

The Effect of File sharing on Consumer's Purchasing Pattern: A Survey Approach

August, 2006

Seonmi Lee*

Abstract

Digital compression and distribution technologies influence the music industry in various ways. This paper investigates how consumer behavior is affected by the free music products on the Internet. Survey methodology was used to determine the respondents' perceived likelihood of purchasing legitimate CDs depending on the free availability of the same music via a streaming service or downloading on the Internet. In the pre-study, several factors affecting consumer purchasing were identified based on the responses of 106 university students. In consideration of these factors, the paper investigated how the price and free music availability jointly affect a consumer's willingness to buy. In addition, this paper examined how the effects of price and non-price factors such as rating of singer, preference for genre, number of songs on a CD, SES factors, and music consumption style may change in the "free" vs. "non-free" Internet availability conditions. The results showed that there was a weak pattern of interaction between price and free music availability, though the interaction effect was not significant. In the non-free Internet availability situation, price along with some other factors had significant effects on consumer purchasing patterns for some CDs, whereas in the free Internet availability situation, price had insignificant effects on a consumer's willingness to purchase all twelve CDs used in the questionnaire. Instead, some non-price factors influenced consumer purchasing patterns.

* Doctoral Student, College of Journalism and Communications, G035, Weimer Hall, P.O.Box 118400, University of Florida, Gainesville, Florida 32611-8400, (352)846-1060, email: seonlee@ufl.edu

INTRODUCTION

Beginning with the Napster trial, a great deal of attention has been paid to the effect of file-sharing and MP3 technologies on the record industry. As Napster, which had a central server enabling users to share and distribute unauthorized digital music, started its service in 1999, music sales began to decrease coincidentally.¹ The record industry sued Napster, claiming that the company was responsible for copying, uploading, transmitting, or distributing copyrighted musical works without permission from the copyrighters themselves, and the court ordered Napster to shut down. To avoid legal problems similar to those of Napster, websites such as Gnutella, KaZaA, and FastTrack have evolved to allow for connections among users without a central server, and in so doing have taken Napster's place in the market.

The recording industry has expressed its concerns that CD piracy will accelerate the recent downturn in sales, believing that unauthorized free music files, transmitted by file-sharing technology, would substitute for legitimate CDs. Indeed, the Recording Industry Association of America (RIAA) reported that CD shipments fell from 1,160.6 million units in 1999 to 634.8 million in 2005. Having taken legal actions against both peer-to-peer (P2P) operators and individuals who downloaded music via P2P sites, the music industry has repeatedly required the government to enforce strong legal protection under the copyright law. The government is actively investigating new policies and how they may influence suppliers, consumers, and society as a whole.

In the past, similar phenomena involving copying from Xerox machines or recording from VCRs are known to have occurred, but without the concern shown to digitalized media. This is mainly because the copied contents from Xerox machines or VCRs are likely to be

¹ Based on data from the RIAA, US CD shipments grew to 1,160.6 million units in 1999. However, it fell gradually from 1,079.2 million in 2000 to 968.5 million in 2001.

distributed through small-scale networks, i.e., family and friends. In addition, the duplication of contents incurred substantial costs in terms of time (e.g., reproduction and physical transmission) and money (e.g., containers for copied works). Also, copied goods were generally of lower quality than the original, and repetitive usage of copies also made the quality even more inferior. More importantly, sellers could appropriate the value from copiers indirectly to recover revenues.

Greater interest in the impact of MP3 and file-sharing technologies is largely due to their unique characteristics. Digital compression techniques enable people to freely download information products at rapid speeds (Lam & Tan 2001). Not only do digitalized copied contents retain the quality of the original, but they are also extremely cheaper to produce and transform. Furthermore, P2P networking technology allows people to share and exchange digital music (Easley et al. 2004). The attributes of such technology are seen as the likely reasons behind the drastic reduction in music sales. Compounding the problem has been the increasing rate of Internet access and usage of file sharing.² In addition, although students in both the US and Korea tend to perceive that downloading without copyrighter's permission is illegal (Kim et al., 2005), they continue to download music, elevating the industry's concerns.

Whether technological advances have only harmful effects on record sales, however, is unclear. The "network effects" of file sharing are such that, as piracy prevails, the value of non-pirated goods rise, implying that a firm can set high prices for legitimate CDs to garner higher profits. The "sampling effects" are such that file sharing may function to inform consumers of new products. In addition, Napster demonstrated that selling individual songs via the Internet was preferred by some consumers. Firms selling songs as individual units were able to capture both high- and low-value consumers through a price discrimination strategy, thereby increasing

² In 2006, 73 percent of all Americans had access to the Internet, up from 48 percent in 1999 (Pew Internet Projects, 2006). In addition, the number of downloaders more than doubled from 2000 to 2005. In March 2005, 27 percent of Internet users (36 million) downloaded digitalized music or video files (Pew Internet Projects, 2005).

revenues. New theories developed to explain the effects of file-sharing technology have yet to consistently point to either negative or positive impacts. Yet, through empirical studies on the effects of file-sharing technology, researchers have reached a consensus that despite some positive impacts of file sharing, it has much stronger negative impacts on record sales in a practical sense.

In order to set appropriate government policies, how P2P technology can affect both suppliers and consumers should be considered. Previous studies have mainly focused on the impact of file sharing on the music industry's bottom line. Few studies have been devoted to an analytic, detailed examination of the impacts of file sharing on consumers in an empirical sense. In other words, it is unclear how the P2P technology may generate changes in consumers' perception and behaviors at a micro level.

Free information products via file sharing and MP3s may alter a consumer's purchasing pattern. Most research claim that the positive effects of a file-sharing system cannot outweigh the negative impacts on record sales, and forecast a continued drop in record sales and subsequent drop in revenues for the record industry. But 634.8 million albums were sold in 2005, a high figure relative to historical data. In other words, demand for legitimate CDs has remained strong despite the availability of free music, suggesting consumers may have experienced certain changes in their purchasing pattern, particularly with respect to price. Thus, to analyze the direct effect of file sharing, it is essential to detect changes in demand.

This paper investigates how consumer behavior is affected by the free music products available via file sharing or MP3. In particular, the paper will explore how price and free availability jointly affect consumers' willingness to buy, and will look into how different price

and non-price factors explain the two distinct situations: the “non-free” Internet availability situation and the “free” Internet availability situation.

LITERATURE REVIEW

Effects of File-sharing on Record Sales

A great deal of theoretical literature on the impacts of file sharing mainly considered the revenues of record companies or overall social welfare, with contradictory results. The effect of digitalized technologies on the market structure of the music recording industry was first examined by Alexander (1994, 2002). Explaining how efficiently file sharing promotes the exchange of digitalized music files, he also warned of the threat of technical advances to the current market system. Bayaan (2004) demonstrated that under the condition of file sharing, a firm’s profits diminished because copied works would substitute for the demand for legitimate CDs due to the near zero costs of acquiring the copied works. Bayaan presumed the two reasons for a consumer’s CD purchase as the difference in quality between original and copied products and the expected penalties for downloading unauthorized music files, and suggested that companies invest in quality differentiation to give consumers incentive to buy rather than take costly legal action to prevent the negative effects of technological advances. Gayer and Shy (2005) documented that without a difference in quality between copied and original products, digital copying technologies would diminish revenues of suppliers because users would not be unsatisfied with the quality of the copied products.

Contrary to this view, other studies claimed either non-negative or positive effects of P2P distribution systems on music sales. Takeyama discovered that using copied products can generate benefits if there are positive demand network externalities (1994), and a firm can maximize profits using intertemporal price discrimination with copying (1997). Others suggest

specific circumstances in which piracy leads to greater profits using indirect appropriability with respect to the relationship between a consumer's marginal cost of sharing and a producer's marginal cost of production (Besen & Kirby, 1989), to the "demand aggregation effect" and the variation in team size (Bako et al., 1999), and to the utility of ownership and sharing, and heterogeneous tastes (Varian, 2000). Another theoretical approach considers the positive network externalities based on a digital file distribution system. As piracy expands the products' user base and elevates the willingness to pay of non-pirates, record companies can raise prices and extract the losses from pirates to non-pirates (King & Lampe, 2003). Pointing out increasing consumers' searching costs and uncertainty about the quality of music products as experience goods, Peitz and Waelboreck (2003, 2004a) suggested that file sharing would operate as an informational tool that would increase sales of original music products.

In sum, the theoretical explanations of the impacts of a P2P system are inconsistent. An evaluation of its effects, then, must examine the question of which effect (negative or positive) is stronger in an empirical sense.

In one empirical study, Liebowitz (2003) provided a big picture of the effects of file sharing. He examined various economic factors affecting record sales including market trends, price per album, price of other substitutes, income, changes in recording formats and media portability, changes in the quality of music or in music taste, changes in the audience, and distribution. Except for "changes in audience," however, none of these factors explained the current downturn in record sales. Liebowitz paid attention to how the rate of CD purchasing in each age group changed from 1999 to 2002, and discovered that the 15 to 24 year olds bought less CDs and downloaded the greatest amount of music. Based on the data, he concluded that file sharing had a negative impact on music sales. After carefully considering all alternative

explanations, it is clear that the new technology is primarily responsible for the decrease in record sales. Yet, the data set utilized might not be appropriate to test the direct relationship between a reduction factor and record sales. The subjects in the age group between 15 and 24 years who buy CDs and those in the group downloading are not the same, so a comparison of those two groups might be problematic. It is possible that those persons who purchased CDs chose no longer to buy CDs or download music (leading to a reduction in CD sales but not an increase in downloads). It is also possible that those who never purchased CDs chose to download music after the introduction of Napster (resulting in no change in CD sales but an increase in downloads). Thus, matching the two groups may not clearly suggest the direct effect of P2P technology on changes in consumer behavior, i.e., switching from CD purchasing to downloading. Therefore, one could draw a conclusion limited to a correlation among variables, rather than a causal relationship.

Zentner (2003) also identified that P2P file networking systems reduce the probability of consumers purchasing legitimate CDs by 30 percent, and subsequently decrease record sales by 7.8 percent, using both Internet sophistication and connection speed as instruments on the basis of the European individual level survey data. He found that purchases among downloaders having broadband connections decrease much more than among those not having such connections, and that the faster connection implies greater downloads, thereby influencing sales more negatively. However, failing to control differences among countries, the exact and direct effects of file sharing could not be explored.

In contrast, Oberholzer-Gee and Strumpf (2004) revealed that there was no effect of file sharing on record sales of average albums. With a semi-experiment design, they observed how P2P network users download with respect to the songs and downloading time, and then matched

the observed data to the record sales to examine the causal relationship between music downloads and sales over a seventeen-week period at a micro level. By examining the relationships between album sales and downloads, they discovered the fact that the most frequently downloaded files are songs from pop charts and popular albums, which means a limited effect of file sharing on record sales. However, the finding that the most downloaded albums are also the bestselling albums and its implication of causation between downloading behavior and purchasing are questionable. In addition, with price as a constant variable, consumer reaction to changes or differences in price and availability of downloads is not considered.

Hui and Ivan (2003) discussed both the positive effects from sampling effect and network externalities and the negative effects from substitutability of free digital media, and then compared these contradicting effects. They used international data for CDs from 1994 to 1998 and concluded that piracy's positive impacts on music sales could not compensate for the negative impacts, ultimately decreasing legitimate demand. Yet, their study examined the piracy across 28 countries collectively and did not control differences among those countries. Leibowitz (2004) discussed factors theoretically related to file sharing, i.e., sampling, substitution, network, and indirect appropriability effects. He claimed sampling effects would influence recording sales negatively because the provision of information does not necessarily increase demand and because a constant CD price would decrease the quantity of demand. Thus, he presumed that file sharing would have negative impacts on record sales.

One study explained the consumer's behavior with respect to purchasing and downloading. Rob and Waldfogel (2004) illustrated that in the downloading situation, high-value consumers with a willingness to download would download whereas those without a

willingness to download would make a purchase. Record companies, or suppliers, would only obtain revenues from those without a willingness to download. Low-value consumers willing to download would download and those unwilling to download would not download and would not buy products. Consumers who download would experience a surplus, the size of deadweight loss would decrease, and their behavior would not affect the suppliers' revenues. In the non-download situation, high-value consumers would buy products regardless of their willingness to download, causing suppliers' revenue to be larger than in the download situation. Low-value consumers who do not purchase CDs would incur a deadweight loss larger than that in the download situation. Using survey-based data with college students in 2003, Rob and Waldfogel analyzed the file-sharing effects on both suppliers and consumers and found that album downloading decreased CD purchasing from \$126 to \$101 per capita whereas it increased consumer surplus to \$70 per capita.

They documented consumer behavior in a simple and analytical way using factors relating to consumers' valuation, their willingness to download, and download availability. However, they assumed that consumers would be indifferent to changes in price in both download and non-download situations, suggesting a miscalculation in surplus and revenue losses. For example, they assumed that a person willing to pay \$15 for CD X in the non-download situation may also be willing to pay the same amount in the download situation. If the market price is \$10, the consumer's surplus is \$5 in the non-download situation, and the revenue loss for suppliers is \$5 in the download situation. However, because of file sharing, consumers' perception of price would have changed. For instance, a person willing to pay \$15 for CD X in the non-download situation may experience his/her willingness to pay to be lower than \$15 in the download situation.

In short, both theoretical and empirical explanations tend to be limited to the effects of file sharing on record sales and disregard possible changes in consumer's perception and behavior. Most theoretical studies make assumptions about consumers without an empirical basis. For example, they are used to distinguish consumers with high- and low-valuation or to provide some conditions that consumers either buy or download depending on the expected penalties or differences in quality between the copied and original works. Those studies do not look into the virtual consumers' perception and behavior with respect to price after the emergence of file sharing, and the reasons for purchasing CDs despite the availability of free music are not investigated empirically. To fill in the gap between assumed and actual perception and behavior, an investigation of the impacts of P2P technology on the consumers' side is necessary.

Effect of File-sharing on Consumer's Purchasing Pattern

Before the emergence of file-sharing networks, people were only able to acquire products by paying for them. However, owing to cost-reducing information technology, one can now easily obtain information products for free and rapidly distribute them via the Internet. Free music products have made the meaning of 'consumption' separate into two parts: usage and purchase. As users do not charge for enjoying legitimate information products by copying from P2P systems, they obtain the behavioral option of not-buy-but-use in addition to either buy or not-buy. The very explicit distinction between usage and purchase may alter the consumer's willingness to buy and give rise to certain changes in his/her purchasing pattern.

From an economic perspective, it is assumed that consumers mostly consider price in the process of purchasing. Stated differently, the price-deterministic model, in which the price operates as the best signal for the market, works in most situations. The amount purchased is

dependent on the price level. As prices increase, demand decreases, and as prices decrease, demand increases.

The degree of change in quantity to change in price would be different if free information products were created in the market. Consumers would face two options to obtain the same music content:³ one for purchasing and the other for downloading. Apart from the matter of relevant costs,⁴ free information goods are priced at zero. When a zero-price product penetrates the market, under the assumption that this good has the same content quality as the original, it may substitute for a more expensive one simply because people are not inclined to pay more for the same thing. Therefore, as soon as they are able to obtain free music, consumers' willingness to buy would decrease faster than when they are unable to do so, thereby lessening the predicting power of price regarding sales quantity.

H1: The price and free music availability will jointly affect consumers' willingness to buy. That is, in the "free" Internet availability condition, consumers' willingness to buy will drop more quickly at a certain price point than at a point in the "non-free" Internet availability situation.

After consumers' perceived level of price plummeted, there was still a substantial number of consumers who purchased legitimate products despite the availability of free music in the market. Why consumers purchase legitimate products in this situation is currently unclear. The residual demand may imply a change in consumers' purchasing pattern in terms of price. That is, in the "free" Internet availability situation, as people have more options (i.e., purchase, copy,

³ Music contents refer to sources of music, namely, songs themselves.

⁴ People have to spend time to search for, download, copy, and burn information products. The time and labor can be calculated as costs; however, they are relatively low in the information age. Thus, this paper excludes the matter of costs to obtain free information products.

not-buy, or not-use) to experience the same music for free via P2P services, consumers would give less weight to the price factor than those in the “non-free” situation, and pay more attention to some of the non-price factors. In other words, non-price factors would play a more important role than price to willingness to buy for music CDs in the “free” Internet availability situation, and finally the importance of price in the “free” Internet availability situation would decrease compared to that of the “non-free” Internet availability situation on purchase.

H2: In the “non-free” Internet availability situation, price will have a greater effect on willingness to buy, while in the “free” Internet availability situation, non-price factors will have a greater effect on willingness to buy.

METHOD

Since the survey conducted during the Napster trial examining the relationship between music downloads and record sales with college students (Fine, 2000), surveys have been preferred by researchers with various sample groups. At the international level, Zentner (2004) used mail survey targeting 15,000 European consumers in 2001 to investigate the effect of music downloads on record sales. At the national level, Peitz and Waelboreck (2004b) employed survey data from 2000 to 2002 to see how file sharing would lead to a loss in revenue. Rob and Waldfogel (2004) conducted a survey with US college students in 2003 focusing on the sales displacement phenomena. The survey method helps show on-time based consumers’ responses to current issues and detect consumers’ intentions which cannot be seen in the analysis of secondary data measuring the amount of music albums sold as a unit of analysis. However, although surveys can ideally stand for the characteristics of a population by using strict probability sampling, practically it might be difficult to represent the entire population exactly.

In addition, survey results tend to fluctuate depending on the samples used. As such, the problems of generalization are often associated with surveys.

This thesis also utilized the survey method because it is the best way to see what people would perceive and how they would behave with the advent of file-sharing technologies. This research explored what and how factors differently affect people's purchase of music CDs under two different conditions: "free" vs. "non-free" Internet availability. Survey studies paid attention to consumers' intention to or not to buy, to or not to download, or both, holding consumers' willingness to buy constant. However, those studies do not concentrate on consumers' virtual responses to price depending on download availability. Because the survey was conducted with Korean college students, it may not be as applicable to the American population. However, an inference could be drawn regarding responses to price depending on free availability on the following grounds. First, Korea has the top-ranked Internet infrastructure in the world,⁵ and the music-streaming and file-sharing phenomena are prevalent in the country. Next, college students in the two countries are commonly characterized as the age group comprising heavy Internet users, heavy downloaders, and heavy music buyers/listeners, which should be taken into account in this research.⁶ Thirdly, participants rate their willingness to buy under hypothetical conditions instead of virtual situations.

Pre-study

⁵ Internet World Stats reported that the Republic of Korea had an Internet penetration of 67.0 percent in Dec. 2005.

⁶ In Korea, the rate of Internet usage was 72.2 percent in 2004, and 95.3 percent of people in their twenties used the Internet in 2004 (White paper Internet Korea 2005, published by National Computerization Agency). For music CD purchases, 68 percent of all music CD purchasers, which ranked the highest, was in the age group between 15 to 24 years in 2004 (Music Industry Association of Korea). In the US, 80 percent of people in their twenties used the Internet in 2004 (Pew Internet & American Life Project, 2005), and 22 percent of all music CD purchasers, which ranked the highest, was in the age group between 15 to 24 years in 2004.

A survey was conducted to determine factors influencing consumers' purchasing patterns. The four factors affecting the purchase of CDs were identified based on responses from 106 Korean university students in 2004. The students received a blank page on which they were to list the factors that they considered when they purchased music CDs. After obvious redundancies were eliminated and similar responses were combined, through discussions with two experts in this field, the following four factors were identified: price, rating of singer, preference for genre, and number of songs on a CD.

These factors were employed to construct various hypothetical situations that would enable the use of statistical analysis for identification of significant factors under two main different situations: "free" vs. "non-free" Internet availability. The structure of the questionnaire, some sample hypothetical situations, and the method of data analysis will be presented precisely in the main research section.

Main Research

The research sought to determine the extent to which consumers intend to buy CDs with the advent of file-sharing technology, and to identify which people show changes in their purchasing patterns.

Subjects

A total of 396 university students in Korea participated in this research from April 25 to April 29 in 2005. The participants were students in Korea University, located in an urban area of Seoul, Korea, serving students from predominantly middle-class households. Since students have no regular income, their monthly expenditure was measured instead. The breakdown of their monthly expenditures was as follows: 9.8 percent of total participants below 30,000 (unit: won,

USD=29.99), 30.6 percent between 30,000-40,000 (won, USD=29.99-39.99), 18.7 percent between 40,000-50,000 (won, USD=39.99-49.99), and 3.3 percent over 50,000 (won, USD=49.99). The breakdown of their monthly spending on CDs was as follows: 67.2 percent of total participants below 10,000 (won, USD=9.99) category, 14.4 percent between 10,000-20,000 (won, USD=9.99-19.99), 6.8 percent between 20,000-30,000 (won, USD=19.99-29.99), and 3.3 percent over 30,000 (won, USD=29.99). The range of hours for free music use was from 0 hour to 21 hours per day, and the mean value was 2.64 hours. The students seemed to be appropriate as participants for this research mainly due to their accessibility to Internet technology and CD purchasing power. To control the gender effect, the number of female and male students was balanced.

Materials

Materials for this survey were based on the list of four factors of purchasing patterns during the pre-study in addition to free music availability. In addition, factors related to each participant's socioeconomic status, such as gender and monthly expenditure, and monthly expenditure on CDs and hours spent using free music, were included because these factors may impact a participant's decision-making process.

To explore how file sharing affects a consumer's purchasing pattern, specifically with respect to his/her response to price, free Internet availability and price were manipulated as main factors. Price was divided into four points, i.e., 'very low,' 'low,' 'average,' and 'very high' to enable participants to perceive the meaning of price. The 'very low' price line was set up as 4,000 won (= \$3.99) reflecting virtual average promotion price, 'low' as 7,000 won (= \$6.99) standing for old or unpopular album price, 'average' as 12,000 won (= \$13.99) representing

virtual average album price, and 'very high' as 19,000 won (\$20.99) indicating hypothetically high price. For "free" Internet availability, two different situations were manipulated: "free" Internet availability situation in which free MP3s or streaming service exists and "non-free" Internet availability situation in which neither service is provided. By combining the four price lines and free Internet availability, a total of eight different conditions were formed: 1) "very low" × "free Internet situation," 2) "low" × "free Internet situation," 3) "average" × "free Internet situation," 4) "very high" × "free Internet situation," 5) "very low" × "non-free Internet situation," 6) "low" × "non-free Internet situation," 7) "average" × "non-free Internet situation," and 8) "very high" × "non-free Internet situation." The questionnaire was constructed under the eight different conditions, respectively, and each material was given to eight different groups of samples. Each condition was described verbally as information for each CD.

Each questionnaire consisted of the descriptions of twelve music albums. Six genres of music were selected: ballad, dance, R&B, rock, trot, and hip-hop. To balance the gender of the artists, one male and one female singer were distributed to each genre, resulting in a total of twelve music CDs. To choose albums that were well known to the participants, twelve CDs were taken from the Korean recording industry's pop charts.

Each CD was composed of the three factors identified in the pre-study, i.e., rating of singer, preference for genre, and the number of songs in a CD. For rating of singer and preference for genre, participants were asked to rate how differently they perceived the two items. Participants used a scale ranging from 1 (poor) to 5 (excellent), and from 1 (not at all) to 5 (very much), respectively. To obtain variations of the number of songs available, the numbers were given as 6 (far below average), 12, 18, and 24 (higher than average). These numbers were randomly distributed to all twelve CD descriptions in each condition.

For the item on willingness to buy music CDs, scores ranged from 1 (not at all) to 5 (very much). Purchase intention, representing likeliness to purchase in this research, is widely used as a proxy to the actual purchase (McQuarrie, 1998). The benefit of this survey is that it made possible the acquisition of information on an individual's purchase perception depending on free availability. The study measured the willingness to buy (behavioral attitude) in hypothetical situations, in either free Internet availability or non-free Internet availability situations, so the results would not reflect the virtual consumers' behavior. Kovar et al. (2000) summarized why measuring purchase intention as an actual behavior would be biased as follows: 1) biased measurement, 2) random measurement error, and 3) possible interference between the period of measuring purchase intention and actual behavior. However, they emphasized that when data of actual behavior is not available, purchase intention is the most powerful measure to infer the actual purchase.

Procedures

Participants were told that they would find twelve descriptions of different singers' albums. The participants' first task was to rate the quality of the presented singer and the preference of the presented genre on a 1 to 5 scale. Next, participants were asked to read three characteristics of the CD and then rate the extent to which they were willing to buy each CD on a 1 to 5 scale. The sample questionnaire is presented in Table 1. In addition, before rating the CDs, participants were asked to answer several questions about socioeconomic factors, such as gender, monthly expenditure, and their music consumption style including monthly spending on CD and time spent using free music. All of these factors may influence the participants' ratings.

Table 1. Sample Description of the Survey

Table 1.1

1. SungMo Jung (Ballad)					
I think the quality of this artist is...	Poor	Below average	Average	Above average	Excellent
I like the genre that this singer performs...	Not at all	A little	Moderately	Somewhat	Very much

Table 1.2

01. SungMo Jung's (Ballad) new album has been released. Information for this CD is as follows:					
This CD contains 24 songs. The price of this CD is \$3.99 and free MP3s or streaming is available for the whole album.					
	Not at all	A little	Moderately	Somewhat	Very much
How willing are you to buy this CD?	1	2	3	4	5

ANALYSIS AND RESULTS

In the “free” Internet availability condition, consumers’ willingness to buy is expected to drop more quickly at a certain price point than at a point in the “non-free” Internet availability situation. A joint effect of price and Internet availability on willingness to buy was investigated by dividing price ranges by four representing ‘very low,’ ‘low,’ ‘average,’ and ‘very high.’ “Free” Internet availability representing the “non-free” Internet availability situation and “free” Internet availability situation were added to set eight different situations. A 4 (Price: Very Low / Low / Average / Very High) × 2 (“Non-free” Internet Availability / “Free” Internet Availability) analysis of variance (ANOVA) with willingness to buy as a dependent variable was conducted, and group means are presented in Table 2 and test statistics in Table 3.

For the joint effect of price and “free” Internet availability, there was no significant effect on willingness to buy [$F(3,388) = 1.055, p > .05$]. Therefore, H1 was not supported, yet the

magnitude of interaction effect is not large ($w^2 = .076$). Figure 1 shows that there was a weak interaction pattern of how the consumers behave relying on price and “free” Internet availability. Under the “non-free” Internet availability situation, participants are expected to keep purchasing CDs, despite the slow reduction rate, from ‘very low,’ through ‘low,’ to the ‘average’ price point. At the point of ‘very high’ price, participants’ willingness to buy is expected to drop quickly because most consumers’ willingness to buy is lower than the ‘very high’ price point. Under the “free” Internet availability situation, participants are expected to continue to purchase CDs from the ‘very low’ to the ‘low’ price point. Unlike in the “non-free” Internet availability situation, their willingness to buy was predicted to fall suddenly when an ‘average’ priced CD was given, and the level of willingness to buy continued to fall up to the ‘very high’ price point. At the ‘average’ price point, the appearing difference between “non-free” and “free” situations is due to a ‘price effect,’ meaning that participants who are willing to buy CDs at an ‘average’ price point in a “non-free” Internet situation show their unwillingness to purchase in a “free” situation because they start to perceive music CDs to be expensive. Regarding the fact that the ‘average’ price point was manipulated to reflect the current average price of CDs, it is implied that consumers now are unwilling to buy a CD at the current price because they are able to obtain free music via the Internet. Considering the fact that a firm sets the CD price of general pop music albums to maximize its profits, a consumer’s unwillingness to buy at that price would have a negative impact on record sales.

Regarding a participant’s willingness to buy at ‘very low,’ ‘low,’ and ‘very high’ price points, there is no difference between “non-free” and “free” Internet availability situations [$t = .784, p > .0125$; $t = -.073, p > .05$; $t = -.826, p > .05$]. At a ‘very low’ price point, one would make a purchase because the price is low enough and one would do the same as at a ‘low’ price point

regardless of free music. At a ‘very high’ price point, consumers would buy less CDs due to the high price in both the “non-free” and “free” Internet availability situations. Because the ‘very high’ price point was manipulated as 19,000 won (\$20.99), a price perceived to be high, consumers who decide to buy would not care much about free music availability and high price. Instead, they might take into account other factors in both the “non-free” and “free” availability situations.

Regarding the main effect of price, there was a significant effect on willingness to buy [$F(3,388) = 3.158, p < .05$]. Regarding the main effect of “free” Internet availability, there was no significant difference between groups [$F(3,388) = 1.055, p > .05$]. Because those results are irrelevant to this research, no interpretations are provided.

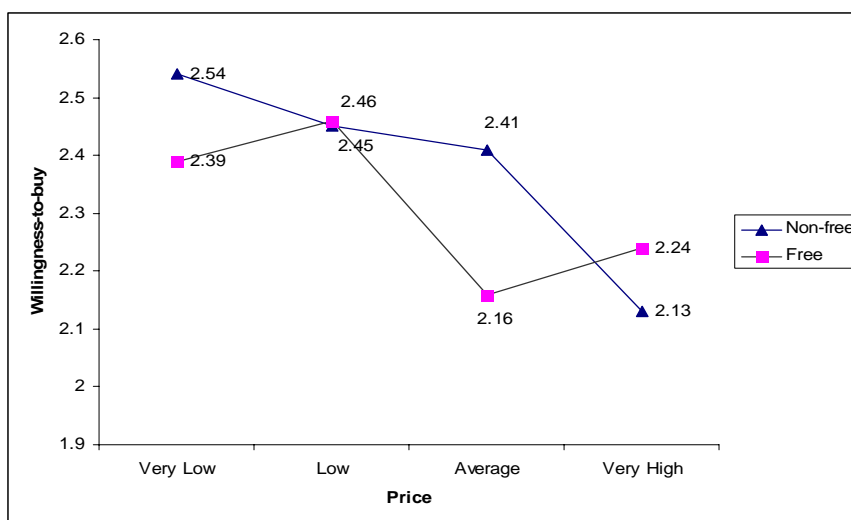
Table 2. Means and Standard Deviations (in parentheses) for Willingness to Buy

	Very Low	Low	Average	Very High
“Non-Free” Internet Availability	2.54 (.64)	2.45 (.72)	2.41 (.75)	2.13 (.55)
“Free” Internet Availability	2.39 (1.17)	2.46 (.75)	2.16 (.64)	2.24 (.73)

Table 3. Effects of Price and “Free” Internet Availability on Willingness to Buy

Source	<i>df</i>	Sums of Square	Mean Square	F	p
Price	3	5.55	1.85	3.16	.03
“Free” Internet Availability	1	.46	.46	.79	.37
Price × “Free” Internet Availability	3	1.85	.62	1.06	.37
Error	388	227.42	.59		
Total	395	235.30			

Figure 1. Pattern of Consumers' Behavior Depending on Price and "Free" Availability



As consumer's willingness to buy in the "free" Internet availability situation drops at the 'average' price point, and then rises up to the 'very high' price point, the quantity of demand would be less affected by price than in the "non-free" Internet situation. Thus, it is predicted that the consumers' purchasing patterns would change with respect to price when they are able to obtain free music CDs. That is, consumers will put more weight on non-price factors than price in the "free" Internet availability situation. Therefore, it was examined how price and non-price factors affect consumers' willingness to buy for CDs in both the "non-free" and "free" Internet availability situations, respectively. Multiple regression analysis was conducted on about twenty-four CDs with price, gender, age, monthly expenditure, monthly spending on CDs, and hours spent using free music as independent variables, and willingness to buy as a dependent variable. Because the effects of each independent variable on a dependent variable have varied much across all CDs, the exact and detailed consumers' purchasing pattern would not be clear by consolidating the effects of each independent variable across all CDs into two separate situations resting on "free" Internet availability. Multiple regression analysis on all twenty-four CDs was conducted, and then individual results were assembled into two separate situations: "free" and

“non-free” Internet availability situations, i.e., twelve in each condition. The importance of price and other non-price factors were then analyzed to determine how they differed among all CDs in each condition by mainly focusing on the effect of price. Test statistics are presented in Table 4.

In this study, it is predicted that participants will consider price on purchase decision in the “non-free” Internet availability situation whereas they will not take into account price in the “free” Internet availability situation, placing more weight on non-price factors. Overall, the results showed that price has a statistically significant effect on participants’ willingness to buy for five out of twelve CDs in the “non-free” Internet availability situation. However, none of CDs demonstrated that price had a significant effect on consumers’ willingness to buy in the “free” Internet availability situation. Thus hypothesis 2 was supported.

For the “non-free” Internet availability situation, price affects purchase intention significantly for five CDs while some other non-price factors have significant effects as well. For example, for CD2, preference for genre, monthly expenditures, and the amount of CDs purchased have significant effects in addition to price. For the other seven CDs with no significant effect of price, other non-price factors have significant effects. For instance, for CD1, the rating of singer and preference for genre have significant effects. This could be explained by reason that for some CDs, when participants are loyal to a singer or genre, they tend to disregard price on purchase. In sum, under the “non-free” Internet availability situation, both price and non-price factors affect willingness to buy either separately or simultaneously depending on the kind of CD. In other words, consumers will buy certain kinds of CDs if the price does not exceed their willingness to buy, whereas they will purchase other sorts of CDs after considering more important non-price factors such as preference for genre.

For the “free” Internet availability situation, price has no significant effects on the purchase of all kinds of CDs. Instead of price, it is predicted that preference for genre significantly influences consumers’ willingness to buy across all twelve CDs. Other non-price factors, such as the rating of singer and the amount of CDs purchased, had significant effects on the purchase of several CDs. For example, preference for genre and hours spent using free music were predicted to affect consumers’ willingness to buy for CD1. Results of the other CDs are summarized in Table 4. In sum, under the “free” Internet availability situation, price has no significant effect on participants’ willingness to buy. Stated differently, it is predicted that consumers would not consider price on purchasing CDs when they are able to obtain free music, and consequently consumers react less to price after the appearance of file sharing.

Table 4. Factors Affecting Consumers' Purchasing Pattern in Each CD in Both "Non-free" and "Free" Internet Availability Situations

"Free" Availability							"Free" Availability						
Availability	CD	Factors	B(S.E.)	β	t	Availability	CD	Factors	B(S.E.)	β	t		
Non-Free	CD1	Price	.00(.00)	-.08	-1.32	Free	CD1	Price	.00(.00)	-.04	-.57		
		Singer	.25(.11)	.16	2.15*			Singer	.17(.14)	.09	1.19		
		Genre	.57(.10)	.44	5.82*			Genre	.53(.11)	.38	4.92*		
		Gender	.16(.16)	.07	1.00			Gender	-.31(.29)	-.07	-1.05		
		Age	.03(.03)	.07	1.02			Age	.02(.03)	.03	.50		
		Expenditure	.00(.00)	-.04	-.63			Expenditure	.00(.00)	.02	.26		
		CD purchase	.00(.00)	.10	1.59			CD purchase	.00(.00)	.08	1.13		
		Hour	-.01(.02)	-.06	-.92			Hour	-.04(.02)	-.16	-2.45*		
	R=.56, R ² =.31, Adj R ² =.29					R=.50, R ² =.22, Adj R ² =.19							
	CD2	Price	.00(.00)	-.16	-2.51*	Free	CD2	Price	.00(.00)	.02	.38		
		Singer	.15(.15)	.08	1.04			Singer	.27(.13)	.18	2.16*		
		Genre	.58(.11)	.41	5.29*			Genre	.57(.11)	.44	5.39*		
		Gender	.31(.17)	.12	1.79			Gender	-.20(.27)	-.05	-.76		
		Age	.04(.04)	.81	1.14			Age	.02(.03)	.04	.64		
		Expenditure	.00(.00)	.13	2.06*			Expenditure	.00(.00)	-.04	-.54		
		CD purchase	.00(.00)	.15	2.44*			CD purchase	.00(.00)	.16	2.62*		
		Hour	-.02(.02)	-.08	-1.21			Hour	-.01(.02)	-.53	-.86		
	R=.54, R ² =.29, Adj R ² =.26					R=.56, R ² =.33, Adj R ² =.30							
	CD3	Price	.00(.00)	-.13	-2.16*	Free	CD3	Price	.00(.00)	-.03	-.38		
		Singer	.15(.10)	.12	1.58			Singer	.34(.13)	.24	2.60*		
Genre		.50(.08)	.48	6.25*	Genre			.34(.11)	.28	3.09*			
Gender		.00(.13)	.00	.017	Gender			-.49(.25)	-.13	-1.94			
Age		.00(.03)	-.03	-.375	Age			-.01(.03)	-.03	-.49			
Expenditure		.00(.00)	-.03	-.47	Expenditure			.00(.00)	.04	.52			
CD purchase		.00(.10)	.12	1.92	CD purchase			.00(.00)	.10	1.44			
Hour		.00(.00)	.00	.02	Hour			-.02(.01)	-.10	-1.53			
R=.59, R ² =.34, Adj R ² =.31					R=.46, R ² =.21, Adj R ² =.18								
CD4	Price	.00(.00)	-.12	-1.972	Free	CD4	Price	.00(.00)	.01	.11			
	Singer	.24(.10)	.18	2.38*			Singer	-.12(.14)	-.08	-.86			
	Genre	.65(.09)	.52	7.10*			Genre	.72(.15)	.53	6.28*			
	Gender	.00(.14)	.00	.012			Gender	-.40(.28)	-.09	-1.44			
	Age	-.02(.03)	-.04	-.61			Age	.01(.03)	.03	.47			
	Expenditure	.00(.00)	-.03	-.58			Expenditure	.00(.00)	-.06	-.79			
	CD purchase	.00(.00)	.11	2.00*			CD purchase	.00(.00)	.02	.32			
	Hour	-.01(.01)	-.03	-.471			Hour	.00(.02)	.00	-.05			
R=.67, R ² =.45, Adj R ² =.42					R=.49, R ² =.24, Adj R ² =.21								
CD5	Price	.00(.00)	-.08	-1.47	Free	CD5	Price	.00(.00)	-.04	-.60			
	Singer	.16(.14)	.09	1.20			Singer	.12(.14)	.07	.80			
	Genre	.84(.11)	.58	7.88*			Genre	.74(.12)	.51	6.24*			
	Gender	.24(.14)	.11	1.69			Gender	-.35(.27)	-.08	-1.30			
	Age	.03(.03)	.07	1.09			Age	-.04(.03)	-.08	-1.35			
	Expenditure	.00(.00)	.01	.21			Expenditure	.00(.00)	.07	1.00			
	CD purchase	.00(.00)	.02	2.82*			CD purchase	.00(.00)	.14	2.23*			
	Hour	.00(.01)	-.04	-.64			Hour	-.03(.02)	-.10	-1.68			
R=.65, R ² =.42, Adj R ² =.39					R=.56, R ² =.35, Adj R ² =.33								

* p<.05

“Free” Availability						“Free” Availability					
CD	Factors	B(S.E.)	β	t	CD	Factors	B(S.E.)	β	T		
CD6	Price	.00(.00)	-.05	-.82	CD6	Price	.00(.00)	-.05	-.87		
	Singer	.18(.13)	.13	1.36		Singer	.36(.16)	.20	2.28		
	Genre	.36(.11)	.33	3.33*		Genre	.66(.13)	.46	5.14*		
	Gender	.07(.18)	.40	.69		Gender	-.38(.27)	-.09	-1.44		
	Age	-.04(.04)	-.08	-1.06		Age	-.06(.03)	-.13	-2.12*		
	Expenditure	.00(.00)	.05	.70		Expenditure	.00(.00)	.00	-.05		
	CD purchase	.00(.00)	.07	1.01		CD purchase	.00(.00)	.01	.19		
	Hour	-.01(.02)	-.03	-.43		Hour	.01(.02)	.04	.68		
R=.44, R ² = .10, Adj R ² =.16					R=.61, R ² = .38, Adj R ² =.35						
CD7	Price	.00(.00)	-.20	-3.11*	CD7	Price	.00(.00)	-.10	-1.68		
	Singer	.01(.13)	.01	.05		Singer	.46(.15)	.25	3.05*		
	Genre	.48(.11)	.43	4.47*		Genre	.62(.12)	.41	5.03*		
	Gender	-.11(.16)	-.05	-.67		Gender	-.47(.26)	-.10	-1.79		
	Age	.02(.03)	.05	.71		Age	-.03(.03)	-.06	-.95		
	Expenditure	.00(.00)	-.06	-.91		Expenditure	.00(.00)	.00	-.07		
	CD purchase	.00(.00)	.10	1.58		CD purchase	.00(.00)	.06	1.09		
	Hour	.00(.02)	-.01	-.20		Hour	.00(.02)	.01	.21		
R=.50, R ² = .25, Adj R ² =.22					R=.64, R ² = .41, Adj R ² =.38						
CD8	Price	.00(.00)	-.13	-2.30*	CD8	Price	.00(.00)	-.06	-.90		
	Singer	-.04(.11)	-.02	-.32		Singer	.06(.16)	.03	.36		
	Genre	.57(.09)	.49	6.31*		Genre	.77(.13)	.52	5.98*		
	Gender	-.40(.15)	-.02	-.26		Gender	-.27(.28)	-.06	-.95		
	Age	-.03(.03)	-.07	-1.07		Age	.00(.03)	-.02	-.27		
	Expenditure	.00(.00)	-.02	-.37		Expenditure	.00(.00)	-.04	-.53		
	CD purchase	.00(.00)	.30	5.13*		CD purchase	.00(.00)	-.15	2.35*		
	Hour	-.01(.02)	-.56	.57		Hour	.00(.02)	-.01	-.16		
R=.61, R ² = .37, Adj R ² =.34					R=.56, R ² = .31, Adj R ² =.29						
CD9	Price	.00(.00)	-.11	-1.50	CD9	Price	.00(.00)	-.09	-1.21		
	Singer	-.07(.22)	-.03	-.32		Singer	.15(.17)	.06	.68		
	Genre	.67(.21)	.33	3.21*		Genre	.36(.17)	.19	2.13*		
	Gender	.20(.31)	.05	.66		Gender	.06(.38)	.01	.17		
	Age	.08(.06)	.10	1.26		Age	.05(.04)	.09	1.21		
	Expenditure	.00(.00)	-.02	-.31		Expenditure	.00(.00)	-.02	-.27		
	CD purchase	.00(.00)	.08	1.14		CD purchase	.00(.00)	.03	.44		
	Hour	.01(.03)	.03	.43		Hour	-.02(.02)	-.06	-.86		
R=.32, R ² = .10, Adj R ² =.06					R=.28, R ² = .08, Adj R ² =.04						
CD10	Price	.00(.00)	-.08	-1.23	CD10	Price	.00(.00)	-.11	-1.42		
	Singer	.45(.06)	.22	2.51		Singer	-.07(.07)	-.08	-.93		
	Genre	.20(.06)	.31	3.50*		Genre	.22(.08)	.24	2.74*		
	Gender	-.02(.09)	-.02	-.24		Gender	-.17(.19)	-.06	-.88		
	Age	.00(.20)	.00	-.03		Age	.01(.02)	.04	.54		
	Expenditure	.00(.00)	.04	.55		Expenditure	.00(.00)	.04	.57		
	CD purchase	.00(.00)	-.02	-.32		CD purchase	.00(.00)	.12	1.66		
	Hour	.00(.01)	-.03	-.40		Hour	-.02(.01)	-.10	-1.41		
R=.49, R ² = .23, Adj R ² =.20					R=.30, R ² = .09, Adj R ² =.05						

* p<.05

"Free"						"Free"					
Avail-ability	CD	Factors	B(S.E.)	β	t	Avail-ability	CD	Factors	B(S.E.)	β	T
	CD11	Price	.00(.00)	-.16	-3.03*		CD11	Price	.00(.00)	-.05	-.75
		Singer	.17(.08)	.17	2.13*			Singer	.32(.10)	.27	3.19*
		Genre	.45(.70)	.52	6.55*			Genre	.29(.09)	.28	3.33*
		Gender	.16(.11)	.08	1.44			Gender	-.28(.22)	-.08	-1.29
		Age	.04(.02)	.11	1.83			Age	.00(.02)	.01	.16
		Expenditure	.00(.00)	-.07	-1.22			Expenditure	.00(.00)	.00	-.05
		CD purchase	.00(.00)	.15	2.80			CD purchase	.00(.00)	.03	.38
		Hour	.00(.01)	-.01	-.19			Hour	.00	.01	-.02
R=.70, R ² =.49, Adj R ² =.47						R=.50, R ² =.25, Adj R ² =.22					
Non-Free	CD12	Price	.00(.00)	-.06	-1.14	Free	CD12	Price	.00(.00)	.02	.28
		Singer	.20(.11)	.15	1.85			Singer	.20(.12)	.13	1.75
		Genre	.58(.08)	.57	6.98*			Genre	.72(.10)	.58	7.63*
		Gender	-.03(.14)	-.01	-.18			Gender	-.53(.25)	-.12	-2.14*
		Age	-.04(.03)	-.01	-.15			Age	.00(.03)	-.01	-.18
		Expenditure	.00(.00)	-.05	-.98			Expenditure	.00(.00)	-.03	-.53
		CD purchase	.00(.00)	-.11	2.07*			CD purchase	.00(.00)	.13	2.44
		Hour	.00(.01)	-.02	-.38			Hour	.00(.01)	-.01	-.14
R=.72, R ² =.51, Adj R ² =.49						R=.70, R ² =.50, Adj R ² =.47					

* p<.05

DISCUSSION

Recent technological advances have greatly impacted music record sales. In this study, how file-sharing technology affected consumers' purchasing pattern was explored. The results suggest there is a weak interaction pattern between price and "free" Internet availability on consumers' willingness to buy, though the interaction effect was not statistically significant. When free music penetrated the market, consumers were able to experience music without payment, their willingness to buy CDs decreased suddenly at an 'average' price level whereas consumers' willingness to buy fell at a higher price level, 'very high,' without free music. This difference represents a 'price effect,' which implies that consumers started to perceive an 'average' price to be expensive simply due to 'free' music distributed via the file-sharing system. Considering the 'average' price in the study reflected the current price of legitimate CDs, the implication here is that consumers may not make a purchase at the current CD price. Because companies generally set the price of a product to maximize profits, the consumers' unwillingness to buy at the current price would lead to a decrease in sales.

This study may support the results of empirical studies in this field by showing the likelihood of a downturn in record sales. It is a generally accepted idea that file-sharing and downloading cause a drop in record sales (Hui & Ivan, 2003; Liebowitz, 2003; Rob & Waldfogel, 2004; Zentner, 2004). However, previous studies presumed that a consumer's willingness to buy would not change after the advent of P2P technology. Moreover, they have not paid attention to price as a variable. Focusing on consumers' willingness to buy depending on price and free availability, this study investigated in greater detail consumers' perception and behavior affected by file-sharing technology.

In terms of price, the results show that consumers' willingness to buy is likely to plummet to an 'average' price level with the emerging free music. In order to generate demand, the price of a single CD must be set below the current price level. Also, with respect to consumers' response to the price of a CD, they may become insensitive as they are able to acquire music products without payment. Consequently, free music downloading may force record companies into a form of limit pricing. Instead of maintaining the price level, companies should concentrate on the strategy of cost reduction to maximize profits. In the case of digital music sales, due to the near zero marginal cost, lowering prices would generate substantial profits. Moreover, lowering prices enough to deter other new entrants would help protect a firm's profitability.

Next, this study demonstrated that price and non-price factor have different effects on consumers' purchasing pattern depending on the availability situation. In detail, under the "non-free" Internet availability situation, price had a statistically significant effect on consumers' willingness to buy for some CDs and some non-price factors have significant effects as well, whereas under the "free" Internet availability situation, price had no significant effect on consumers' willingness to buy across twelve CDs. Instead of price, some non-price factors significantly influence consumers' willingness to buy. This finding suggests how the record industry can reverse the falling demand for legitimate CDs. When the emergence of free music via a file-sharing system turns the attention of consumers to non-price factors ahead of CD purchases, firms must concentrate on the kinds of non-price factors such as various CD characteristics that can attract consumers. For example, by segmenting consumer groups according to preference for genre, and by producing and promoting music designed to fit those segmented groups, firms are able to increase revenues. In a similar context, Bayaan (2004)

recommended that a “bonus” can be provided to give consumers incentive to buy as a possible quality differentiation strategy, and Duchene and Waelbroeck (2003) suggested that the provision of additional services such as leaflets containing lyrics, pictures, an access code to online chat rooms, and live concerts tickets would contribute to an increase in demand.

New sales methods, such as selling music by individual units or bundling, must be developed to absorb low-value consumers as a price discrimination strategy. In fact, Napster was able to experience music consumption through individual songs, and the site is now selling customized music at a cost of a dollar per song. Consumers can now choose songs that they prefer and collect them into one CD, maximizing their utility with this fitted product. A firm is thereby able to increase its revenues by servicing high- to low-value consumers. To sum up, a file-sharing system alters the way of providing music products, benefiting both consumers and suppliers.

Enforcing copyright laws, however, is a different matter. To prevent file sharing from reducing record sales, the recording industry has attempted to employ legal strategies. However, research on copyright enforcement and welfare suggested that legal methods would diminish the total social benefit. Bayaan (2004) documented that the legal method would lessen the variety of music and reduce incentives to produce music, and Duchene and Waelbroeck (2003) analyzed that strong copyright protection may decrease surplus on both the suppliers’ and consumers’ sides. In addition, Chen and Png (2003) theoretically analyzed the effects of government policies (fine, tax, and subsidy) on suppliers, consumers, and overall social welfare, and concluded that fines for users who use illegal copied works would more negatively affect welfare than price cuts, and that taxation on copying medium would be more effective than fines. It was also determined that subsidies would be effective. In addition, it is questionable that legal strategies would boost

the consumers' perceived price level, which has already fallen due to free music products. This is because upgrading expectations of consumers about price is not an easy task (Guiltinan, 1976). Rather, with the legal method, it would be risky for music to be used without hindering both demand and the development of technologies.

This study also provided warnings to other digitalized industries such as film, TV, and game. Those industries also face the risk of penetration from the file-sharing system as well. As distribution, compression, copy, and transition technologies develop, time and labor required to copy, upload, and disseminate information products have been shortened, and consequently those industries will experience the same situations as the music industry. This research suggested that before consumers' willingness to buy falls due to the P2P system, new ways of supplying information products with a low price without a loss of revenue must be developed, as it will be difficult to restore the consumers' falling expectations of low prices.

For future research, this study suggests that a different research design be used. This study utilized a between-subjects design, which asked subjects to rate their willingness to buy in either "non-free" or "free" situations separately. Kirk (1995) noted that a within-subject design helped the research increase the statistical sensitivity, or statistical power, because the error terms used to evaluate the significance of repeated effects in within-subjects designs are considerably smaller than those used in between-subjects designs. For that purpose, this study recommends that other studies in the future employ a within-subjects design, which asks the same subjects to rate in both "non-free" and "free" Internet availability situations.

REFERENCES

- Alexander, P. J. (1994). New technology and market structure: Evidence from the music recording industry. *Journal of Cultural Economics*, 18(2), 113-123.
- Alexander, P. J. (2002). Peer-to-peer file sharing: The case of the music recording industry. *Review of Industrial Organization*, 20(2), 151-161.
- Bakos, Y., Brynjolfsson, E., & Lichtman, D. (1999). Shared information goods. *Journal of Law and Economics*, 42(1), 117-155.
- Bayaan, I. Technology and the music industry: effects on profits, variety, and welfare. Working paper presented at International Industrial Organization Conference, Chicago, April 2004.
- Besen, S. M. & Kirby, S. N. (1989). Private copying, appropriability, and optimal copying royalties. *Journal of Law and Economics*, 32, 255-280.
- Chen, Y. & Png, I. (2003). Information goods pricing and copyright enforcement: Welfare analysis. *Information Systems Research*, 14(1), 107-123.
- Duchene, A. & Waelbroeck, P. Does Peer-to-Peer harm copyright owners? Protecting and distributing digital products. May 2003
- Easley, R., Michel, J., & Devaraj, S. (2003). The MP3 open standard and the music industry's response to Internet piracy. *Communications of the ACM*, 46(11), 91-96.
- Gayer, A. & Shy, O. (2005). Copyright enforcement in the digital era. *CESifo Economic Studies*, 51, 2/3, 477-489.
- Guiltinan, J. G. (1976). Risk-averse pricing policies: Problems and alternatives, *Journal of Marketing*, 40(1), 10-15.
- Hall, R. (2000). Expert Report, A&M Records, Inc. v. Napster, Inc 114F. Supp. 2d 896, 2000. (http://dl.napster.com/Hall_report_final.pdf)
- Hui, K.L. & Png, I. (2003). Piracy and the legitimate demand for recorded music. *Contributions to Economic Analysis & Policy*, 2(1), Article 11.
- Kim, W., Sung D., Kim, M., & Kim, K. (2005). A comparative study on Korean and U. S. college students' views on copyright debate over p2p music file sharing. *Korean Journal of Journalism and Communication studies*, 49, 221-358.
- King, S. P. & Lampe, R. (2003). Network externalities, price discrimination and profitable piracy. *Information Economics and Policy*, 15, 271-290.
- Krik, R. (1995). Experimental design: Procedures for the behavioral sciences (3rd ed.). CA: Brooks/Cole Publishing Company.
- Kover, S. E., Burke, K. G., & Kover, B. R. (2000). Consumer responses to the CPA webtrust Assurance. *Journal of Information System*, 14(1), 17-35.
- Lam, C. & Tan, B. (2001). The Internet is changing the music industry. *Communication of the ACM*, 44(8), 62-68.
- Liebowitz, S. (2003). Will MP3 downloads annihilate the Record Industry? The evidence so far. <http://wwwpub.utdallas.edu/~liebowit/intprop/records.pdf> (retrieved June 6, 2004).
- Liebowitz, S. J. Pitfalls in measuring the impacts of file-sharing. Paper presented in Munich Germany at CESifo Conference, July 2004.
- McQuarri, E. (1998). An alternative to purchase intentions: The role of prior behavior in consumer expenditure on computers. *The Journal of Market Research Society*, 30, 407-435.
- Molteni, L. & Ordanini, A. (2003). Consumption patterns, digital technology and music downloading. *Long Range Planning*, 36, 389-406.
- Music Industry Association of Korea. <http://www.miak.or.kr/>.

- Oberholzer-Gee, F. & Strumpf, K. The effect of file sharing on record sales: An empirical analysis. NBER working paper. Universities research conference, Cambridge, May 2004.
- Peitz, M. & Waelboreck, P. (2003) Piracy of digital products: A critical review of the economics literature. Cfsfo working paper no. 1071 Category 9: industrial organization.
- Peitz, M. & Waelboreck, P. (2004a). File-sharing, sampling, and music distribution. Working paper an International University in Bruchsal, Germany.
- Peitz, M. & Waelbroek, P. (2004b). The effect of Internet piracy on CD sales: cross-section evidence. Cesifo Working Paper No. 1120 Category 9: Industrial Organization, January, 2004.
- Pew Internet & American Life Project's Online Music Report. "Downloading free music: Internet music lovers don't think it's stealing." September 28, 2000, http://www.pewinternet.org/pdfs/PIP_Online_Music_Report2.pdf (15 August 2004).
- Pew Internet & American Life Project's Online Music Report. "Music and video downloading moves beyond P2P." March 2005.
- Pew Internet & American Life Project. "Internet: The mainstreaming of online life." 2005. www.pewinternet.org/pdfs/Internet_status_2005.pdf
- Recording Industry Association of America. "2003 Yearend Statistics." 2004, <http://www.riaa.com/news/newsletter/pdf/2003yearEnd.pdf> (15 August 2004).
- Rob R. & Waldfogel, J. Piracy on the high C's: Music downloading, sales displacement, and social welfare in a sample of college students. National Bureau of Economic Research working paper, Oct. 2004.
- Takeyama, L. N. (1994). The welfare implications of unauthorized reproduction of intellectual property in the presence of demand network externalities. *Journal of Industrial Economics*, 42, 155-166.
- Takeyama, L. N. (1997). The intertemporal consequences of unauthorized reproduction of intellectual property. *Journal of Law and Economics*, 40, 511-522.
- Varian, H. R. (2000). Buying, sharing and renting information goods. *The Journal of Industrial Economics*, 48(4), 474-488.
- White paper Internet Korea 2005, published by National Computerization Agency
- Zentner, Alejandro (2003). Measuring the effect of music downloads on music purchases. University of Chicago working paper. <http://www.internetworldstats.com/top25.htm>

[Appendix 1⁷]

[Type 1]

Questionnaire for Music CD Study

Personal Information

- Gender: Female () Male ()
- Age: ()
- About how much do you spend in a month on purchases for yourself? \$ ()
- How much do you spend specifically on music CDs in a month? ()
- How many hours to you listen to music from a streaming service or MP3 download service from the web during a typical week? () hours () minutes.

Artist information

For each of the below artists, please answer the following questions:

The genre of each CD is given in the parenthesis next to artists' name.

1. SungMo Jung (Ballad)

I think the quality of this artist is.. Poor Below average Average Above average Excellent

I like the genre that this singer performs... Not at all A little Moderately Somewhat Very much

2. Sora Lee (Ballad)

I think the quality of this artist is.. Poor Below average Average Above average Excellent

I like the genre that this singer performs... Not at all A little Moderately Somewhat Very much

3. Seven (Dance)

I think the quality of this artist is.. Poor Below average Average Above average Excellent

I like the genre that this singer performs... Not at all A little Moderately Somewhat Very much

4. BoA (Dnace)

I think the quality of this artist is.. Poor Below average Average Above average Excellent

I like the genre that this singer performs... Not at all A little Moderately Somewhat Very much

5. GuMi (R&B)

I think the quality of this artist is.. Poor Below average Average Above average Excellent

⁷ This is the only one of eight types of sample questionnaires.

I like the genre that this singer performs... Not at all A little Moderately Somewhat Very much

6. SG WannaBe (R&B)

I think the quality of this artist is.. Poor Below average Average Above average Excellent

I like the genre that this singer performs... Not at all A little Moderately Somewhat Very much

7. DoHyung Yoon (Rock)

I think the quality of this artist is.. Poor Below average Average Above average Excellent

I like the genre that this singer performs... Not at all A little Moderately Somewhat Very much

8. JaWooLim (Rock)

I think the quality of this artist is.. Poor Below average Average Above average Excellent

I like the genre that this singer performs... Not at all A little Moderately Somewhat Very much

9. YoonJung Jang (Trot)

I think the quality of this artist is.. Poor Below average Average Above average Excellent

I like the genre that this singer performs... Not at all A little Moderately Somewhat Very much

10. TaeJina (Trot)

I think the quality of this artist is.. Poor Below average Average Above average Excellent

I like the genre that this singer performs... Not at all A little Moderately Somewhat Very much

11. JiWon Eun (HipHop)

I think the quality of this artist is.. Poor Below average Average Above average Excellent

I like the genre that this singer performs... Not at all A little Moderately Somewhat Very much

12. Drunken Tiger (HipHop)

I think the quality of this artist is.. Poor Below average Average Above average Excellent

I like the genre that this singer performs... Not at all A little Moderately Somewhat Very much

Instructions

Now you will be given some descriptions of 12 music CDs. For each CD there will be a description, mentioning different album qualities. The genre of each CD is given in the parenthesis next to artists' name. Assume these CDs are newly released and you have not yet purchased them. After considering the information, please **rate your willingness to purchase each CD**.

01. SungMo Jung (Ballad)'s new album is released.

Information for this CD is as follows:

This CD contains 24 songs.
The price of this CD is \$3.99 and free MP3 or streaming is available for the whole album.

		Not at all	A little	Moderately	Somewhat	Very much
	How willing are you to buy this CD?	1	2	3	4	5

02. Sora Lee (Ballad)'s new album is released.

Information for this CD is as follows:

This CD contains 18 songs.
The price of this CD is \$3.99 and free MP3 or streaming is available for the whole album.

		Not at all	A little	Moderately	Somewhat	Very much
	How willing are you to buy this CD?	1	2	3	4	5

03. Seven (Dance)'s new album is released.

Information for this CD is as follows:

This CD contains 12 songs.
The price of this CD is \$3.99 and free MP3 or streaming is available for the whole album.

		Not at all	A little	Moderately	Somewhat	Very much
	How willing are you to buy this CD?	1	2	3	4	5

04. BoA (Dance)'s new album is released.

Information for this CD is as follows:

This CD contains 12 songs.
The price of this CD is \$3.99 and free MP3 or streaming is available for the whole album.

		Not at all	A little	Moderately	Somewhat	Very much
	How willing are you to buy this CD?	1	2	3	4	5

05. GuMi (R&B)'s new album is released.

Information for this CD is as follows:

This CD contains 6 songs.
The price of this CD is \$3.99 and free MP3 or streaming is available for the whole album.

		Not at all	A little	Moderately	Somewhat	Very much
	How willing are you to buy this CD?	1	2	3	4	5

06. SG WannaBe (R&B)'s new album is released.

Information for this CD is as follows:

This CD contains 24 songs.
The price of this CD is \$3.99 and free MP3 or streaming is available for the whole album.

		Not at all	A little	Moderately	Somewhat	Very much
	How willing are you to buy this CD?	1	2	3	4	5

07. DoHyun Yoon (Rock)'s new album is released.

Information for this CD is as follows:

This CD contains 12 songs.
The price of this CD is \$3.99 and free MP3 or streaming is available for the whole album.

		Not at all	A little	Moderately	Somewhat	Very much
	How willing are you to buy this CD?	1	2	3	4	5

08. JaWooLim (Rock)'s new album is released.

Information for this CD is as follows:

This CD contains 18 songs.
The price of this CD is \$3.99 and free MP3 or streaming is available for the whole album.

		Not at all	A little	Moderately	Somewhat	Very much
	How willing are you to buy this CD?	1	2	3	4	5

09. YoonJung Jang (Trot)'s new album is released.

Information for this CD is as follows:

This CD contains 18 songs.
The price of this CD is \$3.99 and free MP3 or streaming is available for the whole album.

		Not at all	A little	Moderately	Somewhat	Very much
	How willing are you to buy this CD?	1	2	3	4	5

10. TaeJina (Trot)'s new album is released.

Information for this CD is as follows:

This CD contains 24 songs. The price of this CD is \$3.99 and free MP3 or streaming is available for the whole album.
--

		Not at all	A little	Moderately	Somewhat	Very much
	How willing are you to buy this CD?	1	2	3	4	5

11. JiWon Eun (HipHop)'s new album is released.

Information for this CD is as follows:

This CD contains 6 songs. The price of this CD is \$3.99 and free MP3 or streaming is available for the whole album.

		Not at all	A little	Moderately	Somewhat	Very much
	How willing are you to buy this CD?	1	2	3	4	5

12. Drunken Tiger (HipHop)'s new album is released.

Information for this CD is as follows:

This CD contains 12 songs. The price of this CD is \$3.99 and free MP3 or streaming is available for the whole album.
--

		Not at all	A little	Moderately	Somewhat	Very much
	How willing are you to buy this CD?	1	2	3	4	5