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THE ECONOMIC IMPACT OF MUSIC STREAMING

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Abstract. Streaming has established itself as the predominant model for music distribution. It brings undisputed benefits through its global outreach and appeal, speed and convenience, and innovative revenue-generating potential. These benefits are, however, not distributed equally among the stakeholders. The issues of revenue distribution, pricing, transparency, metadata, overall industry effects, and impact on consumption, among others, are posing serious questions about the efficiency of the streaming model and its overall impact on the music industry.

The article reviews the literature and stakeholder views on this topic and analyzes the various economic and non-economic effects of streaming to provide a balanced overview of music streaming. It discusses the elements to be considered in a robust policy on streaming and provides recommendations for a more sustainable growth model for the music industry. A key element in this policy remains the balanced copyright framework, which needs to address the interests of the various stakeholders in music.

The research methods used in this article are a comparative analysis of business practices and data, a review and analysis of legal and stakeholder initiatives, a comparison of existing theoretical and practical approaches in the economic, legal, and business literature, and research on the topic.

The research findings point to several inefficiencies in music streaming in its current form and frame the question of whether the problem is in the music streaming model or its current application.

Keywords: streaming; economic efficiency; copyright

JEL: O31, 034, L82

Introduction

In recent years, music streaming has become the dominant form of distribution and consumption of recorded music. Nowadays, over 713,4 mln. people around the world use streaming services to listen to their favorite music. Revenues from streaming services have increased 15 times in the last decade. The music streaming market is projected to reach 29,6 bln. USD by the end of 2024, with an annual

growth rate of 4,7% (CAGR 2024 – 2027). By 2027, the music streaming market is expected to reach 1,1 bln. users, with a music penetration rate increased to 14,1% worldwide. The available data suggests that streaming has become the most profitable part of the music business, way beyond revenues from digital downloads and physical formats (Statista 2024).

Several significant reasons can explain the attractiveness of music streaming. *First*, this access model provides a much higher supply of content – the millions of titles available through streaming can not be matched by any other format, and the potential of streaming in this regard is virtually infinite. *Secondly*, streaming services are generally cheaper than downloads and physical formats. Moreover, some streaming services provide free music access under certain conditions. This is a significant advantage for users, especially the younger generation, who seek more economically attractive propositions. *Thirdly*, streaming enables users to enjoy more freedom and exercise greater control over what they listen to, in what order, and choose the right access model to the content. Consumers can mix songs from different albums, genres, and artists to easily create their own personalized listening experience. *Fourthly*, streaming has proved to be rather user-friendly - it can be accessed on different devices, offering the necessary portability, which is unavailable through other formats. *Finally*, through the dramatic reduction in the cost and difficulty of distributing music, streaming platforms have allowed more artists to reach audiences without needing label support. According to research, the shift to streaming has led to a 5% increase in the number of new artists entering the market each year (National Bureau of Economic Research 2020).

In summary, streaming provides several economic, business, technology, and consumer advantages, contributing to its dominant role in today's music distribution market. While the benefits of streaming have been widely discussed, much less attention has been paid in the literature to some of the adverse economic effects associated with music streaming as a way of monetizing creative outputs. This article aims to demonstrate some of the financial and non-economic impacts of streaming on the music ecosystem and identify the issues that need to be addressed.

Literature review

The economic impact of music streaming on artist compensation and industry structure has been a subject of increasing scholarly attention in recent years. Several dimensions can be identified in existing research.

The **first group** looks into streaming as a technology solution that revolutionizes the music industry. Singer and Rosenblatt provided a solid background for understanding the revolutionary nature of streaming and its place in the evolution of the music ecosystem (Singer & Rosenblatt 2023). Mhlambi and Nxozi review the digital transformation in the music industry and its dynamics in the broader context of digital disruption in music (Mhlambi & Nxozi 2024). Tschmuck analyzed the

economics and value chain of digital music and the role of streaming as a driver of change (Tschmuk 2021). Karhumaa reviewed music business management in a streaming-dominated landscape, providing a good context for understanding industry-focused interventions (Karhumaa 2024). N. Lupone integrated quantitative analysis with qualitative insights from previous economic literature and industry perspectives and contributed to understanding the interaction between digital disruptors and traditional market dynamics (Lupone 2024). These studies highlight the complex nature of streaming economics and its impact on the music industry.

The **second group** of academic research focuses on the issue of the practical impact of streaming on artist remuneration. There are two distinct dimensions in the literature examining the impact of alternative payment models on music industry stakeholders - one theoretical and one empirical.

Dumont analyzed the consequences of the pro-rata distribution model leading to cross-subsidization between low and high streaming users, streaming fraud, and inequity in compensation for artists (Dumont 2018). Page and Safir studied which artists would benefit from the implementation of a user-centric model based on the characteristics of the individual artists' audiences. According to this research, listening intensity and concentration are key in deciding which remuneration model to choose – a pro-rata or a user-centric payment model (Page and Safir 2019). Theoretical studies focus on the role of users' behavior when assessing and determining the optimal revenue-sharing allocation strategy.

Brynjolfsson suggested that people substitute zero-price online services for goods with a positive price. As a result, the total contribution of these services to GDP figures may decrease even while consumers get access to better-quality digital goods (Brynjolfsson et al. 2018). This research is essential in understanding behaviors and the prospects of different pricing models in streaming.

Aly-Tover analyzed the benefits of streaming for smaller artists. While smaller artists may not have as much leverage with providers as prominent artists, they can still find benefits from having their music on streaming services. Small artists do not expect significant revenue from streaming and use primarily free services to develop their fan base (Aly-Tover et al. 2020).

Gupta and Agrawal posed fundamental questions on the distribution of streaming revenue between artists and Digital Service Providers – DSPs (Gupta and Agrawal 2024). Carter has provided interesting insights on how contractual arrangements in streaming affect the various stakeholders and market players and how industry growth seems to mismatch artiste compensation realities (Carter 2024).

Lupone carried out a detailed empirical analysis based on Spotify's impact on the music industry, focusing on the change in consumption and distribution patterns (Lupone 2024). Leid reviewed the relationship between streaming platforms and content creators and indicated Spotify's role in revitalizing the music industry while potentially undermining artists' economic stability (Leid 2024). Jensen analyzed the

structure of music royalties about the platform economy and formulated proposals on alternative distribution models. This is an essential contribution to the discussion on the economics of streaming (Jensen 2024).

Mazziotti and Ranaivoson developed interdisciplinary research on the principles of engagement and participation of music platforms in the online music value chain. This work indicated the importance of applying mixed methods in the analysis (Mazziotti & Ranaivoson 2024). Clow explored music valuation, artist remuneration, and intellectual property rights using the example of Taylor Swift (Clow 2024). The role of the artist and Taylor Swift's arguments have also been studied by Zehr, who provided empirical evidence that does not support some of the prevailing artiste arguments (Zehr 2021). Of particular importance is the work of Ramesh, who provides empirically based conclusions and suggestions on dealing with the issue of flawed compensation models based on streaming (Ramesh 2024).

The **third group** of academic research focuses on the problems associated with streaming as a game-changer regarding consumer demand and actual consumption of music products. Wlomert and Papies were among the first to analyze streaming services as a substitute for ownership. They stated that consumers may buy less music over time after becoming more accustomed to streaming services (Wlomert and Papies 2016). Aguiar and Waldfogel researched at the country level and found that growth in streaming reduced sales of albums and that an additional thousand streams depress sales revenue by 1.76 USD (Aguiar & Waldfogel 2018). This group of research papers suggests that free music takes away consumers from music ownership but also points to a larger group of factors that need to be considered.

Nguyen found evidence that streaming could bring consumers to the live music market (Nguyen et al. 2014). Live music is a considerable and growing source of income for musicians, and the transfer to the live music market would represent a gain for the industry (Krueger 2019). Zehr suggested that streaming increased revenue in the live music market and could compensate for some of the potential losses and provide benefits to all artists (Zehr 2020).

1. Streaming and the music market today

Data and research from major stakeholders in music confirm the upward trends in music streaming penetration and importance.

The annual report of the International Federation of the Phonographic Industry (IFPI) states that in 2023, the streaming share of global revenue was 63,7%, with growth in subscription streaming revenue of 11,2% (IFPI 2024 Global Music Report). Streaming accounts for two-thirds of the worldwide music market, and this format's growth has been uninterrupted for over 10 years. Physical formats represent only 17,8% of the global market, and live performances 9,5%. This global report is a testimony to a significant shift in the industry away from ownership to an access model. Regional and national data confirm this trend. According to

data from the Recording Industry Association of America, RIAA in the US alone, streaming has contributed approximately 84% of total revenues for the fifth year, with paid subscriptions outpacing other types in this category. During this period, revenues from paid subscription services grew 4% to $5.7 billion, accounting for 78% of streaming revenues – nearly two-thirds of total mid-year revenue (RIAA, 2024).

CISAC 2024 report suggests that in 2023, music collections for authors and composers amounted to 11,8 bln. Euros and 39% came from a digital format, followed by 29% from radio and TV, 26% from live performances and background music, and only 3% from CD, synchronization, and other forms of usage (CISAC, 2024 Report). In the next 5 years, the digital share is projected to rise to 44%, while radio and TV share will drop to 22%, and live performances and background music will grow to 27%. The weighted cannibalization rate from music streaming is expected to be the highest – 30% (CISAC 2024).

According to Will Page, former chief economist of Spotify and PRS, in 2023, the global value of music reached 45,5 bln. USD (Page, 2024). This figure is much bigger than the numbers provided by the IFPI on recorded music and CISAC on authors' and composers' income. The total is composed of 28.5 bln. USD in recorded revenues, 12.9 bln. USD in collective management organization collections, and 4.2 bln. USD in direct publisher income. 63% of the total income generated by music goes to artists and labels, and 37% goes to songwriters, publishers, and their CMOs. Label income growth of 12% was driven mainly by streaming (up 10.4%). This report confirms the impressive dynamic effects of streaming leading up to further growth of the music market.

The streaming market has been dominated by Spotify, the biggest streaming platform with over 30% of the market share, followed by Tencent Music, Apple Music, Amazon, and others.

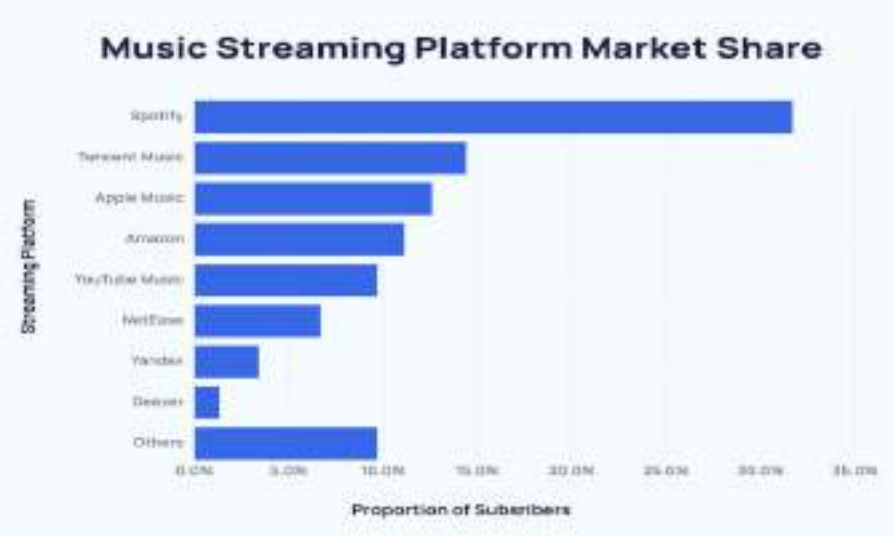

Figure 1. Music streaming platforms' market share

Source: Statista 2024

The available data points to several conclusions:

First, streaming is already well established and currently the dominant format for music distribution, adopted by all regions.

Second, this trend is likely to stay as other formats are either decreasing or marginally increasing, and one develops at the expense of others – while radio and TV income drops, there is an increase in revenue from live performances, while publishing income and synchronization stays stable.

Third, competition in the market is intensifying, and while Spotify still dominates the market, we should not exclude new dynamics in the years to come. Innovation remains the key competitive advantage for creative enterprises in all fields (Aleksandrov 2024; Krushkov, Zayakova-Krushkova 2024).

2. The Economics of streaming

Modern streaming services such as Spotify, Apple Music, Tidal, and others represent a culmination of two decades of cutting-edge technological innovation. They were a logical development and evolution, building on the lessons learned in the complex relationship with P2P and the illegal downloading of music files, which seriously affected the industry and halved its volume.

Streaming can be considered from different perspectives.

It is a technological process that represents data transmission by a server application—received and played back in client applications without needing

permanent storage on a user's device. The receiving applications buffer data and can play it as soon as enough data has been transferred.

Streaming is also a service that provides music at a zero marginal cost for users while relying on libraries of millions of songs. Streaming is a renting model, which can provide an advantage to providers and artists as it eliminates resale and piracy of music.

Streaming is a business model built on the potential of the technology to deliver content directly to consumers. Within streaming are available free and subscription-based models. Free streaming services have functional differences, such as limited skips and automatic shuffle mode (meaning consumers cannot choose which song to listen to). Free services also do not let consumers download music, meaning they cannot listen to music offline. Subscription-based services have the same music library as free streaming services but allow total user freedom from interruption and have advanced features such as downloadable music, unlimited skips, and personalized playlists.

From a copyright perspective, streaming represents an access model where the user is not obtaining ownership rights over the content but only access rights. The fact that royalties are being paid from streaming services suggests that it is a model whereby remuneration for the use of the underlying property is envisaged. However, streaming services do not pay artists directly. Instead, they pay rights holders such as record labels, publishers, and collecting societies. These entities then distribute the royalties to artists based on their contracts and the royalty distribution scheme in place.

As mentioned, the largest consumers of digital music through streaming are young people, who are primarily price-sensitive. They tend to avoid buying music and prefer a subscription model due to the lower price per song. An ownership model becomes less appealing with increased consumer price sensitivity (Li et al. 2020).

Streaming is closely related to the overall impact of digitization in the creative sector. The effect of digitization on creative product markets has been characterized as a "long tail" effect. Online retailing gives consumers access to a long tail of low-demand products unavailable at their local stores. This represents a welfare benefit made possible by digitization that could be called a "long tail in consumption" (Waldfogel 2020). Given the unpredictability of product success at the time of investment, Waldfogel established that change in consumer surplus associated with the tripling of the rate of new product introduction after digitization gives rise to a welfare benefit twenty times the size of the standard long tail.

Another important aspect of digitization that streaming makes use of is the enabling of individual product creation. Before digitization, artists sought investments from record labels. Without record deals, an artist could not perform on a large scale. Digitization allowed individuals to produce music using affordable

hardware and software tools and to distribute it via streaming services, thus breaking the need for expensive promotion and distribution. This is one of the reasons for the exponential growth of music uploaded to streaming platforms. According to CISAC data, the approximate average number of tracks uploaded to DSPs each day is 143,000 (2024), 125,000 (2023), and 100,000 (2022) (CISAC and PMP, 2024).

The streaming model has been controversial in the industry since its inception and received criticism from different stakeholders. Most vocal have been superstars who received much lower remuneration from this service than anticipated.

Streaming did not have an immediate positive effect on the music industry. Initially, it decreased profits in the industry as a whole, but then the sector adjusted and managed to increase its returns from this new consumption model. Streaming services benefit different stakeholders by increasing music discovery, attracting consumers to other areas of the music market, and positively combating music piracy (Zehr 2021).

Music platforms have an important role in the music ecosystem as they lower the entry barriers for independent artists, increase visibility and reach through algorithms and curated playlists, and offer monetization opportunities by creating a new revenue stream with streaming royalties. They offer access to data and analytics, community and networking and encourage creative freedom. Consumers have benefitted from access to large catalogs of music at lower prices, using innovative services such as higher quality audio, view video content, and synced song lyrics.

Streaming platforms perform the functions of intermediaries in the music value chain. They usually do not pay artists to contribute their songs to the platform directly. Instead, once they stream a recording, they pay part of the sales to other intermediaries, each of whom takes a percentage before paying the artists.

The most important part of the music streaming chain – how money moves from the intermediaries to artists – is also the least transparent part of the distribution process. Record labels pay artists under the terms of their contracts, but they are subject to non-disclosure agreements (NDAs). These agreements are complex, if not impossible, to audit.

Streaming can improve the efficiency of the collection and distribution of royalties. Currently, the system of agreements often results in delayed payments when it can take months for royalties to reach artists. CMOs arrangements on web of rights and royalty calculations are sometimes non-transparent to artists. Finally, CMOs still use sampling methods based on radio and TV play to estimate royalty distribution, which can favor established artists and misrepresent actual streaming data.

3. Economic effects associated with streaming

While streaming brings multiple potential benefits to the stakeholders in the music industry, these benefits are not equally shared and accessible to all players.

Here are some of the main areas where streaming does not seem to result in economic efficiency:

3.1. Revenue growth, distribution, and pricing

The value of streams

An efficient model is one that helps grow profits from the service. However, over the last decade, there has been a decrease in the Average Revenue Per User (ARPU) from streaming. The following table provides an overview of the dynamics of the ARPU on the different platforms and the prevailing business models they use.

Table 1. Data on Average Revenue Per User (ARPU) for music streaming on major platforms (in USD)

Platform	ARPU (2024)	ARPU (2022)	ARPU 2020)	Region/ Type	Monetization model	Sources
Spotify	4.40 – 6.84	4.26 – 5.77	5.12 – 6.20	Global average	A mix of premium subscriptions (~45% of users) and ad-supported tier; regional pricing for affordability.	Spotify Annual Reports MIDiA Research Musical Pursuits Spotify Statistics 2024: User, Growth, and Revenue Statistics
	6 – 8	6.50 – 7.50	7 – 8	North America & Europe	High premium adoption, especially in Western Europe and the U.S.	Spotify Annual Reports MIDiA Research
	1 – 2	1 – 2	2.50	India	Focuses on freemium model; localized pricing and partnerships with telecoms.	Spotify Annual Reports Musical Pursuits
Apple Music	8 – 10	9 – 10	9 – 10	Global premium	Premium-only model; emphasizes exclusive content and seamless integration with Apple ecosystem.	Apple Annual Reports MIDiA Research Apple Music Statistics By Revenue, Listeners, and Market Share

Platform	ARPU (2024)	ARPU (2022)	ARPU 2020)	Region/ Type	Monetization model	Sources
Tidal	8.76	8.60	8.50	Global premium	Appeals to niche high-fidelity audio audiences with premium and „HiFi Plus“ tiers.	Tidal Financial Report Musical Pursuits https://headphonesaddict.com/tidal-music-statistics/
YouTube Music	2 – 3	1.80 – 2.40	2.00	Global average	Free tier monetized by ads; offers Premium tier for offline listening and an ad-free experience.	Alphabet Inc. Annual Report MIDiA Research
	<1	<1	~1	India & Emerging Markets	Relies heavily on ad-supported users; Premium tier adoption is low in price-sensitive regions.	Alphabet Inc. Annual Report Musical Pursuits
	5 – $6	1.20 – 2.00	1.10 – 1.50	North America & Europe	Gradual growth in Premium subscribers due to Google ecosystem integration.	Alphabet Inc. Annual Report Musical Pursuits
Tencent Music	1.50 – 2.50	6.50 – 7.50	7.00	China	The ad-supported model is supplemented by unique revenue streams: virtual gifts, tipping, and karaoke features.	Tencent Holdings Annual Report Tencent Music: monthly ARPPU by service type 2024 | Statista Music streaming continues to explode in China - Tencent Music Q4 and full-year 2023 results MIDiA Research

Platform	ARPU (2024)	ARPU (2022)	ARPU 2020)	Region/ Type	Monetization model	Sources
Amazon Music	6 – 8	5.50	6.00	Global	Drives subscriptions through bundling with Amazon Prime; offers ad-supported free tier and HD music options.	Amazon Annual Report Musical Pursuits
Deezer	5 – 7	3.00	3.50	Global average	Subscription-based model similar to Spotify; localized pricing strategies in Europe and Latin America.	Deezer Annual Report Deezer Q3 Earnings
Pandora	2 – 3	<1	<1	United States	Dominated by ad-supported free tier; Pandora Premium (subscription) adoption is growing slowly.	SiriusXM Annual Report Dan Rayburn - StreamingMedia-Blog.com
Gaana	<1	<1	<1	India	Ad-heavy revenue model; limited Premium adoption in price-sensitive markets.	Times Internet Financial Information Musical Pursuits
JioSaavn	<1			India	Freemium model relying on ad revenue; telecom-backed discounts for Premium tier.	JioSaavn Financials Musical Pursuits

Source: compiled by the author

The first conclusion that this table suggests is that on most streaming platforms the ARPU has fallen over time, which means that artists are getting less as the total income per user decreases. Of course, this set of data needs to

be interpreted together with data on increased volumes of music streaming. Other considerations that need to be taken into account in the interpretation of data are the platform strategies to grow market shares, enter new markets with lower purchasing power, promotions seeking longer-term benefits, competitive pressures, etc.

The second conclusion is that ARPU is considerably higher, whereas paid and premium services prevail. This means that business models based on advertising revenue are not likely to be sustainable. The fact that Spotify became profit-making only in 2024 clearly shows that the conversion rate to paid subscriptions has not been sufficiently pronounced. If the predominant streams are based on add-revenue and are not generating sufficient profits, then the streaming model, in the long run, cannot be sustained in its current form.

There are important limitations to streaming. One is the natural limit of the consumer time budget. There are only 24 hours a day, and this cannot be increased. While music is consumed more and more everywhere, there are natural limitations. If subscription levels are flat and not growing sufficiently in recent years, then the question is whether streaming is the model of the future. According to MiDiA, in 2023 and 2024, there were early signs of a slowdown in streaming music consumer behavior. Spotify and YouTube Music were the only leading DSPs to experience weekly active user growth between Q2 2023 and Q2 2024. All other DSPs saw declines over the period. From Q3 2022, all DSPs experienced flattening or declining growth" (Mulligan 2024).

Revenue distribution

From their inception, streaming platforms have been criticized, mainly by artists (both small and established ones), about their compensation levels. The majority of artists today can't profit from streaming revenues only. On-demand streaming services undermine sales of digital files and physical media and are not a financial model that can sustain musical careers.

Following this criticism, several governments have commissioned investigations into this matter. The Digital, Culture, Media and Sport Committee (DCMS) of the United Kingdom conducted a review of the economics of music streaming. It published a report in September 2021 and a follow-up report in January 2023. The UK's Competition and Markets Authority (CMA) undertook a market study into music and streaming services and published its report in November 2022. These reviews concluded that performers are not currently entitled to a fair split of streaming revenue, deeming this unfair considering the marginal costs of production and distribution associated with digital consumption. The CMA similarly found that the split in streaming revenues between songwriters and publishers may be sub-optimal, particularly for songwriters, due to challenges in negotiating increases, but determined that competition policy is not the right tool to reach an optimal split (CMA 2022).

Empirical research by Ramesh published in 2024 found that:

– the top 1% of artists accounted for 78% of all streams and 83% of streaming revenue in 2023. The average *per-stream* rate across major platforms was $0.004 with considerable variations.

– 90% of the artists in this survey reported that streaming accounted for over 50% of their music-related income, up from 30% five years ago.

– 68% of artists stated that their overall income from music had decreased since the shift to streaming dominance.

"These findings confirm that the "superstar economy" effect is well seen and has been aggravated by streaming. A few top artists receive a disproportionate share of revenue" – states Ramesh. He considers this concentration more pronounced than in the pre-streaming era (Ramesh 2024).

A recent study commissioned by the German collecting society GEMA shows that only 15% of the net revenues from the German music streaming market goes to the song (then split between authors and publishers). In comparison, 55% goes to the recording side/ neighboring rights (42.4% to labels and 12.7% to performers), and streaming services retain 30% of the subscription fees (GEMA 2022). Sustainable management constitutes a strategic choice for the 21st century (Stoyanova 2024). However, in the new streaming reality, defining a sustainable strategy from an artist's perspective is rather challenging.

The need for addressing the issue of fair remuneration has led to proposals in some countries to introduce a new remuneration right that would grant performers the right to receive at least a portion of streaming income allocated to their recordings through the collective licensing system at industry standard rates (European Composer and Songwriter Alliance report, 2023). The Council of Music Makers has suggested that all featured artists receive a modern, minimum digital royalty rate, with unrecouped balances written off after a term, on a rolling basis, without additional conditions (CMM, 2023).

Pricing

While streaming is an advanced technological solution, the question remains whether it provides a more realistic and market-oriented pricing model.

The per-stream royalty rates on some platforms are rather low, which forces artists to rely more on touring, merchandise sales, and other revenue streams to make a living. This is particularly true for musicians who are not mainstream.

Some artists have spoken out about these issues, notably, Taylor Swift, who openly criticized streaming services. She removed her music from Spotify in 2014, arguing that the platform's royalty rates were too low. She later returned to streaming services after negotiating better terms. In her editorial article published in The Wall Street Journal she wrote:

"Music is art, and art is important and rare. Important, rare things are valuable. Valuable things should be paid for. Music should not be free, and I

predict that individual artists and their labels will someday decide an album's price point. I hope they don't underestimate themselves or undervalue their art" (Quote from Zehr 2021).

For many years, the prevailing payment model in music has been the pro-rata model. It suggests that all user's monthly subscription fees are pooled, and each rightsholder receives a payment proportional to their share of the total number of streams. Page and Safir concluded that, as a result, intensive music listeners have a disproportionate influence over the distribution of revenues compared to users who use the service less, even though all users pay the same monthly subscription fee (Page and Safir 2019). This system encourages a "winner takes it all" approach and limits cultural diversity. A French National Music Centre study showed that today, 30% of intensive streaming listeners generate 70% of total streams and, therefore, dictate where 70% of the money goes. This model encourages manipulation and fraudulent practices on streaming platforms, known as "fake streams" (Rosenblatt 2023).

New payment models have been proposed, such as the *user-centric* payment system (UCPS) and the *artist-centric* payment system (ACPS). The UCPS model prescribes that a user's monthly subscription fee is only distributed to the songs a user has listened to. This model was first implemented by SoundCloud in March 2021 (Maureau et al. 2024).

The uncertainties surrounding the consequences of the user-centric payment model have led to propositions of a range of other payment models. While the pro-rata model is flawed, the user-centric payment model "*is not the answer either as it creates a different set of imbalances*" (Maureau et al. 2024). Probably against this background, Spotify announced in late 2023 that they are moving away from the status quo payment model and will implement changes that reallocate revenues away from "functional noise recordings," fraudulent and "artificially inflated streams," and songs with <1000 streams per year. The intention behind this focuses on incentivizing "professional artists," addressing fraud, and reducing the platform's operational costs.

In September 2023, the music streaming platform Deezer and Universal Music Group also started exploring an "artist-centric" model. This model also reallocates revenues to "professional artists," defined as those with a minimum of 1000 streams per month by a minimum of 500 unique listeners. The model includes features such as double payment to streams by songs recorded by professional artists *and* to all streams not initiated as part of an algorithmic recommendation sequence. This model also involves a "streaming cap" for individual users so that the weight allocated to specific streams will be gradually reduced for users who stream >1000 streams per month. The artist-centric model seeks to favor professional artists (Moreau 2024) and could potentially bring benefits to lesser-known artists to get exposure to large audiences on streaming platforms.

Regarding payment systems, it must be noted that the models described above cannot solve the problems of different stakeholders automatically. Demand and compensation also depend on such factors as:

– the placement of the music on playlists,
– platform generated algorithmic recommendations,
– the popularity of different genres,
– frequency of releases by the artist,
– the status of the artist – associated with label or independent.

The compensation also depends on the existing copyright legislation. Practices vary regarding the revenue split between music streaming services, labels, songwriters, and recording artists. Several countries have legislated for performers' rights in music streaming.

– The copyright laws of Germany provided for these rights earlier than most other EU countries.

– Italy, Spain, and the Netherlands have amended existing laws to require that the principles of good faith, transparency, and proportionality are upheld in remuneration negotiations.

– In France, creators and industry representatives have negotiated an agreement for a minimum remuneration guarantee for streaming (DCMS report 2023).

3.2. Transparency

The digital music business involves many components which are not very transparent. These include the business models of each streaming platform, the method of calculating and distributing streaming income, the methods of reporting and processing payments by labels, distributors, publishers, and collecting societies, the fees charged by third parties that are involved, and the databases which are used to process music royalties. Without this information rights management cannot be effective.

Recently, two issues have come to the front of the discussion on transparency – playlists and algorithmic recommendations.

Playlists and algorithms play an important role in music streaming. They support music discovery, provide recommendations, and shape customer profiles. Algorithms and playlists influence music listening experiences in various ways. However, these tools remain obscure for music creators and fans. This lack of transparency poses questions regarding discoverability and cultural diversity. Their products are difficult to find for less famous artists if they are not on the playlist. Their music may also be categorized automatically into a genre that does not reflect the creator's intentions correctly. This shapes the cultural offering and puts it into a framework that is not conducive to diversity and innovation.

The algorithms used by streaming operators are based on individual listening habits. It is reasonable to assume that the platform uses music to profile its

users and sell them as data to third parties. These are often packaged offers – playlists are adjusted to activities and moods and combined with data on genre preferences, age, gender, geography, language, and streaming habits, as well as information about broader interests and lifestyle and shopping behaviors. The algorithm also impacts the consumers. It profiles each user within a demographic profile.

In other words, the business model is not based on music but on technology-supported information exchange (Hajis 2020).

Algorithms have a logic component, which specifies the knowledge to be used in solving problems, and a control component, which determines the problem-solving strategies by means of which that knowledge is used. It can be represented as a mathematical function where each possibility of action triggers an appropriate response. In the case of music streaming, the software makes profiles of each song and then the algorithm, based on that information, makes recommendations to the user that come close to that profile.

The categorization of the music is not done by humans and is automated. Spotify and other platforms outsource the task of analyzing each song to the Echo Nest company (currently owned by Spotify). Echo Nest is a music intelligence and data platform that generates its data through machine listening/computer extraction of data, incl. web crawling, data mining, and digital signal processing techniques. Their software analyzes a song in a few seconds and processes the signal into thousands of unique segments, including timbre, beat, frequency, amplitude, vocal syllables, notes, and other computer-measurable characteristics (GitHub https://github.com/echonest).

Consequently, the streamed song's success depends on how the relevant software can process the data it contains. One of the consequences is that creators start creating works that the software would best recognize.

Algorithmic curatorship could also be considered as a control mechanism: it is computationally objective, and at the same time, it over-subjectivizes consumption. This has some potential policy repercussions.

The 2023 DCMS research into the impact of streaming services' algorithms on music consumption found that evidence proving or disproving whether these technologies embed, amplify, or introduce unfair biases is mixed and, at times, inconclusive. The report made several suggestions for streaming services to improve transparency around algorithms for consumers and creators (DCMS report 2023).

While it is difficult to legislate or regulate many of these aspects, the only way forward may be to encourage voluntary industry practices. A good example is the new UK Voluntary Code of Practice on Transparency in Music Streaming, published in January 2024. The code addresses the complexity of licensing models, usage data processing, and reporting royalties while maintaining

legal constraints related to confidentiality, data privacy, and competition laws. Twelve trade associations, membership organizations, and collecting societies have signed on behalf of their members (https://www.gov.uk/guidance/uk-voluntary-code-of-good-practice-on-transparency-in-music-streaming). However, given that non-compliance would not constitute a breach of legislation or relevant contracts, the impact of the new Code is uncertain.

4.3.Metadata

The metadata is crucial for proper rights management, identification of music content, and its due distribution. Now that Big data is coming increasingly into play music files can not travel without their digital passports and attributes. In the context of streaming, metadata appears as the object of transactions. It comes with several caveats – data identification, encryption, standards, and interoperability.

The development of professional standards has never been an issue. The question is which one will be adopted by the industry and gain acceptance. To the extent to which this is a privately dominated industry the standards can not be imposed. They need to reflect a level of understanding and acceptance within the industry. Hence, voluntary practices are again of crucial importance. Metadata is also an area where voluntary industry practices can be most efficient. The UK has recently adopted such a commitment by industry signatories to improve music streaming metadata in the UK over two years by gradually improving metadata in new recordings and ensuring consistent crediting on streaming services; ensuring a core data set is associated with all new recordings; promoting good practice; and establishing expert working groups on education and technical solutions (https://www.gov.uk/guidance/uk-voluntary-code-of-good-practice-on-transparency-in-music-streaming).

The code does not guarantee that the necessary data will be provided. However, if properly embraced by the industry, it will move things in the right direction. Especially if the impact of this code is closely monitored and targets are set for everyone to meet (Council of Music Makers, The Economics of Music Streaming, 2023).

To ensure a fully functioning streaming business, the industry needs to ensure that when recordings are provided to streaming services, all the music-makers involved in a track – including songwriters, session musicians, and studio producers – are fully credited. In this respect, the industry must commit to providing all necessary metadata, such as the International Standard Musical Work Code (ISWC) and the International Standard Recording Code (ISRC), with each new recording as it is delivered to the DSPs. The metadata should also identify the song in each recording using the industry's unique identifier for songs, the ISWC.

Currently the data provided with the ISWC on with new recordings does not identify songwriter and publishers (other identifiers will need to be applied to

get this information). This means that the music-maker's moral right to attribution is infringed. For songwriters, it may result in significant delays to payment, or no payment at all.

4.4. Consumption

Within streaming platforms, playlists have become the main vehicle for song consumption and represent the bulk of streaming music consumption. As convenient as they may be, there are significant downsides to music consumption.

First, the playlists promote the notion that music is something to listen to tangentially and not with complete attention, something light that cannot be very demanding, so music becomes synonymous with superfluous. The CEO of Spotify, Daniel Ek, has said: "soundtrack your entire day, then your entire life" (Eriksson et al. 2019), i.e., music is becoming a background and losing its important social and cultural functions.

Second, playlists develop a very passive attitude towards consumption. Some researchers call this "zero-button user interface", where the software places the music that the user "wants to hear" without the need for any actions like going to a music store, seeing physical records, considering which one to listen to, purchasing, ask for recommendations, etc. This passive attitude is further nurtured by the abundance of curated playlists

Music streaming platforms offer curated playlists tailored to specific moods and activities. These mood playlists provide a new listening experience requiring minimal user intervention. A recent report from CISAC and PMP Strategy published in November 2024 revealed that end-consumers on streaming platforms increasingly gravitate towards passive music - listening, driven by convenience, personalization, and discovery. The study suggests that in the top 100 Spotify playlists in terms of subscribers, 41% are considered as functional/ mood playlists, favoring passive listening (CISAC Study, 2024).

Third, the consumption is governed by data-driven decision-making. Data analytics is the main source for understanding consumer behavior. This approach influences decisions about an artist's image, branding, and the type of music they create. Artists feel more pressure to conform to what the data suggests is popular rather than following their creative instincts. On the other hand, the consumer is led to believe that this is what they like, based on the popularity, which is again communicated through the platforms as opinion builders (Gantchev 2024).

Fourth, streaming enables users to choose to listen to specific tracks. Even if this is monetized, the micro-payments generated by each stream are, in a way, devaluing the music itself because people would not appreciate the album as a concept. The single-oriented nature of streaming encourages artists to move away from conceptual albums and focus on creating hit singles. The result is that songs are now viewed as the central music product and not as part of a

larger artistic expression. Traditionally albums offered a unified listening experience that goes beyond individual songs. Unfortunately, this is no longer the case, which, at least to some extent, can be attributed to streaming.

In the digital age the abundance of creative content creates a huge oversupply. Music supply is everywhere, accompanied by short-form social media content. This leads to much shorter life cycles for music and listeners have shorter attention spans. A logical consequence is that we see more quantity than quality. Artists strive to maintain a strong social media presence to engage with fans and promote their music. They maintain a certain image, blurring the lines between public personal and private life. The consumer feels a direct connection with the artist which stimulates further demand.

Streaming numbers have now become a measure of success. This leads to a new culture where artists are judged by their play counts. This reduces the overall artistic expression, creativity, and human aspects of the music-making process. Moreover, based on streaming analytics, the speed of change on the chart positions puts even more pressure on creators. The evolving roles of traditional industry players and the emergence of new intermediaries highlight the need for artists to develop diverse skill sets beyond music creation. Understanding data analytics, social media marketing, and direct fan engagement have become crucial for success in the streaming era. There is a need for better education for artists in the streaming business, including optimizing their music for digital platforms and leveraging data analytics.

Streaming has a much broader impact than just delivering more music in a more convenient way to users. This technology-driven business model has a wider impact on society and its welfare. Streaming platforms reportedly started as music companies. But they were all technology companies, and nowadays, they portray themselves as media companies. The media has an enormous power in society as it redistributes wealth, increases concentration, and reshapes consumer perceptions.

While streaming platforms have more control over the traditional stakeholders in music, incl. the consumers, this relationship is not straightforward. In 2012, Forbes magazine called Spotify CEO Daniel Ek "the most powerful person in the music business." This statement shows the media perception of streaming, however, it is not true – it is the majors who control the industry, including Spotify. If the majors removed their catalogs from the platforms, they would no longer attract the general public.

The strategy of streaming platforms seems to be that the consumption of the public goes from a storage culture to a streaming culture (Hajis 2021). File sizes have become increasingly large, and consumers are pushed to keep their files in the cloud or simply consume them in streaming. With the shift towards digital music consumption, the physical aspect of music, such as album art, liner notes,

and collectible editions, has diminished. This has contributed to the perception of music by many as a disposable commodity rather than an art form.

4.5. Impact on the overall industry structure

The dominance of streaming has significantly affected the structure and dynamics of the music industry.

– record labels have a much smaller role in the distribution, and to adapt, they are adopting new non-traditional roles incl. data analytics, and playlist promotion;

– the importance of publishing rights has increased because publishers take a much more active role in tracking and monetizing streams for which copyright remuneration is due;

– new intermediaries have appeared, offering services to artists, incl. playlist promotion, and various optimizations based on technology tools;

– streaming has enabled direct relationships and sales between artists and fans, and some artists have monetized their creativity directly to fans, bypassing traditional industry gatekeepers.

– Streaming has also affected the significance of broadcasting and radio, where the recording and publishing sides used to receive an equal share, to the overall detriment of composers and songwriters.

The economics of streaming suggests several potential positive and negative impacts on the industry in the mid and long term:

Positive

– The streaming market will grow further – according to Statista, it could reach over 33 billion USD by 2027. IFPI report shows strong growth in developing and emerging markets. Countries in Asia, Africa, and Latin America are seeing a rise in streaming service adoption. These regions could impact the global music landscape for artists to reach wider audiences.

– With the advance of technology, music streaming will seek to improve sound quality and listening experiences.

– Artificial intelligence (AI) will play a bigger role in music recommendations. Based on listening habits, AI-driven algorithms will make music discovery more personalized than before.

Negative

– As streaming services operate worldwide, they must comply with different laws and regulations in each country. This can complicate how royalties are distributed. The music industry needs to find ways to ensure fair compensation for artists while complying with diverse legal requirements.

– The emphasis on playlist-friendly, algorithm-optimized music could lead to a homogenization of musical styles and loss of diversity;

– the less established artists will have difficulties to succeed only through streaming, and this model may not be a sustainable career path for them;

– the low per-stream rates may disincentivize investment in new, riskier musical projects, favoring established formats and back catalogs;

– streaming has provided global access to artists but this happens in the context of a much stronger global competition, which again puts pressure on local and smaller markets.

4.6. Impact on efficiency

An important area for improving efficiency is optimizing the costs for streaming, which will make the model more competitive. The following cost factors need to be taken into consideration:

– Cloud-Hosting: Undoubtedly, the volume of music content that will be available in the future will increase. Streaming services receive about 1 million new songs weekly (CISAC report, 2024). This leads to much larger volumes and traffic of information, and while cloud hosting liberates companies from the need to maintain their own infrastructure, it's not necessarily cheap. When choosing their server configurations, streamers might need to overestimate their demand in order to deal with unanticipated spikes in access to certain tracks or albums;

– Content Delivery: streaming has a global outreach which means that the streamers with global coverage ambitions will need to invest in content delivery network solutions to minimize latency and maintain the quality of the experience;

– Content Protection: providers of streaming content must obtain licenses for the content, but they also need to invest in digital rights management systems that prevent the material from being ripped. Other forms of IP protection also need to be considered in the context of the IP strategy and business model of the company.

5. The impact of artificial intelligence on music streaming

Streaming is going to be affected by artificial intelligence (AI) in the mid and long-term (Pacheva 2024).

Generative AI represents a potential opportunity for DSPs to generate royalty-free tracks and integrate them into their playlists. This could significantly boost their margins by drastically reducing copyright costs (Gantchev 2024). The expected impact in the mid-term perspective is a moderate penetration rate in volume and value on streaming platforms, and high potential cannibalization of revenue and loss of music creators' streaming revenues to DSPs (CISAC and PMP, 2024).

100% AI-generated music is already streamed on DSPs. Spotify's catalogue now includes AI-generated music created and uploaded by third parties. Boomy is a platform allowing the creation of AI-generated music to be uploaded on DSPs. AI-generated tracks are circulating on streaming

platforms, they are in suggested playlists, and some generate substantial streams. This raises questions about how platforms should handle these tracks (should they be tagged for user identification and/or removed). The impact of this phenomenon, in terms of the volume of tracks and streams, has yet to be quantified.

Generative AI has the potential to significantly impact background music, particularly in tasks where high volumes and quick production times are key. Here, CISAC sees the potential of high cannibalization rates and replacement of human-produced "production music" for B2B use.

Fully Gen AI outputs in Music are expected to be worth c.€16Bn in 2028, doubling on average each year. Gen AI platforms are disrupting the distribution system as they offer prompter users the chance to directly distribute their creations on Spotify.

A Gen AI boost is expected in the music streaming segment due to new usage and functionalities that traditional or new players will monetize

Figure 2. Music Streaming revenues generated by humans, compared to generative AI inputs

Source: CISAC and PMP Study 2024

Conclusions

The shift to streaming has reshaped the economics of the music industry. It has created new opportunities, revolutionized the market, expanded access to music, and revitalized overall industry revenues while addressing some of the issues associated with music piracy.

The first finding of this research is that streaming has had an uneven impact on the different stakeholders. The practical implementation of the streaming model has deepened the structural disbalances in the ecosystem by providing more power in the hands of platforms, digital service providers, labels, and other intermediaries. The platforms and DSPs have gained from the economy of scale, reduction of costs, and new markets. Meanwhile, most of the artists have not been able to capitalize on the new possibilities and have made limited use of the streaming business model.

The second impact is that streaming has significantly affected the traditional music distribution model. The lack of transparency, revenue distribution, and consumption patterns have changed the flow of the revenue streams. This has raised questions about the sustainability of music careers, particularly for mid-tier and emerging artists. Streaming has changed, to some extent, the perception of music and its social and cultural value and given consumption a much higher role as a factor in music generation. Streaming has affected music consumption and brought in more "assisted" and standardized choices among consumers. If streaming alone cannot support a broad range of professional musicians, it may lead to a music ecosystem dominated by superstars and part-time creators, potentially limiting the diversity and quality of musical output.

The third conclusion that can be made is that there are issues that have not yet found adequate solutions. The search for optimal solutions will continue and will require finding new legal and business models for revenue sharing. Such factors as artificial intelligence, the extent of collaboration within the industry and between industry and different rightsholder groups, and the music markets' maturity will influence this process. The future will show whether the streaming model is sustainable for the music industry and whether the problem is the model or its current application.

The economics of music streaming is part of the broader debate on value creation and distribution in the digital economy. Therefore, the solutions that may be developed in this domain may have implications beyond the music industry, potentially informing approaches to fair compensation and sustainable creative ecosystems in other sectors of the digital content economy.

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