Why would artists favor free streaming?

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Ramadan Aly-Tovar[#],
Maya Bacache-Beauvallet[†],
Marc Bourreau[†]
François Moreau[#]

[#] CEPN, University Paris 13 & LabEx ICCA, France
[†] Telecom ParisTech, Department of Economics and Social Sciences, France

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Abstract. While streaming services are becoming the dominant way to consume recorded music, professional musicians remain divided in their opinion toward streaming, especially towards free (ad-supported) services that generate very low royalties. This paper is one of the first attempts to analyze empirically the drivers of the artists' opinion on free streaming. Using survey data from more than 1,100 French professional musicians, we emphasize that, beyond their individual preferences, four main determinants affect the opinion of artists on free streaming: (i) free streaming stands as a discovery tool that helps consumers to explore the music catalogue beyond stars and already well-known artists; (ii) free streaming generates a positive externality on the live music market; (iii) the contractual situation of the artist also matters, since the biggest recording companies obtain much more favorable conditions in revenue sharing from streaming services; (iv) the opinion of artists is also shaped by the consumption habits of their fans.

Keywords. Streaming, recorded music industry, digitization.

1. Introduction

Spotify, Apple Music, YouTube and other streaming platforms are now the dominant gateways for music consumption. In early 2018, they accounted for 75% of total recorded music revenues in the US[1], 56% in France[2], 48% in Germany[3] and 46% in the UK[4]. From the record labels side, streaming is praised for stopping the seemingly never ending decline that the industry experienced over the last 15 years. Hence, according to John Rees, VP of Warner Music (Ifpi, 2016): "*Streaming has the potential to create a golden era for music, with multiple players establishing a truly competitive digital landscape that will benefit artists, consumers and the industry.*" However, the artists' opinion towards streaming is more controversial. Artists' criticisms concern specifically the free (ad-supported) music services provided by most audio streaming platforms (e.g. Spotify) or video-sharing platforms (e.g. YouTube). For instance, Taylor Swift opposed her music to be available on the ad-supported service of Spotify: "*Music is art, and art is important and rare. Important, rare things are valuable. Valuable things should be paid for. It's my opinion that music should not be free* [...]."[5]. Taylor Swift then removed her entire catalogue from Spotify in 2014, before the launch of her new album *1989.* Likewise, Radiohead took down all their albums from Spotify in 2013. This position is far from being merely a reflection of individual opinion. Ray Hair, President of the American Federation of Musicians, recently asked YouTube: "*How rich do you need to be before paying musicians fairly?*".[6] Likewise, Robert Ashcroft, Chief Executive of PRS for Music, the UK society that undertakes collective rights management for musical works on behalf of its 130,000 members, declared "*there is a real problem with ad-funded streaming services. By comparison with subscription services, they do not produce values even remotely equivalent to a download sale - we're talking about hundreds of streams being the equivalent of a download for the songwriter rather than 50 or so. This clearly does not work alone*."[7] Admittedly, in 2017, the ad-supported segment accounted for 56% of Spotify's

[1] https://www.riaa.com/wp-content/uploads/2018/09/RIAA-Mid-Year-2018-Revenue-Report.pdf (retrieved November 13, 2018).
[2] http://www.snepmusique.com/wp-content/uploads/2018/09/Bilan-march%C3%A9-musique-enregistr%C3%A9e-1er-semestre-2018.pdf (retrieved November 13, 2018).
[3] https://www.billboard.com/articles/business/8465986/germany-music-streaming-cds-market-share-bvmi-2018-report (retrieved November 22, 2018).
[4] https://www.bpi.co.uk/news-analysis/fastest-growth-in-uk-record-label-income-since-britpop/ (retrieved November 22, 2018).
[5] https://www.theguardian.com/music/2014/nov/04/taylor-swift-spotify-streaming-album-sales-snub (retrieved October 25, 2017).
[6] https://www.musiciansunion.org.uk/Files/Reports/Campaigns/Report-on-Joint-FIM-AFM-International-Conference-o.aspx
[7] https://www.prsformusic.com/what-we-do/protecting-music/our-perspective-on-streaming

users but only for 10% of its revenues: a free-user generates through advertising revenues an average yearly income of $2.6 against $51.7 for a subscriber[8]. The situation is even more critical with music video streaming platforms such as YouTube. While the bulk of Spotify's revenue are paid to the recorded music industry (more than 75% in 2018), sheltered behind the "safe harbor provisions"[9] YouTube is exempted from the obligation to negotiate the access to the catalogue of music labels and thus usually pay less than the market rate (Liebowitz, 2018). In 2016, the 900 million users of music video sharing services alike YouTube only generate $0.55 billion of revenues for the recorded music industry, that is to say only $0.6 per user (Ifpi, 2017).

Artists face a revenue-exposition trade-off with free-streaming. On the one hand, free-streaming generates very low advertising revenues per stream as compared to paid-streaming, and therefore artists derive lower revenues from free-streaming than paid-streaming. An artist relying mainly on revenues from her recorded music would therefore like a faster shift to paid-streaming and may thus have a negative opinion on free streaming. On the other hand, free-streaming allows a larger audience to participate to the platform, which means a larger exposition to a potential audience for music artists. For example, Midia Research states that "*YouTube is the main way that all consumers aged 16 to 44 discover music*".[10] A new artist who wishes to develop her audience may benefit from the larger audience and exposition allowed by free-streaming compared to paid-streaming. Due to this trade-off, it is not a surprise that artists are not unanimously against free streaming. In France, for instance, 40% of professional musicians have a positive opinion on free streaming services (see below).

In this paper, we propose a theoretical framework which emphasizes several factors that could explain the positive opinion of some artists on free streaming. The two first factors pertain to the above mentioned promotional effect argument. First, since free streaming stands as a costless discovery tool for consumers, some artists could value the opportunity to widen their audience more than the potential loss in recorded music sales. Second this audience widening should be especially profitable to artists who are touring the most. Our third and fourth factors relate to more specific arguments. Third, an artist who believes that her record label has a strong bargaining power with streaming platforms should be more favorable

[8] https://www.sec.gov/Archives/edgar/data/1639920/000119312518063434/d494294df1.htmn#rom49429412 (retrieved March 5, 2018)
[9] The "safe harbour provisions" is a legislation created to prevent Internet Service Providers being blamed for copyright infringement undertaken by their users as long as they accept to remove infringing works quickly after being notified of such infringement (Liebowitz, 2018).
[10] https://musicindustryblog.wordpress.com/2018/08/28/state-of-the-youtube-music-economy-2-0-a-turning-point-for-all-parties/

towards free streaming. We consider that major labels have a stronger bargaining power because of the attractiveness of their music catalogue and are thus able to secure a greater share of streaming revenues. Fourth, an artist whose audience is more prone to use free streaming should also be more favorable to this new consumption mode. Since youngest consumers are over represented in the population of free streaming users, artists who target this specific audience should have a better opinion on free streaming.

At a first glance, the issue of artists' perception of free streaming could appear quite close from the debate on artists' opinion towards piracy. Indeed, in both case recorded music comes at a zero marginal cost for consumers with an unlimited catalogue. As for free streaming, some artists have also a positive opinion on piracy (Bacache-Beauvallet et al., 2015). However a closer look shows that free streaming and piracy strongly differ. Firstly, free streaming is legal conversely to piracy. This should eliminate ethical considerations and lead to focus on economic concerns. Secondly, conversely to piracy, free streaming generates revenues, although smaller than pay-streaming. Artists can thus directly benefit from free streaming depending on their contracts and on their fans listening behavior.

To address our research questions we use a survey from more than 1,100 French professional musicians polled in autumn 2014. We estimate the impact of our different variables of interest on the probability for an artist to have a positive opinion on free streaming. Our results show that artists whose objective is to expand their audience see free streaming rather positively conversely to artists who already have an established fan base; artists who mainly yield revenues from touring also have a better opinion on free streaming; artists signed by a major label see free streaming more favorably than artists under contract with a small independent label, which is consistent with the hypothesis that major labels have a stronger bargaining power towards streaming platforms; finally the younger the fans of an artist are, the more positive her opinion on free streaming is.

The remainder of the paper is organized as follows. Section 2 reviews the literature. Section 3 presents the theoretical framework and the research hypotheses. Section 4 is devoted to the data, the empirical strategy and the results. Section 5 deals with the discussion of the results and their implications. Section 6 concludes.

2. Literature review

Among the huge literature devoted to the digitization of information goods[11], and especially of the music industry, a growing part deals with the streaming issue. Three flows of papers can be distinguished: those that study if streaming substitutes or complements other music consumption channels (whether legal or illegal); those devoted to the impact of streaming on consumer behavior; and finally papers that deal with the impact on the business model of the music industry and of the streaming platforms, as well as with legal ramifications of the growth of streaming.

The question whether streaming and purchasing music substitute or complement to one other is still open, existing literature providing seemingly contrasting results. A first set of papers suggest substitutability. Aguiar and Waldfogel (2017) find that Spotify use displaces permanent downloads. From a panel of 2,500 music consumers repeatedly observed over more than one year, Wlömert and Papies (2016) show that the adoption of a free streaming service as well as the adoption of a paid streaming service cannibalizes consumers' music expenditures. From a quasi-natural experiment[12], Hiller (2016) shows that free streaming negatively impacts album sales. However, if streaming displaces sales among best-selling albums, a promotional effect dominates among the lower ranked. Conversely, several papers conclude to the complementarity of streaming and music sales. Relying on individual-level click-stream data of a representative sample of 5,000 French Internet users and exploiting the introduction of a free streaming cap by the platform Deezer, Aguiar (2017) shows that free streaming stimulates music purchasing, especially for lighter streamers. Aguiar and Martens (2016) also use click-stream data on a panel of more than 16,500 European consumers and find a positive relationship between the use of licensed streaming websites and licensed websites selling digital music, suggesting a stimulating effect of music streaming on digital music sales. From two quasi-experiments in Germany[13], Kretschmer and Peukert (2015) find that online videos availability is complementary to recorded music sales. New artists and mainstream artists benefiting disproportionately from video availability on YouTube. Despite these contrasting results, it should be noticed that a seemingly robust conclusion appears: the impact of free streaming on digital sales is less negative or more positive for new artists than

[11] See Belleflamme (2016) for a progress report.

[12] The removal of Warner Music content from YouTube in January 2009, and its restoration in October 2009.

[13] In 2009, virtually all official music videos were blocked from YouTube due to a legal dispute. The situation remained largely unchanged until the dedicated platform VEVO entered the market in 2013, making videos of a large number of artists available over night.

top sellers. The link between streaming and piracy is also not clear. From surveys conducted on 1,052 undergraduate students in two universities in South Florida, Borja and Dieringer (2016) find a positive correlation between frequent use of streaming services and illegal downloading. Aguiar (2017) also finds that free streaming stimulates piracy activity. Conversely, Aguiar and Waldfogel (2017) show that Spotify displaces music piracy! However, it should be emphasized that these results are not necessarily contradictory. At the individual level the impact of streaming on sales and piracy could be different from the impact in the aggregate[14] (fallacy of composition, e.g. Hammond (2014)).

The research devoted to the impact of streaming on consumer behavior mainly focuses on the discovery opportunity offered by streaming as compared to purchasing channels. The zero marginal cost of music discovery through streaming should, especially for those with high discovery costs, foster the exploration of the catalogue of streaming services. Aguiar (2017) indeed emphasizes that his results are consistent with streaming allowing discovery of products. From a panel data set of individual consumers listening behavior on digital music platforms, Datta et al. (2017) show that consumer adoption of streaming leads to an increase in the quantity and the variety of music consumption, as well as to an increase in discovery of new music.

Finally, a last stream of the literature on streaming deals with the impact on the industry as a whole and on record companies' and streaming platforms' business models. As far as the global revenues of the music industry are concerned, Aguiar and Waldfogel (2017) show that the losses from displaced sales are roughly outweighed by the gains in streaming revenue. In other words, interactive streaming appears to be revenue-neutral for the recorded music industry. Likewise Wlömert and Papies (2016) estimate that the overall effect of streaming on industry revenue is positive (the positive effect of paid streaming outweighs the potentially negative effect of free streaming). In a theoretical setting, Hiller and Walter (2016) identify conditions under which the rise of streaming and the adaptation of music industry will encourage the release of fewer songs, but higher quality songs. Dang-Nguyen et al. (2014) show that free streaming has a positive impact on the live music market, suggesting that record companies should seek for diversification outside the recorded music market. Adopting a different perspective, Thomes (2013) and Carroni and Paolini (2017) switch the analysis from the recorded music industry to platforms strategy, especially on the choice

[14] Free streaming may stimulate piracy and sales for lighter music listeners while the most intensive music listeners could subscribe to premium streaming and thus give up on piracy and purchases. In that case free streaming complement sales and piracy at the individual level, but in the aggregate the decrease in sales and piracy from intensive listeners may outweigh the increase from lighter music listeners.

among the various possible business models: subscription, advertising, or freemium (a combination of the two previous). In the legal field, the research had been focused on the effects that digitization and streaming have on the copyright laws (Towse, 2013; Hogan, 2015).

To the best of our knowledge, there is no paper devoted to explain the opinion of artists on streaming, and especially on free streaming. Some of the previous papers just provide a few insights. For instance, by emphasizing that famous artists' music sales should be more negatively, or less positively, affected by free streaming (Hiller, 2016; Kretschmer and Peukert, 2015). The present paper aims at filling this gap.

3. Theoretical framework and research hypotheses

We argue that four features of the recorded music industry are key-determinants of the opinion of artists on free streaming. First, the shift from selling to renting music that allows consumers to increase their discoveries; second, the evolution of the relative importance of recorded music market as compared to ancillary markets (such as live music for instance); third, the relative bargaining power of music labels towards streaming platforms; fourth, the specific demographic composition of free streaming users.

Up to the rise of streaming services, the digitization of the music industry has led to a nearly zero marginal cost of production and delivery of digital file but to a above zero marginal cost for consumers (the usual price to purchase a downloaded song remains around $0.99). With streaming, the zero marginal production/delivery cost of each copy of a song translates in a zero marginal cost for consumers. Streaming services offer an unlimited access to a huge music catalogue for a flat rate (subscription) or for free within the ad-supported service. A consumer has access to any song and not only to those for which her expected utility justifies to pay $0.99. The potential for music discovery is hence much higher with streaming than with pay-downloads or physical purchase. Datta et al. (2017) highlight that music streaming platforms are indeed a discovery tool for consumers. Hence those artists who already have an audience or are popular enough should be less favorable to free streaming. This is how we can interpret the position of Taylor Swift (see introduction). Conversely, artists still unknown (especially the newbie) need to expand their audience and thus should be more favorable towards free streaming. For example, Ben Berry, a musician member of a band called Moke Hill, sees Spotify as the instrument by which his band has get to be

known[15]: "*With no marketing, PR or label support, Spotify has exposed to an audience who otherwise have little chance of finding us.*" This discovery tool feature of streaming platforms leads us to posit the following hypothesis:

H1: Artists who need to expand their audience are more favorable towards free streaming.

Moreover, this discovery process does not only foster the increase of future audience in the recorded music market (for the next albums for instance) but can also have a short run effect on ancillary markets for which recorded music generates a positive externality. The most important of these ancillary markets is the live music market which has benefited from the digitization of music (Mortimer et al., 2012; Bacache-Beauvallet et al., 2015), notably through free streaming (Dang-Nguyen et al., 2014). Hence, our second hypothesis:

H2: Artists who yield large revenues from ancillary markets of recorded music are more favorable towards free streaming.

The recorded music market is highly concentrated with three companies (the so-called Majors) accounting for around 70% of worldwide sales. The domination of the majors is even more important in the streaming submarket (see Table 1). Securing the access to the majors music catalogue is thus mandatory for the various competing streaming platforms. This provides a huge advantage in bargaining power for the majors towards streaming services that translates into various specific clauses in the contracts that link them. The contract signed in 2011 between Sony Music and Spotify has been made publicly available[16]. It shows, among others, that Spotify has accepted to pay huge advances to Sony, which could be cut back if Spotify earns over that amount in the corresponding contract year. Moreover for the ad-supported service Spotify has accepted to pay a minimum of $0.00225 per stream to Sony[17]. Consequently, the actual sharing of streaming revenue benefits more to major music labels than it should. Revenues are indeed supposed to be shared on a basis of 70/30 (70% for music labels and 30% for the platform) for subscription services and 55/45 for ad-supported

[15] https://www.wired.com/2014/11/one-band-who-loves-spotify/(retrieved march 5, 2018).

[16] https://www.theverge.com/2015/5/19/8621581/sony-music-spotify-contract (retrieved October 25, 2017).

[17] Although considered as very low by right holders (see introduction), the revenue per stream yielded from free streaming is probably about ten times larger than the revenue per listener drawn from radio broadcast. In France, in 2017, the average number of listeners per song broadcasted on the radio amounted to 67,057 (source: https://www.cnv.fr/sites/cnv.fr/files/documents/PDF/ Ressource/Obs%20eco/DMR_2017_livret_2.pdf). Furthermore, according to the Adami, an artist earns 100 euros each time her music is broadcasted 14 times on radio (hence, 200 euros for the music label and the artist since revenues from radio are equally shared between both of them). Thus a back-of-the-envelope calculation shows that 938,805 radio listeners are needed to generate 200 euros for right holders, which amounts to €0.0002 per listening.

services. However, the analysis of Spotify's annual financial statement shows that in 2015 the amount paid to the recorded music industry reached 84% of Spotify's revenues. During the first quarter 2018, this figure was still above 75%. A note in the financial statement of Spotify clearly links this difference between the scheduled and actual payment of Spotify to music right holders to the various contractual clauses mentioned above.[18]

Table 1 – Majors' market share on the worldwide recorded music market in 2016

	Global recorded music market (%)	*Streaming music market (%)*
Universal Music	28.9	30.4
Sony Music	22.4	22.7
Warner Music	17.4	18.6
Total Majors	68.7	71.7
Independent labels	31.3	28.3
Total market	100.0	100.0

Source: Midia Research

Conversely, small independent labels are not proposed the same profitable clauses in their contract with streaming platforms. They do not even negotiate directly with them but have to contract with a digital aggregator (e.g. Believe) which will make their contents available on streaming platforms against a share of the revenues. The bargaining power towards streaming platforms being much more important for a major label than a small independent label[19], it is reasonable to believe that an artist signed by a major label will be more confident in the ability of her label to secure a good deal than an artist signed with a small independent label. Hence our third hypothesis:

H3: An artist signed by a Major label has a more favorable opinion on free streaming than an artist under contract with a small independent label.

Another feature of the recorded music industry in the streaming age that can impact the opinion of artists is the specific demographic composition of streaming users. Streaming

[18] "The Group has certain arrangements whereby royalty costs are paid in advance or are subject to minimum guaranteed amounts. An accrual is established when actual royalty costs to be incurred during a contractual year fall short of the advance payments or the minimum guaranteed amounts. The Group also has certain royalty arrangements where it would have to make additional payments if the royalty rates were below those paid to other similar licensors (most favoured nation clauses). An accrual is recognised when it is probable that the Group will make additional royalty payments under these terms."

[19] https://www.musicbusinessworldwide.com/global-market-shares-2016-sony-and- warner-gain-on-universal-as-indies-rule/ (retrieved October 25, 2017).

services, and above all free streaming services, are especially popular among young consumers. Hence, the 15-29 only accounts for 22% of the French population but for 34% of streaming subscribers and for 36.5% of free streaming users. Put in other words, the penetration rate of music streaming for the whole French population (15+) is 35% but reaches 54% for the 15/29 (SNEP, 2015). Hence, a musician who performs a genre especially appreciated by young listeners should be more favorable to free streaming in order to "follow" her audience. We thus propose our fourth hypothesis:

H4: The younger the target audience of an artist is, the more positive her opinion on free streaming should be.

4. Empirical strategy

4.1 Data

The data set was built from a survey realized by a specialized company GfK-ISL and conducted on late 2014 on the French musicians who were members of Adami, the French organization for the collective administration of performers' rights. Adami gathers all the French professional musicians. To belong to the Adami a musician has indeed to have already release an album sold in conventional music stores. Furthermore, belonging to the Adami is mandatory to receive payments from radio airplays, TV broadcastings, etc. About 8,500 musicians received a paper or online questionnaire, and we receive 1,239 answers of which 1,103 were considered valid[20].

The dependent variable is created using the following question from the questionnaire: "Are you favorable towards the distribution of your music by free streaming". Four answers were proposed: very favorable, rather favorable, rather unfavorable, very unfavorable. Table 2 below displays the frequency for each of these opinions. We note that while less than one artist over ten has a very favorable opinion on free streaming, the three other opinions are equally distributed over the population.

Table 2 – Question used to build dependent variables

[20] We checked that our sample is representative of the whole populations of musicians belonging to the Adami. We also checked that the way the questionnaire has been answered (paper vs. online) has no impact on our results.

"Are you favorable towards the distribution of your music by free streaming"	*Frequency*
Very unfavorable	27.3
Rather unfavorable	31.7
Rather favorable	32.5
Very favorable	8.5
Total	100.0

We first use as dependent variable *FREE_BINARY,* a dichotomous variable which equals 1 if the artist declared to be very or rather favorable to free streaming, and 0 otherwise. However, to account for the richness of the information we gathered on the intensity of the preferences of the artists towards free streaming we also use an ordered probit model. *FREE* is a categorical variable which takes the value 0 if the answer was "very unfavorable", 1 for "rather unfavorable", 2 for "rather favorable" and 3 if the answer was "very favorable".

With respect to the first hypothesis we consider the level of prestige or fame of an artist as well as her commercial success. We create a dummy variable *GOLD* taking the value of 1 if the artist has already received either a gold record or a music award, and taking the value of 0 otherwise. Those artists already benefit from a wide audience and should not see streaming as a tool to discover them. We thus expect *GOLD* to have a negative sign. At the opposite of the success spectrum, we consider the case of lesser known musicians. *MUSREV* is a dummy variable that takes the value of 1 in the case that the revenues an artist receives from music are less than 50% of their personal income and 0 otherwise. Actually, *MUSREV* may capture two different aspects of an artist. Besides low-audience artists who have not (yet?) encountered success, *MUSREV* may also be associated to less professional artists who have chosen to keep a non-musical job while being a musician. However, in both cases, such a musician should be less concerned with free streaming, either because it allows her to expand her audience or because she does not consider music revenues as essential for her. We thus expect this variable to have a positive sign. We also take into account that free streaming offers a greater potential to expand the audience of a newcomer in the artistic career than of an incumbent who is more likely to be already known from her potential fans. The variable *CAREER* classifies the length of the artist career in five categories (less than 5 years, from 6 to 10, from 11 to 20, from 21 to 30, more than 30 years). *CAREER* is expected to have a negative sign[21]. We prefer to use the length of the career instead of the age because not all artists enter the career in their youth[22].

[21] The negative impact of the length of the career on the opinion on free streaming might also pertain to a strategic effect. Incumbents, and in particular star artists, could view newcomers as potential competition. They thus may have a negative opinion on free streaming, because streaming allows newcomers to improve their

As far as the second hypothesis is concerned, we construct the dummy *STAGE* that takes the value of 1 if concerts are identified as the most important source of income of an artist and if she performed more than ten concerts in the last year, the variable takes the value of 0 otherwise. We included *STAGE* to capture those artists who want to widen their audience because their main income comes from touring. We posit that these artists have a more favorable opinion on free streaming because they expect more from their touring revenues than from recorded music sales. We thus expect *STAGE* to have a positive sign.

To test our third hypothesis we create several dummy variables to distinguish the contract status of the artists. First we construct a dummy variable *NOCONTRACT* to account for those artists not signed by a music label. *MAJOR* (resp. *LARGE* and *SMALL*) is a binary variable that takes the value 1 if an artist has a contract with a major (resp. a large independent and a small independent) label and 0 otherwise. A major label can secure better deals with streaming platforms which generate higher revenues for the label that should translate into higher income for the artists. Conversely, small independent labels usually don't contract directly with streaming services and have to contract an intermediary, a digital distributor, who will make their music available on digital platforms. The digital distributor charges the independent label for this service which reduces the revenues of right holders and thus of artists. Considering *SMALL* as the reference category, we expect *MAJOR* to have a positive sign.

Our fourth hypothesis relates to artists who perform music genres that have young people as their main targeted audience. According to a poll conducted by CSA Research in France in June 2015, young consumers display specific music tastes. As shown on Table 3, some musical genres are under-represented among young listeners (French popular music, Classical, Jazz, World music), other genres are slightly over-represented (Pop-rock, Others), but two musical genres turn out to be very significantly over-represented as the most preferred among young listeners: electronic music and urban music. For these two musical genres, the ratio of the share among 18-24 year-old listeners to the share in the whole population reaches 2.6 and 3.3, respectively. Whereas Electronic and Urban are the preferred musical genres for only 12% of the French population, it is the case for 36% of the 18-24 year-old population!

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notoriety and increase their audience. Unfortunately, we do not have any variable in our dataset that would allow us to test for the existence of this strategic effect. It could be partially captured, though, with the variables *NOCONTRACT* and *MUSREV*. They indeed allow to distinguish incumbents (who have a contract with a record company or who make their living from music) from low audience artists that could benefit from new promotion tools such as free streaming.

[22] Using simultaneously the age and the length of the career generates a collinearity issue. We however checked that using the former instead of the latter does not change our results. We checked that there are no other collinearity issues among our interest variables (VIFs never exceed 2.00).

Table 3 – Most preferred musical genre for French adults

% of French adult who consider this genre as their most preferred	*Whole population (1)*	*18-24 (2)*	*(2)/(1)*
French popular music	31	9	0.29
Pop-rock	27	37	1.37
Classical	9	2	0.22
Jazz	5	2	0.40
World music	7	3	0.43
Electronic music	5	13	**2.60**
Urban music (rap, RnB, …)	7	23	**3.29**
Others	9	11	1.22
TOTAL	100	100	

Source: CSA Research, *Les Français et la musique*, June 2015.

We thus created a dummy *ELECTRO_URBAN* which takes value 1 if the musical genre of the artist is either urban music or electronic music, and 0 otherwise. Since young listeners are more favorable to free streaming and are also much more prone to listen to electronic or urban music, we expect the coefficient of *ELECTRO_URBAN* to be positive.

Moreover, we include various control variables. Firstly, we take into account the specific case of artists who do not produce any new music anymore, but still have (old) fans who continue to listen to them. They could be favorable to free streaming because they can earn royalties, even though they do not sell physical or digital albums anymore. In our database, we are not able to accurately identify artists who have not released any album for many years. However, we create a proxy that captures this idea: a dummy variable called *ACTIVE* which takes value 1 if the artist has participated to a recording session within the past 12 months, and 0 otherwise. Secondly, we consider the presence of the artists in the internet through the dummy *WEB* that takes the value of 1 if the artist has a web-page dedicated to her musical activity and 0 otherwise. Our aim is to control for the general inclination of the artists on digitization. It is possible that some artists may not be favorable to streaming just because they are not favorable to digitization at all. Thirdly, to address the concerns about piracy, we added a categorical variable *PIRACY* that takes the value 1 if the artist declared not to be bothered by her music being shared in P2P networks, and 0 otherwise. Our goal is to check that the opinion on free streaming is not perfectly aligned on the opinion about piracy, even if some artists could consider piracy and free streaming as two promotional tools. For a comprehensive discussion on the determinants of the artists' opinion towards piracy, see for instance Bacache-Beauvallet et al. (2015). Fourthly, we include the traditional socio-demographic variables. A dummy variable *GENDER* that takes the value of 1 if the artist is a

female. *PARIS* that takes the value of 1 if the artist lives in Paris or in the nearest suburbs. The dummy variable *EDUCATION* takes the value 1 if the artist earned at least a master degree. We also control for artists' personal income. In the questionnaire, the artist was asked to indicate if her individual yearly total income (including musical and non musical activities) was under €9,000, between €9,000 and €15,000, between €15,000 and €30,000, between €30,000 and €60,000, or over €60,000. From these five possible answers we built five dummies: *INCOME1* to *INCOME5*. Table 4 displays the descriptive statistics of the artists belonging to our dataset.

Table 4 – Descriptive statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
FREE	1,103	1.222121	.943302	0	3
MAJOR	1,103	.0398912	.1957924	0	1
LARGE	1,103	.0262919	.1600747	0	1
SMALL	1,103	.1677244	.3737908	0	1
NOCONTRACT	1,103	.7660925	.4235061	0	1
GOLD	1,103	.2919311	.454857	0	1
STAGE	1,103	.4052584	.4911647	0	1
MUSREV	1,103	.4496827	.4976874	0	1
CAREER	1,103	4.057117	.9484928	1	5
ELECTRO_URBAN	1,103	.0580236	.2338941	0	1
PARIS	1,103	.3961922	.4893271	0	1
GENDER	1,103	1.198549	.3990889	1	2
INCOME1	1,103	.2103354	.4077317	0	1
INCOME2	1,103	.1903898	.3927867	0	1
INCOME3	1,103	.3399819	.4739175	0	1
INCOME4	1,103	.1813237	.3854609	0	1
INCOME5	1,103	.0779692	.2682447	0	1
EDUCATION	1,103	.3553944	.4788498	0	1
WEB	1,103	.6917498	.46198	0	1
ACTIVE	1,103	.6518586	.4765972	0	1
PIRACY	1,103	.3952856	.4891337	0	1

4.2 Results

We first use a simple probit model and then a classical ordered probit model as presented by Wooldridge (2010). The ordered probit model for y conditional on independent/control variables x is determined by:

$$Y^* = x\beta + \epsilon \quad \text{with} \quad \epsilon|x \sim \text{Normal}(0,1)$$

Where β is K×1 and x does not contain a constant. Let $\alpha_1 < \alpha_2 < \ldots < \alpha_J$ be unknown cut points and define:

$$y = 0 \text{ if } y^* \leq \alpha_1$$
$$y = 1 \text{ if } \alpha_1 < y^* \leq \alpha_2$$
$$\vdots$$
$$y = J \text{ if } y^* > \alpha_J$$

To obtain the conditional distribution it is only necessary to compute each one of the response probabilities for each one of the values of y. Hence we end up with the following conditional distribution:

$$P(y = J|x) = P(y > \alpha_J|x) = 1 - \Phi(\alpha_J - x\beta)$$

This model can be estimated by MLE to obtain the β coefficients.

Table 5 displays the results of both the simple probit and the ordered probit. First we observe that both models provide very close results. All the independent variables we use to test our four hypotheses (in bold on Table 5) are significant in both models, although significance turns out to be higher for the ordered probit than for the simple probit.

The various variables that account for the willingness of artists to expand their audience all have the expected sign. The variable *GOLD* is negative and significant. For artists who already encountered success, the low revenue effect of streaming dominates the audience expansion effect. Conversely, artists who still remain lesser known are more favorable towards free streaming: *MUSREV* is positive and significant. Musicians who are still confidential and earn less than half of their personal income from musical activities indeed seem to see streaming as a way to increase their audience. Likewise newbie artists are also more favorable to free streaming that can help them to develop a fan base: *CAREER* is negative and significant. The longer the artistic career of an artist is, the less favorable to free

streaming she is[23]. Our first hypothesis is thus supported. Our second hypothesis is supported as well. *STAGE* is positive and significant[24]. Artists who are touring a lot and earn the largest part of their income from live music are more prone to accept free streaming[25]. Free streamers make some discoveries and could decide to go to see them on stage. With respect to the third hypothesis, as expected, *MAJOR* is positive and significant. Artists signed by a major label are much more favorable to free streaming than artists under contract with a small independent label.[26] Our explanation is that the former are confident in their major label to negotiate a favorable deal with streaming platforms.[27] Finally, with respect to our fourth hypothesis, the coefficient of *ELECTRO_URBAN* is positive and significant[28]. This confirms that artists know what the habits of their fans are and accept easily free streaming if their audience is among the most intensive users of this music consumption channel.

Although the simple probit and the ordered probit provide very close results, Table 5 highlights that we should split the dependent variable in four categories rather than two. The three thresholds "cut1", "cut2" and "cut3" allow us to assess to which of the four categories of the dependent variable a specific combination of covariates leads (Wooldridge, 2010; Green and Hensher, 2010).[29] If two cut points are not statistically different, this suggests that the two adjacent categories of the dependent variable can be collapsed in a single one. We have successively tested cut1 = cut2 and cut2 = cut3 (tests available upon request). In both cases we reject the null hypothesis that cut points are equal ($p < 0.000$). This gives support to rely as we will do hereafter on the ordered probit model with four categories.

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[23] We also test a configuration in which we split the variable *CAREER* in four dummies: "10 years or less", "11 to 20 years", "21 to 30 years", and "more than 30 years". Only the two last categories turn out to be significantly different from the first one (taken as the reference). This highlights that the negative impact of the length of the career on free streaming is driven by the artists who already spent more than 20 years in the music business (the estimation results are available upon request from the authors).

[24] The variable *STAGE* is only weakly significant at 10% in the simple probit model ($p=0.107$).

[25] We could expect this effect to be less salient for artists under contract with a major label, since those artists are supposed to already benefit from large promotional efforts (including marketing expenses, radio airplay, …). This hypothesis can be tested through the inclusion of an interaction term: *MAJOR*STAGE*. However, our data does not allow us to give support to this conjecture since this interaction term turns out to be insignificant.

[26] The positive and significant coefficient for *NOCONTRACT* gives also support to hypothesis 1. Artists not under contract are also supposed to look for an audience expansion and worry less on recorded music revenues.

[27] An alternative explanation could be that musicians on major labels are not unfavorable to free streaming merely because their revenues are already "secured". Although our dataset does not make it possible to test for this conjecture, we would expect the artists under contract with a major label to be rather indifferent to free streaming rather than strongly favorable. Yet, 15% of artists from majors declare to be "very favorable" to free streaming while this is the case for only 6% of the artists under contract with an independent label and for only 9% of the artists who do not hold any contract.

[28] Distinguishing electro musicians from urban music artists with two dummies instead of one shows that the positive impact on the opinion on free streaming does exist for both categories with a similar magnitude.

[29] For each combination, the latent variable, y^*, is calculated from the coefficients of regression (2) on Table 5. If $y^* \leq cut1$, then $y = 0$ (very unfavorable), if $cut1 < y^* \leq cut2$, then $y = 1$ (rather unfavorable), if $cut2 < y^* \leq cut3$, then $y = 2$ (rather favorable) and finally if $y^* > cut3$, then $y = 3$ (very favorable).

Table 5 – Regression results

	Simple Probit (1)		Ordered Probit (2)	
Dependent variable:	*FREE_BINARY*		*FREE*	
GOLD	**-0.302*** **	**(0.0923)**	**-0.204*** **	**(0.0769)**
MUSREV	**0.122***	**(0.0864)**	**0.189*** **	**(0.0730)**
CAREER	**-0.0673***	**(0.0434)**	**-0.0701** **	**(0.0367)**
STAGE	**0.105***	**(0.0845)**	**0.127** **	**(0.0711)**
MAJOR	**0.412** **	**(0.217)**	**0.495*** **	**(0.184)**
LARGE	-0.0170	(0.272)	0.127	(0.220)
SMALL	Ref.		Ref.	
NOCONTRACT	0.223**	(0.110)	0.184**	(0.0915)
ELECTRO_URBAN	**0.231***	**(0.168)**	**0.328*** **	**(0.141)**
PARIS	-0.0152	(0.0831)	0.0347	(0.0698)
GENDER	-0.0728	(0.104)	-0.138	(0.0882)
INCOME1	Ref.		Ref.	
INCOME2	-0.0770	(0.125)	-0.0549	(0.106)
INCOME3	-0.0833	(0.114)	-0.0705	(0.0970)
INCOME4	-0.112	(0.135)	-0.127	(0.114)
INCOME5	0.0233	(0.177)	0.0569	(0.148)
EDUCATION	-0.0672	(0.0849)	-0.0529	(0.0714)
WEB	-0.0566	(0.0874)	-0.134*	(0.0735)
ACTIVE	-0.0275	(0.0881)	-0.0226	(0.0744)
PIRACY	-0.253***	(0.0804)	0.318***	(0.0683)
Constant	-0.0394	(0.297)		
cut1			-0.859***	(0.252)
cut2			-0.009	(0.251)
cut3			1.201***	(0.254)
Observations	1,103		1,103	
Pseudo R-squared	0.034		0.029	

*** p<0.01, ** p<0.05, * p<0.1; standard error in parentheses

On Table 6 we observe the effects that these variables have on the probabilities of belonging to each of the four categories of the dependent variable. The marginal effects show clearly how the probabilities of each opinion on free streaming (from very favorable to very unfavorable) change for each of our main covariates variable. For instance, for an artist under contract with a major label (as compared to artists signed by a small independent label) the probability to belong to the "very unfavorable" category decreases by 15.8 percentage points whereas the probability to belong to the "rather favorable" category increases by 11.0 percentage points. Likewise, all other things being equal, for each step forward in her career (from "less than 5 years" to "more than 30 years", through "6 to 10 years", 11 to 20 years" and "21 to 30 years), the probability to fall in the "very unfavorable" increases by 2.2 percentage points. We also notice that being specialized in urban or electronic music decreases the probability to be very unfavorable to free streaming by 10.5 percentage points.

For all the variables that have a positive impact on the opinion on free streaming, unsurprisingly, the increase in probability is always more important for the "rather favorable" than the "very favorable" category.

Table 6 – Marginal effects

	Very unfavorable	Rather unfavorable	Rather favorable	Very favorable
MAJOR	-.158***	-.026**	.110***	.074 ***
GOLD	.065***	.011**	-.045***	-.031***
STAGE	-.040*	-.007*	.028*	.019*
MUSREV	-.060***	-.010**	.042***	.028**
CAREER	.022*	.004*	-.016*	-.010*
ELECTRO_URBAN	-.105**	-.017**	.073**	.049**

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

Note: the above marginal effects are derived from regression (2) on Table 5 but only marginal effects of interest variables are reported.

Finally, we also notice from Table 5, as suggested in introduction, that the opinion on piracy is highly positively correlated with the opinion on free streaming. The less tolerant towards piracy an artist is, the less favorable to free streaming she will be. Probably because both piracy and free streaming share the same feature: a positive promotional effect and a negative impact on revenues. But they also differ since free streaming is a legal consumption channel conversely to piracy. To better understand how the artists' opinion on these two phenomena are jointly built we ran a bivariate (seemingly unrelated) ordered probit model. It allows us to explain both free streaming and piracy simultaneously with errors possibly correlated. Table A.1 in the appendix shows that the opinions on free streaming and piracy are jointly driven (we reject the null hypothesis of both equations being independent). Hence some patterns are clearly similar: star artists have a negative opinion on both piracy and free streaming while artists who earn less than half of their revenues from music or artists not under contract with a recording company see piracy and free streaming more positively. However, Table A.1 confirms that taking into account the opinion about piracy has no impact on our previous results and that the determinants of the artists' opinion on free streaming remain unchanged.

5. Discussion

The analysis of the perception of artists on free streaming discloses several key-determinants. Firstly, the widely publicized issue of the opposition between stars and more confidential artists. Free streaming is simultaneously a discovery tool for consumers and a low-paying consumption channel for artists (as compared to pay-streaming and pay-downloads). The winners of a gold record and/or of a main music award have already been discovered and expect revenues from their recorded music. Consequently they are unsurprisingly much less favorable to free streaming than newcomers in the music industry or incumbent but yet unsuccessful artists. For these two categories of artists, generating revenues from recorded music in the short run is less important than expanding their audience. Artists whose careers have just started or who want to widen their audience see streaming as a discovery tool, for so, they see free streaming as a platform to reach a bigger audience and generate interest in their work.

Secondly, we emphasize that taking into account the business model of an artist is also relevant to understand her opinion on free streaming. Recorded music is known to generate a positive externality on the live music market (Mortimer et al., 2012). Hence, artists who yield the main part of their revenues from touring are more tolerant towards free streaming. The potential loss that stems from consumers using free streaming instead of pay-streaming or pay-downloads is probably compensated by the increase in demand for their live performances. It is worth to notice that in France, between 2005 and 2015, the revenues from live music performances[30] have experienced a 8.6% average annual growth. In the meantime, recorded music sales in France decrease at an average annual rate of 8.2%!

Thirdly, the bargaining power of the various types of music labels (Majors vs. Indies) towards streaming services impact the opinion of artists on free streaming. An artist signed by a Major recording company is more tolerant towards free streaming probably because she knows that her label has negotiated very favorable conditions in revenue sharing with streaming platforms. Making available the catalogue of Major labels, including the vast majority of star-artists, is mandatory for streaming platforms to guarantee their attractiveness. Conversely, artists under contract with a small independent labels are less satisfy with free streaming since it is notorious that they do not benefit from the same advantages. Even artists without contract are more favorable towards free streaming. This can be seen in two ways. The first is that artists with no labels see free streaming as an audience expansion tool and the success they could accomplish in it as a way to help to secure a contract with a label. In

[30] The growth of the revenues generated by live music performances is estimated from the revenues generated by the tax of 3.5% collected on each live music performance organized in France. See: https://www.cnv.fr/.

second place, it is possible that artists with no contract receive a greater part of the income generated by their work in the streaming platforms which leads them to see free streaming in a positive light.

Finally, our results also highlight a generational divide among artists and among consumers. Youngest and newbie artists are more favorable towards streaming probably because they are more sensitive to both digitization as a new standard for the music industry and to the increase in audience that streaming allows. But above all, artists take into account the behavior of their fan base to form their opinion towards free streaming. Since youngest music listeners are over-represented both in streaming users and in electronic and urban music fans, artists who belong to these two musical genres are much more tolerant towards free streaming. They have to make their music available accordingly to their fans behavior.

A possible weakness of the previous analysis is that we are not sure to capture solely the opinion on free streaming. Our measure of the opinion of artists on free streaming could reflect their opinion on streaming in general (free or paid-for). We thus ran a bivariate (seemingly unrelated) ordered probit model that allows us to explain both free and paid streaming simultaneously with errors possibly correlated[31]. As shown in Table A.2 in the appendix the null hypothesis of independence of the two equations is rejected, but our results remain unchanged for free streaming. As far as the opinion on paid-streaming is concerned, it seems to be rather driven by the personal characteristics of the artist than by professional features captured by the independent variables.

To what extent these results can be generalized? Should they be considered specific to France and/or to a specific period of time? Of course, our theoretical framework has been tested solely in the French case. However, since all the hypotheses from our theoretical framework are supported, there is no reason to believe that our results are specific to the French case. France is among the top five recorded music markets worldwide and the French recorded music market is organized very similarly to other Western music markets (US, UK, Germany, …): the market shares of major labels are similar, the star system exists everywhere, in all the markets digital music sales experienced a strong growth and streaming is the main driver of this growth, live performances are in every market the main stream of revenues for artists, … Furthermore, the lower acceptance of free streaming is not specific to France as testified by the statements of the representatives of musicians' federations in the US

[31] An alternative would be to rerun our basic regression with only those individuals whose opinion towards pay-streaming is positive (which is the case for 70% of the artists). The results, available upon request, show that there is no significant difference with the results obtained on the whole sample.

or in UK (see introduction). Thus, although we rely on a sample of French artists, there is no reason to believe that our results are specific to France. The only caveat could be that Deezer, one of the world leading music streaming platforms, was created in France in 2007, before the launch of Spotify in October 2008. French musicians had thus been familiar with streaming platforms for many years at the time of the survey. However, whatever the specific impact it could had have on the opinion of French artists on free streaming services, such a specificity has probably vanished since the share of the recorded music market that is due to streaming services is now close in the three main European markets (UK, Germany and France) and is even greater in the US (see the introduction). Of course, though we believe that the same qualitative effects would be at play in other countries, the magnitude of each effect may vary depending on the specificities of each local market.

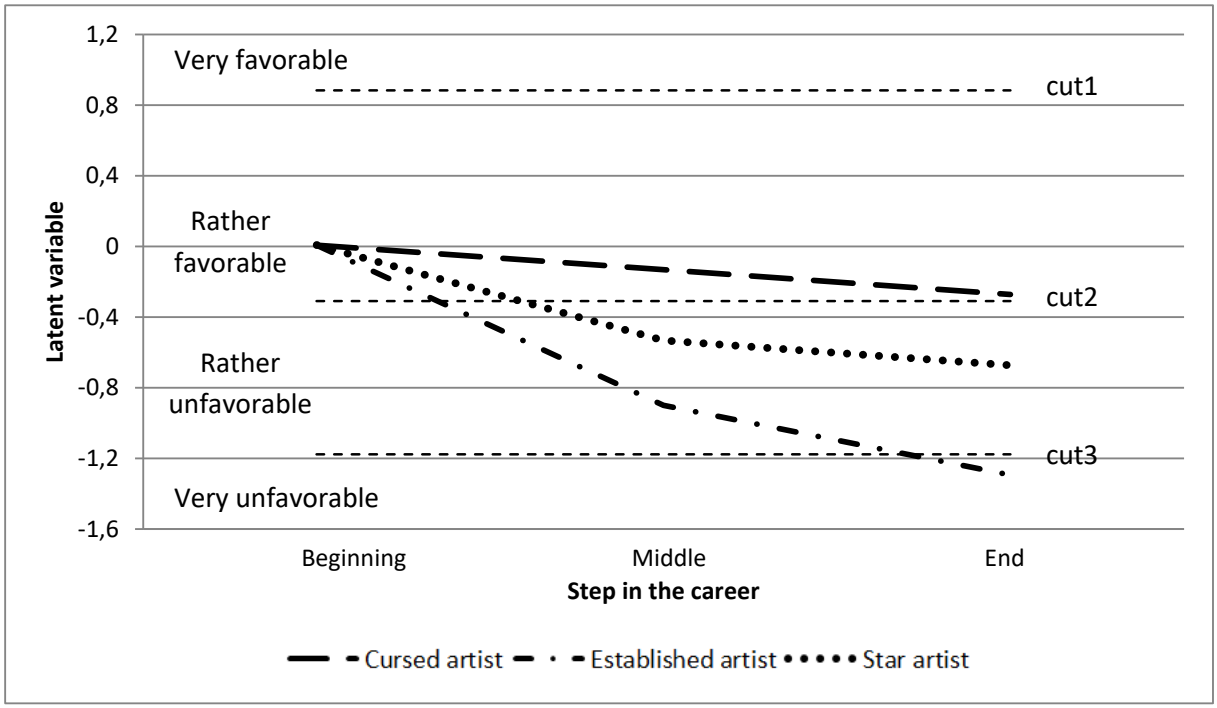
Another limitation could be that our results are specific to the time period of survey. However, in 2014 the French music streaming market was seven years old and hence was not in infancy anymore. If numerous stars who had been refusing to be on free streaming platforms had finally accepted (Taylor Swift, Thom Yorke, Adele, …), the reason was probably that they could not afford to remain out of what is now the core of the recorded music market. That does not necessarily imply that their opinion about free streaming has changed. To study whether the opinion on free streaming depends on the presence on these platforms, we built a dummy (*AVAILABLE*) which takes the value 1 if the music of the artist is available on at least one of the main French streaming platforms at the time of the survey (Spotify, Deezer, Qobuz) and 0 otherwise[32]. Table A.3 in appendix shows that the presence on platforms has no significant impact on the opinion of the artist on free streaming. So, there is no reason to believe that artists who now rejoin free streaming platforms are more favorable to this distribution channel than previously. According to McIntyre (2017), Taylor Swift rejoined Spotify because "*she and her team are smart enough to see how the tides have changed […]. Spotify is simply too large and far too important these days to ignore, no matter what an artist looking to be No. 1 feels about their financial ethos.*" Likewise, although Radiohead's music has gradually made its way back to Spotify, Thom Yorke still declares to be troubled by the streaming platform's remuneration structure (Levine, 2017).

Eventually, can we make any forecast on how the opinion on free streaming will evolve, in particular for the lucky and/or talented newbie artists who will encounter success? To answer to this question, we use our econometric model to predict the value of the latent

[32] We also test a configuration in which *AVAILABLE* includes the presence on YouTube. The results remain unchanged.

variable, and thus the category of opinion on free streaming, for specific values of the covariates (that define several counterfactual scenarios) and at different steps in the artist's career.[33] We start with the average newbie woman artist and imagine three counterfactual scenarios. In the first one (*Cursed artist*), this newbie artist will never encounter success all over her career. In the second counterfactual (*Established artist*), the newbie will not become a star, but will have some success at the middle of her career which will finish by fading away. Finally, in the third counterfactual (*Star artist*), we consider the case of an artist who quickly encountered a large success which will last all along her career.

Figure 1 – Counterfactual scenarios



Note: Each of the three points of these trajectories (Beginning, Middle, End) corresponds to the value of the latent variable deduced from the coefficients of the covariates displayed on Table 5 (see Table A.4 in appendix for details).

Figure 1 displays the predicted value of the latent variable in each of these counterfactuals for the three steps of the career (start, middle, end). Starting with an artist rather favorable to free streaming at the beginning of her career, we observe that in all the scenarios the opinion on free streaming declines. While a cursed artist could still remain rather favorable to free streaming which could be seen as a possible source of promotion all along her career, an established artist would end up with a very unfavorable opinion on free streaming at the end of her career. However, this should not necessarily raise concerns about the sustainability of

[33] Of course, a strong underlying assumption in these counterfactual scenarios is that the opinion of an artist in *N* years will be the same than an artist who is currently *N* years more advanced in her career.

the free streaming since, as already mentioned, the opinion on free streaming seems to be somewhat disconnected from the actual presence on these platforms as illustrated by the still critical opinion of the artists who have rejoined Spotify after a several years period of absence.

6. Conclusion

This paper is one of the first attempts to analyze which factors drive the opinion of artists on free streaming (ad-supported), this opinion being deeply divided among the musicians population. To deal with this issue we use poll-data from a survey about more than 1,100 French professional musicians. Whereas 70% of musicians turn out to have a positive opinion on pay-streaming (subscription), this figure falls to 40% for free streaming. One obvious explanation lies in the low ow of revenues generated by a free streaming user (about 40 times less than revenues generated by a pay-streaming user). Hence what drives the positive opinion on free streaming? Our results highlight four main reasons.

Firstly, streaming, and especially free streaming, stands as a discovery tool that may help consumers to explore the music catalogue beyond stars and already well-known artists. Young artists, newcomers in the artistic career and artists who still not earn more than half of their personal income from their musical activity are more favorable to free streaming. They value more the opportunity to expand their audience than worry about the low revenues they will obtain. Of course, this is the opposite for star-artists who already won a gold record or a main music award. Secondly, the personal business model of each artist matters. Artists whose revenues mainly come from live performances take into account the positive externality that recorded music generates on the live music market. For them, each free-streamer is an opportunity to sell an additional ticket for a next concert. They are thus also more favorable to free streaming. Thirdly, the contractual situation of the artist also matters. All music labels do not have the same bargaining power towards streaming platforms. With their huge catalogue which includes most of the top-selling artists, the three major record companies (Universal Music, Sony Music, Warner Music) are more than essential for any streaming platform. Majors thus obtain very favorable conditions in revenue sharing with streaming services and the artists they have under contract seem to believe that this will be also profitable for them. Conversely, artists signed by small independent labels, which are considered as much less valuable by streaming platforms, know that the revenues sharing will

be much less favorable for them. Fourthly, the opinion of artists is also shaped by the evolution of consumers behavior. Since young music listeners are much more prone to adopt new technologies and hence to use free streaming, musicians who perform musical genres that encounter a huge success among the young audience (i.e. electronic music and urban music) are more prone to accept free streaming. They have no choice but to "follow" their fan base in their new mode of music consumption. This suggest that the acceptance of free streaming could increase in the future with the growing adoption of this new mode of consumption by music listeners.

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Appendix

Table A.1 – Bivariate probit regression results (*FREE* / *PIRACY*)

	FREE	*PIRACY*
GOLD	-0.227***	-0.216**
	(0.0767)	(0.0923)
MUSREV	0.206***	0.160*
	(0.0728)	(0.0865)
CAREER	-0.0704**	-0.0126
	(0.0367)	(0.0439)
STAGE	0.136**	0.0919
	(0.0710)	(0.0852)
MAJOR	0.500***	0.0719
	(0.184)	(0.232)
LARGE	0.0874	-0.461
	(0.220)	(0.312)
SMALL	Ref.	Ref.
NOCONTRACT	0.218**	0.313***
	(0.0911)	(0.110)
ELECTRO_URBAN	0.337***	0.105
	(0.141)	(0.170)
PARIS	0.0293	-0.0436
	(0.0697)	(0.0836)
GENDER	-0.124	0.0922
	(0.0880)	(0.104)
INCOME1	Ref.	Ref.
INCOME2	-0.0270	0.226*
	(0.106)	(0.125)
INCOME3	-0.0662	0.0273
	(0.0968)	(0.114)
INCOME4	-0.136	-0.104
	(0.114)	(0.136)
INCOME5	0.0330	-0.223
	(0.148)	(0.185)
EDUCATION	-0.0533	-0.00989
	(0.0713)	(0.0855)
WEB	-0.152**	-0.164*
	(0.0733)	(0.0870)
ACTIVE	-0.0364	-0.121
	(0.0742)	(0.0878)
Athrho	0.197*** (0.0422)	
cut11	-0.952*** (0.251)	
cut12	-0.0945 (0.250)	
cut13	1.084*** (0.252)	
cut21	0.427 (0.297)	
Observations	1,103	
LR test of indep. eqns. :	chi2(1) = 21.94 Prob > chi2 = 0.0000	

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

Table A.2 – Bivariate probit regression results (*FREE* / *PAY*)

	FREE	*PAY*
GOLD	-0.204***	-0.00607
	(0.0770)	(0.0767)
MUSREV	0.185**	-0.0974
	(0.0731)	(0.0732)
CAREER	-0.0681*	-0.0105
	(0.0368)	(0.0368)
STAGE	0.121*	0.00485
	(0.0712)	(0.0713)
MAJOR	0.496***	0.0340
	(0.184)	(0.185)
LARGE	0.124	-0.0593
	(0.220)	(0.217)
SMALL	Ref.	Ref.
NOCONTRACT	0.178*	0.0159
	(0.0915)	(0.0909)
ELECTRO_URBAN	0.333**	0.0100
	(0.142)	(0.143)
PARIS	0.0351	0.164**
	(0.0698)	(0.0700)
GENDER	-0.139	-0.120
	(0.0885)	(0.0882)
INCOME1	Ref.	Ref.
INCOME2	-0.0538	-0.0602
	(0.106)	(0.106)
INCOME3	-0.0658	-0.00604
	(0.0971)	(0.0973)
INCOME4	-0.133	-0.0836
	(0.115)	(0.115)
INCOME5	0.0515	-0.0307
	(0.149)	(0.150)
EDUCATION	-0.0560	0.00559
	(0.0715)	(0.0714)
WEB	-0.134*	-0.0255
	(0.0735)	(0.0737)
ACTIVE	-0.0266	-0.0883
	(0.0744)	(0.0745)
PIRACY	0.315***	-0.00720
	(0.0684)	(0.0685)
Athrho		
cut11	0.313*** (0.0367)	
cut12	-0.860*** (0.252)	
cut13	-0.00161 (0.252)	
cut21	1.192*** (0.255)	
cut22	-1.569*** (0.256)	
cut23	-0.810*** (0.253)	
	0.529** (0.253)	
Observations	1,101	
LR test of indep. eqns. :	chi2(1) = 72.63 Prob > chi2 = 0.0000	

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

Note: *PAY* is a categorical variable with four categories corresponding to the answers “very unfavorable”, “rather unfavorable”, “rather favorable” and “very favorable” to the question “What is your opinion on the distribution of your music through pay (subscription) streaming platforms?”

Table A.3 – Ordered Probit regression results taking into account availability on streaming platforms

Dependent:	*FREE*	
GOLD	-0.197***	(0.0772)
MUSREV	0.191***	(0.0730)
CAREER	-0.0764**	(0.0372)
STAGE	0.127**	(0.0711)
MAJOR	0.485***	(0.184)
LARGE	0.133	(0.220)
SMALL	ref.	
NOCONTRACT	0.171*	(0.0923)
ELECTRO_URBAN	0.342***	(0.142)
PARIS	0.0397	(0.0700)
GENDER	-0.140	(0.0883)
INCOME1	Ref.	
INCOME2	-0.0539	(0.106)
INCOME3	-0.0656	(0.0971)
INCOME4	-0.120	(0.115)
INCOME5	0.0714	(0.149)
EDUCATION	-0.0520	(0.0715)
WEB	-0.120	(0.0746)
ACTIVE	-0.0158	(0.0747)
PIRACY	0.313***	(0.0684)
AVAILABLE	-0.0782	(0.0728)
cut1	-0.923***	(0.259)
cut2	-0.0542	(0.258)
cut3	1.138***	(0.261)
Observations	1,103	
Pseudo R-sq	0.030	

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

Table A.4 – Definition of the three counterfactual scenarios

Beginning		Middle	End
Average newbie woman artist: not yet signed by a recorded music label, does not yield the majority of her revenues from music, bulk of her music earnings from touring, tolerant towards piracy, did not already earn a music award.	***Cursed Artist***: will never encounter success all over her career.	*CAREER*=3	*CAREER*=5
	Established Artist: will not become a star but will have some success. At the middle of her career, she will make her living from music, she will be touring a lot, will get a contract from a large independent label, will win a music award, and consequently will be less tolerant toward piracy. At the end of her career however, her success will not remain high enough to keep her contract with a large independent label (she will sign with a small independent label) and her live music revenues will decrease a lot.	*CAREER*=3, *GOLD*=1, *MUSREV*=0, *LARGE*=1, *PIRACY*=0	*CAREER*=5, *SMALL*=1, *STAGE*=0
CAREER=1, *GENDER*=2, *GOLD*=0, *MUSREV*=1, *NOCONTRACT*=1, *STAGE*=1, *PIRACY*=1; all other covariates at their mean.	***Star Artist***: will quickly encounter a large success and will benefit all along her career from a contract with a major music label, a steady success on stage and the recognition by the public and her peers through gold records and music awards.	*CAREER*=3, *GOLD*=1, *MUSREV*=0, *MAJOR*=1, *PIRACY*=0	*CAREER*=5

Note: Only the variables which value has changed from the previous step are displayed in the “Middle” and “End” steps.