sold to consumers by title. The other dependent variable Rental represents the number of times a CD was rented. The data for the rental top 300 are collected by the Compact Disc & Rental Commerce Trade Association of Japan (CDV-Japan). The rank is measured by the number of times that a particular CD was rented. The available data on rental occurrences are only annual data by title while CD sales are available on both weekly and annual bases. Therefore, sales and rentals data used for estimation in this study resulted in annual data by title. The quantity of CDs sold and data for making explanatory variables (Artist, CD price, Genre, Male, Female and Company) are available from the *Oricon Yearbooks* while data for the rental top 300 are available from the CDV-Japan web site.

The top 300 titles consist of 160 singles and 140 albums. While 237 million albums (units) were produced in Japan in 2005, the number of singles was 64.7 million, based on data obtained from the RIAJ. Thus, the album is a popular format in the retail market. Interestingly, however, singles exceed albums in the list of the rental top 300 in this study. The number of rental occurrences and retail units sold are the total of those in 2005 and 2006 because music CDs are sometimes sold and rented for a period exceeding one year. However, none of these CDs appeared on the hit charts and rental charts in 2007.

It is generally expected that consumers are familiar with artists who have already had high sales of audio recordings and that CDs featuring these artists have a good chance of becoming hits. The variable Artist represents high sales of all audio recordings featuring an artist in the previous year or the year before last (in units of 100,000 yen). However, it cannot be assumed that the relationship between

artist's popularity and CD sales is linear. Therefore, this study incorporates the quadratic term of the variable to allow for a non-linear relationship. It is also anticipated that CDs featuring artists who have already had high sales are rented frequently in a way that corresponds to the sales of their CDs. Therefore, the variable Artist representing the previous performance of artist is also included in equation (2). The effect of an artist's previous performance on CD sales is tested by the estimates α_2 and α_3 . The effect of previous performance on rental occurrences is tested by estimate of β_2 . As shown in the next section, the estimate of the linear term β_2 was not significant at the 10 percent significance level. Furthermore, when the quadratic term was included in equation (2), neither the linear nor the quadratic term was statistically significant. Therefore, the quadratic term of the variable artist was added to only equation (1).

CDs are sold at list price because the resale price maintenance system has been applied to the Japanese music market up to the present. Thus, the variable CD price is the list price of a CD. The average album price was 2.6 times higher than the average single price. On the other hand, the variation coefficients for single prices and album prices were 13.8% and 12.7%, respectively, as shown in Table 1. That is to say, while CD prices remarkably differed by format, the variations in prices among the CDs that belong to the same format were small. Thus, the variable album dummy is added to the variable CD price in order to distinguish between single and album. The variable album dummy is set to 1, if the CD is an album, and is set 0 otherwise.

The rental price is not set by CD title but depends on whether the CD is a single or an album. The rental price of an album is almost double that of a single. Thus, the variable Rental price is single dummy that represents the difference in rental price by format. The variable Rental price is set to 1, if the CD is a single, and is set to 0 otherwise.

The variable Genre represents whether the CD features Japanese artists or foreign artists. The variable Genre is set to 1 if the CD features a foreign artist, and is set to 0 otherwise.

Artists are classified into three categories; male solo artist, female solo artist and group consisting of several artists. The variable Male is set to 1 if the CD features a male artist, and is 0 otherwise. Similarly, the variable Female is set to 1 if the CD features a female artist, and is 0 otherwise.

Major record companies can afford to conduct large-scale advertising campaigns. Thus, this study distinguishes whether or not a CD is released by major record companies. The variable Company is a binary variable that is set to 1 if the CD is produced by one of the five major record companies (AVEX Entertainment, EMI, Universal Music, Warner or Sony Music Entertainment and their subsidiaries), and is set to 0 otherwise.

Table 1 shows a sample summary. The variables Sale, Rental, Artist and CD

price are measured by quantity while the variables Genre, Male, Female, Company and Rental price are binary. The values of skewness and variation coefficient for the variable Sale were larger than those for the variable Rental. Thus, it seems that CD sales were more concentrated in the specific titles, compared with rentals. In the row for the variable Genre, the number of CDs featuring foreign artists was only 10 (0.0333), implying that familiar music for Japanese is domestic music featuring Japanese artists. The numbers of CDs featuring a male artist and a female artist were 24 (0.080) and 94 (0.3133), respectively.

Table 1: Sample Summary

	Average	Maximum	Minimum	Skewness	CV(%)
Sale	233,868	2,070,766	12,319	3.1931	134.15
Rental	62,586	310,752	3,676	1.6169	94.84
Artist	13,832	86,601	0	1.8248	126.99
CD price	1,981	4,200	500	0.2911	48.41
Single price	1,124	1,835	500	-0.6316	13.83
Album price	2,960	4,200	1,800	-0.2104	12.70
Genre	0.0333	1	0	5.1995	539.42
Male	0.0800	1	0	3.0963	339.68
Female	0.3133	1	0	0.8049	148.28
Company	0.5500	1	0	-0.2010	90.60
Rental price	0.5333	1	0	-0.1336	93.69

CV: Coefficient of variation (%)

Sale: the number of CD sold to consumers by title

Rental: the number of times a CD was rented

Artist: the high sales of total audio recordings featuring an artist in the previous year or the last year before (100,000 yen)

CD price: the list price of a CD (yen)

Single price: the list price of a single (yen)

Album price: the list price of an album (yen)

Genre: CD featuring foreign artists = 1

Male: CD featuring a male artist = 1

Female: CD featuring a female artist = 1

Company: CD produced by a major record company = 1

Rental price: single dummy representing the difference in rental price by format (single CD = 1)

Table 2 shows the correlation coefficients. Among four variables other than binary variables (Sale, Rental, Artist and CD price), the highest value was the correlation coefficient between Sale and Rental, exceeding 0.5. The correlation coefficient between Sale and Artist was almost the same as that between Rental and Artist. The correlation coefficient between Sale and CD price was positive at the

1 percent significance level, contrary to expectation.⁷ In addition, the correlation coefficient between Rental and Rental price was also positive, showing that singles with low prices tend to be rented more frequently, compared with albums.

Table 2: Correlation Coefficients

	Sale	Rental	Artist	CD price	Genre	Male	Female	Company	Rental price
Sale	1.000								
Rental	0.547	1.000							
Artist	0.355	0.351	1.000						
CD price	0.251	-0.320	-0.109	1.000					
Genre	0.089	-0.138	-0.053	0.135	1.000				
Male	-0.001	-0.093	-0.125	0.085	0.014	1.000			
Female	-0.076	0.072	0.118	-0.102	-0.045	-0.199	1.000		
Company	-0.098	-0.002	-0.023	-0.013	0.131	0.119	0.120	1.000	
Rental price	-0.207	0.375	0.142	-0.956	-0.199	-0.069	0.099	-0.013	1.000

Sale: the number of CD sold to consumers by title

Rental: the number of times a CD was rented

Artist: the high sales of total audio recordings featuring an artist in the previous year or the last year before (100,000 yen)

CD price: the list price of a CD (yen)

Rental price: single dummy representing the difference in rental price by format (single CD = 1)

Genre: CD featuring foreign artists = 1

Male: CD featuring a male artist = 1

Female: CD featuring a female artist = 1

Company: CD produced by a major record company = 1

Empirical Results

This paper estimated equations (1) and (2) simultaneously, using the generalized method of moments (GMM) that brings consistency gains in the presence of heteroscedasticity. Table 3 shows the estimation results. The value of α_1 (Rental) was positive at the 1 percent significance level, implying that a CD that was rented frequently has a large amount of sales. On the other hand, the value of β_1 (Sale) was also positive at the 1 percent significance level. This shows that CDs with high sales are rented frequently. Thus, both markets have a positive external effect on each other.

This study also examines the coefficients of other variables. In addition to positive correlation coefficient between Sale and CD price in Table 2, it was

found that the price elasticity was also positive from the estimate α_4 in Table 3. However, the null hypothesis was not rejected at the 10 percent significance level. Furthermore, there was a difference in price elasticity between single and album, judging from the estimate of α_5 .

While the value of α_2 (Artist) was negative, the value of α_3 (Artist²) was

Table 3: Estimation Results of CD and Rental Demand in 2005

Coefficients	Estimates
α_0 (constant)	1.7808 (1.7183)
α_1 (Rental)	0.6907 (0.1743)***
α_2 (Artist)	-0.1354 (0.0395)***
α_3 (Artist ²)	0.0174 (0.0044)***
α_4 (CD price)	0.3028 (0.2429)
α_5 (CD price \times Album dummy)	0.1015 (0.0464)**
α_6 (Genre)	0.8789 (0.1895)***
α_7 (Male)	0.1244 (0.1207)
α_8 (Female)	-0.2898 (0.0712)***
α_9 (Company)	-0.1254 (0.0712)*
β_0 (Constant)	1.3485 (0.9520)
β_1 (Sale)	0.7086 (0.0834)***
β_2 (Artist)	0.0139 (0.0122)
β_3 (Rental price)	1.2621 (0.0724)***
β_4 (Genre)	-0.7533 (0.1652)***
β_5 (Male)	-0.0903 (0.1034)
β_6 (Female)	0.2133 (0.0715)***
β_7 (Company)	0.1232 (0.0628)*
adjusted R ² (Sale)	0.6731
adjusted R ² (Rental)	0.7465

Note *** 1% ** 5% * 10% The standard errors are in parentheses.

Sale: the number of CD sold to consumers by title

Rental: the number of times a CD was rented

Artist: the high sales of total audio recordings featuring an artist in the previous year or the last year before (100,000 yen)

CD price: the list price of a CD (yen)

Rental price: single dummy representing the difference in rental price by format (single CD = 1)

Genre: CD featuring foreign artists = 1

Male: CD featuring a male artist = 1

Female: CD featuring a female artist = 1

Company: CD produced by a major record company = 1

Album dummy: album CD = 1

positive at the 1 percent significance level. The combined values show that the previous performance of the artist contributed to an increase in CD sales.⁸ On the other hand, the value of β_2 representing the effect of previous performance of artist on rental occurrences was also positive in equation (2), but was not statistically significant at the 10 percent significance level. It seems that rental occurrences do not depend on the previous sales of the artist.

With regard to the CDs featuring foreign artist, the estimate of α_6 (Genre) was significantly positive while that of β_4 (Genre) was negative at the 1 percent significance level. This implies that consumers tend to prefer purchase over rental when CD features foreign artists. Furthermore, the values of α_8 (Female) and β_6 (Female) show that a CD featuring a female artist tends to be rented rather than purchased.

Discussion

Many record companies have consistently claimed that the rental system has had an adverse effect on CD sales because most rental users make a copy of the CDs they rent in order to enjoy the music later. Contrary to this assertion, this study found that CDs with higher sales had higher frequency of rental, and that CDs with high frequency of rental had higher sales. Therefore, the assertion by record companies that the rental system had an adverse effect on CD sales was not supported. Record companies endeavor to find artists who have consumer appeal and develop them while rental stores are not directly engaged in promotional activities for artists. The relative insignificance of rental stores' contribution to the development of artists may cause record companies to consider rental stores as free riders.

Papies and Clement (2008) carried out an empirical study that examined the demand for movie downloads, and found that movie consumers were segmented into online and offline users by several factors such as the past behavior of consumers. Likewise, music users may also be divided into purchasers and rental users under the condition where the rental fee is about 10 percent of a CD's retail price,⁹ judging from the estimation results in this study. However, factors influencing the positive feedback between purchase and rental remain to be elucidated.

Prices of albums are higher than those of singles. If consumers were sensitive to CD prices and considered purchase and rental as substitutes, they would choose to rent albums and purchase singles based on price. However, this paper found that consumers were insensitive to CD prices and singles tend to be rented more frequently than albums. RIAJ (2008) found that consumers choose the way they obtain music, based on a balance between loyalty to the artists and cost, and they

purchase albums featuring their favorite artists, despite their high cost. The results in this study are consistent with those of the RIAJ (2008).

This study found that the impact of an artist's previous performance on CD sales was significantly positive. On the other hand, the artist's performance had a weaker influence on the number of times a CD was rented. Peitz and Waelbroeck (2006) and Gopal *et al.* (2006) stated that downloading using file sharing software is a sampling exercise that allows consumers to audition artists in order to find the ones they really like. Some consumers may also consider renting CDs as a type of sampling exercise, due to the low rental price, in a way that corresponds to file sharing as described by Peitz and Waelbroeck (2006) and Gopal *et al.* (2006). However, this is only a hypothesis and further analysis is needed.

This study found that CD price was not an important determinant of CD demand. Stamm (2000) measured income and price elasticities of audio recordings in 20 countries. Stamm stated that the null hypothesis regarding price elasticity was not rejected in 11 countries while the values of income elasticities in 19 countries were larger than 1 and were statistically significant. The estimation results of this study are consistent with the results of Stamm (2000), namely, that price was not a significant factor affecting demand for audio recordings. However, the explanatory variables used in this study were limited due to the unavailability of data¹⁰ and we cannot rule out that uncontrollable factors related to music quality and CD attributes influence the reliability of estimation.

Concluding Remarks

The Japanese rental system, established through negotiations among the interested parties, had not been subjected to economic analysis prior to this study. This paper found that rentals did not have an adverse effect on CD sales. If the results derived from the top 300 rental CDs in 2005 are applied to the entire music market, it would be preferable for the music industry to consider rental stores as just another channel. In this case, the optimal copyright fees that generate the maximum total revenues need to be investigated as the next step.¹¹ Furthermore, it seems that consumers opt to either purchase or rent, based on different criteria. In other words, the rental system provides Japanese consumers with the opportunity to experience a variety of music.

Creative industries such as the music industry are sometimes referred to as the "copyright business," and the growth of this sector is undoubtedly influenced by copyright regulations and laws. A wide range of copyright issues such as piracy, remain to be resolved. This empirical study is the first step toward an economic analysis of the Japanese copyright system.

Finally, several remaining problems or limitations need to be pointed out.

First, the subjects of this study were the top 300 rental CDs, and the variables used in this study were also limited due to the unavailability of data. It would be desirable to re-estimate the functions using samples across several years and using additional variables representing attributes of CDs in order to obtain more robust results. Second, although this study found that the retail and rental markets had positive external effects, the factors influencing the positive feedback were not investigated. The RIAJ (2008) reported that whether a CD is purchased or rented is influenced by age and gender. If rental users and purchasers could be clearly distinguished, it would be reasonable to consider them as two separate markets. A study using individual data would be an effective way of examining which factors lead to positive feedback. Research using individual data is the next step.

In line with the recent development of the broadband network, channels for distributing music and video are expected to increase. The relationships among various forms of media that distribute content should be discussed further from both legal and economic viewpoints.

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NOTES

1. With regard to the rental system in Japan, see Handa (1993), Wakamatsu and Kimura (1993), Kimura (1994), and Ando (2005).
2. More precisely, the Provisional Law on the Right of Lending for Audio Recordings that gave lending rights to record companies and performers was enacted in 1984. However, since the Copyright Law was amended to provide the right, the provisional law was abolished in 1985. That is to say, the rental system has been regulated by the provisional law since 1984.
3. For songwriters, the duration of an exclusive lending right begins with the creation of each work and expires 50 years after their death.
4. For the rental system in other countries, see Taylor and Towse (1998) and Yashiro (2004).
5. For the information about private copying by rental users, see the RIAJ (2006).
6. The artists and songwriters receive copyright fee from rental stores in proportion to the number of times a recording is rented.
7. The correlation coefficient between single CD sale and single price was also positive at 0.1707 at the 5 percent significance level. Similarly, the correlation coefficient between album CD sale and album price was 0.1899 at the 5 percent significance level.
8. When the effect of an artist's previous performance on CD sales was calculated, using the estimates of α_2 and α_3 as well as the average of an artist's previous sales, the value was 0.291.
9. According to the investigation of music users conducted by the RIAJ (2008), during the previous 6 months, 16 percent of consumers purchased and rented CDs, 20 percent only purchased CDs and 15 percent used the rental system without buying a CD. Thus, it seems that consumers are distributed nearly equally into the following three categories: purchase and rental, purchase only, and rental only.
10. The number of songs recorded in a single and an album, and the total duration of all songs on a CD may be candidate variables that should be included in the model. However, this study did not use the variables because these data were not available for all CDs.
11. When record companies sell their audio recordings to rental stores, they add a surcharge to their list price as a copyright fee. Artists and song writers receive copyright fees from rental stores in proportion to the number of times their audio recording is rented. However, the levels of surcharge and copyright fees are determined through negotiations without a scientific analysis.

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