The willingness to pay for online music in the presence of copying: An empirical investigation

First draft (December 2006)

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Keywords

Digital goods, music business models, willingness to pay, ordered Logit model

Abstract

This paper examines the willingness to pay (WTP) for an original –a legitimate copy of a work– when perfect digital copies are freely available. In so doing, we highlight some conditions for the viability of new business models facing the fast development of "everything is for free" environments. We use micro-data about WTP obtained from contingent valuation technique. We test them using an ordered Logit model. We suggest three results: (1) There exists a positive WTP for online music in the presence of copying and it is lesser than prevailing market price; (2) This WTP doesn't depend so much on demographics but rather on ethical concern, usability, the choice of titles, and the structure of the social embeddedness of individuals; (3) The importance of the social embeddedness suggests that alternative models to BtoC paying downloads can be viable.

1. Introduction: "From free to fee"?

Nowadays online music mainly consists in two kinds of access: on the one hand, online sales – with the representative model of iTunes Music Store– and on the other hand, free access through illegal file sharing networks. The latter one prevails as a major way to access music on the Internet and more recently, among mobile phones. This success is not so much explained by the so-called "free mentality" but rather by the willingness of copiers to access a wider diversity of titles and the range of possible uses unimpeded by digital devices (Rochelandet, Le Guel, 2005).

There has been much debate about the impact of P2P file-sharing networks on content markets. P2P file-sharing is suspected to decrease the sales of records while impeding the emergence of new profitable online business. Accordingly, in OECD countries, copyright legislations have been reinforced to fight against P2P sharing. But in fact, such a legal evolution presupposes only one kind of business model according to which individuals have to pay an average price (0.9 euros for each music tracks) for enjoying a use-restricted content. From our point of view, such a 'magic' price is not so the result of some natural matching between demand and supply but much more the result of an inefficient replication of traditional business practices on the Internet. New business models such as those of In2TV, YouTube and Jamendo suggest that alternative arrangements can be implemented face to a purely BtoC commerce. They appear, in fact, to be better fitted to the main feature of the Internet, namely to be a decentralized networks grounded on sharing behavior.

This paper examines the WTP for an original –a legitimate copy of a work– when perfect digital copies are freely available. In particular, the study deals with the willingness to pay (WTP) for legal online music despite the possibility of file-sharing. Among the various factors economic literature has already highlighted to explain the impact of copying on the overall sales of music figure the free nature of digital copies, the ethical concern about the impact of file-sharing and the perception of legal risk. But until now, no study has tested them simultaneously on a large sample. We try to fill this gap by using the contingent valuation technique to obtain micro-data about WTP and by testing them through an ordered Logit model. In so doing we expect to build further some criteria in order to evaluate alternative online services in the field of music and movie business. We suggests three results: (1) There exists a positive WTP for online music in the presence of copying and it is lesser than prevailing market price; (2) This WTP doesn't depend so much on individuals' demographics but rather on ethical concern, usability, the choice of titles, and the structure of their social embeddedness; (3) The importance of social embeddedness suggests that models alternative to BtoC paying downloads can be viable.

2. Literature and Theory

2.1. P2P literature: welfare considerations and alternative models

P2P literature is made of two approaches. The first one envisages the impact of P2P sharing on the market for originals: Does P2P file-sharing represent a social cost or a social benefit? How to design law in order to eliminate or to promote it? The second approach analyses the efficient running of P2P systems as methods of delivering contents: Why do people contribute or not for resources on those networks? How to eliminate free-riding? (*inter alia* Krishnan *et al.*, 2003, Vishnumurthy *et al.*, 2003). Crossing these two approaches consists in evaluating new business models grounded on P2P sharing networks as an alternative to online sales per unit (the "ITMS model").

The first approach is quite well documented by Liebowitz (2006), which aims at demonstrating that file-sharing should have a negative impact on the content industries. We demonstrate elsewhere that his demonstration can be contested by econometric analysis with strong methodological choice and when conducted on a large heterogeneous sample (Rochelandet, Le Guel, 2005). Nevertheless, according to Liebowitz, substitution effect, sampling, (local and global) network effects and indirect appropriability constitutes the main factors used to examine whether or not file-sharing can actually cause damages to the industry. By questioning those arguments generally used to suggest the positive impact of file-sharing on record sales, he suggests that "the substitution effect is quite simple to analyze. The copy is treated as a substitute for the original. If the copy is identical or close

in quality to the original, and if the cost of making the copy is low, the copy for a price of zero dominates the original at its positive price." More generally, his analysis challenges the idea according to which file-sharing can represent an innovation by generating viable and more profitable business models than those prevailing nowadays.

Conversely, some studies put forward the new opportunities offered by P2P sharing. Therefore, it appears more relevant to consider file-sharing and new behavior of consumers as the conditions for the emergence of new models, which can mix paying and free access rather than one unique model relying on the payment for use-restricted contents. Nevertheless, studies on file-sharing have not yet addressed the question how much money people are willing to pay for accessing legally these resources and for getting legitimate copies when free copies are available. Moreover, none considers the very mechanisms through which such a WTP can be increased. Our purpose is to fill this gap by envisaging new business models in online music. In particular, we suppose that the exploitation of the very features of sharing networks (network effects and direct social interactions) can increase the WTP for both digital contents and new online services enabling viable business models based on direct exchanges among individuals.

2.2. Contingent valuation and cultural goods

Contingent valuation refers to the various survey-based technique to valuate the non-market goods and services by asking a sample of individuals how much they would be prepared to pay for a specified change in the supply of a given public good. Economic issue arises from the fact that individuals or organizations derive utility from those resources, while it proves difficult to evaluate such benefits. Contingent valuation constitutes one of the major techniques to measure them, widely used in environmental studies. In the field of cultural economics, it mainly concerns heritage and historic sites (Schuster, 2003).

Why and how evaluate the WTP of individuals in the field of digitized cultural goods? Music contents considered both as market goods and as non-traded goods when they are illegally shared. It could be interesting here to determine the value individuals put on music titles in order to evaluate the degree of substitution between originals and digital copies.

Our approach consists in evaluating the willingness to pay for an original when a perfect digital copy is freely available. Such an assessment is crucial to study the viability of new business models based on sharing behavior. On the one hand, the WTP could be zero (or most of the individuals are not prepared to pay for) ; in this case, paying models cannot coexist in the presence of free/unimpeded models, because individuals will always preferred the free copy to the original.

On the other hand, if the WTP is positive, then heterogeneous business models can develop all together. In this case, the issue is to evaluate the WTP according to individuals and to understand why it is positive. Some explanations have been suggested such as the income, the taste for cultural goods (music or movies), the consumption habits created by the past purchases of original CDs, the ethical concerns of individuals (who can considered that copying is a bad thing) and the risks associated with copying such as lawsuit, the risk of being attacked by virus or spyware…(*inter alia* Holm, 2003, Buxmann *et al.*, 2004, Liebowitz, 2006). Rational individuals thus are supposed to make a balance between the utility a specified content confers to them and the various costs they incur by getting a copy rather an original exemplar.

[insert] : Regner and Barria (2005) provide empirical proof for significant voluntary payments for music, albeit not in a purely voluntary context.

In addition, some recent papers in management literature explore the willingness to pay for online services (Ye et al., 2004, Chyi, 2004, Shih, 2003, Gefen, 2003). They suggest that relying exclusively on advertising revenues is not always a sustainable business model for the online delivery of contents. Models based on free access to online resources (online newspapers, databases…) are not considered as viable models because advertising revenues are uncertain over Internet and not enough to finance the production of those information goods. Moreover, free (lawful) access is supposed to challenge and substitute for traditional "offline" goods. Thus, it proves crucial to change or to diversify the sources of revenues. Two classical business methods

consist in: (1) online unit sales of digital contents directly to consumers (for example, iTunes) and (2) subscription models (for example, MusicMe in France).

Those empirical studies thus are useful to determine the WTP for online services that can be currently freely accessed. They suggest that the WTP for online services is influenced by the perceived convenience these services provide for individuals and their online experience and habit. They envisage also other determinants such as fairness – one must pay for a service because it is a duty or because it might disappear through lack of revenues –, better quality expectations – one expects that paying services will be of better quality than the same services delivered freely –, "free mentality" – one has been accustomed to getting free services and one find illegitimate to pay for them –, and so on.

Besides, charging fees for services is often supposed to be incompatible with illegal file-sharing success. Many commentators suggest expanding strong enclosure strategies using DRM technologies in order to strengthen the expansion of paying models. Two scenarios then are to be considered according to which illegal files swapping disappear or do not. In the second case, new generations of technology appear and could ground upon direct exchanges amongst individuals (Rochelandet & Le Guel, 2005). So the issue is not so much to fight illegal sharing behavior but rather to understand precisely how to extract some value from them.

3. Willingness to pay and its determinants

3.1. Variables and Hypotheses

The explained variable is denoted by *WTP*. It represents the sum that an individual would accept to pay for an original exemplar of a musical track when perfect digital copies are freely available from her or his neighbors or through a P2P network[i].

We can envisage two cases according to the level of *WTP*.

First case: The WTP is equal to zero

At least a high significant proportion of individuals (more than 60% for instance) are not prepared to pay for originals when they can get a copy for free. In this case, we can infer that paying and "free" models could not coexist, because copiers do never accept to buy original content, even at a more personalized price. So there are two incompatible solutions: either producers and retailers have to design models either entirely grounded on digital enclosure (DRM), or they produce some models of distribution totally grounded on the free availability of contents, for example on sales of complementary goods, advertising or exploitation of private data.

Second case: The WTP is positive

At least a high proportion of people are prepared to pay a certain sum for original whereas they can get copies for free. In this case, there can be a coexistence of paying and free models. The question then is: How to articulate the two kinds of models in order to extract enough value from consumer to recoup fixed costs and to make profit? According to us, a first step to tackle this difficult question is to understand why this value is positive. In other words, what are the different determinants to be tested?

In addition to demographics, different variables can be suggested:

1. The **purchase of CDs** (denoted by *CULTSPEND*)**:** The more an individual buys original CDs, the more she/he is willing to pay for online music. This idea is grounded on the habits individuals take when they buy CDs. However, such a proposition could be questioned, because the utility derived from the use of CDs is not the same as in the case of online music. Dematerialized music is not the same product of CDs. For instance, it is not possible to lend or resale legal online music. We suppose nevertheless that this variable may be significant.

Proposition 1: *The level of CD purchase impacts significantly and positively WTP.*

2. The **ethical concerns** (denoted by *ETHIC*) of the individual regarding the copying of copyrighted works: Individuals can consider copying as unfair regarding the intellectual effort of artists or to

endanger the existence of the record industry. *ETHIC* indicates psychological costs the individuals bear when they feel ethically wrong the fact of copying contents. Here, we suppose that individuals make their calculus integrating other variables than the sole preference for music and relative prices of originals and copies. In a previous study, we show that this variable reduces the intensity of copying over P2P networks. Similarly, *ETHIC* can increase the *WTP* for originals of individuals, which are more ethically concerned.

The index *ETHIC* was built by requesting respondents to scale –between "do not agree", "quite not agree", "agree" and "fully agree"– their ethical concerns about copying behavior through four questions: "According to you, copying (1) endangers the movie and record markets; (2) affects the income of authors and artists; (3) does not respect the work of authors and artists; (4) is blamable in itself." We confer the value 1, 2, 3, 4 for each scaled variable and then add up them.

Proposition 2: *The ethically awareness is strongly and positively related to WTP.*

3. The **legal risk** (denoted by *LEGRISK*), namely the perceived likelihood to be caught and sanctioned for illegal activities. This variable represents another cost that individuals integrate in their rational calculus and perception. The impact of those heterogeneous perceptions of risks among individuals regarding their WTP for originals is supposed to be positive. It can be assimilated as an 'avoidance' cost: The more risk-adverse an individual is, the more she/he will be prepared to pay in order to save on the perceived cost to be caught and sanctioned for illegal file-sharing.

The variable *LEGRISK* was build by asking respondents to choose between four perceived levels of risk: no risk, low risk, medium risk and high risk. One key fact to be noted is that a wide campaign against copying was led shortly before we began our survey. So we suppose that respondents are quite aware of the risks associated with such practice. Thus, we consider the WTP for originals by ranging well-informed copiers from risk-adverse ones to risk-lovers.

Proposition 3: *The more risk-adverse is an individual facing the risk of being sanctioned by law, the greater she/he will be willing to pay for legitimate copies.*

d. The **social embeddedness** (assessing by *Herding* and *Herdingbis*): Individuals are supposed to be lesser willing to pay for originals the fewer is the proportion of copiers in their social neighborhood.

Individuals are supposed to be influenced both in their preferences and choices by the preferences and choices of their social neighboring (friends, family, colleagues). The more there are copiers in their relatives and friends, the more individuals tend to be copiers (local interaction effect, Rochelandet, Le Guel, 2005), and therefore the more they preferred copies rather than originals.

So we make the following proposition:

Proposition 4: *The proportion of copiers in the social neighboring of individuals impacts negatively* WTP.

e. The richness of the supply: the **diversity of music titles** (denoted by *Music diversity*) and the **set of possible uses** (denoted by *Usability*)

Online music features are strongly linked to the way it is delivered to individuals. Concerning illegal file-sharing, a greater diversity of titles can be found over P2P networks than over commercial platforms. Similarly, shared contents through P2P networks are not protected by DRM devices and are available at MP3 format that allows to play music tracks whatever the portable players and to share them among friends. By contrast, paying online music suffers from these features by delivering a limited range of use-restricted contents. In other words, lack of diversity and usability impacts negatively the WTP for originals. According to Sundararajan (2004), 'restricting the rights of usage that contribute to customer value [reduces] this value'. We suppose therefore that the greater the set of uses is, the more the individuals derive utility and are willing to pay for the content.

Therefore, we make the two following propositions:

Proposition 5: *The more the diversity of contents associated with paying online music is judged as insufficient, the lower is WTP.*

Proposition 6: *Individuals' desire for unrestricted usability impacts negatively WTP.*

The other independent variables that may explain WTP may be grouped as **demographics** (education, socio-professional group/occupation, household structure and income). The increase in age of the respondent is expected to reduce the intensity of copying. Younger people will be more open in their use of newly introduced ICTs. In fact, age usually reflects many other variables favorable to the intensity of a copying activity such as technical skills and income. Furthermore we hypothesize a positive impact of income level on the intensity of copying. The influence of the other demographics can be positive, negative or neutral.

The table 1 summaries the independent variables used in our econometric test.

Table 1: Variables

VARIABLE	DESCRIPTION	EXPECTED SIGN
Demographics - Gender - Age - Income	 - - -	 (indeterminate) (+) (+)
Cultural spending	CD & DVD purchases	(+)
Herding	The proportion of copiers in the social neighboring (relationship density)	(-)
Ethic	Ethical concern towards copying	(+)
Legal risk	Perception of legal risks (to be caught)	(+)
Usability	The set of uses possible from originals in comparison to copies (online music)	(-)
Music Diversity	Perception of cultural diversity associated with originals (compared to file-sharing)	(-)
Herdingbis (friends)	The proportion of copiers in friendship	(-)

3.2. Data and methodology

This article measures and explains the willingness to pay for originals when digital copies are freely available and whatever the method or technology used to get them. We apply survey methodology to measure the value individuals are prepared to pay for an online music track.

We base our analysis on primary data gathered in January and February 2005: 2,828 individuals were surveyed using a paper survey directly addressed to individuals and a Web-based survey. Note that non-response bias leads to a reduction in the size of the sample depending on the considered variables in the model. Sample reduction represents no more than 26% (maximum, i.e. for the general model). To simplify missing data correction, we choose listwise deletion approach (Allison, 2001). Further paper will use multiple imputation procedure for incomplete mixed data (Schafer, 1997). The sample bias due to Web-based survey had been corrected using a post-stratification method implemented with SAS macro (CALMAR method, INSEE[ii]). However, there is no significant bias and therefore we choose to present our model without post-stratification.

The description of the sample figures in the table 2.

Table 2: Description of the sample

Variables	Mean	Min	Max
Dependent variable (WTP) 0 euros	26,04 %	0	1
0.10 to 0.30 euros	31,58 %	0	1
0.40 to 0.50	28,38 %	0	1
0.60 to 0.90	14 %	0	1
Gender (Ref : man)	78 %	0	1

Age <25	22,58 %	0	1
25-30	19,05 %	0	1
31-40	23,16 %	0	1
41-50	15,45 %	0	1
>50	19,74 %	0	1
Income (index)	4.23 (sd=2,29)	1	9
Cultural spending (index)	2.09 (sd=1,27)	1	7
Ethic (index)	6.39 (sd=2,60)	4	16
Legal risk (index)	2.64 (sd=0,91)	1	4
Herding (index)	2.81 (sd=1,11)	1	4
Usability (index)	2.81 (sd=1,14)	1	4
Music diversity (index)	3.33 (sd=0 ,94)	1	4
Herdingbis (friends)	53 %	0	1

Note that about 74% of respondents state that they are willing to pay for original music track. Their WTP ranges from 0.1 to 0.9 euros and the mean is far from being null (0.30 €). However, the standard deviation of 0.27 € suggests that the WTP is not superior to 0,6 €: there is a significant request for lower prices of originals.

Because the WTP for originals is an ordered qualitative variable, we cannot use Tobit model. Instead, we use an ordinal regression model (Train, 2003) to forecast the determinants of the willingness to pay for an original when copies are freely available. y^* is a latent variable divided into J ordinal categories:

$$y_i = m \quad if \ \tau_{m-1} \leq y_i^* \leq \tau_m \quad for \ m = 1 \ to \ J$$

Specifically:

$$y_i = \begin{cases} 1 \Rightarrow \ 0 \ Euros \ if \ \tau_0 = -\infty \leq y_i^* < \tau_1 \\ 2 \Rightarrow \ 0.10 \ to \ 0.30 \ Euros \ if \ \tau_1 \leq y_i^* < \tau_2 \\ 3 \Rightarrow \ 0.40 \ to \ 0.50 \ Euros \ if \ \tau_2 \leq y_i^* < \tau_3 \\ 4 \Rightarrow \ 0.60 \ to \ 0.90 \ Euros \ if \ \tau_3 \leq y_i^* < \tau_4 = +\infty \end{cases}$$

We define the structural model for latent variable as $y_i^* = x_i\beta + \varepsilon_i$ where i is the observation and ε a random error vector.

Cutpoints τ_1 through τ_{J-1} are estimated and we suppose that $\tau_0 = -\infty$ and $\tau_J = +\infty$.

We can define the maximum likelihood as the product of four components:

$$\begin{cases} \Pr(y = 1|x) = F(\tau_1 - x\beta) \\ \Pr(y = 2|x) = F(\tau_2 - x\beta) - F(\tau_1 - x\beta) \\ \Pr(y = 3|x) = F(\tau_3 - x\beta) - F(\tau_2 - x\beta) \\ \Pr(y = 4|x) = 1 - F(\tau_3 - x\beta) \end{cases}$$

$$L = \prod_{i=1}^{N} \Pr(y = 1|x)^{y_{i1}} . \Pr(y = 2|x)^{y_{i2}} . \Pr(y = 3|x)^{y_{i3}} . \Pr(y = 4|x)^{y_{i4}}$$

with $N = 2828$ respondents and $y_{im} = 1 \ if \ i \ chooses \ m, \ 0 \ otherwise$.

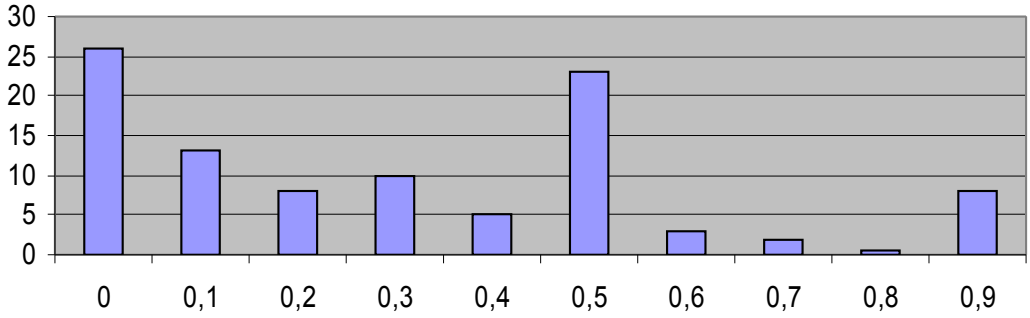
We use maximum likelihood estimation to determine β vector of parameters.

4. Empirical results

4.1 Willingness to pay estimates

Figure 1 presents a histogram of respondents' stated willingness to pay.

Figure 1: Respondents' stated willingness to pay (€ and %)



Only 26% of respondents exhibited a zero WTP for originals, whereas 8% were prepared to pay the full price of an original. 66% are not willing to pay the full (charged) price of an original music track but they were willing to pay a positive sum ranged from 0.1 euro to 0.8 euro with a majority between 0.1 and 0.5.

4.2 Ordered Logit model results

This section discusses the results that were derived from estimating the ordered Logit model of the willingness to pay for an original sound track when a perfect digital copy is freely available. These results are displayed in the table 3 (see appendix 1).

The first column displays the variables used to test the *WTP* variable. The results of the general model figure on the second column. Subsequent columns partition the general model into eight specific ones to test the propositions suggested in the previous section. Note that some variables incorporated in the general model are not significant due to the correlations among some of them. When we estimate independently those determinants, they become significant at a level less than 5% or 1%.

As expected, we validate our various propositions. Main variables are generally significant and of the predicted sign. Note that some variables are quite robust (*Age, Cultural spending, Ethic, Herding, Herdingbis, Music diversity*). Other variables prove less robust (*Legal risk, Income, Usability*). As usual in economic studies on information technology and usage, gender is not significant.

All the results (significance and sign) are summarized in the table 4.

Table 4: Summary of the results

VARIABLE	EFFECTS ON WTP
Demographics - Gender - Age - Income	 (indeterminate) (+)*** (+) (its significance depends on the co-tested variables)
Cultural spending	(+)**/***
Herding	(-)**/***
Ethic	(+)***
Legal risk	(+)**/not significant in general model
Usability	(-)***/not significant in general model
Music Diversity	(-)***
Herdingbis (friends)	(-)***

5. Implications and conclusion

A first result is that individuals do not take only the free feature of digital copies into consideration when they value originals. So the "free mentality" hypothesis is not fully tenable to justify and foster the legal and technical enclosure against illegal file-sharing.

In fact, our study suggests that there is not a simple opposition between those who are willing to pay for legal online music and those who are not. Individuals are heterogeneous in their valuation of

originals so that it should be profitable to exploit these differences in WTP. Perhaps there is a potential market to exploit and likely to generate higher levels of profit than traditional business models. In fact, individuals integrate other variables into their calculus such as ethical concerns, cultural diversity and usability of contents. Note that cultural behavior and valuation are strongly embedded into the social neighboring of individuals. Innovative distribution models should fuel and exploit social interactions in order to be viable and source of higher remuneration for artists and producers. Online music retailers have to modify their business models if they want to impose them over the Internet.

5.1. Old and new pricing models

Because the WTP is positive, pricing strategies could be a solution to allow content producers and retailers to appropriate sufficient remuneration and therefore to permit a mutually beneficial coexistence of file-sharing and paying models. According to Shapiro & Varian (1998), due to the zero cost of additional copy, a low price can be sufficient to recoup high fixed costs of production of information goods. So pricing models different from the one prevailing currently (namely ITMS model) can be suggested.

(1) A price reduction could be sufficient to lead low-value consumers to buy online music and so to generate sales enough to compensate the fixed costs. This is the idea suggested by Chen & Png (2003) according to which price reduction is more socially desirable than legal fighting against illegal copying. However, this low price strategy has two drawbacks: The first one is that individuals tend to assess and declare a WTP higher than it would be if they actually have to pay. The second one is that both retailers and copyright holders are not prepared to accept a reduction in their margins and royalties. Thus, such a cut in prices may encounter resistance from copyright holders. All in all, our study shows that this price reduction has to be significant because the majority of positive valuations are ranged below half of the full price of an original music track.

(2) Price discrimination constitutes a pricing model that could enhance both consumers' surplus and producers' benefits. It could be implemented according to the individual preferences. Although it would be unrealistic because of the inherent costs of detection and revelation of preferences, this strategy is conceivable through the exploitation of personal data over P2P networks (in this way, file-sharing could serve to facilitate the implementation of price discrimination over paying models by revealing preferences of copiers!). Price discrimination could also be made according to the product features. Buxmann et al. (2004) suggest that music industry should price-discriminate contents according their nature: current hits, older titles, rarities and works of new artists. But once again, individuals could overstate their WTP and revenues might be not enough to cover fixed costs.

5.2. Innovation

By contrast to those classical pricing models, our study suggests that music industry should not try to replicate traditional models but rather innovate in order to increase the WTP of individuals (see also Rochelandet, 2005). In so doing, WTP is not considered a fixed variable. According to our econometric results, two variables allow to increase WTP and support innovation in the field of online music: Allowing more uses by implementing less DRM protection –at least by ensuring interoperability between standards– and offering a much wider set of choices in terms of music titles may enhance the WTP for originals. Of course, there could be a substitution effect (Liebowitz, 2006) associated with a weaker technical enclosure. But two facts counterbalance such an opinion. First, WTP increase can be enough to generate enough revenue. Secondly, our analysis has also suggested that most of copiers are ethically concerned people, which could be sensitive to significant innovation from record industry and new comers.

So we predict that a radical innovation in business model could enhance social welfare by increasing authors' remuneration, consumers' surplus and middlemen's margins. In particular, alternative models might be more efficient than the iTunes model if they respect two conditions: (1) A stronger matching with actual cultural behavior (need for cultural diversity, wide usability, recommendations among friends, and so on);

(2) A greater integration of the new conditions of demand formation on the Internet (new forms of social interactions and information dissemination, new possibilities of use…).

Further investigation will consist in examining the WTP for the right to download and share freely copyrighted contents. Our next step will consider P2P sharing as a non-market service that could be translated into a paying model. Online sharing of contents gives people some utility through the contents they enjoy afterwards and the information they get about the shared contents. In counterpart, they could be willing to pay to be entitled to access contents without restriction and whatever the sharing technology they use. Such approach does not assess the existing services, but an entitlement. It helps to evaluate the models based on an unimpeded access to cultural works: Who would be prepared to pay? How to increase their willingness to pay? How to induce to pay those who wouldn't be prepared to?

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Appendix 1: Econometric results

Table 3: Ordered Logit Model (Dependent variable: WTP)

Variables	General Model	Demog	Cultural spending	Ethic	Legal risk	Herding	Usability	Music diversity	Herdingbis (friends)
Gender (Ref : man)	0.066 (0.62)	-0.143 (-1.58)	-0.104 (-1.22)	-0.025 (-0.28)	-0.131 (-1.45)	-0.092 (-1.02)	0.049 (0.47)	0.064 (0.62)	-0.084 (-0.84)
Age (Ref :<25) **25-30**	0.454*** (3.27)	0.376*** (2.88)	0.293*** (2.76)	0.487*** (3.68)	0.372*** (2.84)	0.344*** (2.63)	0.402*** (2.96)	0.447*** (3.28)	0.344** (2.53)
31-40	0.558*** (3.96)	0.534*** (4.16)	0.516*** (5.12)	0.663*** (5.11)	0.550*** (4.28)	0.406*** (3.11)	0.505*** (3.75)	0.560*** (4.15)	0.465*** (3.46)
41-50	0.673*** (4.24)	0.682*** (4.86)	0.679*** (5.94)	0.797*** (5.61)	0.712*** (5.05)	0.502*** (3.47)	0.653*** (4.35)	0.691*** (4.62)	0.631*** (4.23)
>50	0.448*** (2.72)	0.735*** (5.42)	0.766*** (7.18)	0.760*** (5.53)	0.770*** (5.64)	0.455*** (3.11)	0.594*** (3.96)	0.561*** (3.74)	0.506*** (3.37)
Income	0.019 (0.95)	0.037** (2.13)		0.024 (1.37)	0.036** (2.04)	0.045** (2.57)	0.031 (1.62)	0.026 (1.36)	0.038** (2.05)
Cultural spending	0.088*** (2.77)		0.066** (2.44)						
Ethic	0.173*** (9.21)			0.195*** (12.80)					
Legal risk	0.063 (1.37)				0.094** (2.29)				
Herding	-0.104** (-2.42)					-0.191*** (-5.12)			
Usability	-0.052 (-1.37)						-0.134*** (-3.82)		
Music diversity	-0.109** (-2.27)							-0.240*** (-5.51)	
Herdingbis (friends)	-0.257*** (-3.07)								-0.358*** (-4.46)
LL	-2671	-3308	-3770	-3205	-3292	-3293	-2775	-2793	-2866
τ_1	-0.026 (-0.09)	-0.576 (-4.38)	-0.576 (-5.32)	0.716 (4.32)	-0.406 (-2.66)	-0.980 (-6.38)	-0.817 (-4.70)	-1.236 (-6.13)	-0.759 -4.99
τ_2	1.481 (5.15)	0.813 (6.15)	0.812 (7.43)	2.173 (12.73)	0.985 (6.39)	0.420 (2.75)	0.616 (3.54)	0.200 (1.00)	0.661 4.35
τ_3	3.171 (10.76)	2.364 (16.91)	2.344 (19.99)	3.827 (20.83)	2.536 (15.75)	1.979 (12.53)	2.202 (12.21)	1.789 (8.76)	2.233 13.99

*: Significant at 10%, **: Significant at 5%, ***: Significant at 1%. (...) Student coefficient.

[i] 'Perfect' means that copies are very closed to originals from a technical viewpoint.
[ii] http://www.insee.fr/en/home/home_page.asp. See ‘Classification, Definitions – Methods’ page, ‘Statistical Tools’ page and download CALMAR Macro.