

2017

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Recommended Citation

Drevets, Joseph K., "Spotify, Piracy and Patronage: How Consumers Make Decisions Regarding Musical Consumption in the Streaming Age" (2017). *University Honors Theses*. Paper 427.
<https://doi.org/10.15760/honors.423>

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Spotify, Piracy and Patronage: How Consumers Make Decisions Regarding Musical Consumption in the Streaming Age

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Abstract: This study analyzed how consumers evaluate online music streaming services through a discrete choice survey. A multinomial logit model was applied to estimate how important varying levels of price, artist welfare, and advertisements were to consumers' willingness to pay (WTP) for a monthly subscription service to a digital music catalogue. The survey was administered online, with 100 total valid samples. Respondents viewed the morality of copying and distributing copyrighted digital music as different from the physical theft of private property. The most important factors in deciding a respondent's WTP for service were: the welfare of the artists who list their music on the website, whether the service had advertisements, and the household income of the respondent. Consumption characteristics such as how much a respondent spends on music a month, or how much time they spend listening to music did not have a discernible effect on their WTP.

"The Music Industry is a matrix that is counter to what is natural and right."
- Prince

Introduction

As of 2015, realtime entertainment, or streaming, accounted for roughly 70% of national internet traffic (Sandvine, 2015). There is increasingly more and more digital multimedia content readily available to anyone with a high-speed internet connection. Netflix, Youtube and Spotify are the biggest magnates of the streaming age, and all three deal in copyright-protected content with subscription and advertisement-based business models (Rehardt, 2015). Subscription and advertisement services have largely replaced physical sales as a revenue stream for media producers; (Yu, 2017) however, the pirating that began around the turn of the century with the rise of peer-to-peer file sharing, still exists (U.S Copyright Report, 2015). Consumers still have the choice to pirate digital content, but by and large are choosing to pay for subscriptions or watch advertisements instead (Friedlander, 2015). This thesis will explore how consumers who utilize musical streaming services value their purchases and the factors that affect their willingness to pay for digital audio content.

Literature Review

Willingness to Pay

In the time shortly following Napster, and the widespread use of peer-to-peer file sharing websites, there were many studies conducted in attempt to understand how consumers valued digital sales in relation to piracy (Chiou 2005, Peitz and Waelbroeck 2003). Researchers generally used Willingness to Pay (WTP) metrics to evaluate consumers elasticity in regards to digital content. WTP is a common method employed by economists to evaluate non-market transactions. It is commonly used in environmental or public work cost-and-benefit studies as it is easy to find

through survey-based research (Hsu and Chieu 2007), but is useful in any situation where market prices are non-existent or unreflective of how consumers value the good in question. An individual's WTP for a certain good is obtainable simply by giving them a set of discrete choices asking them whether or not they would purchase the good at varying price levels. Homburg et al (2005) argued that consumers WTP for non-homogenous goods is derived from past experiences from the same or similar products that the consumer has repeatedly received and enjoyed in their past.

Willingness to Pay is correlated with income for most goods, but it also can be affected by socio-economic factors such as education and location (Skuras and Vakrou, 2002). WTP found for socially beneficial offerings is often affected by a phenomenon known as warm glow (Nunes, 2003). Warm glow is an event that occurs in contingent valuation surveys, when respondents over-value a hypothetical service because it is socially favorable thing to do. Respondents often like to think they would use a public service such as a State Park or a public swimming pool more than they actually end up utilizing it. They also might not want to be thought of as someone who is against public spending on morally charged issues such as welfare or conservationism; therefore, even though a population might respond favorably to a WTP survey, they might not vote to increase taxes to the rate they theoretically agreed to pay for to fund the service.

Musical Patronage

The social view of digital music piracy, beginning with the rise of peer-to-peer file sharing around the turn of the century, was varied. Many consumers shared the same negative attitudes towards the music industry that rock artists expressed in their music; Prince famously said, "The music industry is a matrix that is counter to what is natural and right." This rock-and-roll based,

rebellious attitude towards the corporatization of music led to peer-to-peer sharing being viewed as almost a vigilante-type movement: taking the music from the rich corporations and giving it to the fans who deserve it.

Another factor that led to the social acceptance of pirating was the vast, above production costs of Compact Disks in the early 2000's. Before CD's, consumers were used to paying around \$10-\$15 for a vinyl record, but when the industry switched to CD's, the prices stayed high. The new technology was at first expensive to produce, but, by the mid 90's, the cost to manufacture, package and ship a CD was less than a dollar each (Witt, 2015). Despite this low production cost, CD's were still being sold for the old vinyl price of \$10-\$15.

Chou et al (2005) applied a valuation model comparing pirated and purchased music in a survey conducted among Taiwanese students. Chou wanted to see if music consumers were less likely to illegally download music from artists that they were already fans of. The students said that they were more likely to pay for music from their favorite artists, while they were more likely to pirate music they hadn't heard before. This study also showed that while students had a negative view of piracy, a majority admitted to pirating at least once before, and that their propensity to pirate was negatively affected if friends and family were made aware of their actions. Chou argued that there exists a desire to buy music from artists that an individual looks up to and is familiar with, but a tendency to pirate music from artists that a consumer has not heard before.

The matrix modeling the decision to purchase a physical copy, a digital copy or to pirate a song or album is complex. Consumers seem worried not only about their own economic welfare, but also about the economic welfare of the artists they support (Chou, 2005). This would lead us to believe that the music market is not operating on a scale of individual utility, but rather

as a balance between patronage and consumption. Musical patronage has a long history, dating back to the times of Bach and Beethoven, when wealthy aristocrats would sponsor symphonies and compositions by financially supporting the artist while they worked on the piece. Modern, artist centered websites like Bandcamp, are designed around giving artist 100% of the profits from their work. The fans who then buy the music get to show on their profile all the artists they have supported, to gain prestige among their peers. This leads to a sense of fan involvement that does not exist from big-box consumers such as Best Buy or digital marketplaces such as iTunes.

It is not certain whether music consumption and patronage are substitutes or complements, or whether an increase in artist welfare increases the demand for a product. Gupta (2004) argues that consumers are aware of the potential losses a firm might undertake due to pirating, but in the end will pirate if they feel they are not being offered a “fair price.” Consumers like to support companies that they build have built a relationship with, but are hesitant to put up money for an experience they have never tried before (Cheng, 1997).

Ethical Consumption

Consumers buying music from sources that give a higher percentage of the profits to artists is an example of ethical consumption. Consumers are balancing the social outcomes of their purchasing power with their budget constraints. Arnot (2006) conducted an experiment in ethical consumption at a Canadian University examining the Willingness to Pay for Fair Trade coffee. Arnot used a revealed preference design to find that purchasers of Fair Trade coffee are much less responsive to price changes than the rest of consumers. That study indicates that ethical aspects of the good were more important to those consumers than the price, calling into question the typical cost minimization models used to examine normal goods.

Ethical consumption is a growing phenomenon inside the United States and around the developed world. If part of the attractiveness of ethical consumption is social approval from other ethical consumers, than an increase in ethical consumers will make ethical consumption more attractive (Starr 2009). This exponential effect could radically reshape markets in a relatively short amount of time. If social attitudes towards pirating and streaming shift towards a desire to pay more for the music we consume in order to support artists, then there could be a reactive drop in low-cost third-party streaming and digital pirating.

Effect on Industry

It is not empirically clear whether the rise of file-sharing has truly had a negative impact on the music industry. It is clear that as peer-to-peer file-sharing networks grew in the early 2000s, the music industry quickly lost revenue, but there is no hard evidence to prove that the relation between the two is causal (Leibowitz 2006). Rob and Waldfogel (2006) compared and contrasted ex and post-ante (before and after consumption) valuations of musical purchases among university students, and estimated only a 10% sales displacement due to illegal downloads.

Many artists argued that file-sharing had a positive effect on their careers, by allowing more people to gain access to their music. Artists who had not had the benefits of mass marketing from their record labels were found and shared among friend groups online, creating many niche, cult followings. Easy digital access gave pathways for artists who did not have radio play to introduce fans to their music without investing in a \$10 record.

Takeyama (1994) argued that easy access to free downloadable music increases social welfare. He wrote that the reproduction of intellectual property results in a Pareto Improvement, a change that benefits at least one person while making no one worse off, because the increase in

the music's social network acts as a positive externality. Even though a firm's short-term profits might decrease as a result of unauthorized reproduction, long-term profits actually increase due to increased record sales. Takeyama is proposing that the music industry can enjoy increased demand created by the supply of pirated files in the market.

Khouja and Rajagopalan (2008) argue that in a market affected by pirates, a firm might be better off raising prices to a level where high-value consumers, consumers who are not sensitive to price, still purchase music while low-value consumers, consumers who are very sensitive to price, turn to illegal methods of consumption. Theoretically, the increased revenue from the high-value consumers will compensate for the low-value consumers lost to pirating. Since the nature of music is so artist specific and unique, one artist's record is not always a substitute for another artist's record. Firms with copyright protection on their music act as monopolists in the market and are able to exert an enormous amount of influence on market prices. The Big 5 labels (BMG, Warner, Universal, Sony, EMI) put pressure on retail stores to not lower prices of CD's in the wake of Napster. They were afraid if stores lowered their prices for CD's that consumers would never again be willing to pay the high prices for the copyrighted material (Bishop, 2004). This monopoly power has created a distorted market that has become even more complex with the advent of streaming services.

Research Design

Research Hypotheses

We expect ethical consumers of the product will have a concern for the artists wellbeing and their continuing ability to produce music, and therefore they will increase their valuation of the service if the artists they support make a greater profit:

H1: The level of patronage, or percentage of profits derived from a consumers purchase that goes to the artist, is positively related to a consumers WTP for a subscription to a streaming service.

We expect rational respondents to lower their valuations of services that require them to listen to advertisements between songs, therefore:

H2: If a music streaming service plays advertisements in-between songs, it will have a negative effect on a consumers WTP for the service.

Low-value consumers (Khouja, 2008) who are willing to pirate will have a lower valuation of streaming services because they are willing to risk the legal and social consequences of copyright violation.

H3: A consumers positive attitudes towards piracy will be negatively related to their WTP for a music streaming service.

H4: A consumers positive attitudes towards private property will be negatively related to their WTP for a music streaming service.

We expect a consumers socio-economic background will effect their WTP

H5: A consumers income will have a positive effect on on their WTP for a music streaming service.

H6: The amount of time a consumer listens to music a day will have an affect on their WTP for a music streaming service.

Questionnaire and Survey

The survey was conducted among 100 individuals who regularly stream music, and was administered online via the survey software Qualtrics. The average response time for the survey was 4 minutes, with 9 demographic inquiries and 7 contingent valuation choices about potential musical streaming services. The questionnaire was designed based on findings in the literature and discussions with consumers who had purchased or pirated digital music using different formats. A trial survey was conducted prior to the formal survey and the questionnaires were modified based on suggestions from trial respondents.

In the survey, questions regarding how much time and money respondents spent on digital music services and their attitudes towards private property and digital piracy were asked. The questionnaire used a likert scale to evaluate respondents attitudes towards specific statements. The formal survey took place from April 12th, 2017 - May 12th, 2017. In answering the questions of attitudes towards private property and digital pirating, respondents were assured their questionnaires were strictly anonymous and that their data would be used for research only and that personal information would not be revealed under any circumstance. This is compliant with the Portland State Institutional Review Board and the rules laid out by the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research in the Belmont Report.

The survey was built using a 3x2x2 fractional factorial design. The three factors being: Price - with levels \$0/month, \$7/month, and \$12/month, Percentage of Revenue Given to Artist - with levels 0%, 50%, and 100%, and Advertisements - with levels present, or not present. These factors and levels, integrated into pairwise comparisons to create potential choices for a respon-

dent, revealed multiple strictly dominated pairs. All pairwise comparisons that contained a strictly dominated option, such that the alternative option was cheaper, and provided more revenue to the artists than the other, were eliminated from the pool of comparisons. The remaining 78 competitive pairings were added to the survey. The respondents were asked to make a choice between two discrete potential services from 7 random pairings from the greater pool, based on varying levels of the factors.

Analytical methods

A multinomial logistic regression was used to interpret and model the data. This method is used to model nominal outcome variables, in which the log-odds of the outcomes are modeled as a linear combination of the predictor variables. This logit model is useful when explaining discrete choices, or specific options among mutually exclusive alternatives. Since this study is analyzing stated preference data, the logit model enabled us to make predictions based on past reactions to changes in the choice matrix. There are three types of variables at work in a multinomial logit model (Croissant, 2010): alternative specific variables x_{ij} with a generic coefficient β , individual specific variables z_i with an alternative specific coefficients γ_j , alternative specific variables w_{ij} with an alternative specific coefficient δ_j . From these variables, we can create a satisfaction

index:

$$V_{ij} = \alpha_j + \beta x_{ij} + \gamma_j z_i + \delta_j w_{ij}$$

Satisfaction can be thought as an ordinal value, with it's only purpose in this model a metric to compare the choices that the individual is making between alternatives j and k:

$$V_{ij} - V_{ik} = (\alpha_j - \alpha_k) + \beta(x_{ij} - x_{ik}) + (\gamma_j - \gamma_k)z_i + (\delta_j w_{ij} - \delta_k w_{ik})$$

Models are built then dependent on what an individual would choose in order to receive the highest level of satisfaction. Factor analysis was also used to focus in on the most influential factors that affected consumers evaluations of the streaming services. All of the metrics and processing for the study were run in the open-source software R, using the “mlogit” library.

Empirical Results

Descriptive results of respondents

The total valid samples in the research results were 100. The average amount of money spent on music per month among the respondents was 6 dollars and 23 cents, which is close to the results from a Nielson Music 360 (2015) study that found that the average amount of spending on digital music among US consumers was 5 dollars and 20 cents a month. The estimated annual income per household was \$40,350 per year, which is quite lower than the median household income for the United States: \$51,939 (U.S. Census Bureau, 2014). Respondents agreed 20% more with the statement “It is morally wrong to take a physical product.” than the statement “It is morally wrong to copy and distribute music.” This indicates that the respondents saw a moral, if not legal, divide between physical theft and copyright violation. This is consistent with actions and

Figure I:
The means of the descriptive statistics

Items	Average Response	Standard Error
1. Last month, how much money did you spend on recorded music?	\$6.23/month	\$6.96
2. Yesterday, how much time did you spend listening to music on your streaming service?	1hr 43min	47.23 min
3. What is your estimated annual household income?	\$40,350/yr	\$23,615
4. On a scale from 1-5, how strongly do you agree with this statement: It is morally wrong to take a physical product.	4.49	0.92
5. On a scale from 1-5, how strongly do you agree with this statement: It is morally wrong to digitally copy and distribute music.	3.67	1.10

attitudes in the extant literature (Rafael 2006, Peitz 2003, Harbaugh 2010) which reflect that individuals do not think of pirating a digital copy of an album the same way as stealing a physical copy of a record.

The average time spent listening to music on streaming services was among respondents 1 hour and 43 minutes, within the range of a 2014 study (Edison Research) conducted among US teenagers which found that the estimated average time consumers spent listening to digital and FM radio was 1 hour and 57 minutes.

Results of multinomial logit

This research utilized a multinomial logit model, regressed using the software R, to test whether six hypotheses (H1-H6) could be supported. Regression coefficients are listed in Table II. The coefficients listed are measurements of the relative satisfaction levels from changing a factor one level, i.e, the consumer receives .968 less satisfaction from the service if the price increases from

the base level of \$0/month, to a new price of \$7/month. If we exponentiate this coefficient we get the log-odds of choosing the new option over the base option, keeping all things constant: .39, or rather a 61% decrease in the probability of choosing the service if the price increases from \$0 - \$7.

Figure II:

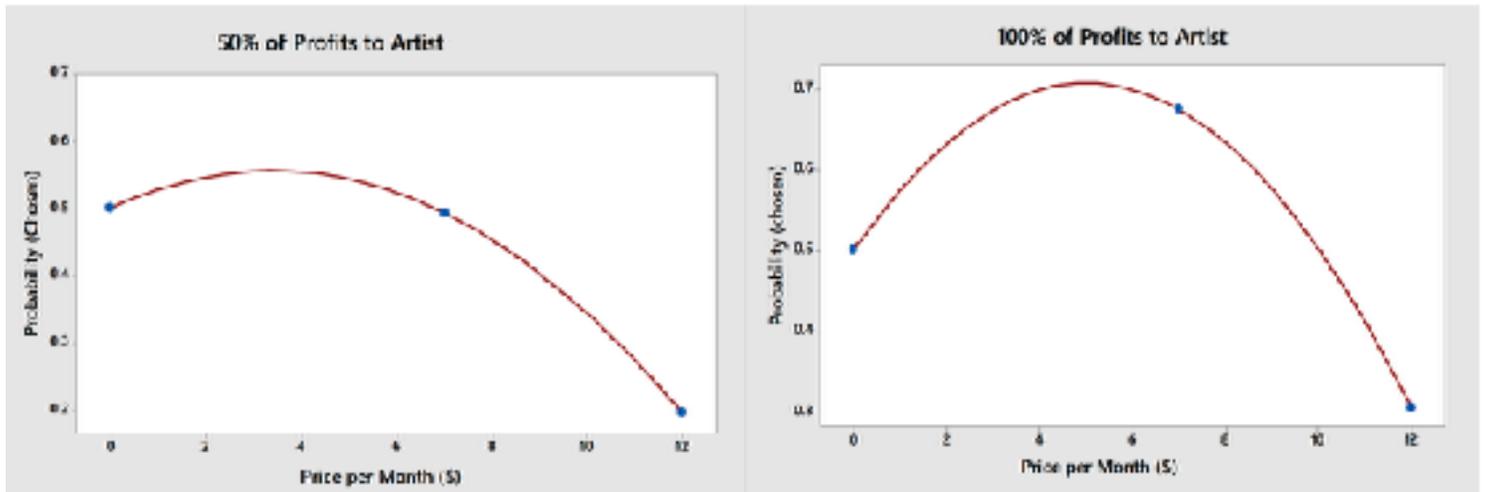
Maximum-Likelihood Estimates
and Standard Errors of the Logit Coefficients

Items	Coefficients	Standard Error
\$12/Month	-1.894	0.281
\$7/Month	-0.968	0.180
Ads	-1.511	0.203
100% of Profits	1.398	0.173
50% of Profits	0.954	0.157

Results revealed that the first hypothesis could not be rejected: that the level of patronage, or percentage of profits derived from a consumers purchase that goes to the artist, is positively related to a consumers WTP for a subscription to streaming service. The coefficient for when a service gives 100% of profits to artists is positive, as predicted, with a significant t-stat and relatively small standard error. The coefficient for when the service gives 100% is also significantly greater than when it only gives 50%. Respondents were nearly as sensitive to changes in artist welfare as they were to price differences.

The second hypothesis: If a music streaming service plays advertisements in-between songs, it will have a negative effect on a consumers WTP for the service, can also not be

Figure III:
 Probabilities of choosing a paid service that provides revenue for the artist against a free, third-party service



rejected. The coefficient for Advertisement is negative and significant and plays a large part in a consumers valuation for a streaming service. If we exponentiate the coefficient we can see that if the service has ads, the comparative log-odds of choosing the service are 0.1565, or rather, almost a 84% decrease in the probability of a respondent choosing that service. This is consistent with market evidence, as most paid streaming services remove ads once you commit to a paid subscription.

To examine the effects of the factors on a decision, let us consider two hypothetical pairings (Figure III). If we compare a service that is free, with no advertisements and no revenue that goes to the artist with a service that gives 50% of their profits to the artists and then with a service that gives 100% of profits to the artists, we see a surprisingly high WTP. Respondents had a higher probability of choosing service that cost \$7/month but provided all profits to the artist than a free service that did not contribute at all to artists' welfare. Even at 50%, respondents had about an equal probability of choosing the paid service that benefitted artists and the free service.

Figure IV:
Coefficients of factors affecting WTP

Items	Coefficient	Standard Error
\$15,000 - \$29,999/yr	0.193	0.235
\$30,000 - \$44,999/yr	0.017	0.296
\$45,000 - \$59,999/yr	0.165	0.367
\$60,000 - \$79,999/yr	0.360	0.498
Over \$80,000/yr	0.462	0.275
Pirate (2)	0.862	0.873
Pirate (3)	0.350	0.665
Pirate (4)	0.672	0.645
Pirate (5)	0.519	0.601
StealProperty(2)	0.011	0.672
StealProperty(3)	0.206	0.658
StealProperty(4)	0.406	0.640
StealProperty(5)	0.591	0.649
TimeListeningtoMusic (15)	-0.090	0.363
TimeListeningtoMusic (30)	-0.164	0.319
TimeListeningtoMusic (60)	-0.290	0.340
TimeListeningtoMusic (120)	0.154	0.340
TimeListeningtoMusic (180)	-0.229	0.326

At the \$12 price point, respondent's were much less willing to spend in order to support artists and we see a sharp drop in the probability of choosing a \$12 service in relation to the free offering.

Results of factor analysis

The third hypothesis: if a consumers positive attitudes towards piracy will be negatively related to their WTP for a music streaming service, we must reject. There is hardly any evidence from out study to indicate that a consumers attitude towards the morality of pirating affects their WTP for a streaming service. The fourth hypothesis must also be rejected, we do not find any significant correlation between respondents views towards private property and their WTP.

We reject the fifth hypothesis: that music streaming services are normal goods, and that a consumers WTP for the good is related to their income. The income effect is most prevalent among the respondents in the top bracket of the response field, or those with annual household incomes over \$80,000/year; however, the coefficients for the first 4 fields, or those with annual incomes from \$0 - \$59,999, are roughly similar, indicating that the elasticity of demand for musical streaming services is negative and has a non-linear relation to income. Therefore, the null hypothesis must be rejected since the study does not provide sufficient evidence that income is directly related.

We must reject the null for our sixth hypothesis: the amount of time a consumer listens to music a day will have an affect on their WTP. The data is inconclusive and non-linear with the coefficients changing signs at unexpected times. The evidence does not indicate any relationship between time listening to music and a WTP for streaming services.

Conclusion

Summary

As modern economic transactions becomes increasingly made up of monthly or annual digital subscriptions, as opposed to one-time physical payments, it is vital for economists to understand the way consumers think about and evaluate subscription offerings. The music industry is being reinvented by streaming services and if firms and musicians ignore how fans derive value from consumption, they will be a step behind the rapidly changing future-forming processes.

This study examined consumers Willingness to Pay for subscription-based musical streaming services through survey and analysis. The results suggested that consumers are willing to increase their valuations for streaming services if the artists they stream are given a greater percentage of the revenue derived from their payments; however, in this study, respondents were made aware of the differences in artist welfare, in a way they might not be exposed to in the marketplace. Our survey gave respondents the complete information that they may or may not regularly be available to them when they are making these types of purchases in a practical setting. This study also indicates that consumers will greatly lower their valuation of a streaming service if they experience advertisements intermittently between content.

This study suggests that income has to be above a certain threshold to be a determinant in a consumers elasticity towards a streaming service, indicating that there might be two types of consumers in the market: high-value and low-value. High value consumers valuation of the streaming services is so far above their WTP that they are willing to pay more to increase the service in any way (i.e remove ads, increase artist profits). Low-value consumers have a tight margin and while clearly see removing ads and increasing artist profits as a good, they have to balance the demand for a better product with their budget constraint.

Implications

This study suggests that consumers who stream music are willing to pay more for services that give a larger percent of profits to the artists whose music they have in their catalogue. If streaming services make how they treat their artists an important part of their corporate image, they can increase subscriptions and station themselves as the ethical choice in the music industry. It is clear that those with higher incomes have a higher Willingness to Pay for subscription services. However, those high-value consumers can choose to support artists either through Vinyl music collections, or on artist owned digital platforms such as Bandcamp, where fan profiles conspicuously display the artists they support. Streaming services face a market made up of largely, young consumers who can not necessarily afford to support artists on Bandcamp or with physical purchases, but still have an ethical consumerist mindset, and a desire to support them with the funds they do pay to gain access to their work.

Limitations and further research

This study is made up of a relatively small sample, with only 100 qualified respondents and poor diversification across differing consumer types. The limited scope of data is due to the lack of time and funding that goes towards undergraduate research projects. This study suggests findings that would best be replicated in a larger study, conducted across multiple socio-economic backgrounds with a focus on differences in how various demographic groups value streaming services.

There is past research that indicates that this study could be a victim of a warm glow effect. The warm glow effect is a phenomenon that occurs in contingent valuation surveys where in consumers overvalue prospective purchases in order to help them be perceived as generous or

ethical. Since supporting artist's is generally considered a positive trait, individuals might like to think of themselves as hypothetically willing to pay more to increase the percentage of revenue given to artists, but in reality, when offered the good while being subjected to their budget constraint, they might change their minds.

Understanding how consumers' evaluate digital streaming and subscription services is vital to an understanding of how the modern economy works. Further economic research should explore and expand on the ideas outlined in this paper. There is a vast world of new economic transactions that need examination to aid economists in modeling and predicting outcomes in a digital world.

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