



Volume 32, Issue 4

Why do pirates buy music online? An empirical analysis on a sample of college students

Grazia Cecere

Telecom Ecole de Management, Institut Mines-Télécom and Université Paris 11, ADIS.

Nicoletta Corrocher
KITeS, Bocconi University

Fabio Scarica
Vodafone

Abstract

Despite a considerable amount of theoretical and empirical research in industrial organisation literature on the relationship between piracy, music sales and their antecedents, a significant gap exists for what concerns the linkage between digital music piracy and the recent success of online music stores (OMS). Our aim is to investigate the motivations behind digital music purchases on a population of college students who are music pirates. In doing so, we rely upon an original dataset from a survey carried out in 2010 on a population of university students, who are pirates. The results show that the likelihood that pirates buy digital music from an OMS is positively related to the level of Information & Communication Technologies (ICT) skills of the respondents, including the experience in online purchases, and to the individual interest in music.

Citation: Grazia Cecere and Nicoletta Corrocher and Fabio Scarica, (2012) "Why do pirates buy music online? An empirical analysis on a sample of college students", *Economics Bulletin*, Vol. 32 No. 4 pp. 2955-2968.

Contact: Grazia Cecere - grazia.cecere@telecom-em.eu, Nicoletta Corrocher - nicoletta.corrocher@unibocconi.it, Fabio Scarica - fabio.scarica@gmail.com.

Submitted: August 06, 2012. **Published:** October 25, 2012.

Submission Number:EB-12-00580

Why do pirates buy music online? An empirical analysis on a sample of college students

Grazia Cecere

Telecom Ecole de Management, Institut Mines-Telecom

Nicoletta Corrocher

KITeS, Bocconi University

Fabio Scarica

Vodafone

Abstract

Despite a considerable amount of theoretical and empirical research in industrial organisation literature on the relationship between piracy, music sales and their antecedents, a significant gap exists for what concerns the linkage between digital music piracy and the recent success of online music stores (OMS). Our aim is to investigate the motivations behind digital music purchases on a population of college students who are music pirates. In doing so, we rely upon an original dataset from a survey carried out in 2010 on a population of university students, who are pirates. The results show that the likelihood that pirates buy digital music from an OMS is positively related to the level of Information & Communication Technologies (ICT) skills of the respondents, including the experience in online purchases, and to the individual interest in music.

Submitted: Aug 06 2012. Revised: October 25, 2012.

The effect of piracy on social welfare is controversial (Rob and Waldfogel, 2006; Sundararajan, 2004). Scholars agree that, even in presence of some positive effects, piracy harms the industry's revenues (Peitz and Waelbroeck, 2006b; Oberholzer-Gee and Strumpf, 2007). This means that the losses in sales deriving from piracy are not compensated by the benefits deriving from the so-called sampling effect, i.e. an increase in revenues due to the fact that file sharing induces a better match between consumers' tastes and their willingness to pay. Therefore, illegally downloadable music is generally considered quite a close substitute for music purchased legally (Peitz and Waelbroeck, 2005).

In 2010, global recorded music sales amounted to \$15.9 billion, with trade revenues registering a decline of 8.4% compared to the previous year; 57% of this loss was due to the world's two biggest markets (the U.S. and Japan). Indeed, in the US overall sales fell by 10%, while Japan saw an overall market decline of 8.3% (IFPI, 2012). Between 2004 and 2009 global music sales fell by almost 30% (Connolly and Krueger, 2005; Kennedy, 2006). Representatives of the industry ascribe this situation to the presence of widespread piracy all over the world. Moreover, around 37% of all CDs purchased in 2005 were pirated and during the same year almost 20 billion songs were illegally downloaded (Kennedy, 2006), mostly from P2P networks. Nevertheless, the digital environment has also been an important source of opportunities for the music industry. The birth of iTunes marked the beginning of an astonishing growth for legal digital music purchases. In 2009, 27% of the music industry's global revenues came from digital channels, (reporting a 12% increase compared to 2008 (Kennedy, 2010)). On the whole, the increase in the value of digital music market for the period 2004-2010 was around 1000%, with online and mobile revenues accounting for around 40% of music sales in the U.S. (Moore, 2011).

In dealing with music piracy, a growing number of empirical studies examine the relationship between online file sharing and off-line purchases, without considering the effect on the on-line sales of digital music. Only a recent paper by Waldfogel (2010) considers the displacement effect of piracy on the sales of digital music by iTunes. Apart from this contribution, very little attention has been paid to the phenomenon of digital music purchases and, more specifically, to the success achieved by some online music stores (OMS) in relation to piracy. This represents an interesting line of inquiry, since OMS have become more and more successful over time, even if they sell a good that has a very close substitute freely available on peer-to-peer (P2P) networks. Firstly, it is important to understand whether the success obtained by OMS is due only to a change in consumption habits, or if it actually represents a tangible opportunity for the industry to weaken the impact of piracy. Second, if the latter proves to be true, one becomes immediately interested in assessing the determinants and the motivations of this phenomenon. The present paper examines the reasons why consumers who illegally download music from the Internet also buy music from OMS. In doing so, it relies on an original dataset from a survey carried out in 2010 on a population of university students.

2. Piracy and music sales: review of the literature, research issues and hypotheses

The relationship between the traditional production as well as distribution of music products and the emergence of the digital environment has been analyzed in depth by the industrial organization (IO) literature (Leyshon, 2001; Peitz and Waelbroeck, 2006b). Theoretical models have mainly focused on the relationship between CD sales and physically pirated copies, also accounting for the positive direct and indirect network externalities that piracy can induce on the demand for legally sold products, (Hui and Png, 2003) and for the impact of

P2P networks on the music industry (Rob and Waldfogel, 2006). Only a few papers address the case in which both legal and illegal distribution of music takes place over the Internet. An important exception is the article by Bhattacharjee et al. (2003), who show that offering music online is always beneficial to legal sellers, as it enables them to compete more effectively with illegal networks. Starting from the existing models, scholars have investigated empirically the effects that illegal download and file sharing activities have on legal sales of offline music. Zentner (2006) finds that people who regularly download music illegally online are also more likely to buy music off-line. For users of P2P systems, piracy reduces the probability of buying music, thus explaining a drop in music sales ranging from 7.8% to 14.5%. These results are in line with Rob and Waldfogel (2006), who find that downloading reduces per capita music expenditures from \$126 to \$101 but raises per capita consumers' surplus by \$70. Peitz and Waelbroeck (2004) and Liebowitz (2005) examine the trend of music sales and file sharing activities over time and find that illegal downloads have an important role in explaining the decline in CD sales in the U.S. market. More recently, Waldfogel (2010) considers the displacement effect of piracy on the sales of digital music by iTunes and finds that the displacement rates of online sales ranges between -0.15 and -0.3. Against the dominant evidence on the negative effects of piracy on offline music sales, Oberholzer-Gee and Strumpf (2007) show that the estimated effect of file sharing on sales is not significant and conclude that most P2P users were individuals who, in the absence of file sharing, would not have bought the music they downloaded. Finally, Mortimer et al. (2012) demonstrate that file-sharing has increased the popularity of smaller artists and has positively affected the demand for their live performances, while revenues from concert revenues for well-known artists appear to have been largely unaffected by file-sharing.

Since the emergence and success of OMS could represent an important change in consumption habits supporting the legal consumption of music, thus reducing piracy, it is interesting to assess the determinants of this phenomenon. The vast majority of the literature on piracy assumes that consumers attach a higher value to the original (physical) copy of a good. Many scholars expect a CD to have a higher intrinsic value than a digital music file, since consumers might be interested in aspects like the design of the cover and the presence of the lyrics (Peitz and Waelbroeck, 2006a). Finally, studies investigating software piracy (Conner and Rumelt, 1991; Givon et al. 1995) suggest that the higher value attached to the original copy might also derive from the presence of additional services, manuals etc. However, when we compare legally purchased online music and digital pirated copies it is reasonable to argue that such differences are negligible. A user who buys songs from an OMS owns a good with the same set of characteristics as the pirated copy available on P2P networks. Both goods are in digital format and can be considered very close substitutes. Therefore we intend to analyze why consumers should pay a price for a good that is freely available by investigating the motivations that lead pirates to buy music online.

The first motivation behind online music purchases has to do with the level of interest in music as such and with the users' willingness to reward their favourite artists. In order to demand a given digital product (whether pirated or legitimate), a consumer must like the product so that the utility derived from its consumption offsets the price (if any) paid and/or the associated transaction costs (OECD, 2009). Rob and Waldfogel (2006) show that an interest in music influences both piracy and the purchase of CDs. Zentner (2006) finds that individuals who listen to pirated digital music are more likely to buy music offline. Similarly, Andersen and Frenz (2010) find that an interest in music influences both the purchase of CDs and the diffusion of paid for electronically-delivered music. Furthermore, individuals who illegally download music can discover new titles and increase their consumption of CDs or of music bought from OMS (Bounie et al., 2005), in case their interest in music impacts positively on their willingness to pay. The utility/value an individual assigns to a product is

reflected in his or her willingness to pay for that product. Even if a good is available for free – as in the case of digital music – the literature dealing with the dynamics of “*pay what you want*” shows that it is possible that an individual chooses to pay for that good (Chandran and Morowitz, 2005; Fernandez and Nahata, 2009; Kim et al., 2009; Regner, 2010; El Hardi et al., 2011). The theoretical foundation of this behaviour lies in the “dictator game”, whose results show the co-existence of two attitudes: “gamesmen” behaviour, which is based on self-interest criteria, and “fairmen” behaviour, which is based on altruistic principles or moral values (Hoffman et al., 1996). The fairmen behaviour in particular has to do with the concept of reciprocity. Individuals might decide to honour the social norm of reciprocity because of a sympathetic linkage between them and the person that will benefit from the reciprocating action. To put this idea into the context of music, people might decide to buy a digital copy of a record, instead of downloading it, because they want to reward a particular artist they like¹, or because of altruism, social norms, social-images concerns and guilt (Regner, 2010). Moreover, this deep form of recognition of other people’s work is partly coherent with moral judgment or ethical concerns (Higgins and Makin, 2004; Chiou et al., 2005). Furthermore, users might be interested in music-related information, which could explain the fact that they join an online music-subscription service (Walsh et al., 2003). Regner and Barria (2009) study the strategic interaction between label/artists and customers, showing that a voluntary payment constitutes sequential reciprocity equilibrium. In short, the more one has developed a deeply emotional connection with this form of artistic expression, the higher the value provided by music consumption and, in turn, the higher the likelihood to reciprocate. Thus, we formalize the first hypothesis:

H1: An individual with a higher interest in music is more likely to legally download a music file.

The second driver of online music purchases is related to the presence of indirect network effects between MP3 players and OMS, which are particularly strong in the case of iTunes and the iPod (Spulber, 2008). iTunes is a piece of multifunctional software, developed in 2001 together with the iPod. All iPod users have to use this software in order to upload music files and to manage their music libraries. The iTunes Music Store was launched in 2003 with a large music library and a very simple pricing scheme (\$0.99 for a single song) and allows users to buy digital music from their favourite artists without infringing any copyright. Although the software iTunes and the iTunes store are closely related, iPod owners do not need to buy music on the iTunes store in order to play it on their MP3 player. However, they are tightly connected to the Apple community and it is reasonable to argue that possessing an iPod encourages users to buy music on the iTunes platform, as they are often in contact with the store (see Voids et al., 2006 on the relevance of the effect of belonging to a community on online purchases). On the basis of this, we formulate our second hypothesis:

H2: Consumers owning an iPod are more likely to buy music online.

3. Data and empirical analysis

3.1 Data description

In order to test the hypotheses, an online survey was submitted to college students in 2010. College students are considered as a population displaying significant pirate behaviour,

¹ The case of Radiohead, who let their fans pay what they wanted for their album “In Rainbows”, provides a classic example.

because of their relatively high levels of ICT skills and their budget constraints (Peitz and Waelboreck, 2006). The survey was made accessible through official online forums of the major European and American universities², while the structure of the questionnaire partly draws on Bounie et al. (2005) and Zentner (2006). Our empirical analysis is based upon a sample of 416 individuals.³ 47.1% of the sample is composed of male students and the average age is 22.84. Almost 81% of the individuals are Italians. With respect to education, 44.7% of the sample includes undergraduate students and the most frequent disciplines are Economics, Engineering, Philosophy and Letters, and Law. Turning to their interest in music, many of the interviewees do not intensively listen to music. The statistics show that 34.9% of the sample listen to music between 1 and 5 hours a week, while 24.6% listen to it between 6 and 10 hours. Still, 26.3% of the students declare that they listen to music for more than 15 hours per week. All students declare that they have illegally downloaded at least part of their music collection and therefore everyone in the sample can be considered a pirate. What interests us is that almost one third of the respondents indicate that they bought at least once from an OMS (although the incidence of such purchases on their music collection is on average lower than 25%). As expected, iTunes turns out to be the favourite OMS, since on average, 74.19% of digital music purchases took place on this store. In terms of motivations behind the purchase of digital music, the user-friendliness of such platforms and the willingness to reward favourite artists are the top scoring ones.

3.2 Empirical analysis

The aim of the empirical analysis is to investigate the determinants of online music purchases within a group of pirates. In order to test our research hypotheses, we estimate a probit model in which the dependent variable – ONLINE MUSIC PURCHASES – is a dummy that takes value 1 if the respondent has purchased music in digital format from an OMS at least once and 0 otherwise.

As far as an interest in music is concerned, a set of variables in the questionnaire investigated the behaviour and attitude of users towards music. By means of a factor analysis, we have constructed an index based upon the following items: hours per week of music listening (0; 1 to 5 hours; 6 to 10 hours; 1 to 15 hours; more than 15 hours), playing a musical instrument (yes/no), regularly reading a music magazine (yes/no), number of live performances attended in a year (0; 1-3; 4-6; 7-9; >9) and size of CD collection (<10; 10-30; 31-50; 51-100; >100). Cronbach's alpha for these items is equal to 0.698, a value that is above the threshold for acceptance. The factor analysis extracts only one factor – MUSIC INTEREST – explaining 44.2% of the total variance. In line with our hypothesis, we expect online buyers of music to display a high level of interest in music. In order to test the role of (indirect) network effects between iTunes and iPod, we include a dummy variable taking value 1 if the respondent owns an iPod and 0 otherwise. We expect this variable to be positively correlated with the probability of purchasing music online. Finally, we include a set of control variables. First, we consider a set of socio-demographic variables such as gender, country – which is a dummy assuming value 1 in case the respondent is Italian 0 otherwise – and college faculty. Second, we measure

² Official forums referred to the following universities: London Metropolitan University (London, UK), Temple University (Philadelphia, Indiana, U.S.), The Stockholm School of Economics (Stockholm, Sweden), Università Cattolica del Sacro Cuore (Milan, Italy), Università Commerciale “Luigi Bocconi” (Milan, Italy), Università degli Studi di Milano (Milan, Italy), Università degli Studi di Pavia (Pavia, Italy), Università degli Studi di Roma “La Sapienza” (Roma, Italy), Université des Sciences Sociales – Toulouse 1 (Toulouse, France).

³ The survey collected 571 responses. The questionnaire indicated that 155 of them had to be dropped due to incompleteness or because some serious inconsistencies were spotted.

general attitude towards online shopping with the number of online purchases. For this purpose, we build a dummy variable `FREQINTERNETPURCH` which takes value 1 if respondents declared that they engaged in online purchases more than 6 times per year and 0 otherwise. Even in this case, we expect those familiar with online shopping to be more inclined to buy music from OMS. Third, we take into consideration the level of ICT skills. A question in our survey asked respondents to evaluate on a 5-point Likert scale their ICT skills. We performed a factor analysis on the relevant items⁴ and extracted two factors, explaining 65.84% of the total variance. Table 1 shows the results of the analysis. The first factor – *basic ICT skills* – reflects the knowledge of basic ICT applications requiring a relatively low level of proficiency to be effectively used as happens in the case of word processors, spreadsheets or the creation of presentations. The second factor – *advanced ICT skills* – is explained by activities requiring more advanced skills: creating a webpage, programming, managing a database, configuring an Internet connection. We expect online buyers to be characterized by a lower level of skills as compared to their peers.

Table 1: Factors defining ICT skills⁵

	Advanced ICT Skills	Basic ICT Skills
<i>Word Processors</i>		0.871
<i>Spreadsheets</i>	0.453	0.552
<i>Presentation</i>		0.844
<i>Database Management</i>	0.731	
<i>Web Page</i>	0.806	
<i>Configuring Conn.</i>	0.661	
<i>Compress Files</i>	0.574	0.549
<i>Programming</i>	0.857	

Third, we include a proxy for income, i.e. the number of months working for money in the last year. We build four dummy variables – `INCOME0`, `INCOME1`, `INCOME2`, `INCOME3` – corresponding to the number of months working for money (0; 1-3; 4-6; >6). Many studies indicate that income is inversely related to music piracy (e.g. Rob and Waldfogel, 2006, Kim et al., 2009). The theoretical arguments supporting this result state that higher income levels increase the affordability of a given good by diminishing its relative incidence on the available income. Table 2 shows the descriptive statistics. The correlation matrix is presented in Annex A. The estimation does not try to identify cause-effect relationships; rather its aim is to highlight the robust relationship between the probability of buying music and its determinants.

⁴ Scale reliability was firstly evaluated by leveraging on Cronbach's alpha for the 8 listed items. The test showed a value equal to 0.869, which is above the minimum threshold for acceptance (0.6).

⁵Varimax rotation with Kaiser normalization. Values below 0.4 are not visualized.

Table 2 – Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
oms_purch	414	0.321	0.468	0	1
gender	414	0.471	0.500	0	1
italy_foreing	414	0.819	0.386	0	1
highskill	414	0.000	1.001	-1.585	2.571
lowskill	414	-0.002	1.001	-3.488	1.856
architecture	414	0.022	0.146	0	1
economics	414	0.353	0.478	0	1
law	414	0.094	0.292	0	1
engineering	414	0.128	0.335	0	1
philetters	414	0.106	0.309	0	1
political	414	0.048	0.215	0	1
math	414	0.039	0.193	0	1
income0	414	0.519	0.500	0	1
income1	414	0.220	0.415	0	1
income2	414	0.092	0.289	0	1
music interest	414	0.003	1.003	-0.841	3.659
FrenqInternetPurch	413	0.426	0.495	0	1
ipod	356	0.551	0.498	0	1

4. Results

The results of the probit model are presented in Table 3, while Table 4 provides the marginal effects. Model 1 includes the ICT skills variable and the control variables, Model 2 adds the remaining variables but the one related to iPod and Model 3 represents the complete model. As far as hypothesis 1 is concerned, we observe that an increase in the interest in music increases the odds of buying from OMS. Pirates who are more interested in music are also more inclined to buy online. This result reflects the existence of a willingness to reward artists, in line with the literature on pay-what-you-want. In relation to this, an important result comes from the iPod variable, which has a positive and significant coefficient corroborating hypothesis 2. This signals both the effect of belonging to the Apple community and the impact of (indirect) network effects deriving from the complementarity between iTunes and iPod on the likelihood of buying music from OMS. From a managerial perspective, this result suggests that enforcing strong complementarities between digital audio players and OMS might support legal music selling. Our findings suggest the existence of a positive effect of income on the probability of buying music online, which is in line with the results in the literature. Similarly, the probability of purchasing from OMS is also related to the general online behaviour of users. In particular, making a high number of online purchases per year determines a substantial increase in the odds of buying from OMS. Finally, pirates studying law and economics are more likely than other students to buy music online. This might signal higher moral concerns related to piracy or an increased awareness about its legal consequences by students coming from these faculties. The probability of an ICT-skilled person buying music online increases, while the index relating to the basic usage of common IT tools is largely insignificant. There are several possible justifications for this result. First, individuals with high ICT skills are aware of the technical characteristics of the digital files so they might prefer to buy music online instead of downloading it illegally. Second, these people tend to be pioneers, are always prone to buy new products and applications and are experienced users.

	(1)		(2)		(3)	
GENDER	0.02	(0.14)	-0.03	(0.15)	0.02	(0.16)
ITALY_FOREIGN	-0.41**	(0.17)	-0.24	(0.18)	-0.19	(0.21)
HIGHSKILL	0.26***	(0.09)	0.23**	(0.09)	0.20*	(0.10)
LOWSKILL	0.06	(0.08)	0.03	(0.08)	0.12	(0.09)
ARCHITECTURE	0.72	(0.47)	0.85*	(0.48)	0.38	(0.63)
ECONOMICS	0.43**	(0.19)	0.43**	(0.19)	0.38*	(0.21)
LAW	0.54**	(0.26)	0.64**	(0.27)	0.55*	(0.30)
ENGINEERING	0.09	(0.25)	0.08	(0.27)	0.10	(0.30)
PHILETTERS	0.52**	(0.26)	0.47*	(0.27)	0.41	(0.30)
POLITICAL	0.56*	(0.34)	0.59*	(0.36)	0.73*	(0.43)
MATH	0.02	(0.38)	0.17	(0.37)	-0.11	(0.40)
INCOME0			-0.04	(0.19)	-0.07	(0.21)
INCOME1			0.07	(0.22)	-0.11	(0.24)
INCOME2			0.54**	(0.27)	0.44	(0.31)
MUSIC INTEREST			0.13*	(0.07)	0.16**	(0.08)
FREQINTERNETPURCH			0.48***	(0.14)	0.45***	(0.15)
IPOD					0.66***	(0.16)
_cons	-0.48**	(0.20)	-0.89***	(0.26)	-1.25***	(0.32)
Wald chi 2	23.88		45.42		52.90	
N	414		413		356	

Robust standard errors in parentheses. Level of significance: *p<.10, ** p<.05, *** p<.01

Table 4 - Probit Regression. Marginal Effects*

	(1)		(2)		(3)	
	AME	S.E.	AME	S.E.	AME	S.E.
GENDER	0.706	4.817	-0.843	4.625	0.534	4.912
ITALIAN	-14.774**	6.199	-7.996	6.153	-6.025	6.506
HIGHSKILL	8.835***	2.975	7.381**	2.914	5.890*	3.042
LOWSKILL	2.160	2.549	1.031	2.500	3.717	2.739
ARCHITECTURE	26.419	17.396	29.662*	16.362	12.028	20.679
ECONOMICS	14.770**	6.423	13.953**	6.011	11.306*	6.299
LAW	19.226**	9.505	21.722**	9.133	17.650*	9.672
ENGINEERING	3.218	8.872	2.452	8.702	3.065	9.207
PHILETTERS	18.725**	9.441	15.888*	9.273	12.940	9.629
POLITICAL	20.437*	12.531	20.131	12.561	23.766*	14.008
MATH	0.771	12.871	5.471	12.485	-3.342	11.511
INCOME0			-1.173	6.001	-2.042	6.189
INCOME1			2.257	6.986	-3.377	6.852
INCOME2			18.508*	9.541	13.891	10.204
MUSIC INTEREST			4.181*	2.202	4.832**	2.311
FREQINTERNETPURCH			16.025***	4.779	14.245*	4.901
IPOD					19.783*	4.508

*Marginal effects are computed using the Chamberlain method which implies to compute the average marginal effect instead of the marginal effect on the average. The *Margeff* command implemented in Stata permits with the option *percent* to compute directly the variation in percentage of $Pr(y=1/x)$.

4. Discussion and conclusions

A number of managerial and policy considerations can be derived. First, despite the findings, the ability of OMS to penetrate those segments in where piracy is widespread is still quite low. Even consumers who have bought from OMS tend to purchase a relatively low number of songs/albums. This can be interpreted as a sign of the fact that the proposed business

models are not yet able to stimulate the creation of loyal customers. On the other hand, this also means that there is a huge room for improvement. The vast majority of those who buy from OMS declared that a significant number of their purchases (almost 70%) takes place on iTunes. Furthermore, when respondents were asked to indicate other (unlisted) OMS from which they bought music in digital format, they mentioned almost exclusively OMS that offer à la carte downloads. Therefore a pricing structure based on an “à la carte” menu is more effective than one based on subscriptions. Second, the interest in music seems to be an important driver of online music purchases, suggesting that OMS should give more exposure to the linkage between music purchases and artist rewarding. On the one hand, they could create sections dedicated to independent artists that do not share profits with large companies in the industry, thus establishing a direct link between customers and those who benefit from rewards. On the other hand, advertising and criteria for content search could be used to emphasize the relationship with the artist. For instance, one might create promotions that invite users to help their favorite artist to reach top positions in specific charts and reward those consumers who contribute in case the event occurs. Third, the result concerning the role of Apple’s strategy suggests that indirect network effects are important in strengthening the link between customers and OMS, and in stimulating online music purchases. Furthermore, members of the iTunes community that are engaged in discussing and exploring everything concerning the music domain might favor online purchases. Nevertheless, communities can also be used to stimulate and strategically control the dynamics underlying the sampling effect. By creating a secure environment for knowledge sharing and purchasing activities, OMS can encourage the debate on selected artists and genres, developing ad hoc discussions, contests or surveys. This, in turn, might stimulate curiosity and willingness to explore, while at the same time increasing customer loyalty. In addition, such practices might increase the perceived legitimacy of the service by “opening” to some extent the boundaries of the firm and by creating a more direct channel with customers. This strategy, by relying on network effects, might become an important source of competitive advantage for OMS.

References

- Andersen, B., Frenz, M. (2010) “Don't blame the P2P file-sharers: The Impact of Free Music Downloads on the Purchase of Music CDs in Canada” *Journal of Evolutionary Economics* **20** 715-740.
- Bhattacharjee, S., Kaveepan, L., Gopal, R., Mardsen, J. (2003) “No More Shadow Boxing with Online Music Piracy: Strategic Business Models to Enhance Revenues” 36th Annual Hawaii International Conference on System Sciences, Track 7.
- Bhattacharjee, S., Kaveepan, L., Gopal, R., Mardsen, J. (2006) “Whatever Happened to Payola? An Empirical Analysis of Online Music Sharing” *Decision Support Systems* **42**, 104-120.
- Bounie, D., Bourreau, M., Waelbroeck, P. (2005) “Pirates or Explorers? Analysis of Music Consumption in French Graduate Schools” Working Paper.
- Chandran, S., Morwitz, V. G. (2005) “Effects of Participative Pricing on Consumers' Cognitions and Actions: A goal theoretic perspective” *Journal of Consumer Research* **32** (2), 249-259.
- Chiou, J.S., Huang, C.Y., Lee, H.H. (2005) “The antecedents of music piracy attitudes and intentions” *Journal of Business Ethics* **57**, 161-174.

- Conner, K. R., Rumelt, R.P. (1991) "Software piracy: An analysis of protection strategies" *Management Science* **37**, 125-139.
- Connolly, M., Krueger, A. B. (2005) "Rockonomics: The economics of popular music" in: *Handbook of the Economics of Arts and Culture* by Ginsburgh, V.A., Throsby, D., Eds., North Holland: Amsterdam, 667–720.
- El Harbi, S., Grolleau, G., Bekir, I. (2011) "Substituting Piracy with a Pay-What-You-Want Option: Does it Make Sense?" *European Journal of Law and Economics* DOI: 10.1007/s10657-011-9287-y
- Fernandez, J., Nahata, B. (2009) "Pay What You Like" Working Paper.
- France, J. (2008) "Top 5 Online Music Stores" CNET News" July 17th 2008, available at http://news.cnet.com/8301-17938_105-9992592-1.html, last accessed, January 21st 2011.
- Gayer, A., Shy, O. (2003) "Internet and Peer-to-Peer Distributions in Markets for Digital Products" *Economics Letters* **81**, 197-203.
- Givon, M., Mahajan, V., Muller, E. (1995) "Software Piracy: Estimation of Lost Sales and the Impact on Software Diffusion" *Journal of Marketing* **59**, 29-37.
- Higgins, G. E., Makin, D. (2004) "Does social learning theory condition the effects of low self-control on college students' software piracy?" *Journal of Economic Crime Management* **2**, 1-22.
- Hill, C.W.L. (2007) "Digital piracy: Causes, consequences and strategic responses" *Asian Pacific Journal of Management* **24**, 9-25.
- Hoffman E., McCabe K., Smith V.L. (1996) "Social Distance and Other-Regarding Behavior in Dictator Games" *The American Economic Review* **86**, 635-660.
- Howard, P., Rainie, L., Jones, S. (2001) "Days and nights on the Internet: The impact of a Diffusing Technology" *American Behavioral Scientist* **45**, 383-404.
- Hui, K.L., Png, I. (2003) "Piracy and the legitimate demand for recorded music" *Contributions to Economic Analysis and Policy* **2**, article 11.
- IFPI Press Releases (2012) "Recording Industry in Numbers 2011", January 23rd 2012, available at http://www.ifpi.org/content/section_resources/dmr2012.html, last accessed, February 16th 2012.
- Kennedy, J. (2006) "Piracy Report. IFPI reports" available at <http://www.ifpi.org/content/library/piracy-report2006.pdf>, last accessed, July 20th 2010.
- Kennedy, J. (2010) "Digital Music Report, IFPI reports" available at <http://www.ifpi.org/content/library/dmr2010.pdf>, last accessed, July 20th 2010.
- Kim, J. Natter, M., Spann, M. (2009) "Pay What You Want: A new participative pricing Mechanism" *Journal of Marketing* **73**, 44-58.

Liebowitz, S. J. (2005) "Economists Examine File-Sharing and Music Sales" *The Industrial Organization of digital Goods and Electronic Markets*. MIT press Publication 05-02.

Leyshon, A. (2001) "Time - Space and Digital Compression: Software Formats, Musical Networks, and the Reorganisation of the Music Industry" *Environment and Planning* **33**, 49-77.

Moore, F. (2011) "Digital music report. IFPI reports", available at <http://www.ifpi.org/content/library/DMR2011.pdf>, last accessed January 20th 2010.

Mortimer J. H., Nosko C., Sorensen A. (2012) "Supply responses to digital distribution: Recorded music and live performances" *Information Economics and Policy* **24**, 3–14.

Oberholzer-Gee, F., Strumpf, K. (2007) "The effect of file sharing on record sales: An empirical analysis" *Journal of Political Economy* **115**, 1-42.

OECD, 2009. *Piracy of Digital Content*. OECD: Paris.

Peitz, M., Waelbroeck, P. (2004) "The effect of internet piracy on CD Sales: Cross-Section Evidence" Working Paper.

Peitz, M., Waelbroeck, P. (2005) "An economist's guide to digital music" *CESifo Economic Studies* **51**, 359-428.

Peitz, M., Waelbroeck, P. (2006a) "Piracy of digital products: A critical review of the theoretical literature" *Information Economics and Policy* **18**, 449-476.

Peitz, M., Waelbroeck P. (2006b) "Why the music industry may gain from free downloading - The role of sampling" *International Journal of Industrial Organization* **24**, 907-913.

Regner, T. (2010) "Why Consumers Pay Voluntarily: Evidence from Online Music" Jena Economic Research Paper #2010-081.

Regner, T., Barria, J.A. (2009) "Do consumers pay voluntarily? The case of online music" *Journal of Economic Behavior & Organization* **79**, 395–406.

Rob, R., Waldfogel, J. (2006) "Piracy on the High C's: Music downloading, sales displacement, and social Welfare in a sample of college students" *Journal of Law and Economics* **49**, 29-62.

Rogers, E. M. (2003) *Diffusion of innovations*, The Free Press: New York, 5th edition.

Spulber, D.F. (2008) "Unlocking technology: Antitrust and innovation" *Journal of Competition Law & Economics* **4**, 915-966.

Sundararajan, A. (2004) "Managing digital piracy: Pricing and protection" *Information Systems Research* **15**, 287-304.

Voida, A., Grinter, R. E., Ducheneaut, N. (2006) "Social practices around iTunes", in *Consuming music together: Social and collaborative aspects of music consumption technologies* by K. O'Hara, B. Brown, Eds., Springer: The Netherlands, 57-83.

Waldfogel, J., 2010. "Music file sharing and sales displacement in the iTunes era" *Information economics and policy* **22**, 306-314.

Walsh, G., Mitchell, V.W., Frenzel, T., Wiedermann, K. (2003) "Internet-induced changes in consumer music procurement behavior: A German perspective" *Marketing Intelligence & Planning* **21**, 305 – 317.

Zentner, A. (2006) "Measuring the effect of file sharing on music purchases" *Journal of Law and Economics* **49**, 63-90.

Zhang, M.X. 2002) "Stardom, Peer-to-Peer and the Socially Optimal Distribution of Music" *mimeo*, Sloan School of Management, MIT.

Annex A

	1	2	3	4	5	6	7	8	9	10	11	12	13
OMS_PURCH	1												
GENDER	0.0673	1											
ITALIAN	-0.0934	0.0101	1										
HIGHSKILL	0.1705*	0.3435*	0.0168	1									
LOWSKILL	0.1169	0.1568*	0.0665	0.4630*	1								
ARCHITECTURE	0.0395	0.0582	-0.0152	-0.0417	-0.0108	1							
ECONOMICS	0.0131	-0.0631	0.1152	-0.1769*	0.0391	-0.1099	1						
LAW	0.0207	-0.0302	0.0487	-0.0805	-0.0910	-0.0485	-0.2411*	1					
ENGINEERING	0.0466	0.2315*	-0.0246	0.4961*	0.1577*	-0.0568	-0.2825*	-0.1246	1				
PHILETTERS	0.0318	-0.1054	0.0412	-0.0662	-0.0052	-0.0511	-0.2542*	-0.1122	-0.1314*	1			
POLITICAL	0.0142	0.0355	-0.0391	-0.1296*	-0.1054	-0.0334	-0.1661*	-0.0733	-0.0859	-0.0773	1		
MATH	-0.0302	0.0616	-0.0995	0.0019	0.0245	-0.0297	-0.1478*	-0.0652	-0.0764	-0.0688	-0.0449	1	
INCOME0	-0.1057	0.0408	0.0805	-0.0636	-0.1360*	-0.0223	0.0168	0.0364	-0.0652	-0.0132	-0.0086	0.0924	1
INCOME1	-0.0020	-0.0218	-0.0056	-0.0179	0.0857	-0.0387	-0.0019	0.0049	-0.0104	-0.0307	0.0714	-0.0454	-0.5499*
INCOME2	0.1221	-0.0318	-0.0876	-0.0227	0.0717	0.0102	-0.0249	-0.0751	0.0540	0.0266	0.0068	-0.0200	-0.3295*
MUSIC INTEREST	0.1751*	0.1575*	-0.1525*	0.1628*	0.1329*	0.0597	-0.1237	-0.0285	0.0526	0.0722	0.0683	-0.0039	-0.0822
FREQINTERNETPURCH	0.2284*	0.1291*	-0.1325*	0.2153*	0.1496*	-0.0953	0.0366	-0.0614	0.1219	0.0188	-0.0581	-0.0466	-0.1221
IPOD	0.2330*	-0.0468	-0.0936	0.0589	0.0823	0.0298	0.0064	0.0650	0.0358	0.0099	-0.1274	0.0544	-0.0548

Level of significance * p<.01