



On the life cycles of successful rock bands

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Abstract

A typical feature of life cycles of rock bands is that they seem to consist of two distinct stages. A first stage associates with initial entry and a second stage seems to be related to more mainstream success. This paper proposes a simple model to describe these two stages in the life cycles. The model is put to an empirical test by analyzing the numbers of annual shows of forty-nine heavy metal bands. It is found that initial peak success is attained, on average, after seven years, and that the second wave of success occurs after twenty years, again on average. The second peak associates with twice as much success as the first.

Keywords Rock bands · Life cycle · Logistic function · Empirical generalizations

JEL Classification O33 · Z11

1 Introduction

This paper seeks to describe common patterns in the life cycles of successful rock bands. Given the size of the industry and its impact on people, there are various studies that analyze the industry, its players, and the individual rock bands in more detail. A recent important contribution is Krueger (2019), which gives detailed and lucid insights in the music industry. Not many rock bands are successful, and many do not become successful (Strobel and Tucker, 2000), and even less rock bands become superstars (Rosen, 1981).

What seems to be lacking in the relevant literature is a generalization of descriptive features about the careers of successful rock bands. For example, how long after the entry in the music industry did it take for a now well-established rock band to have initial success? And how long did this success last? What happens when mainstream listeners adopt the music? If there is such a second generation, after how many years does that success peak?

As many rock bands have a long history, this paper focuses on rock bands like Metallica and Guns N Roses. A second choice in this paper is to measure the success of a rock band by the annual number of shows that have been performed. I consider the number of shows

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because accurate annual data are available for long periods of time, whereas for other indicators of success such lengthy series of data are not available.

To summarize the descriptive features of a range of rock bands, this paper puts forward a simple empirical model. The model includes two episodes of success. The first concerns entry, debut, and first shows, and is usually confined to early adopters of the music of a particular rock band. Without losing the first adopters, a second episode may associate with a broader audience, and it may be that this second period involves more success than the first wave.

The model is fitted to empirical data for forty-nine different but successful heavy metal bands. The bands cover a wide spectrum of subgenres, countries of origin, and years of debut, and hence there is substantial variation in the data. It is found that the model fits very well with the empirical data, and that various generalizing statements can be made. One of these is that the second wave of success peaks many years after the peak of the first wave. And the second wave of adopters, measured by the number of shows, outnumbers the amount of first wave adopters.

The outline of this paper is as follows. Section 2 provides a literature review on various measures of success. Section 3 describes the data and presents some basic statistics. Section 4 puts forward the empirical model. Section 5 presents the estimation results. Section 6 concludes with a discussion and various avenues for further research.

2 Literature review

There are various measures of success of creative performance. When we focus on the music industry, one can think of various measures of income. If artists have enough income, they can sustain and have a longer career. Income can be generated by album sales, concert ticket sales, merchandise sales, licensing deals and, in recent years, for example Spotify downloads. Enough income does not come overnight, and it may take a while to happen.

There are also various factors that influence the success, for example, of rock bands. One can think of external service providers, online platform searches, copyright revenues, social media impact, and the length of time that they stay high on hit lists, see for example, Cox, Felton and Chung (1995), Fisher et al. (2002), Giles (2007), Hughes et al. (2013), Krishnan (2010), and Smith (2013).

A recent example of the association of rankings and success is provided in Boughanmi and Ansari (2021), who consider Billboard 200 rankings for the period 1963–2016. Their focus is on specific albums of musical performers. Like the approach in Giles (2007), Elliott and Simmons (2011) consider vinyl and CD sales, live albums, soundtracks, and the total amount of albums sold. These data are viewed as a cross section, and then a power law is fitted to the data with various moderating factors. This latter approach is rather common across relevant studies, and that is the approach to translate annual or weekly observations into cross-sectional data. An exception perhaps is Albinsson (2013), where the analysis concerns yearly revenues for individual music IPR owners.

Studies on creative industries, other than the music industry, have similar characteristics. Study the growth and decline in mobile game diffusion, and these authors consider the number of days for a game to reach the top 20 in the Google Play game download chart. Walls (2019) looks at the market for DVDs and considers daily data for 2006–2009 on rank and sales revenues for a top thirty of DVDs. As concerning books, Gaffeo, Scocu and Vici

(2008) study demand distribution dynamics, where they look at numbers of book sales in Italy 1994 – 1996, which are then treated as a cross section per book and included in the estimation of power laws.

In our present study we wish to explore the life cycles of rock bands over time, and hence we need a measure of success that can be observed for many years over time. Inspired by Connolly and Krueger (2005), who address concert revenues, we decided to consider the number of shows per year as a measure of success. Of course, such a measure also comes with its limitations, but on the positive side we will see that data are available ever since the start of the bands that we consider, that these data are relatively free from measurement errors, and that, due the sample length, it allows us to study various features of the life cycles of rock bands.

3 Data

In this paper, we measure success as the number of shows given per year by a rock band.¹ Next, it must be decided which successful rock bands will be considered. For that matter, a list of the forty-nine best metal bands is taken.²

Table 1 presents the forty-nine bands in alphabetical order. To illustrate how the data look like, consider the annual number of shows from 1968 to and including 2017 for Black Sabbath in Fig. 1. There are years with zero shows and the peak year is 1970 with 171 performances. This is a measure of new success. Additionally, Fig. 2 presents the cumulative success for Black Sabbath. The Black Sabbath data are by no means exceptional, as can be learned from Fig. 3, which presents the cumulative success (here all measured as the cumulative number of annual performances) over the years for all forty-nine rock bands in the sample.

The forty-nine bands cover various subgenres³ within the heavy metal genre,⁴ like thrash metal (Slayer), industrial metal (Nine Inch Nails), rock and roll (Guns N Roses), death metal (Death), doom metal (Paradise Lost), and power metal (Helloween). Also, the forty-nine bands are from various countries. The US and UK dominate, but Brazil, Japan, Germany and even the Netherlands (Within Temptation) are represented. Furthermore, as Table 1 indicates, the starting year of the rock bands, which is here the year with their first show, can be any year between as early as 1968 (Black Sabbath) and as recent as 2010 (Babymetal and Ghost). The final column shows that there is also great diversity in the number of total performances, with 281 (Babymetal) as the minimum and 2754 (Motörhead) as the maximum. In sum, the data display substantial variety.

Some further statistics of the forty-nine rock bands are presented in Table 2. The maximum amount of shows in one year is obtained by Anthrax (with 213 shows). The highest average number of shows across the years is performed by Ghost (76.5). For

¹ The data source for the number of shows is www.setlist.fm

² This list appeared on (<https://www.loudersound.com/features/the-50-best-metal-bands-of-all-time>) and was consulted early 2020. At present, this website does not exist anymore. It contained fifty names of rock bands. It turns out however that for the band Burgerkill not enough data are available to fit the model, and hence just forty-nine rock bands will be further analyzed. All data used in this paper can be obtained from the author. A recent and rather similar list of best rock bands appears on <https://loudwire.com/top-metal-bands-of-all-time/>.

³ The author has no conflict of interest with the choice for the forty-nine rock bands.

⁴ https://en.wikipedia.org/wiki/Heavy_metal_music

Table 1 Statistics on annual shows by forty-nine heavy metal bands

Band	Start	Years	Total (including 2019)
ACDC	1973	44	2180
Alice In Chains	1988	31	1074
Amon Amarth	1993	27	1280
Anthrax	1982	38	2497
Avenger Sevenfold	2000	19	1260
Babymetal	2010	10	281
Black Sabbath	1968	50	1879
Death	1984	15	490
Deftones	1990	30	1783
Dio	1983	26	1274
Disturbed	1990	30	1283
Dream Theater	1986	34	1627
Faith No More	1983	34	1032
Five Fingers Death Punch	2006	14	868
Ghost	2010	10	765
Gojira	1998	22	1065
Guns N Roses	1985	35	960
Helloween	1985	35	1158
In Flames	1994	26	1583
Iron Maiden	1976	44	2476
Judas Priest	1969	51	2437
Killswitch Engage	1999	21	1568
King Diamond	1985	35	576
Korn	1983	37	2018
Lamb of God	1999	21	1337
Linkin Park	1998	20	933
Marylin Manson	1989	31	1648
Mastodon	2000	20	1451
Megadeth	1984	36	2341
Meshuggah	1990	30	849
Metallica	1982	38	2038
Mötley Crüe	1981	39	1810
Motörhead	1975	41	2754
Nightwish	1997	23	888
Nine Inch Nails	1988	32	1046
Opeth	1991	29	1236
Pantera	1981	21	1150
Paradise Lost	1988	32	1510
Rage Against the Machine	1991	21	572
Rammstein	1994	26	808
Sabaton	1999	21	1404
Sepultura	1989	36	2123
Slayer	1982	38	2160
Slipknot	1995	25	1161

Table 1 (continued)

Band	Start	Years	Total (including 2019)
System of a Down	1995	25	746
Tool	1991	29	1084
Trivium	2001	19	1692
Type O Negative	1990	20	952
Within Temptation	1997	23	781

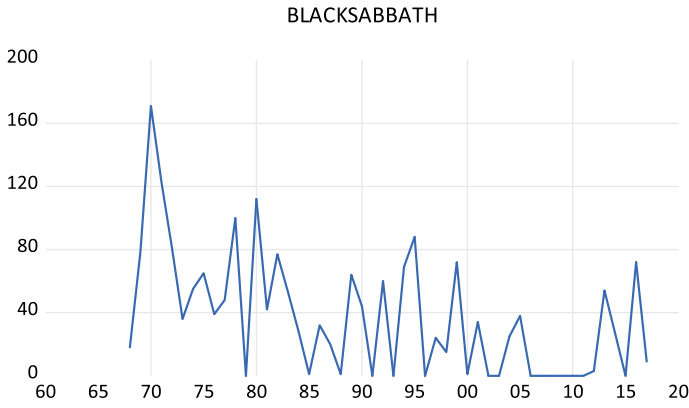


Fig. 1 Number of shows per year by Black Sabbath, 1968–2017

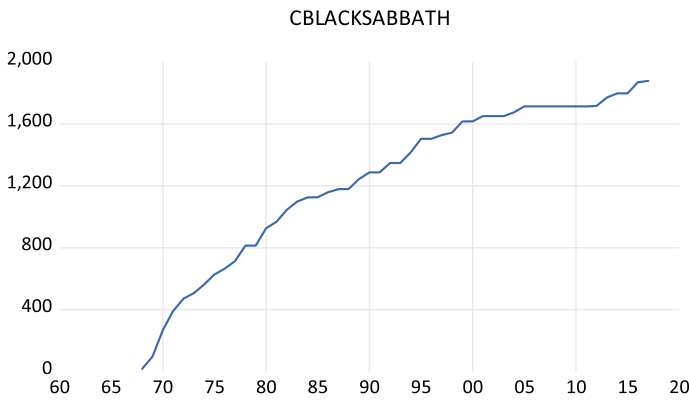


Fig. 2 Cumulative number of shows by Black Sabbath, 1968–2017

some bands there is a substantial difference between the mean and median, and this is caused by the fact that some bands (like Alice in Chains, Disturbed, King Diamond) did not perform at all during a range of years, before they came back with a potential second wave of success. Trivium can be seen as the most active band over their years.

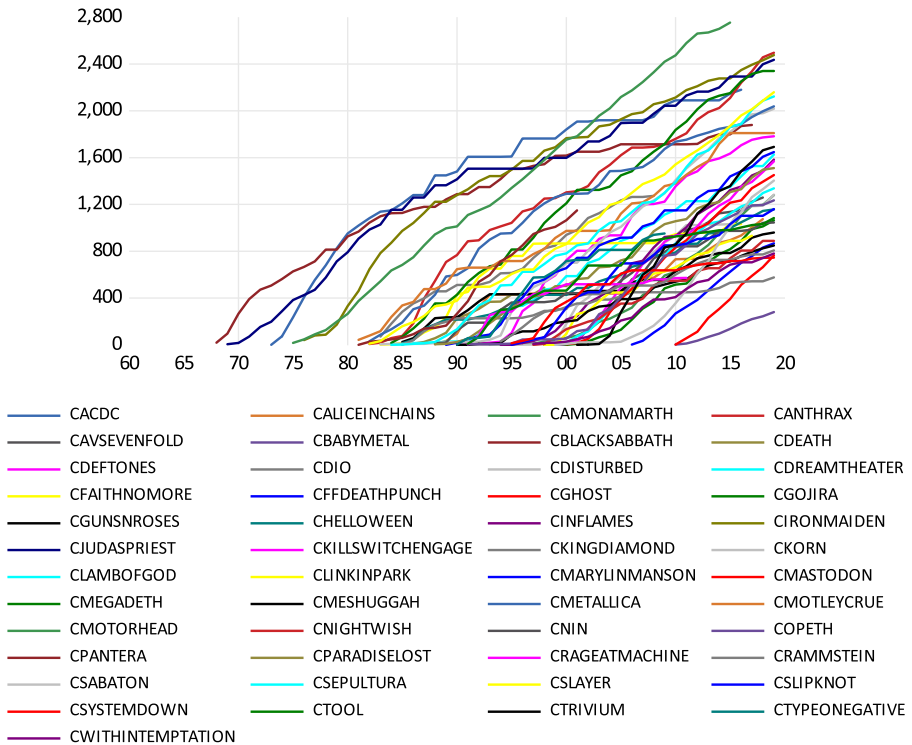


Fig. 3 Cumulative number of shows by all forty-nine heavy metal bands

4 The empirical model

It is now helpful to have a simple model that can be fitted to the data. The main idea in the present study is that there potentially are two waves of success. A generalization to three of more waves is conceptually straightforward and might be interesting for future work. A first wave could occur after the debut, where the first shows are booked, where positive critical appraisal appears in the relevant media, and where the first adopters embrace the rock band. This first wave success, measured by the cumulative number of annual shows, can be described for example by a logistic curve $G_{1,t}$ like

$$G_{1,t} = \frac{m_1}{1 + \exp(-\gamma_1(t - \tau_1))}$$

where $t = 1, 2, 3, \dots, T$, where $m_1 > 0$ is the total cumulative amount of success and where $\gamma_1 > 0$ measures the steepness of the curve around the inflection point $\tau_1 > 0$. At the inflection point $t = \tau_1$, cumulative success equals $m_1/2$. The logistic function is easy to analyze, and its parameters are easy to estimate.⁵

⁵ One may adopt more complicated versions of the logistic function, as is done in for example Rossman, Chiu & Mol (2008), but as will be seen below, the combination of two logistic functions is very flexible to describe a multitude of patterns in the data. In marketing research, one typically resorts to the familiar Bass (1969) model, which is also easy to analyze, but the way the model is formulated does not make it easy to separate two generations, see van den Bulte and Stremersch (2004).

Table 2 Statistics on annual shows by forty-nine heavy metal bands

Band	Mean	Median	Maximum	Minimum
ACDC	49.5	31.5	171	0
Alice In Chains	34.6	7	154	0
Amon Amarth	47.4	45	122	1
Anthrax	65.7	54	213	0
Avenger Sevenfold	66.3	67	134	5
Babymetal	28.1	30.5	46	3
Black Sabbath	37.6	30	171	0
Death	32.7	32	124	0
Deftones	59.4	44	187	0
Dio	49.0	47.5	109	0
Disturbed	42.8	8.5	160	0
Dream Theater	47.9	41.5	138	0
Faith No More	30.4	3	196	0
Five Fingers Death Punch	62.0	66	101	3
Ghost	76.5	77	123	3
Gojira	48.8	41	116	0
Guns N Roses	27.4	20	89	0
Helloween	33.1	28	95	0
In Flames	60.9	56	157	0
Iron Maiden	56.3	46	185	0
Judas Priest	47.8	45	138	0
Killswitch Engage	74.7	77	146	0
King Diamond	16.5	5	74	0
Korn	54.5	54	74	0
Lamb of God	63.7	67	137	1
Linkin Park	46.7	40	170	0
Marylin Manson	53.2	39	152	0
Mastodon	72.6	82.5	142	6
Megadeth	65.0	73	131	0
Meshuggah	28.3	24	91	0
Metallica	53.6	50	167	0
Mötley Crüe	46.4	42	145	0
Motörhead	67.2	72	110	10
Nightwish	38.6	34	114	0
Nine Inch Nails	32.7	8	110	0
Opeth	42.6	41	130	0
Pantera	54.8	47	166	1
Paradise Lost	47.2	43	115	3
Rage Against the Machine	27.2	5	174	0
Rammstein	31.1	31	110	0
Sabaton	66.9	68	167	0
Sepultura	59.0	66.5	127	0
Slayer	56.8	62	111	0
Slipknot	46.4	28	135	0
System of a Down	29.8	17	139	0
Tool	37.4	19	134	0

Table 2 (continued)

Band	Mean	Median	Maximum	Minimum
Trivium	89.1	84	202	1
Type O Negative	47.6	28	133	0
Within Temptation	34.0	24	90	0

After that first wave, new success may die out, maybe because a second or third album is not that good, there are problems within the band, some band members may go solo, and replacement must be found, amongst possible reasons. Issues with managers can appear, problems with drugs and money can emerge, and of course new competitive bands with perhaps similar music may enter the market. When reading the internet pages on various bands, one can encounter many anecdotal stories on almost every rock band. When a rock band persists, it may make a re-entry with a new album or albums which also may attract either a more mainstream audience or a new generation of younger adopters. Taking again a logistic function, this second wave of success may be described by a logistic function $G_{2,t}$ as

$$G_{2,t} = \frac{m_2}{1 + \exp(-\gamma_2(t - \tau_2))}$$

where $m_2 > 0, \gamma_2 > 0$, and $\tau_2 > 0$. When herding is at stake (Banerjee, 1992), it may be that m_2 is much larger than m_1 . And, obviously, $\tau_2 > \tau_1$.

It is proposed in this paper to take the sum⁶ of the two waves,⁷ like

$$G_{1,t} + G_{2,t} = \frac{m_1}{1 + \exp(-\gamma_1(t - \tau_1))} + \frac{m_2}{1 + \exp(-\gamma_2(t - \tau_2))}$$

to describe the total cumulative success. To illustrate, Fig. 4 presents the two separate waves of successes (not yet cumulative) for some hypothetical values for the six parameters ($m_1, m_2, \gamma_1, \gamma_2, \tau_1, \tau_2$), whereas Fig. 5 presents the two waves with cumulative success. More important is Fig. 6, which presents $G_{1,t} + G_{2,t}$. As we saw from Fig. 3, this pattern is very often seen for rock bands and their annual shows. For data on the total number of shows G_t , with $t = 1, 2, 3, \dots, T$, and with an error term, the empirical model reads as

$$G_t = \frac{m_1}{1 + \exp(-\gamma_1(t - \tau_1))} + \frac{m_2}{1 + \exp(-\gamma_2(t - \tau_2))} + \varepsilon_t$$

where ε_t is an error term with mean 0 and constant variance σ^2 . The six unknown parameters (and their associated standard errors) can be estimated using Nonlinear Least Squares (NLS).

⁶ Norton and Bass (1987) propose to have two (or more) successive generations, like G_1 and G_2 , and to make the progress of each next generation dependent on the progress of an earlier generation. This makes sense when consumers can leapfrog to a next generation of product, but here for music, it cannot be observed (or predicted) from the first wave of success that there ever will be a second wave. At the same time, usually we observe some aggregated measure of success instead of separate waves.

⁷ What is proposed here is more in line with what is proposed in Fisher and Pry (1971).

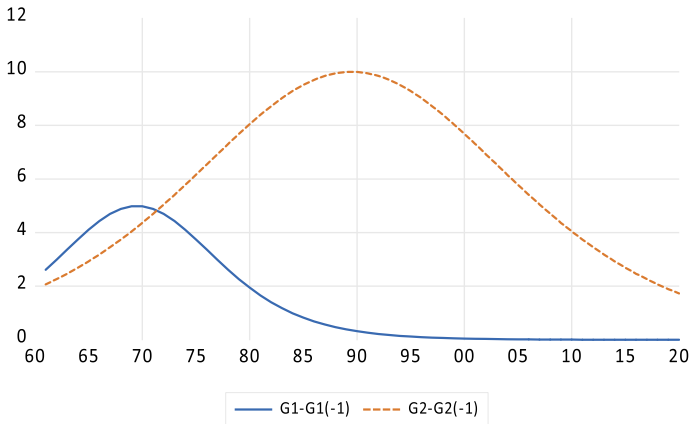


Fig. 4 Theoretical pattern of new success, measured by two stages: Hypothetical data for 1960 to 2020

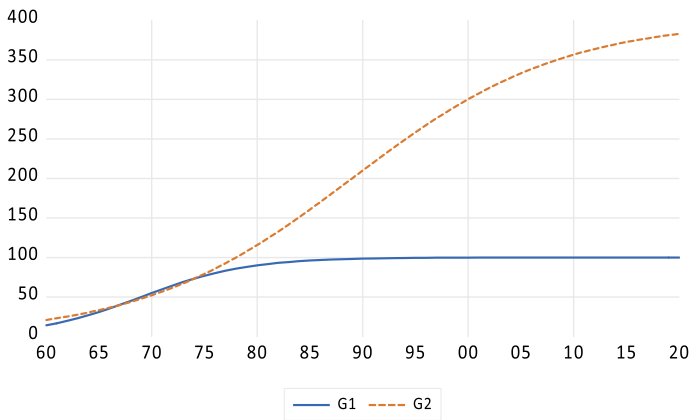


Fig. 5 Theoretical pattern of cumulative success, measured by two stages: Hypothetical data for 1960 to 2020

The six estimated parameters for N (here forty-nine) cases provide the basis for some empirical generalizations. A first generalization concerns the values of τ_1 (the peak moment of the first wave of success), and τ_2 (the peak moment of the second wave of success), and their ratio or difference. That is, how long does it take to have a second wave of success? A second generalization concerns the values of m_1 and m_2 , and specifically their ratio or difference. That is, how much larger (or smaller) is the second wave of success relative to the first? A third generalization concerns the values of γ_1 and γ_2 . If the first wave of success happens fast, then growth (and decline) of new success around the peak moment can be steep. And, when it takes a while for the second wave of success to occur, then one may perhaps expect that $\gamma_2 < \gamma_1$. Finally, one may look at the relation between m_2 and τ_2 , that is, it is perhaps not unexpected that the later the second wave of success comes, the larger is the total cumulative success.

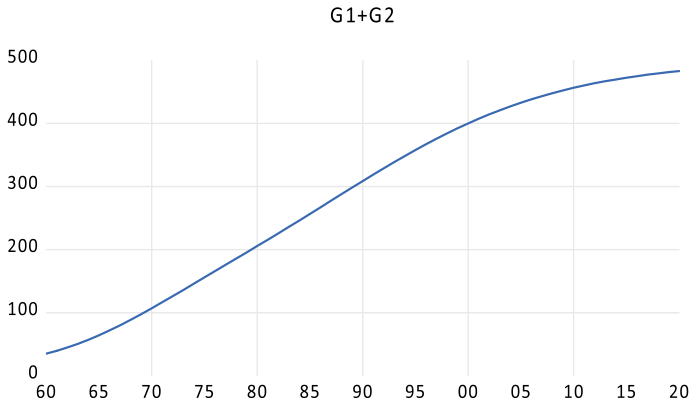


Fig. 6 Theoretical pattern of cumulative success, measured as the sum of the two stages: Hypothetical data for 1960 to 2020. Note that it is this type of data that we observe in practice

5 Estimation results

The estimation results for m_1 and m_2 , with their associated standard errors, are presented in Table 3. Summary statistics for the forty-nine cases are presented in the first two rows of Table 5. In eight cases for both parameters, the associated t statistics are smaller than 2, but in all other cases, the maturity levels are estimated with substantial precision. This is also reflected by the (unreported) estimated values for the errors ϵ_t which are very small.

A regression of forty-nine values of $m_2 - m_1$ on a constant term, gives (with an estimated standard error in parentheses)

$$m_2 - m_1 = 465(81.7)$$

Hence, m_2 is estimated as significantly larger than m_1 . The mean of the ratio $\frac{m_2}{m_1}$ is 2.76 and the median is 1.83. In short, the first empirical generalization for these forty-nine successful metal bands is that the second wave of success is about twice as large as the first wave.

Table 4 first reports the estimation results and associated standard errors for γ_1 and γ_2 . In forty and forty-one cases, respectively, the t statistics are larger than 2. A regression of $\gamma_1 - \gamma_2$ on a constant, gives

$$\gamma_1 - \gamma_2 = 0.724(0.117)$$

This means that the speed with which the first peak of new success is attained is 0.724 larger than the speed with which the second wave success is attained. This provides a second empirical generalization. The first wave of fans apparently adopts the music of a band much faster than the second wave of fans.

The last two columns in Table 4 present the estimation results for the timing of the peaks of the two waves. A traditional t statistic is of not much value here (as the null hypothesis that $\tau_1 = 0$ is not meaningful) but comparing the estimates with the estimated standard errors shows that the inflection points are estimated with substantial precision. Table 5 shows that the τ_1 is estimated on average as 7.28 years, while the average of the forty-nine estimates of τ_2 is 20.6 years. The mean of the ratio $\frac{\tau_2}{\tau_1}$ is 3.22 and the median is

Table 3 Estimation results
(Estimated standard errors in
parentheses)

Band	m_1	m_2
ACDC	823 (216)	1316 (239)
Alice In Chains	417 (13.0)	744 (81.9)
Amon Amarth	755 (223)	636 (320)
Anthrax	882 (135)	2419 (615)
Avenger Sevenfold	508 (439)	762 (487)
Babymetal	35.8 (37.9)	269 (47.4)
Black Sabbath	868 (262)	963 (292)
Death	135 (43.6)	351 (36.8)
Deftones	664 (108)	1206 (154)
Dio	451 (18.8)	891 (38.0)
Disturbed	347 (83.1)	864 (97.6)
Dream Theater	868 (987)	1203 (2457)
Faith No More	858 (22.5)	316 (474)
Five Fingers Death Punch	200 (103)	761 (141)
Ghost	101 (52.7)	807 (77.6)
Gojira	457 (124)	7701 (198)
Guns N Roses	427 (15.1)	626 (77.7)
Helloween	129 (30.0)	1316 (104)
In Flames	738 (540)	1074 (892)
Iron Maiden	1024 (131)	1594 (202)
Judas Priest	1408 (49.2)	1186 (143)
Killswitch Engage	763 (223)	1027 (499)
King Diamond	162 (32.2)	403 (52.0)
Korn	459 (46.7)	1750 (80.9)
Lamb of God	712 (497)	770 (748)
Linkin Park	317 (72.4)	651 (112)
Marylin Manson	593 (109)	1349 (249)
Mastodon	458 (186)	1095 (250)
Megadeth	1374 (118)	1047 (171)
Meshuggah	281 (176)	663 (268)
Metallica	1030 (273)	1143 (419)
Mötley Crüe	606 (70.1)	1522 (199)
Motörhead	730 (122)	2359 (202)
Nightwish	637 (78.2)	288 (127)
Nine Inch Nails	361 (35.5)	660 (52.5)
Opeth	242 (81.9)	1061 (76.7)
Pantera	188 (60.9)	1065 (41.2)
Paradise Lost	292 (72.1)	1403 (144)
Rage Against the Machine	500 (113)	157 (1405)
Rammstein	481 (24.6)	298 (33.2)
Sabaton	180 (98.5)	1393 (98.1)
Sepultura	567 (94.5)	2005 (255)
Slayer	233 (81.8)	2255 (168)
Slipknot	645 (313)	644 (621)
System of a Down	458 (209)	287 (228)
Tool	224 (61.6)	819 (74.2)

Table 3 (continued)

Band	m_1		m_2	
Trivium	571	(162)	1228	(234)
Type O Negative	525	(98.6)	591	(175)
Within Temptation	419	(77.8)	358	(96.2)

2.83. In short, the third empirical generalization is that the first wave of success takes seven years to occur, and it takes around twenty-one years for the second wave of success.

Finally, in a regression of the forty-nine estimates of m_2 on an intercept and the estimates of τ_2 , the slope parameter is estimated equal to 34.4 with standard error 9.73. The $R^2 = 0.210$. Hence, the fourth feature of the life cycles is that the longer it takes to have the second wave peak, the larger is the second wave success.

6 Discussion and conclusion

Based on a simple empirical model that matched well with the data on cumulative annual shows of forty-nine heavy metal bands, this paper has established four common features of the life cycles of successful rock bands. The first is that the second wave of success is about twice as large as the first wave. The second is that first wave of fans adopts the music of a band much faster than the second wave of fans. The third feature is that the first wave of success, on average, takes seven years to occur, and it takes about three times as many years for the second moment of peak success. Finally, the fourth feature is that the later the second wave peaks, the larger is the second wave (and total) success.

This paper has studied only forty-nine rock bands, and this analysis can of course be extended to other genres and to individual performers. Upon doing so, one may follow the lines of thought in Rossman, Chiu and Mol (2008) and introduce a second layer in the model, which contains the characteristics of the rock bands, to see which of those characteristics influences the parameters in the logistic curves.

All in all, the main conclusion of this paper is that the life cycle of a successful rock band is a lengthy one. In terms of years, initial success does not come fast, nor does the second wave of success. Next to quality and other factors, apparently it is perseverance that seem a key factor for a successful career in the music industry.

This paper studied the market for heavy metal music. It is of course interesting to study other markets, like those for books, video games and movies, where there are sequels to early works. It is not the same issue as we have discussed here, but it may well be that sequels arouse attention to initial releases and earlier work of film makers and authors.

What is it that artists can learn from the results in this study? It seems that success spreads over a long period of time. Immediate success is rarely seen, and the second wave of success can take a long while. So, it seems that not giving up is an important factor of success. This associates with the recognition that rock bands are a joint effort, see Phillips & Strachan (2016), and Ceulemans et al. (2011), and that success assumes perseverance.

An obvious limitation of this study is that we have measured success just by the numbers of shows per year. Of course, the amounts of shows do not tell the full story. The size of the venues will be different, and some bands would prefer small venues while others are attracted to festivals. More detailed data would be useful, while also having insights into

Table 4 More estimation results (Estimated standard errors in parentheses)

Band	γ_1	γ_2	τ_1	τ_2
ACDC	0.709 (0.234)	0.134 (0.022)	5.56 (0.335)	18.6 (2.39)
Alice In Chains	1.38 (0.248)	0.287 (0.041)	3.84 (0.148)	25.4 (0.801)
Amon Amarth	0.362 (0.039)	0.423 (0.196)	14.7 (1.18)	23.3 (0.785)
Anthrax	0.663 (0.166)	0.118 (0.028)	7.41 (0.278)	32.8 (3.102)
Avenger Sevenfold	0.781 (0.437)	0.368 (0.177)	5.02 (0.583)	11.3 (2.72)
Babymetal	2.25 (3.833)	0.655 (0.124)	3.14 (0.399)	6.82 (0.434)
Black Sabbath	0.301 (0.068)	0.137 (0.036)	6.44 (0.676)	24.6 (3.65)
Death	3.94 (4.12)	0.474 (0.071)	6.26 (0.299)	9.02 (0.687)
Deftones	0.835 (0.175)	0.253 (0.044)	8.15 (0.203)	19.8 (0.622)
Dio	0.880 (0.109)	0.324 (0.025)	2.64 (0.143)	17.4 (0.209)
Disturbed	1.87 (0.922)	0.321 (0.047)	11.5 (0.250)	18.9 (0.716)
Dream Theater	0.273 (0.133)	0.176 (0.336)	13.7 (2.62)	31.3 (6.66)
Faith No More	0.509 (0.035)	0.271 (0.245)	8.742 (0.169)	33.2 (10.2)
Five Fingers Death Punch	1.33 (0.630)	0.431 (0.087)	3.85 (0.171)	9.48 (0.480)
Ghost	3.37 (3.03)	0.499 (0.060)	3.42 (0.401)	7.11 (0.549)
Gojira	0.676 (0.126)	0.423 (0.145)	9.35 (0.494)	17.6 (0.545)
Guns N Roses	0.544 (0.071)	0.273 (0.046)	4.72 (0.264)	28.9 (0.898)
Helloween	2.22 (1.62)	0.128 (0.012)	3.24 (0.311)	25.3 (0.878)
In Flames	0.418 (0.142)	0.261 (0.217)	10.2 (1.252)	21.5 (1.632)
Iron Maiden	0.541 (0.086)	0.118 (0.018)	7.41 (0.178)	27.5 (1.07)
Judas Priest	0.289 (0.017)	0.158 (0.026)	11.3 (0.246)	40.7 (0.971)
Killswitch Engage	0.651 (0.144)	0.316 (0.179)	6.63 (0.392)	17.2 (1.005)
King Diamond	2.22 (1.39)	0.165 (0.033)	2.96 (0.230)	18.9 (1.02)
Korn	1.13 (0.234)	0.211 (0.014)	13.6 (0.157)	27.0 (0.312)
Lamb of God	0.546 (0.208)	0.301 (0.293)	7.18 (0.797)	16.4 (2.31)
Linkin Park	1.68 (0.685)	0.326 (0.081)	3.75 (0.189)	12.4 (0.657)
Marylin Manson	0.653 (0.151)	0.174 (0.037)	7.812 (0.230)	24.1 (1.07)
Mastodon	0.950 (0.376)	0.312 (0.079)	5.50 (0.234)	13.4 (0.880)
Megadeth	0.250 (0.023)	0.319 (0.069)	10.5 (0.760)	27.7 (0.589)
Meshuggah	0.407 (0.148)	0.238 (0.106)	9.80 (1.38)	22.8 (1.30)
Metallica	0.342 (0.064)	0.157(0.065)	8.67 (0.485)	26.8 (1.82)
Mötley Crüe	0.511 (0.098)	0.165 (0.029)	5.53 (0.378)	29.1 (0.937)
Motorhead	0.431 (0.072)	0.143 (0.015)	8.74 (0.237)	28.4 (0.475)
Nightwish	0.335 (0.051)	0.674 (0.417)	8.69 (0.888)	19.6 (0.823)
Nine Inch Nails	0.600 (0.165)	0.350 (0.058)	4.69 (0.504)	20.4 (0.459)
Opeth	0.918 (0.358)	0.278 (0.015)	13.6 (0.394)	19.8 (0.620)
Pantera	2.22 (1.39)	0.293 (0.026)	11.1 (0.211)	14.3 (0.640)
Paradise Lost	0.931 (0.377)	0.181 (0.025)	6.68 (0.315)	22.3 (0.572)
Rage Against the Machine	0.602 (0.153)	0.266 (1.51)	4.05 (0.466)	21.1 (55.8)
Rammstein	0.490 (0.064)	0.588 (0.145)	4.78 (0.325)	17.7 (0.445)
Sabatón	0.901 (0.364)	0.399 (0.017)	11.2 (0.445)	16.0 (0.344)
Sepultura	0.574 (0.118)	0.172 (0.026)	9.68 (0.262)	28.7 (0.714)
Slayer	0.777 (0.463)	0.132 (0.012)	6.47 (0.572)	26.2 (0.630)
Slipknot	0.555 (0.206)	0.246 (0.279)	6.91 (0.617)	19.6 (2.22)

Table 4 (continued)

Band	γ_1	γ_2	τ_1	τ_2
System of a Down	0.888 (0.394)	0.259 (0.167)	4.86 (0.250)	12.4 (5.31)
Tool	3.05 (3.39)	0.245 (0.032)	2.91 (0.223)	12.6 (0.709)
Trivium	1.27 (0.444)	0.376 (0.092)	5.59 (0.196)	13.0 (0.601)
Type O Negative	1.00 (0.267)	0.210 (0.056)	5.06 (0.229)	14.6 (3.73)
Within Temptation	0.505 (0.073)	0.543 (0.171)	9.20 (0.708)	17.4 (0.647)

Table 5 Summary statistics of the estimated parameters

	Mean	Median	Maximum	Minimum
m_1	532	480	1407	36
m_2	997	890	2418	157
γ_1	1.02	0.675	3.94	0.249
γ_2	0.291	0.271	0.674	0.117
τ_1	7.28	6.67	14.7	2.64
τ_2	20.6	19.8	40.7	6.82

the prices paid by the attendees could be useful. Collection of such relevant data is definitively an interesting issue for further research.

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