

Pirates or corsairs?

An experimental analysis of property rights in digital music

Maria Escriva

University of Valencia
maria.escriva@uv.es
Telephone +34 96 165409
Edificio Institutos
Campus Tarongers
C/Serpis,29
46022 - Valencia

Enrique Fatas

University of East Anglia
e.fatas@uea.ac.uk
Telephone +44 (0) 1603 593415
Norwich NR4 7TJ
United Kingdom

We analyze the willingness to pay for digital music in a field experiment in which actual music consumers buy digital music. We use a robust incentive compatible mechanism to elicit their willingness to buy five different products. In addition to that, we systematically control for the goods' attributes in six different dimensions: audio quality, availability, buying options, previews, revenues sharing and brands. We collected individual information about buying practices, musical tastes and policy views. Our results suggest that consumers exhibit a strong opposition to traditional digital rights policies based on property rights' management. More interestingly, this opposition is negatively related to their willingness to pay for it: consumers supporting these policies were willing to pay significantly less for the music.

Very preliminary draft

1. Motivation

Music is a cultural good with multiple attributes. Music is a unique individualized experience for consumers, and part of their lives. The music selected by each consumer somehow reflects her personality, and as an experience good consumers can only determine its real value after listening. Stigler and Becker (1977) show that marginal utility is typically increasing in consumption.

The intense technological evolution of digital music markets generated a hot debate on property rights. Together with the exponential growth of broadband access to Internet, the digitalization of music created a space for innovations and a challenge to traditional distribution channels. Lindemman et al (1998) analyze how this process transformed the music industry. The digital revolution made easy to get a copy of the original music file, with the same quality, at no cost. P2P networks immensely facilitated the access to an endless number of digital music files.

The 2010 Annual Report on Digital Music Report, published by the International Federation of the Phonographic Industry (IFPI), shows that the digital music market grew exponentially in the last years: 29% of their revenue came from digital music. Music consumers get today music in formats that were inexistent, sometimes unthinkable only a few years ago. They can buy tracks or entire albums from digital web stores, using mobile apps, subscription services, and may listen to music through streaming services for free without downloading the files. Global revenues in the music industry grew by an estimated 8% to US\$5.2 billion in 2011, with strong consumer demand for both single track downloads (up 11%), digital albums (up 24%) and fast-expanding subscription services. The number of music service subscriptions grew by an astonishing 65% in 2011.¹

In this paper we try to understand the demand for digital music analyzing real consumers' willingness to pay (WTP) in the laboratory. The experimental approach is not new. Chiang and Assane (2009) study consumers' WTP for digital music in the

¹ To 13.4 million worldwide, according to IFPI estimates on the IFPI, report 2012.

laboratory, focusing in the role of consumers' individual features. Their results show that income levels and risk attitudes positively influence WTP. Using data coming from two large surveys, Shina et al (2010) find that the music industry could benefit from removing digital rights management software (DRM), and transform some P2P users into paying consumers. Papies et al. (2011) empirically test the publicity based streaming business model and identify different consumers segments. Regner and Barria (2009) show that open contracts is a viable business option using data from online music store *Magantunes*. Tu and Lu (2006) experimentally studied the optimal price strategy in different segments of downloading and streaming.

Our contribution to this growing literature is our specific attention to property rights regulation as an explanatory variable of demand for digital music. In a general sense, our experiments follows the experimental method used by most of the papers mentioned in the paragraph above. Our study reproduces a real music market in the laboratory, in which customers make real purchase decisions. As we will explain in detail below, our participants were a stratified sample of young music consumers, aged between 19 and 30, regular internet users, selected to participate in the experiment because they were music consumers (and listen to music on a daily basis).

As participants in our study made real purchase decisions, we can analyze their WTP for digital music in detail. In each decision, customers chose the maximum price they were willing to pay for digital music. Each round, we systematically manipulate their level of information about the musical good. By doing so, we are able to deduce how customers value different music, reaching quantitative conclusions not only about the attributes, but also about how perceptions about the regulation of music property rights affects WTP for music. As consumers complete an in deep questionnaire, we are additionally able to map consumers' WTP for music across an heterogeneous population, and link demand to sociodemographic features.

In our experiment, consumers make buying decisions in four different stores, replicating well known music retailers (*El Corte Inglés*, *iTunes*, *Spotify* and *Jamendo*). This makes a detailed analysis of music consumption possible in at least two parallel dimensions. First, we can measure how consumers react to different services, offered by different stores and assess the brand value. Second, we can test whether the piracy regulation makes a difference in the WTP for music in different stores.

Given that the experimental method relies on an incentive compatible methodology, we are confident that the true preferences of consumers are revealed in this study. As the understanding of the experiment was severely controlled, we believe there is little room for systematic biases in consumers' decisions.

The rest of the work is as follows. We present the experimental method in section 2, the main results in section 3 and conclude in section 4.

2. Experimental design

Our experiment is designed to reveal the maximum price that subjects are willing to pay for a digital music album. The experimental environment is virtual but very similar to the one we find in the music market. We use an incentive compatible mechanism to reveal consumers' WTP: the Becker-DeGroot- Marshck (BDM) mechanism, described in Becker et al. (1964), BDM hereafter.

The BDM rules are simple. Each subject submits a bid to purchase one unit of the good offered for sale. The experimenter randomly draws a sale price from a pre-specified interval from zero to a price greater than the maximum possible WTP. Any subject who submits a bid greater than the sale price receives an item and pays an amount equal to the sale price. The others do not receive units and make no payment.

In this sense, consumers make real decisions in a controlled environment and purchase real products (in our experiment, digital music). The interesting and well-known property of this BDM mechanism is that bidders have a dominant strategy in bidding an amount equal to their true valuations for the good. Unlike survey data, the auction provides a common homogeneous unit, money to measure preferences, see Fox et al. (1998) or Hoffman et al. (1993). Noussaire et al. (2004) use it to elicit WTP for products that differ in their content of Genetically Modified Organism; Bazoche et al. (2009) used this mechanism to study the WTP to pay for specific wines' *Appellation of origin*.

Following the standard recruitment procedures, participants in the laboratory's database received an email with a link. To participate in the study they had to fill an online questionnaire in which we collected individual information about customers' music

preferences, including their favourite bands, and music spending. Collecting this information was critical to make a selection of music consumers potentially interested in buying digital music, and getting information about their tastes, to an ad-hoc music catalogue to be used in the experiment.

The experiment was run at the laboratory for Research in Experimental Economics (LINEEX) at the University of Valencia in Spain. The software was developed using a mix of Z-Tree (see Fischbacher, 2007) and a web environment developed with PHP from scratch in the laboratory.

Each experiment was realized in four stages:

- (1) Training stage
- (2) Experimental stage
- (3) Purchase stage
- (4) Questionnaire

We describe in detail the different stages below.

2.1 The training stage

As in other studies using the BDM mechanism, we introduce a training stage. The objective was not only to make consumers familiar with the BDM and the technological environment; but, to give them the chance of making some money to purchase music in the experimental stage. Participants were informed upon arrival that they had earned a show-up fee of 5€. Depending on their decisions in the training stage, they could make a significant amount of additional money.

In this stage the experimentalist distributed and read the instructions aloud. Participants made a single decision in each of the five rounds: they chose a maximum purchase price of a virtual product (their WTP). This virtual good had a private value for each participant, randomly and individually determined at the beginning of each round. The computer randomly chose it from a uniform distribution between 0 and 100.

Each round, after all participants had selected their individual WTP, the computer randomly selected a selling price. Whenever the WTP was equal or above the selling price, the participants purchased the virtual good, earning the difference between their private value and the selling price they paid. If the submitted price was lower than the

selling price then they made no additional earnings. At the end of this stage, the BDM logic was discussed with participants to make them see that there was only one rational WTP, the one matching the private value (see Noussair et al, 2004, for details of this discussion stage).

2.2 The experimental stage

Before the experimental stage started, participants received a set of headphones, as part of their final reward. Written instructions were distributed and read aloud by the experimentalist, and questions were privately answered. It was made clear that at the end of this stage they would be able to buy a real digital music album, and not a virtual good as in the previous stage. They could select an album from a set of their favourite bands, as we used their answers in the pre-experimental questionnaire to build up the music catalogue.

The experimental stage had six rounds. In each round, participants received specific information about the different stores. Each round, they had to select a maximum buying price (to signal their WTP) for an album in each store. As 40 consumers made decisions in 6 rounds and five stores, the experimental stage generated a dataset of non-independent 1,200 observations.

At the end of the experiment one round, store and selling price were randomly selected for each participant. Participants bought the album only if their WTP for it in that round and store was not below the selected selling price. If that was the case, they immediately were asked to select the album (or the songs, see below) in the corresponding store, following the BDM mechanism explained above. The price was deducted from their first stage earnings. If their WTP was below the selling price, participants did not buy the album and their earnings were paid in full and private.

Figure 1 summarizes the experimental design:

[Figure 1 around here]

In each stage, participants received information about five stores, identified by a letter in the first five rounds: A, B, C, D and E. The brands were only revealed to consumers in the last round, to evaluate the brand's value. Stores were replicated in local servers at LINEEX, and closely matched the main features of real stores. The experimentalists had

already bought a large number of albums in each of these stores to allow for the distribution of the digital music. The five stores analysed in the experiment were the following:

- A. *El Corte Inglés*: A well-known Spanish department store. Participants were buying here a CD rather than a digital album.
- B. P2P: Participants could download the albums bought by the experimentalists for free. In other words, the laboratory was paying for the music, but not the consumers. This second possibility was introduced to control for the possibility of illegal downloads, as it will be explained below in detail.
- C. *iTunes*: The main on line music store. The laboratory's computer engineers carefully replicated the media player, so when participants decided to buy music here, they could easily listen to samples or select a bundle of songs rather than a full album, as in the iTunes website.
- D. *Spotify*: The well-known music streaming service. Participants could buy digital music in a replicated digital store, and were able to listen to samples.
- E. *Jamendo*: It is a community of free, legal and unlimited music published under creative commons license. The Creative Commons license is an alternative copyright system that allows creators to distribute their works while deciding which rights to preserve and which to waive for the benefit of consumers.

We manipulated the information participants received about each store in the following way:

Round 1

Participants could listen to samples of digital music in each store. The quality of the audio file corresponded to the quality of the music sold in each store. The audio quality was maximum in store A, low in store B, and middle in the other three. We generated files with different audio qualities manipulating the MP3 compression: 360 kbs for the top quality, 128 kbs for the middle and 28 kbs for the low. Songs were selected using participants preferences and in close correspondence to the real music catalogue available in each store (e.g. in store E only independent music was available). In addition to this, participants received information about the variety of music they could find in each store: full in stores A and B, almost full in C, large but relatively smaller in D and independent in store E.

Round 2

Participants received information about the music format (CD in store A, MP3 digital music in the other four), and about the fact that they would need to go to a store to get it had they bought the album in that store. They were also told that they could get music for free in store B.

Round 3

Participants were informed about the possibility of listening to songs before buying in stores B to E. In stores C and D, samples had a limited time extension (20 seconds). In store D had to listen to some moderately unpleasant industrial noise before getting the samples (as a proxy for publicity).

Round 4

Participants got information about a 25% possibility of getting additional materials for free in store A (a booklet and a DVD). In addition to that, they got additional information about store B: a 10% probability of paying a random fine between €1 and €3, and with a 20% probability of getting a corrupt file rather than the original file.

Round 5

In this round it was explained to subjects how the revenue was distributed to the bands. The information was specifically relevant in store E (full revenue went to bands) and B (the inexistent revenue could not be distributed). In the other three stores, a diagrammatic representation of the real distribution of revenue between bands, music companies and stores was presented to subjects.

Round 6

Participants got the actual stores' names.

3. Results

The dynamic evolution of WTP is presented in Figure 2.

[Figure 2 around here]

Using a Wilcoxon Matched Pairs (WMP) test we can map whether WTP differences are statistically significant in each store. Store A (*El Corte Ingles*) starts with a very high price, suggesting that consumers react to the audio quality of the songs they listen to. In round 2 the price goes down in a non-significant way (WMP p-value =0.239) as a reaction to the possibility of listening to songs before buying in the other stores. In round 3 the price goes down almost 20% in a statistically significant way (WMP p-value < 0.000), and it significantly increase in round 4 when participants are aware of the possibility of getting additional materials for free (WMP p-value<0.000). The distribution of revenues harms the price in a significant way (WMP p-value=0.003). The brand value is analyzed in an independent way later.

The evolution of prices in store C (*iTunes*), is smoother than in store A. Round 2 has no a significant difference (WMP p-value=0.500). Sample songs does make a positive price effect, however this difference is not statistically significant (WMP p-value=0.113). In round 4 the WTP decreases (WMP p-value= 0.009), which is affected by the effect of the extras for free. Rounds 5 and 6 have no significant effect on prices (WMP p-value 0.544) and (WMP p-value = 0.171) respectively.

Store D (*Spotify*) starts below of the stores A and C. As previous stores, round 2 has no a significant difference (WMP p-value=0.983). Round 3 has a negative and significant price effect (WMP p-value=0.019). Despite the negative trend, the next three rounds are not significant effect on price evolution (WMP p-value=0.994), (WMP p-value=0.521) and (WMP p-value=0.500) respectively.

Finally, store E (*Jamendo*) starts at the same price level that store D. Prices on round 2 is not significantly affected by the sample song (WMP p-value=0.833). Prices decrease in next rounds, concretely round 3 and round 5 have no significant effect on prices (WMP p-value=0.105) and (WMP p-value=0.499) respectively. However, changes on prices decrease in rounds 4 and 6 are statistically significant (WMP p-value=0.002) and (WMP p-value=0.000) respectively.

Different way of looking data is compared with the values obtained in each round by the different shops. General pattern observed can be summed up in three great results. First, physical format has still market, provided the distribution will linked to differential quality extra materials beyond the reach of digital product. This result is supported by the fact store A prices are statistically significant higher than any other store for round 1

and 4 (WMP p-value < 0.000 in all cases except for store E with (WMP p-value=0.002). In the other stages physical format can not compete with the flexibility of digital format. We observe this in Round 3 despite being the prices not statistically significant, the price fall to the third place, being marginally higher than store in 10% (WMP p-value = 0.058)

Second, the ability to listen full songs on streaming before buying does not provide specific benefits to store D, which undergoes on the announcement system and always get lower prices than its direct competition (store C). These differences are significant in all rounds (WMP p-values between .000 and .005). Store D is the worst store valued by consumers in the last round, this is statistically significant with all the stores (WMP p values between .000 and 0.002) except with store E which is non-significant. Despite a relatively positive brand image, as discussed below.

Third, the independent shop store E is benefited by the information on its license, we can observe this information is disclosed in round 5. The price that consumers are willing to pay exceeds that of its rivals in the digital segment (€ 6.19 versus € 5.64 for iTunes and € 3.90 for store D but this differences are significant only with store D (WMP p-value=0.049). However, is penalized with a low price paid for the different catalogue in the early rounds, with significant differences respect to store A and store C in round 1 (WMP p-value < 0.000).

Figure 3 gives information about the evolution of the potential demand, as a percentage of subjects who are willing to buy the product in each round (positive prices). This graph confirms the idea pointed before about the fragility of the demand for music in physical format, which loses about a third part of potential buyers in round 3, and recovers strongly in round 4. Problems identified in terms of prices in the case of store D are committed to the demand analysis, presenting a clear line down as the experiment progresses. The other two stores have more stable patterns, with no significant differences.

[Figure 3 around here]

General conclusions in terms of prices are listed in Figure 4, which represent the final values that consumers are willing to pay in the last two rounds, when all information has been provided to subjects. We represent two columns price on round 5 and round 6

for each store. Store A is valued above digital format, although this valuation depends critically on the ability to offer extra material. Interestingly, brand's value is very different for each store: is positive for store A and store D (although the difference is only significant in the first case (WMP p-values = 0.013) and (WMP p-values = 0.000), respectively). Other two stores brands' differences are not statistically significant. Fidelity in independent public results in a very positive value at the end, even though brand has a negative value (price low from € 6.16 to € 5.34, with a p-value= 0.000).

[Figure 4 around here]

Experimental methodology allows us to identify profiles consumption distribution. Using a post-experimental survey described in the appendix, we try to analyze these patterns and understand some determinants of consumer decisions. Table 1 presents results of four econometric estimates with random effects at the individual level and estimating an OLS function. In each model we try to link Internet shopping habits with the prices submitted buy subjects in the experiment.

[Table 1 around here]

Buying music on the Internet has a positive and significant effect in all shops. However, if we compare with other variables, we can difference three types of consumers: cultural goods consumers, who normally consume other kind of cultural products (tickets for events and books) and affects positively the music format that they purchase (physical format in store A, see model 1), independent music consumer buy music on store E or store C and his consumption on tickets for cultural events affects positively the price but is not significant, although the music competes with spending on technology (computers has a negative sign for prices in store C). Finally, the casual consumer of music that is associated with store D and it does not affect his cultural consumption.

Table 2 presents the results of similar estimation using demographic variables. In the same way with the results of other researches presented in motivation, positive income explain prices in all cases, and women are consistently more willing to pay for music than men. Interestingly, being self-support form their parents define store A and store C consumer profile but not for store D and E.

[Table 2 around here]

On figure 5 the box plots show how the gender effect is stronger for the three first rounds in all the shops but the effect is softened and tends to disappear at the end of the experiment.

[Figure 5 around here]

Table 3 represents the evidence of how affect music consumer profile in the willingness to pay in each store, take care with the music market monitoring in general and special attention with two consumer characteristics identifies in the questionnaire at the end of the experiment: frequency of sharing music (we do not ask about which mechanism to share the files they used to preserve their privacy). While monitoring the market has a positive and varied effect on the prices, frequency of sharing has a positive effect on the price that they want to pay in each shops.

[Table 3 around here]

Figure 6 represents relation between sharing music (variable that we use on figure 3) and monthly expense on music, we explain that we refer to all the money expense on concerts, CD, mp3, or another kind of product related with music. We represent the regression between these two variables with confidence interval (5%-95%) in all shops. Graph suggests a positive and strong relation: as larger sharing level, more money spends on music.

[Figure 6 around here]

Figures 7 and 8 complete this analysis representing the relationship between willingness to pay (vertical axis) and sharing level (horizontal axis) in general using the box plots, and analyzing by stores using two way graphs. As we saw on table 3, both graphs suggest that higher level of sharing, higher willingness to pay for music.

[Figure 7 around here]

[Figure 8 around here]

Finally, on Table 4 and Figure 9, we relate the opinion of consumers about the current legal framework, using a question in the final questionnaire where we asked about the

[Table 4 around here]

level of agreement with the SGAE works (the experiment was conducted before the latest corruption scandal in the SGAE.) Both analyses shows SGAE defenders presents less willingness to pay subjects who declares against. Table 4 shows that disagree with the SGAE has a significant positive effect on all prices, while Figure 9 we represent this relationship for each store.

[Figure 9 around here]

4. Conclusions

Our study focuses on estimate consumer's WTP for digital album. In our data, our main results can be summarized in three main points. Firstly, our data reveal, audio quality and extra material have not found competitors on digital format, thus consumers significantly value an attractive design for the physical CD.

On the other hand, music industry, governments and artists are worried about high levels of piracy and peer-to-peer and how that affects their business. The observed behavioral patterns show us those participants who regularly share music has higher WTP and reach higher levels of spending music (concerts, CD, mp3 files,...). Finally, our results suggest that consumer exhibit strong opposition to strict anti-piracy laws and traditional digital right polices based on property right's management. Consumers supporting these polices were willing to pay significantly less for music comparing with subjects against anti-piracy law.

We consider some limitations to our study attending the actual regulation of copyright in Spain, where exist some controversy with the anti-piracy laws and the organization that control the property rights².

² Our experiment was run before the last corruption scandal in which director and other manager members of this organization were relating to charges of the misappropriation funds.

5.- References

- Bazoche, P. , Combris, P. , Giraud-Heraud, E., 2009. Willingness to Pay for Appellation of origin: Results of an Experiment with Pinot Noir Wines in France and Germany. Working Paper ALISS 2009-02.
- Becker, G., DeGroot, M., Marschak, J., 1964. Measuring utility by a single-response sequential method. *Behavioral Science* 9, 226-236.
- Bellemare, M.F. , Holmberg, A.M., 2010. The Determinants of Music Piracy in a Sample of College Students. *Social Science Research Networks*.
- Bernard, J., Bernard, D., 2009. What Is It About Organic Milk? An Experimental Analysis. *American Journal of Agricultural Economics* 91(3), 826-836.
- Bertrand, M., Karlan, D., Mullainathan, S., Shafir E., Zinman, J., 2009. What's Advertising content Worth? Evidence for a Consumer Credit Marketing Field Experiment. *The Quarterly Journal of Economics* 125 (1), 263-305.
- Brandts, J., 2007. La economía experimental y la economía del comportamiento. *Filosofía y economía: una mirada metodológica*. Enciclopedia Iberoamericana de Filosofía.
- Chiang, E. Assane, D., 2009. Estimating the WTP for digital music. *Contemporary Economic Policy* 27 (4)
- Gnezy, A., Gnezy, U., Nelson, L.D., Brown, A., 2010. Shared Social Responsibility: A Field Experiment in Pay-What-You-Want Pricing and Charitable Giving. *Science Magazine* 329,325-326.
- Hoffman, E., Menkhaus, D., Chakravarti, D., Field, R., Whipple, G.D., 1993. Using Experimental Auctions in Marketing Research: A Case Study of New Packaging for Fresh Beef. *Marketing Science* 112(3), 318-338.
- Fischbacher, U., 2007. z-Tree: Zurich Toolbox for Ready-made Economic Experiments. *Experimental Economics* 10, 171-178.

Fox, J.A., Shogren, J.F., Hayes, D.J. and Kliebenstein, J.B., 1998. CVM-X: Calibrating Contingent Values with Experimental Auction Markets.” American Journal of Agricultural Economics 80(August):455-65.

IFPI Digital Music Report 2010. Music how, When, Where You want It. www.ifpi.org

IFPI Digital Music Report 2011. Music at the Touch of a Button. www.ifpi.org

IFPI Digital Music Report 2012. Expanding Choice. Going global. www.ifpi.org

Lindemann, M.A., Schmid, B.F. Framework for specifying, building, and operating electronic markets. International Journal of Electronic Commerce,3,2 (1998), 7-21.

Lusk, J.L., Alexander, C., Rousu, M.C., 2007. Designing Experimental Auctions for Marketing Research. The Effect of Values, Distributions, and Mechanisms on Incentives for Truthful Bidding. Review of Marketing Science , 5 (3).

Makkonen, M., Halttunen, V., Frank, L., 2011. The Effects of Gender, Age, and Income on the Willingness to Pay for Music Downloads. 24th Bled eConference eFuture: Creating Solutions for the Individual, Organisations and Society, 102-113.

Mandel, P., Süßmuth, B., 2010. A Re-Examination of the Role of Gender in Determining Digital Piracy Behavior. Working Paper, 88, University of Leipzig Germany.

Noussair, C., Robin, S., Ruffieux, B., 2004. Do Consumers Really Refuse To Buy Genetically Modified Food? The Economic Journal 114, 102-121.

Papies, D., Eggers F., Wlömert N., 2011. Music for free? How free ad-funded downloads affect consumer choice . Journal of the Academy of Marketing Science 39, 777–794.

Regner, T., Barria, J. A., 2009. Do consumers pay voluntarily? The case of online music. Journal of Economic Behavior & Organization 71, 395–406.

Sinha, R.K., Machado, F.S., Sellman,C., 2010. Don't Think Twice, It's All Right:

Music Piracy and Pricing in a DRM-Free Environment. American Marketing Association , Journal of Marketing 74 , 40–54.

Smith, V., 1994. Economics in the Laboratory. Journal of Economic Perspectives, 8:1.

Stigler, G.J., Becker, G.S., 1977. De Gustibus Non Est Disputatum. The American Economic Review, Vol.67, N° 2, 76-90

Teck, H.H., Lim, N., Camerer, C.F., 2006. Modeling the Psychology of Consumer and Firm Behavior with Behavioral Economics . Journal of Marketing Research 43, 307-331.

Tu, T., Lu,M., 2006. An Experimental and Analytical Study of On-Line Digital Music Sampling Strategies. International Journal of Electronic Commerce 10 (3), 39–70.

www.jamendo.com/es

www.spotify.com

www.apple.com/es/itunes/

http://www.ifpi.org/content/section_views/view042.html . April 2011. Sabiene Heindl.

<http://es.nielsen.com/news/20100705.shtml> .July 2010. Nielsen España.

<http://www.artenetsgae.com/anuario/anuario2010/home.html> Anuario SGAE de las Artes Escénicas, Musicales y Audiovisuales (2010)

APPENDIX: Figures and tables

Figure 1: Experimental design

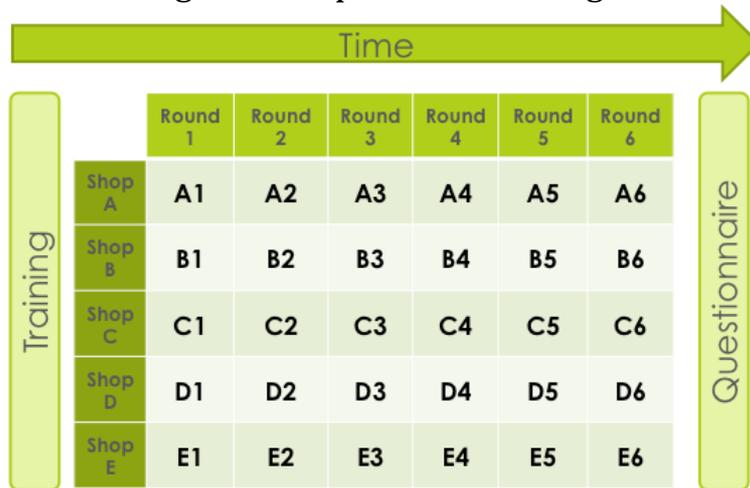


Figure 2: WTP across rounds (average prices)

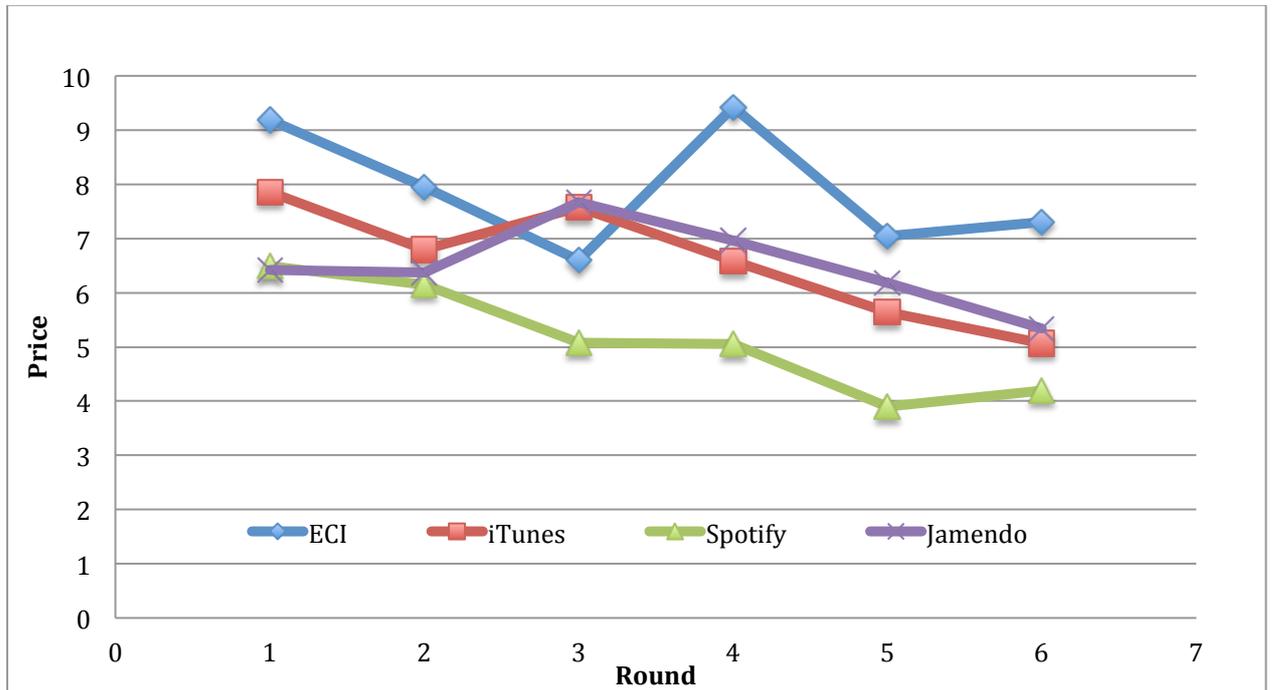


Figure 3: Demand across rounds (% positive WTP)

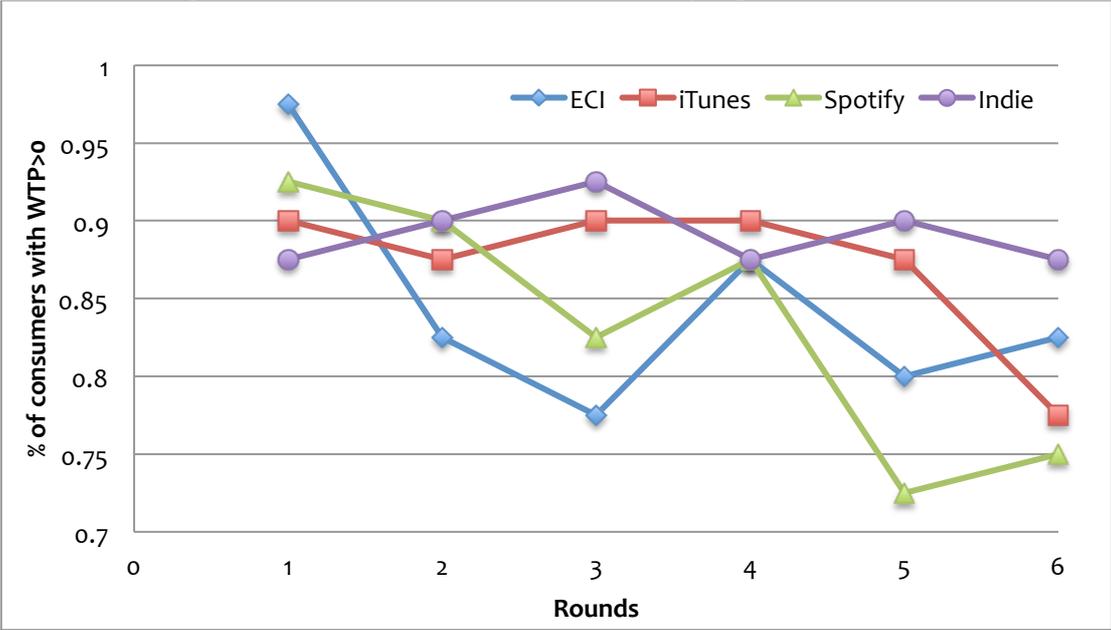


Figure 4: Brand value

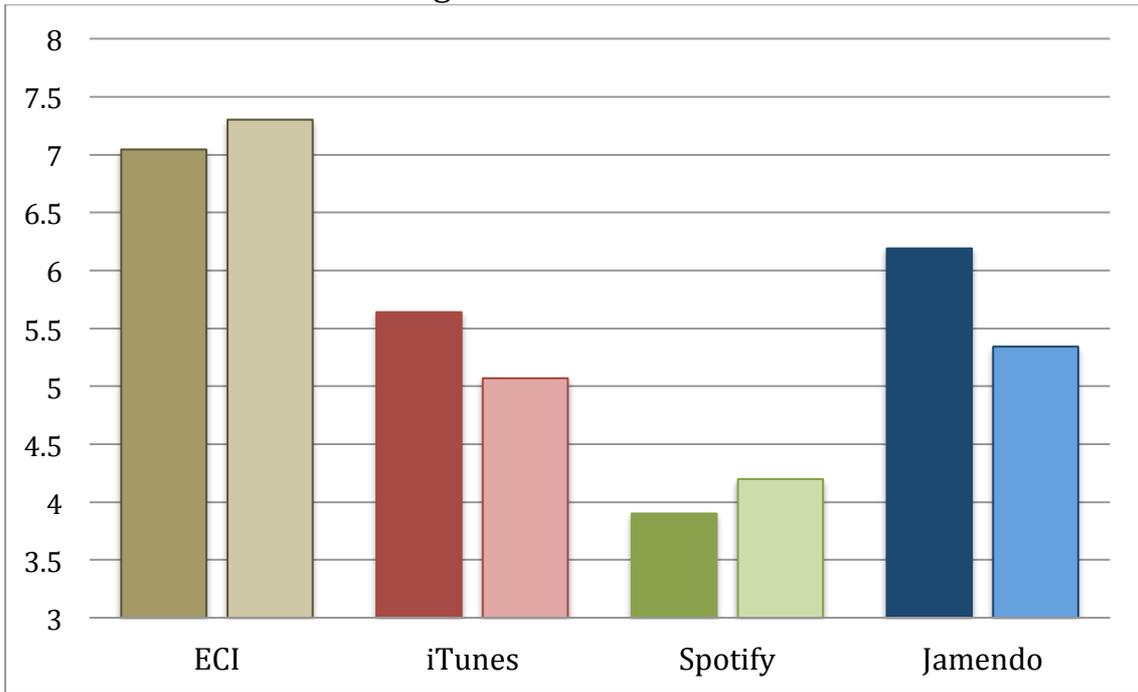


Table 1: Internet habits and WTP
(round dummies omitted)

WTP	(1) ECI	(2) iTunes	(3) Spotify	(4) Jamendo
Music	8.000** (3.773)	6.659** (2.995)	5.919** (2.263)	6.873* (3.795)
Tickets	4.763** (2.169)	2.608 (1.983)	1.456 (1.409)	3.356 (2.265)
Books	6.041* (3.079)	4.016 (2.725)	0.507 (1.825)	2.528 (3.257)
Clothes	-1.103 (1.794)	-2.290 (1.676)	-0.840 (1.324)	-0.464 (2.049)
Travels	-3.143 (2.826)	-1.051 (2.161)	-0.101 (1.651)	-1.081 (2.650)
Computer	-1.214 (1.835)	-2.531 (1.522)	-0.473 (1.290)	-1.815 (2.018)
Food	-2.687* (1.375)	-4.824*** (1.290)	-4.428*** (0.982)	-4.366*** (1.133)
Others	-1.073 (2.040)	-1.148 (1.719)	-0.0268 (1.388)	-0.727 (2.116)
Constant	8.070*** (2.852)	8.914*** (2.599)	5.924*** (1.877)	6.018** (2.427)
Observations	240	240	240	240
R-squared	0.240	0.230	0.198	0.188

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 2: Demographics
(round controls omitted)

WTP	(1) ECI	(2) iTunes	(3) Spotify	(4) Jamendo
Female	4.493** (2.135)	5.442*** (1.723)	3.729** (1.437)	5.819** (2.210)
Age	-0.240 (0.368)	0.147 (0.331)	0.228 (0.271)	0.529 (0.401)
Education (parents)	0.205 (0.383)	0.254 (0.304)	0.198 (0.251)	0.318 (0.342)
Family Size	1.883** (0.881)	1.452** (0.677)	1.377** (0.622)	1.098 (0.694)
Independence	-5.560*** (1.787)	-2.851* (1.604)	-1.542 (1.572)	-1.303 (1.564)
Constant	9.852 (11.19)	-1.274 (10.21)	-4.462 (8.302)	-12.24 (12.57)
Observations	240	240	240	240
R-squared	0.149	0.219	0.178	0.182

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Figure 5: Gender and WTP

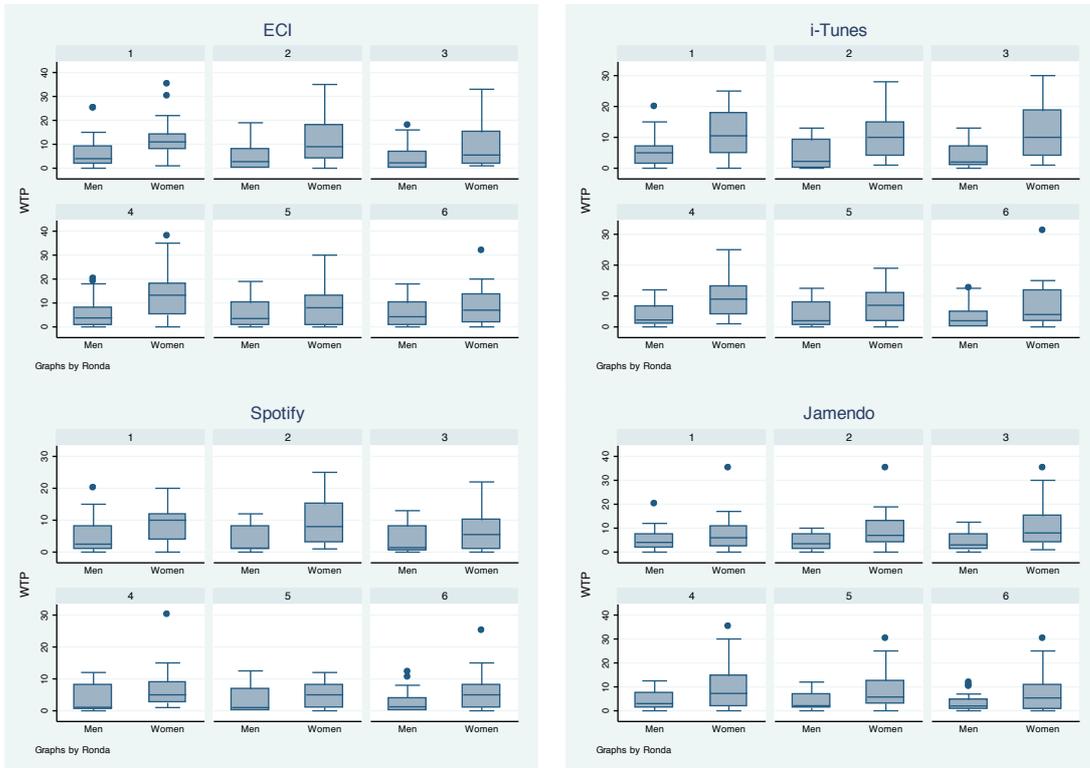


Table 3: Music consumption and WTP
(round controls omitted)

	(1) ECI	(2) iTunes	(3) Spotify	(4) Jamendo
CD New	1.326*** (0.485)	0.927** (0.404)	0.617* (0.352)	0.771* (0.430)
CD Special	0.414 (0.376)	-0.489 (0.313)	-0.303 (0.273)	0.124 (0.333)
CD Offer	0.0195 (0.294)	-0.0602 (0.245)	0.134 (0.214)	0.0560 (0.261)
CD Sales	0.752** (0.342)	1.016*** (0.285)	0.676*** (0.248)	0.716** (0.303)
No CD	-1.539*** (0.439)	-0.905** (0.365)	-0.692** (0.318)	-0.816** (0.389)
Digital New	-0.406 (0.516)	-0.625 (0.429)	-0.463 (0.374)	-0.372 (0.457)
Digital Sales	-1.014*** (0.307)	-0.677*** (0.255)	-0.395* (0.223)	-1.063*** (0.272)
No Digital	0.167 (0.309)	-0.254 (0.257)	0.0785 (0.224)	-0.182 (0.274)
Streaming	-0.781*** (0.300)	-0.0811 (0.250)	-0.226 (0.218)	-0.647** (0.266)
Streaming buy	0.293 (0.412)	-0.0203 (0.343)	-0.213 (0.299)	0.0458 (0.365)
Music Unknown	0.212 (0.278)	0.263 (0.231)	0.367* (0.201)	0.380 (0.246)
Following groups	0.328 (0.442)	0.536 (0.368)	0.312 (0.321)	1.115*** (0.392)
New	1.288*** (0.309)	1.063*** (0.257)	0.349 (0.224)	0.984*** (0.274)
Downloaded	-0.522 (0.326)	-0.344 (0.271)	0.0287 (0.236)	-0.367 (0.288)
Sharing	0.832*** (0.271)	0.630*** (0.226)	0.504** (0.197)	0.814*** (0.240)
Constant	6.404** (3.123)	4.916* (2.598)	4.215* (2.267)	1.405 (2.767)
Observations	240	240	240	240
R-squared	0.389	0.379	0.318	0.388

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Figure 6: Sharing and music spending

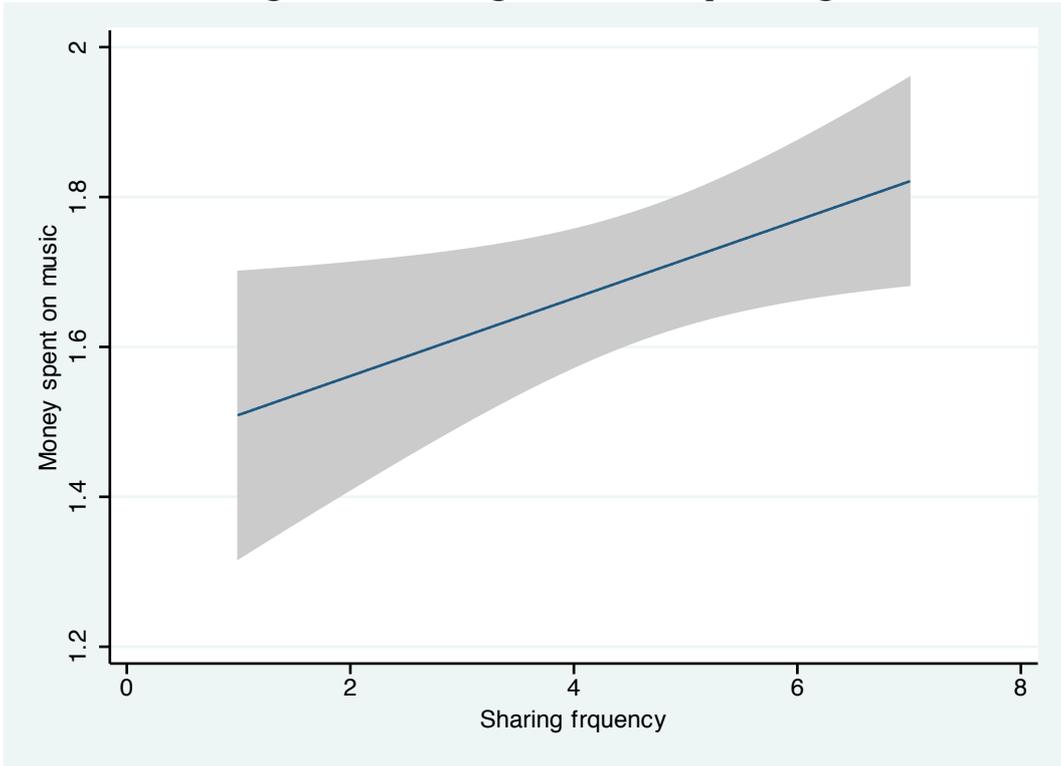


Figure 7: Sharing and WTP

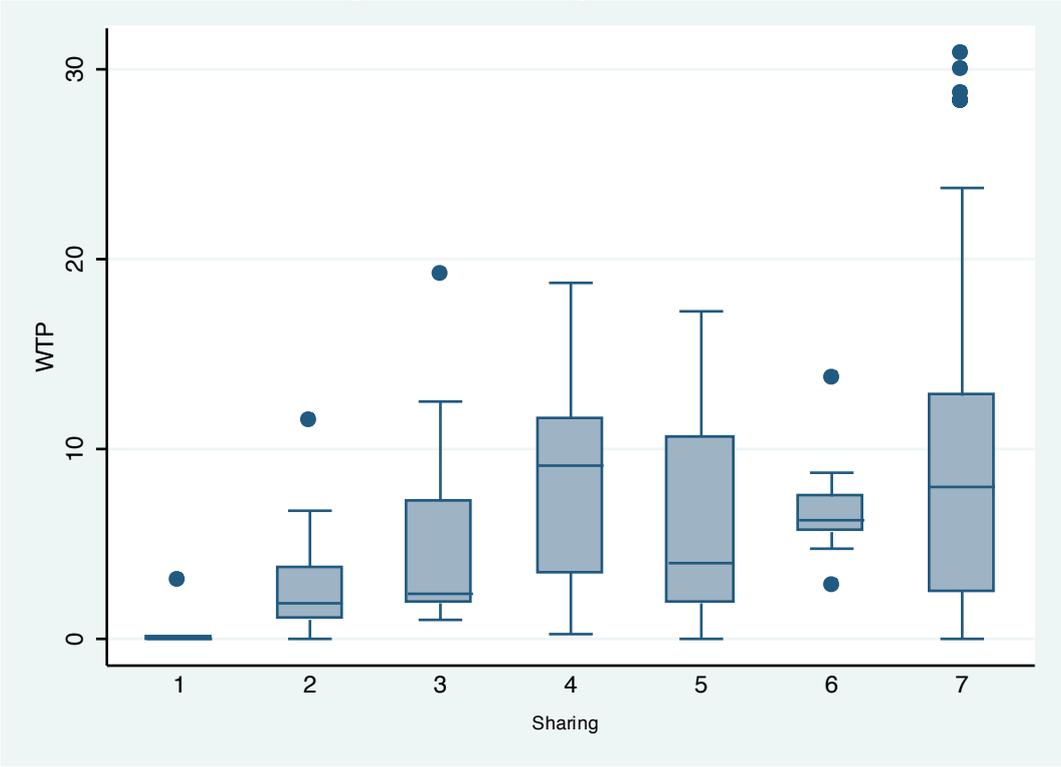


Figure 8: Sharing and WTP

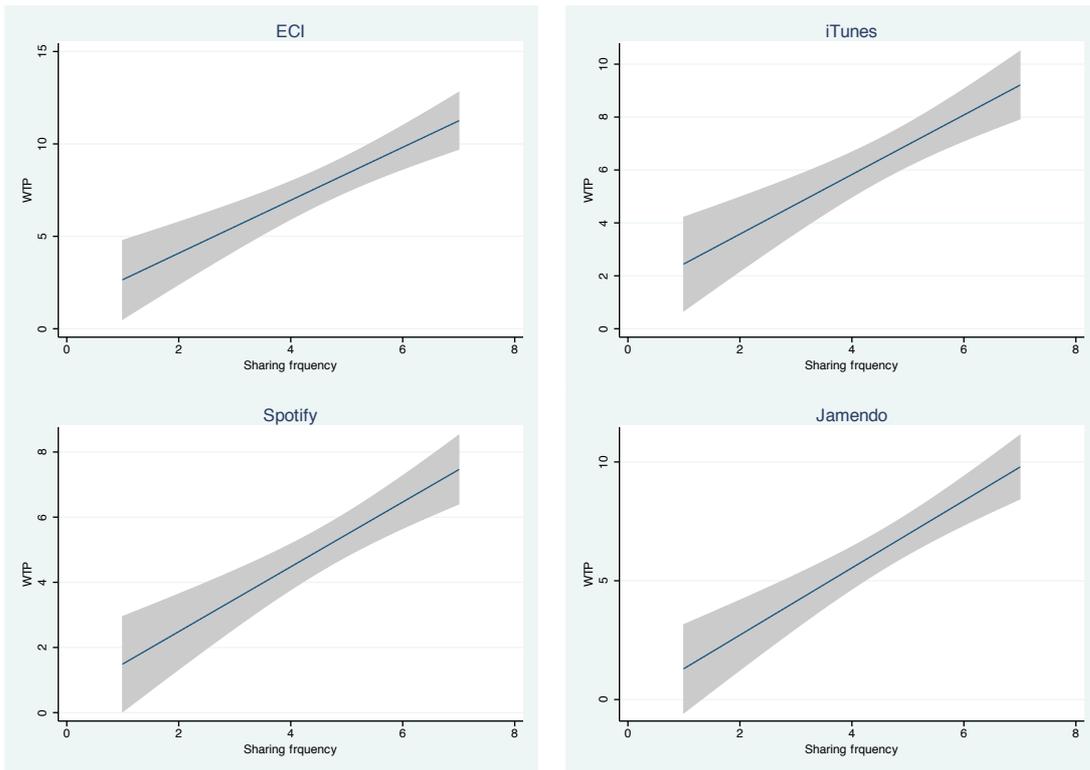


Table 4: Regulation views and WTP
(demographic variables and round controls omitted)

	(1) ECI	(2) iTunes	(3) Spotify	(4) Jamendo
SGAE	1.383** (0.588) (0.249)	1.101** (0.426) (0.176)	0.688* (0.385) (0.158)	1.051 (0.628) (0.187)
Constant	-5.812 (4.974)	-5.412 (3.598)	-1.966 (2.997)	-8.553* (5.027)
Observations	240	240	240	240
R-squared	0.191	0.296	0.197	0.283

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Figure 9: Views on regulation and WTP

