Artist Investments and Streaming Popularity

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Introduction

The recorded music industry has experienced multiple technological disruptions in the past twenty years, leaving market participants at every level in a constant state of adjustment. Industry revenues were defined in the 1990s by the mass adoption of CDs as the primary listening medium, steadily increasing as consumers updated their libraries to the newest high-fidelity format. Annual recorded music revenues in the U.S. peaked in 1999 at $14.6 billion, with CDs representing 88% of sales (RIAA). The following 20 years saw the advent of the MP3, peer-to-peer file sharing, the iPod, digital download music stores, and streaming platforms, a steady flow of technologies that served to unbundle songs from albums, drive down unit prices, render CDs obsolete, and encourage subscriptions over purchases. By 2019, revenues were down to $11.1 billion, a 50% drop from the inflation-adjusted peak, with CDs only representing 5.5% of sales (RIAA). Streaming platforms became the dominant listening medium by far in that time. Despite paying content providers fractions of a penny per stream, streaming royalties accounted for 85% of U.S. music industry revenue in the first half of 2020 (RIAA).

In addition to tectonic shifts in distribution, the industry experienced democratizing revolutions in production and education. Recording capability once confined to expensive studios became readily available for home use thanks to advances in computing power and retail recording software/hardware. Recording and instrumental expertise once attained through expensive apprenticeships and instruction began being shared freely on YouTube, blogs, and discussion boards. At the same time consumers were moving towards consumption patterns that net artists a fraction of CD and digital sales, the number of musicians and hobbyists releasing music was exploding. 35,000 albums were released in 2000 (Stein). By mid-2019, Spotify was adding 20,000 songs *per day* to its platform, a number that rose to 40,000 per day just a year later (Music Business Wordwide). The Spotify catalog now carries over 50 million tracks, including 700,000 podcasts (Spotify). Competition among artists for attention and revenue is intense and increasing by the day.

Despite these massive industry shifts, the business strategies employed by artists today remain similar to those employed by major labels twenty years ago. Thousands are spent on high-end production, music videos, and expensive PR campaigns. The only modern addition to the promotional tool kit is social media advertising. Given the current industry landscape, it's more important than ever that musicians who wish to create a sustainable career allocate resources towards items that provide a reliable return in revenue or exposure. With streaming platforms being the dominant market for recorded music as a backdrop, this paper focuses on exploring the relationship between an artist's streaming popularity and their investments in production and promotion.

Model

The following model is used to explore the relationship between marginal investments in ad spending, PR campaigns, production costs, and music videos with percent changes in stream counts.

$$Ln(StreamCount) = \beta_0 + \beta_1 ProdCost + \beta_2 ProdCost^2 + \beta_3 AdSpend + \beta_4 PR + \beta_5 HQVid + \beta_6 NumAlbums + \beta_7 SinglesEPs + \beta_8 DLabel$$

StreamCount	Quantity of streams between Jan 1 and Aug 31, 2020
ProdCost	Amount spent on production for most-streamed album ($1000s)
AdSpend	Total amount spent on social media ads ($100s)
PR	Total number of PR campaigns
HQVid	Number of high-quality music videos released
NumAlbums	Number of albums in Spotify catalog
SinglesEps	Number of singles and EPs in Spotify catalog
DLabel	1 if artist released music on a record label

Controls include the number of albums and singles/EPs available on Spotify, to account for differing streaming catalog sizes, and whether or not an artist enjoyed the benefits of record label affiliation, which include additional promotion and access to listeners who follow those labels. Spotify was chosen as a reference catalog due to its position as the most-used platform in the data set, representing over 70% of streams.

The mechanisms through which these investments could increase listenership are straightforward. Social media ads can be targeted to individuals with relevant musical tastes and direct them to an artist's Spotify page, a strategy employed successfully by the most-streamed artist in the group. PR campaigns distribute music to industry tastemakers and amplifiers like blogs, radio stations, and curated Spotify playlists with large audiences hungry for new music. Investments in professional engineering, mixing, and mastering bring consistent and higher sound quality across a wider range of formats. An artist spending money on these items would hope that music recorded in a professional studio, mixed and mastered by experienced engineers, and promoted with social media ads and PR campaigns alongside a high-quality music video would be streamed more often than music recorded on the cheap and released without promotion.

Description of Data

42 artists provided digital sales reports, providing a by-day account of 2.9 million streams across 28 platforms in 2020, and responded to a survey gathering information about their profiles and investments. Two artists were dropped from the set due to the unique nature of their streaming success, one as a result of having a song preloaded in a popular operating system, the other as a result of producing "elevator music" for the specific purpose of being placed on mood-based Spotify playlists curated by close connections.

Eight of the 40 artists in the data set are affiliated with a record label. The quantitative data used in the model are summarized in Table 1.

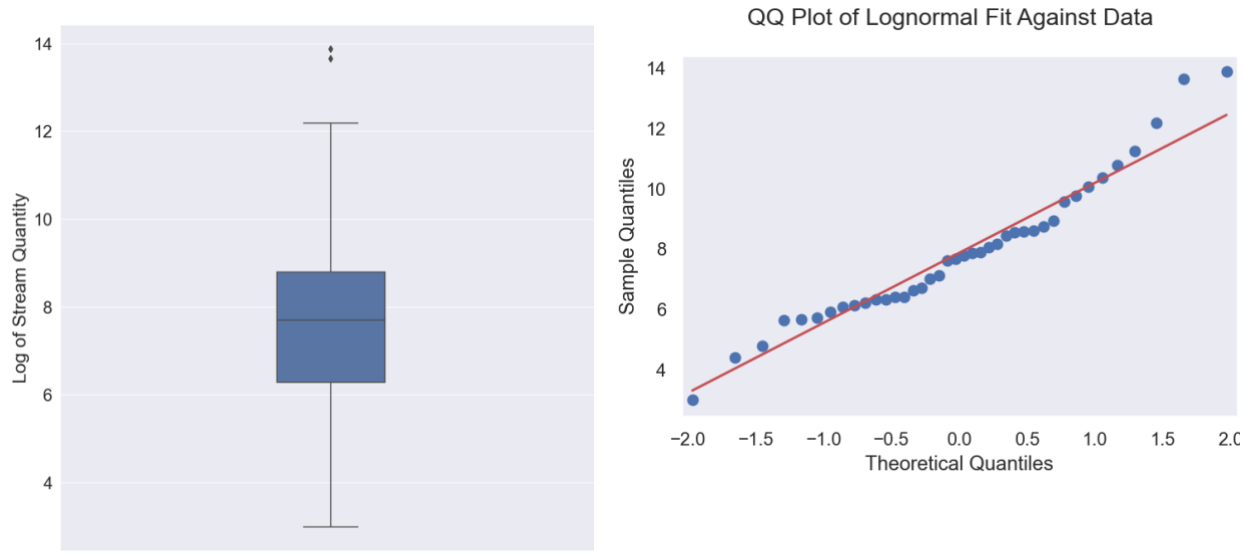
Table 1

	StreamCount	*NumAlbums*	*SinglesEPs*	*AdSpend*	*PR*	*ProdCost*	*HQVid*
Mean	59,668	3.1	1.6	6.63	1.2	4.917	2.0
Min	20	0	0	0	0	0	0
Median	2,241	2	0	1	1	3.75	0
Max	1,062,833	19	12	120	4	18	14
Std. Dev.	212,641	3.2	2.8	20.19	1.2	4.256	3.5

n = 40

The two most popular artists enjoyed more streams together than the bottom 38 combined. Stream counts in this group are approximately lognormally distributed.

Figure 1



Investigation of scatter plots in Figure 2 reveals a few points of interest, namely the two high-leverage outliers in ad spending and a potentially non-linear relationship between production costs and stream counts.

Figure 2

Results

The OLS regression results are summarized in Table 2. Each regression controls for the number of albums, singles, and EPs on Spotify. The first four regressions also control for record label affiliation. This control was dropped in regressions (5) and (6) given a lack of statistical significance or substantial influence on other coefficients.

Regressions (1) and (2) explore the linearity of the relationship between *ProdCost* observations and stream counts. The addition of a squared term improved measures of fit, increasing adjusted R^2 and reducing the standard error of the regression. Both *ProdCost* term coefficients remain fairly consistent throughout the following regressions, providing evidence of diminishing marginal returns on production spending within this group of artists. Using regression (5) as a benchmark, production investment returns topped at around $9500. A natural log term and the addition of a cubic term were also tested but failed to provide a better fit.

The addition of the *AdSpend* and *PR* campaign variables in regression (3) increased the magnitude and statistical significance of the *NumAlbums* coefficient. Given that PR campaigns

Table 2

Dependent Variable: Log of stream quantity (Jan 1 – Aug 31, 2020)						
Regressors	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)[1]**
ProdCost ($1000s)	0.219** (0.081)	0.909*** (0.192)	1.090*** (0.243)	1.159*** (0.289)	1.085*** (0.259)	1.113*** (0.256)
ProdCost^2 ($1000s)		-0.047*** (0.012)	-0.057*** (0.015)	-0.060*** (0.017)	-0.057*** (0.016)	-0.057*** (0.015)
AdSpend ($100s)			0.045*** (0.010)	0.048*** (0.011)	0.050*** (0.011)	0.079* (0.046)
PR			-0.668* (0.339)	-0.715* (0.374)	-0.639* (0.369)	-0.618 (0.367)
HQVid				-0.073 (0.089)		
NumAlbums	0.006 (0.094)	0.024 (0.072)	0.143** (0.066)	0.160** (0.077)	0.184*** (0.063)	0.186*** (0.061)
SinglesEPs	0.346*** (0.113)	0.383*** (0.105)	0.315*** (0.063)	0.347*** (0.073)	0.290*** (0.062)	0.317*** (0.065)
DLabel	1.434 (1.071)	1.372 (0.953)	1.059 (0.801)	1.034 (0.757)		
Intercept	5.946*** (0.552)	4.423*** (0.528)	4.238*** (0.530)	4.126*** (0.563)	4.308*** (0.515)	4.076*** (0.510)

[1] *Two Ad Spend outliers removed, n=38*
**** 1%, **5%, *10% significance level*

***F*-Statistics and *p*-Values on Joint Hypotheses**						
ProdCost, ProdCost^2 *= 0*		14.082 (<0.001)	13.087 (<0.001)	9.495 (<0.001)	10.870 (<0.001)	12.037 (<0.001)
AdSpend, PR = 0			9.710 (<0.001)	11.186 (<0.001)	11.138 (<0.001)	3.267 (0.052)
AdSpend, PR, HQVid = 0				7.794 (<0.001)		
All investment variables = 0			10.934 (<0.001)	10.029 (<0.001)	11.991 (<0.001)	10.691 (<0.001)
SER	1.906	1.617	1.441	1.446	1.479	1.458
Adjusted R^2	0.342	0.527	0.624	0.621	0.604	0.541

accompany new album releases, it's no surprise that *PR* observations are strongly correlated with *NumAlbums* observations. Surprisingly the *PR* variable has a negative coefficient throughout all regressions, with additional campaigns associated with a 60-70% drop in stream

counts. An additional $100 in ad spending was associated with a roughly 5% increase in stream counts.

The addition of the *HQVid* variable in regression (4) had no meaningful impact on other coefficients in the model, and no statistically significant relationship with stream counts was found.

Regression (5) excludes the HQVid and *DLabel* variables and appears to best represent the relationships in the data, with 60.4% of the variance in stream counts predicted by the regressors. Given that R^2 increases with the addition of multiple regressors with non-zero coefficients, adjusted-R^2 is reported across all regressions instead, which deflates the explained sum of squares by a factor proportional to the number of regressors. The F-statistic testing all investment variables was highest in this regression. Regression (6) applies this model to a data set removed of the two *AdSpend* outliers. The standard error of the *AdSpend* coefficient is higher in regression (6) than all others, indicating that its statistical significance relied heavily on the outliers. Accordingly, though the *AdSpend* and *PR* coefficients are similar to those of regression (5), the null hypothesis that they jointly equal zero is rejected at a much lower degree of confidence. In all other specifications, null hypotheses that the coefficients of production variables, promotion variables, and all investment variables equal zero were rejected at the 1% significance level.

As for controls, additional singles and EPs are associated with a larger increase in stream counts than additional albums. It could be that frequently releasing a small number of songs encourages listenership more than releasing a whole album every few years, and/or that algorithmic playlists favor artists who do so.

Other potential explanatory variables including artwork spending, whether or not streaming catalogs included cover songs, and the number of years since an artist was most active were tested in various configurations and proved insignificant.

Summary

The results indicate that some artist investments are associated with more streaming activity than others. Investing in quality production had the strongest positive relationship with higher stream counts up to around $9000, at which point investing in social media ads was associated with similarly modest increases in stream counts. There was no evidence that releasing high-quality music videos or investing in PR campaigns increased streaming popularity. Controlling for all other variables, additional PR campaigns were actually associated with lower stream counts. Given that the median revenue from eight months of streaming activity in this group was $8.02, artists should consider what other returns are likely for these expensive investments. There was no statistically significant difference in streaming popularity between artists with label affiliations and those without and, curiously, additional singles and EPs had a stronger positive relationship with stream counts than additional albums.

This analysis suffers from sample selection bias, as data was obtained from volunteers and is skewed towards jazz/instrumental artists in the Northwest. Given that high-performing artists were less likely to participate due to difficulty in obtaining streaming data from management, and that jazz is among the least popular genres, it's possible that parameter estimates have a downward bias. The ad and production spending data suffers from rounding

and recollection error, as the majority of independent musicians don't keep precise records of their spending. There's almost certainly simultaneous causality at play, as artists who experience some success with a release are more likely to invest more in following releases. Tracking artists over time with more precise spending records and direct access to streaming data from a platform instead of through artists would limit the effects of many of these issues.

Relevant variables omitted from the analysis include touring activity, song placement in media, and some measure of the cultural relevance that makes an artist more likely to receive press and attention, which would be difficult to define and quantify. For all of these reasons, the relationships found in this analysis are likely limited to this group and should not be generalized to a random set of artists or one with substantially different characteristics.

Works Cited

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I did not give, receive, or use any unauthorized assistance on this project.
Signed, Tarik Abouzied