**Listening to Uncertainty
in the Music Business:
Fat Tails and Resilience**

**P. H. Longstaff
Joseph Steinhardt
January 2011**

Program on Information Resources Policy

⬣ *Center for Information Policy Research*

🛡 *Harvard University*

The Program on Information Resources Policy is jointly sponsored by Harvard University and the Center for Information Policy Research.

Chairman
Anthony G. Oettinger

Managing Director
John C. B. LeGates

P. H. Longstaff was a communications lawyer for twenty years before joining the faculty of Syracuse University to concentrate on interdisciplinary public policy research for the communications sector. Longstaff received an M.P.A. from Harvard University in 1994 and has been a Research Associate at the Program on Information Resources Policy since 1995. Joseph Steinhardt is a doctoral student at Cornell University.

Executive Summary

This paper builds on a previous PIRP Research Report that looked at resilience in the movie industry. New ideas about the resilience found in many systems are described here and tested with regard to the music industry by looking at music sales data and interviews with music-industry professionals. The paper shows that the music industry is a complex adaptive system characterized (for every year analyzed) by a fat-tail distribution for sales of recorded music. Over the past 15 years, the top of the tail has become lower and the tail lengthened. This shape of the distribution curve means that the big hits do not sell as many copies as in the past and that the number of recordings has increased. It indicates a system existing with increasingly high uncertainty. The music industry survives this uncertainty owing to several attributes and strategies that are seen in many resilient systems, including the capacity to try many things (recordings, artists, etc.) and to use loose coupling (short-term contracts, wider networks) that permit music businesses to take advantage of opportunities and cut losses. Adaptation to new technical means of recording, promoting, and distributing music has been more rapid at the "bottom" end of the industry (artists and producers) than at the top, but even large music companies are becoming more loosely coupled and using shorter term contracts and wider networks to search for the next big hit. The paper ends with recommendations for any industry that finds itself in a period of high uncertainty.

Chapter One

Introduction

For the music industry, the past fifteen years have been a time of unprecedented uncertainty, adaptation, and change. Some of the changes were painful, particularly for previously successful companies, whose revenues fell drastically. Some of the adaptation was welcomed, especially among artists who could now buy inexpensive equipment and software to make their own CDs or distribute their music online. Many other industries would have been destroyed by all this new uncertainty. But the recorded music business has always lived with a lot of unknowns, and it is its long experience with resilience that may ultimately save it.

Many people have tried to find the right formula for predicting success in the music business, but, as one of the people interviewed for this project pointed out, "if somebody had found it they would be the richest guy in the business and there is nobody like that." Things like follow-up albums after big hits, popular artists, good writers, and good touring ability have some predictive power, but even the tried and true can be flops, and the goal of predictable investment remains elusive. There are still surprise hits and surprise flops, and there are many, many recordings that sell very few copies and do not make any money. Although no one can change the uncertainty at the level of an individual recording, resilience strategies might play an important role at the level of the industry. In this paper, we look at this industry by using the tools of complex systems, resilience, and network science, and we provide a list of possible "to do" items that arise from our analysis.

The survival of the music industry is now of more than passing interest for players such as computer and telecommunication companies that find dealing with recorded music an increasingly large part of their business. Those companies may find our analysis useful in their dealings with an industry that operates far from what they might consider "normal." And it is possible that the music business has some things to teach *any industry* that finds itself in a time of high uncertainty and in need of some resilience.

To newcomers, the whole entertainment industry is a weird place. There has been a lot of uncertainty there for as long as anyone can remember, even if those in the industry don't always admit it. Hit movies, hit books, and hit songs remain hard to predict. For example, the U.S. film industry (often referred to as Hollywood) has some of the least predictable products in the world (in terms of which movies will be big hits), and it suffers some giant failures every year.[1] Yet it is also one of the most stable and successful industries in the world, accounting for a very large share of U.S. exports annually.[2] The film industry shows strong evidence of resilience in a complex, unpredictable environment.[3]

---

[1] See, e.g., Arthur DeVany and W. David Walls, "Bose-Einstein Dynamics and Adaptive Contracting in the Motion Picture Industry," *The Economic Journal*, vol. 106, no. 439 (Nov. 1996), pp. 1493-1514.

[2] For an overview of how the movie business works, see, e.g., Mark Litwak, *Reel Power: The Struggle for Influence and Success in the New Hollywood*, New York: William Morrow & Co., 1986; and Harold L. Vogel,

The music industry faces two distinct challenges that are similar, but not identical with those facing the film industry: the continued unpredictability of customer demand at the micro level (sales of recorded music) and market-shifting technology at the macro (industry) level. This paper deals primarily with customer demand for recorded music, but these two challenges for the music industry are so intertwined that it would be unrealistic to attempt to examine the role of one without also discussing the role of the other.

Our project builds on a previous effort that looked at the movie business.[4] The data available for record sales are somewhat different from those used in the analysis of the movie industry, so we have performed a more limited data analysis that was supplemented by interviews with ten industry executives. In these interviews we also asked about what appears to be "common knowledge" in the business: the reduced role of radio, retail, and specialized cable channels, like MTV, and the effect this reduced role has on the predictability of sales. We do not deal with other aspects of the music business, such as concerts.

Moving Music Sales Then and Now

Traditionally, the stability of the recording industry at the macro level was due, in part, to stable relationships between the record companies and radio, retail, and specialized cable channels. These relationships made possible a limited amount of predictability regarding which songs or albums would become hits.

In the case of radio, the record companies provided content which then drove singles and album sales. According to a former major-label executive we interviewed, the more hit singles on an album, the more copies it was expected to sell. Retail stores also played an important role in turning radio hits into sales. The location of music in a retail store, on the end-caps of aisles, near listening stations, and near special displays had a significant impact on sales, and record companies offered promotions to the stores in return for these coveted spots.

The first threat to the harmony of this system of mutual benefit came in the 1980s with the rise of "Big Box" chains such as Wal-Mart and Best Buy, which used music as a loss-leader (often selling at less than their cost) to encourage customers into their stores. This threat changed the traditional retail relationships dramatically, because the stores were ordering 500,000 copies of a new release and selling them at a price so low that traditional music stores simply couldn't compete. Nonetheless, throughout the 1980s and 1990s, music sales flourished, peaking in 1996 with 3.4 billion units sold worldwide.[5]

When the cable channel MTV debuted in 1984 with a music video called "Video Killed the Radio Star," by The Buggles, some may have wondered if MTV would do just that. But flashy videos and other

---

(cont'd) *Entertainment Industry Economics*, Fifth Edition, Cambridge U.K. and New York: Cambridge University Press, 2001.

[3] P. H. Longstaff, Raja Velu, and Jonathan Obar, *Resilience for Industries in Unpredictable Environments: You Ought To Be Like Movies,* Program for Information Resources Policy, Harvard University, July 2004. Available at http://pirp.harvard.edu/pubs_pdf/longsta/longsta-p04-1.pdf.

[4] See note 3.

[5] See, *The Times* UK. "Music sales fall to their lowest level in over twenty years." http://business.timesonline.co.uk/tol/business/industry_sectors/media/article4160553.ece.

programming aimed at a hip, young demographic only added to the hit-making infrastructure of the industry, benefiting both the radio and music industries.

Not until nearly fifteen years later did a real threat emerge in the form of digital file-sharing networks such as Napster. At its peak in February of 2001, Napster had over 25 million unique users. In October of that year, Apple launched its first game-changing iPods which, while not the first portable MP3 (MPEG-1 or MPEG-2 Audio Layer 3 [or III]) player, dominated over 80% of the market by 2004. [6] By 2010, the Apple iTunes Music Store had sold over 10 billion songs and was selling 70% of online digital music worldwide.[7] During the 2000s, a number of music-recommendation websites, including Pandora, Last.fm, and Lala, were launched, directly challenging the role of radio in marketing music.

At the macro level, the effect of the market-shifting move to digital technology was a steady decline in physical music sales, radio listenership, and music sales in brick-and-mortar retail stores. One researcher has looked at music retail data over a four-year period and concluded that high-speed Internet decreased the number of music-specialty stores and contributed significantly to their demise.[8] Even the Big-Box retailers began to devote less space to physical music, as they expanded their selection of MP3 players.[9] Considerable debate and research have been focussed on the impact of file sharing on legal music sales using a number of different approaches. One study examined album sales across 99 U.S. cities over a five-year period leading up the opening of the iTunes Music Store and found that illegal file-sharing caused a significant decline in record sales.[10] Additional studies found that even in the iTunes Music Store era, for each additional song stolen, paid consumption is reduced by between −15% and −3% of a song.[11]

A number of articles have suggested ways in which the music industry could remain profitable, including the use of marketing innovations, such as guerilla marketing and grassroots techniques, while appealing to the core values of their target demographics (e.g., eco-friendliness when marketing to college-age consumers). One researcher suggests several themes key to success—including *product line extensions* (i.e., ring tones), *innovative pricing* (i.e., near-instant price reaction to events), and a *"search" as a product itself"* (i.e., music-suggestion sites like Pandora).[12] Yet others have suggested that the music

---

[6] See, Bloomberg. "Apple's Jobs Taps Teen iPod Demand to Fuel Sales, Stock Surge." http://www.bloomberg.com/apps/news?pid=newsarchive&sid=a58iozj_2jXM.

[7] See, CNN Tech. "With iTunes, Apple has thrown weight around." http://www.cnn.com/2010/TECH/biztech/05/27/cnet.itunes.apple/index.html.

[8] See, Alejandro Zentner, "Online sales, Internet use, file sharing, and the decline of retail music specialty stores, *"Information Economics and Policy*, vol. 20, no 3 (2008), pp. 288–300.

[9] See, The Daily Swarm. "Big box stores Best Buy, Wal-Mart & Target cutting back on CDs." http://www.thedailyswarm.com/headlines/big-box-stores-best-buy-wal-mart-target-cutting-back-cds/.

[10] See, S. Liebowitz. "Testing file-sharing's impact by examining record sales in cities," *Management Science*, vol. 54, no**.** 4 (2008), pp. 852–859.

[11] See, Jared Waldfogel. "Music file sharing and sales displacement in the iTunes era." *Information Economics and Policy*. (2010)

[12] See, Sudip Bhattacharjee. "Re-tuning the music industry: can they re-attach in business resonance?" *Communications of the ACM*, vol. 52, no. 6 (2009), pp. 136-140.

industry needs to learn to embrace innovations such as file sharing or risk further damage. [13] While any or all of these recommendations may be valid, we think that going back to the fundamentals of the music industry (that is, things that haven't changed because of the various new recording technologies) may be the best place to look for clues to the future. To that end, we examine the resilience strategies of the industry—how it has survived uncertainty in the past may be the best evidence for how it will survive now.

Organization of This Paper

In **Chapter Two** we give the highlights of our interviews with ten industry professionals and an analysis of the available data to look for evidence of a complex adaptive system with gamma distributions similar to those found in the movie industry. Unlike a "normal" distribution (**Figure 1-1**), in which there are a few events at the high and low ends and most events in the middle, a power-law distribution indicates that extreme events are happening in a very few cases but many more events that are not successful are also occurring, and that very few events are taking place in the middle range.[14] A gamma, or fat-tail, distribution (**Figure 1-2**) often indicates a system with high uncertainty.

At the macro level of the music industry there are now several large record companies, many small producers, and many, many, artists who are recording and distributing their own work. If charted by annual income they all make up a very clear power-law distribution. At the micro level (sales of individual products—singles or albums) all the data indicate and all our interviewees confirmed that there has always been a power-law distribution.
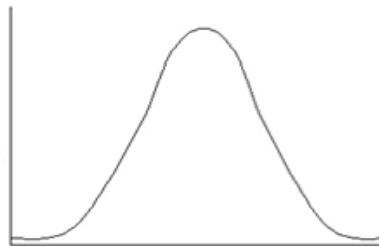

Figure 1-1
Normal Distribution

---

[13] See, K. Oestreicher and J. Kuzma. *The Music Industry & Its Consumers: A Potential Divorce Through Technology and Shifting Market Linkages? Proceedings of the 2009 EBES Conference,* Istanbul 01-02 June 2009 Istanbul: Kadir Has University, 2009.

[14] For a discussion of fat tails appropriate for nonspecialists, see, Chris Anderson, *Long Tail, The, Revised and Updated Edition: Why the Future of Business is Selling Less of More,* Hyperion (2008); Ian Bremmer and Preston Keat, *The Fat Tail: The Power of Political Knowledge in an Uncertain World*, Oxford University Press (2009); and Malcom Kemp, *Extreme Events—Robust Portfolio Construction in the Presence of Fat Tails,* Wi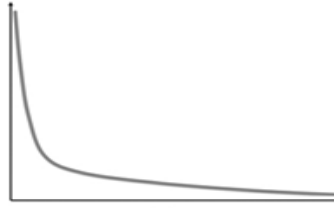ley (2011). For the mathematically inclined, see, e.g., http://functions.wolfram.com/GammaBetaErf/Gamma/introductions/Gamma/05/.

Figure 1-2
Gamma or Fat-Tail Distribution

In **Chapter Three** we look at the attributes of complex adaptive systems and, more specifically, how the music industry exhibits these attributes. The attributes include intricate interdependencies, a wide variety of variables, nonlinear effects and cascades, and constant adaptation.

In **Chapter Four** we look for evidence of "resilience strategies" in the music business. There is new work being done on resilience in many disciplines, including such diverse fields as mathematics, political science, ecology, and business management. This work has revealed the possibility that complex, unpredictable systems, particularly those that operate as a network, have some things in common.[15] Effective resilience strategies often deal with a diversity of resources, appropriate scales of action, loose and tight connections (tight coupling) in appropriate places, and effective networks. All of these strategies are found in the music business. We also note the kinds of things that will make a resilience strategy fail.

In **Chapter Five** we suggest strategies for firms in the recording industry or *any firm* that must operate under high uncertainty. These are almost exactly the same as those developed after a study of the film industry. This similarity seems to indicate that these strategies are broadly applicable to a variety of firms and industries—even those outside the entertainment industry.

---

[15] See, P. H. Longstaff, "The Resilient Company: Bouncing Back When Things Become Unpredictable," posted on *Navigating New Media 2/12/2010*. Available at http://www.navigatenewmedia.com/Home/Article.aspx?100013.

Chapter Two

Project Data Analysis

Analysis of Multiple-Year Data. To explore the music industry effectively over the years studied, we randomly sampled sales of ~400 albums per year over a seven-year period (2003-2009) as well as album sales from 1995 for comparison. Our sample covered an enormous range of album sales, from 0 to ~15 million [ml deleted; not used again]. **Table 2-1** shows median album sales for each year in comparison with sales of the bestselling-album in that year, as well as total sales of all the albums looked at for that year.

Table 2-1

Year	Sample (N)	Median Album Sales (Thousands)	Best-Selling Album Sales (Thousands)	Total Sales in Sample (Millions)
2009	402	61	3814	24.6
2008	402	87	3491	35.1
2007	402	59	1619	23.6
2006	435	66	1674	28.6
2005	414	139	5943	57.6
2004	404	142	5977	57.4
2003	409	162	4758	66.4
1995	414	237	14665	98.0

The data in the table demonstrate what is common knowledge in the industry: album sales have been declining over the past seven years, especially in comparison with 1995, and sales of best-selling "hit" albums are exponentially above average. The relationship between best-sellers and the industry as a whole is explored in **Table 2-2**. There the analysis does not help to predict which albums will be hits and which will not, but it does show that a small percentage of the albums released in a given year tend to comprise a significant amount of all albums sold that year. Further support for the fat-tailed nature of the industry can be found in a histogram of sales by album over a seven-year period (for similar figures for individual years, see **Appendix A**).

Further analysis reveals a fractal nature (a repeating pattern at smaller scales) of the industry, in which individual pieces of the fat tail are themselves tailed. **Figures 2-1–2-3** show histograms, for the bottom 98% of albums sold in a given year in our sample and for all albums with sales of less than one million copies (similar tables can be found in **Appendix B**).

While these tables and figures provide no predictive power regarding where a release may fall in the tail, they clearly illustrate the complex, fat-tailed nature of the industry. The next section of this chapter seeks a deeper understanding of the uncertainty within the industry through interviews with industry professionals.

Table 2-2

Year	Ratio of Best Seller to Median	Top 2% of Albums Sold (%)	Top 5% of Albums Sold (%)
2009	62.4	54.4	72.8
2008	40.0	49.4	70.5
2007	27.6	43.1	60.4
2006	25.5	32.4	53.6
2005	42.7	44.7	66.9
2004	42.1	45.4	65.4
2003	29.3	36.4	61.6
1995	61.9	39.0	60.0

Figure 2-1

ALBUM SALES ACROSS BOTTOM 98% (2003-2009)

Mean = 56025.23
Std. Dev. = 144981.519
N = 2,810

Frequency

COPIES SOLD (Total = 157 mil)

Figure 2-2

ALBUM SALES ACROSS BOTTOM 95%

Mean = 34549.64
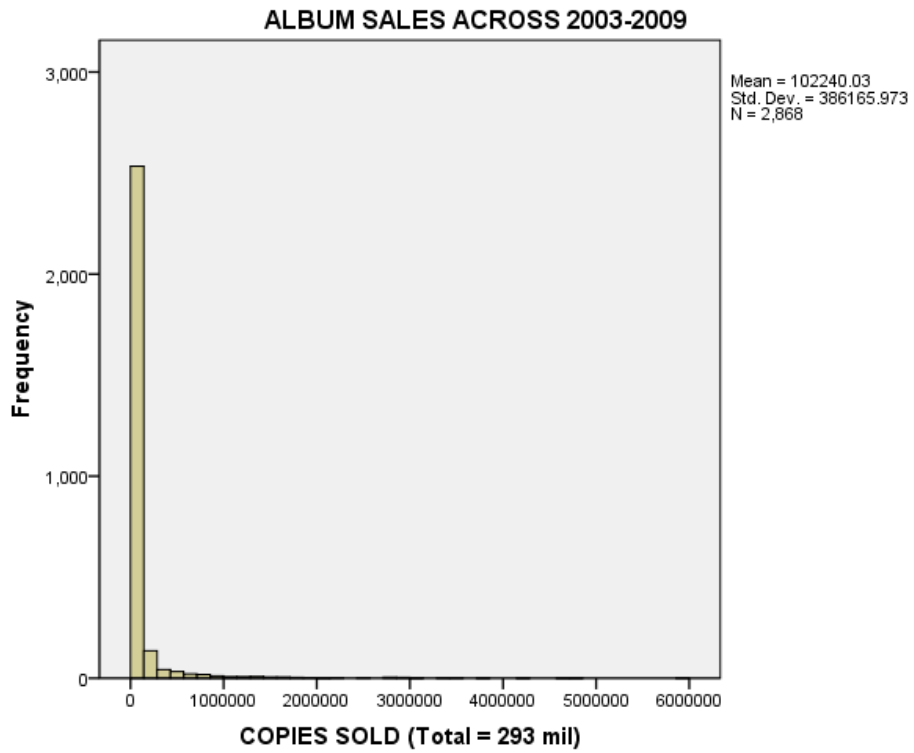Std. Dev. = 70524.636
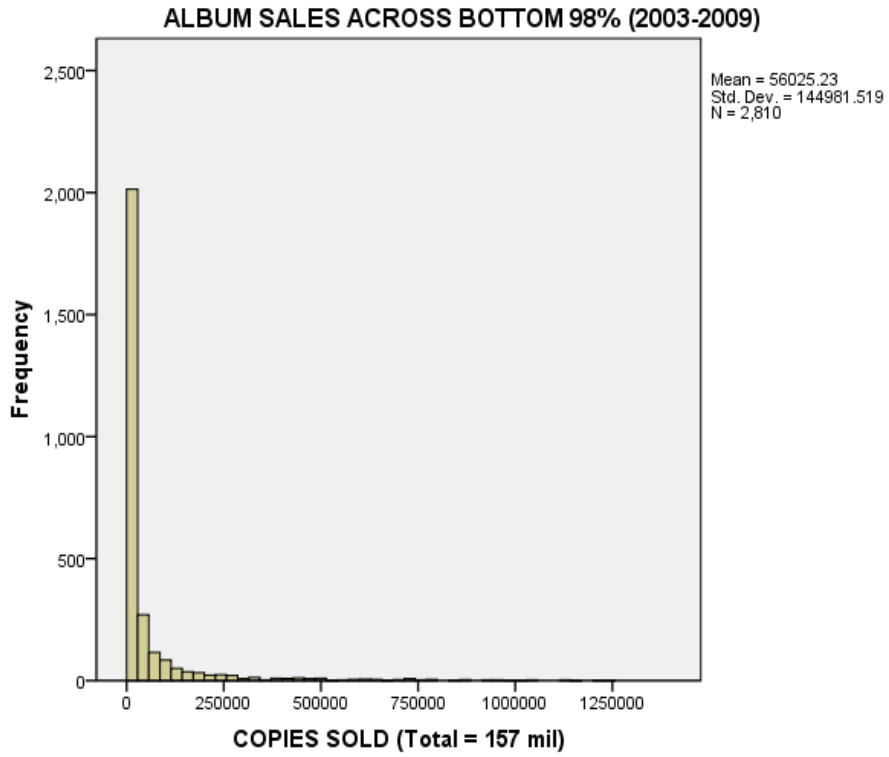N = 2,725

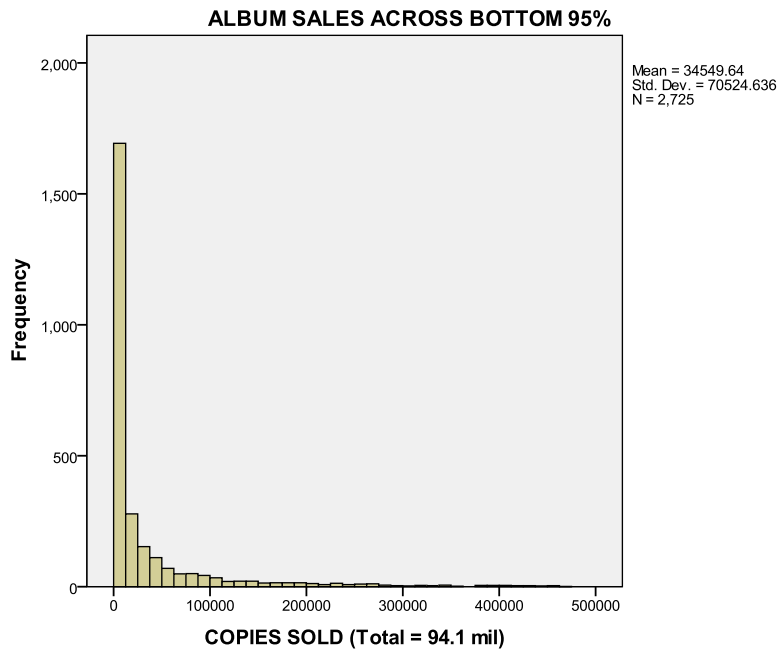Frequency

COPIES SOLD (Total = 94.1 mil)

Figure 2-3

Interviews of Industry Professionals

In order to test some of the ideas here about uncertainty in the music industry (if it has increased in the last fifteen years, and, if so, how the industry has been responding), we interviewed ten industry professionals, listed in **Appendix C**. Some of them are named, whereas others chose to be listed only by their job description or background, or both. The interview guide in **Appendix D** was used for all interviews, and it is used here to organize the aggregation of data collected in those interviews.

Fat Tails. We asked the interviewees to look at a "normal distribution curve and a fat-tail distribution and asked which one best described the sales in the industry last year. All of them were very certain that it was the fat-tail distribution and said it was the same in 1995. However, most of them thought the curve had changed slightly since 1995, because fewer songs or albums were released that year and the "winners" sold more copies. So the tail is longer today (more music is recorded and distributed), but those lucky enough to have a hit will not sell as many copies as they would have in 1995.

Uncertainty: Predicting Hits. All the executives interviewed agreed that it has never been possible to predict hit recordings or hit artists reliably. One executive put it succinctly: "If somebody could predict hits all the time they would be at the top of the business and they would be rich. But there is nobody like that." One executive with access to comprehensive industry data said that only one in ten new artists ever become profitable—and nobody knows which one it will be at the outset."

Prediction may be somewhat easier in some genres, with previously successful artists, and for what one executive called "made-up" artists—those who do not record their own work and are "designed" to accommodate specific trends. One executive suggested two other variables in predicting hits: the experience of the producer and the past success of the songwriter. A song that is "fresh" might have a better chance than older songs, but one that is "too fresh" is said to be more likely to fail. But even in these categories there have been, and continue to be, unexpected winners and losers. And the categories can change: popular genres fade, "hot" producers and songwriters lose "that magic," and artists with a string of hits can fail.

There have always been attempts to use "research" to make more reliable predictions. In the 1990s, some record companies used galvanic skin-response meters to test people's emotional responses to songs. While this looked "scientific," it apparently had low levels of predictability for hit songs. Today, research might consist of asking people's opinions of samples of songs played for them in a "call-out" of random phone calls. Their responses are compiled to show radio stations the likelihood that a song will be popular and should be on their playlist. But even strong radio play does not always predict strong sales.

One executive suggested that since there are so many artists recording today it is difficult for producers to check them all out to make predictions about who will succeed. But even if one does all the research one can, one can still be wrong. Rick Dobbis said, "Predicting the taste of the public is always a moving target. Like everybody else, I had a few projects where I thought the numbers lined up, but they didn't make it."

Another executive said that data on peer-to-peer file sharing are sometimes helpful but they do not always predict sales. After a song hits the market, sales can be tracked. Some data that can be used and to

predict an upward (or downward) trajectory in the charts include sales patterns; radio-request patterns; the impact of a live performance (a spike, no spike, or a sustained increase); the sale of related merchandise (T-shirts, etc.); and the impact of reviews and press coverage. New data sources include tracking legal and illegal downloads, traffic in the blogosphere, and listening services such as Pandora.

One music industry consultant explained the difference between where hits came from in the pre-Internet era, as compared with the present. In the past, the general industry model was a "push" model, essentially a top-down approach by which albums were pushed toward the consumer through a network of gatekeepers. In the Internet era, major labels operate under a "pull" model, in which groups release albums.

Tipping and Cascades. All the interviewees had witnessed artists and genres cascade both up and down. When a music genre cascades up or down it can take companies that specialize in that type of music with it. Some of those interviewed thought that the movement back down was less likely to be a cascade and more likely to be gradual. One executive said that for new artists a cascade can happen any time after the music is released, but for established artists it usually happens (or not) in the first week after release. Because access to Internet traffic data is immediate, cascades are often easier to spot early, rather than later. One executive with experience in both recorded music and radio said, "For example, you *knew* when the Grunge movement was over. Something gets to a peak and then all of a sudden it's so yesterday."

The artists and recordings that stay around for a long time (neither rising nor falling quickly) are, according to one analyst, those in certain genres. For example, classic rock holds sales over a longer time than other genres do. Some artists have "shocking" rises and falls, and these are seldom predictable. But nothing grows forever. Eventually, a genre or artist fades. The speed of fading is difficult to predict. Public taste can be moved by the actions of many actors, including Amazon, National Public Radio, iTunes, morning TV shows, and airlines magazines. For this reason, many companies diversify—they know that genres come and go without much warning.

Long-Term Contracts (Tight Coupling). In 1995, record companies were vertically integrated, and they owned distribution and marketing companies or had these functions in-house. They had long-term contracts with disc-pressing companies, jacket printers, etc. With the drop in sales resulting from the appearance of Napster and other file-sharing services, many companies that held long-term contracts went out of business.

All the executives interviewed agreed that contracts in the industry are more short-term today. Technology advances have made it cheaper to make and distribute products so a record company will not be saddled with long-term contracts with suppliers. Most marketing services have been moved out-of-house, because record companies are often smaller today. Many recordings not handled by the large record companies are marketed and distributed by artists on a do-it-yourself basis. The huge increase in recording does not therefore mean more business for independent marketing firms. Distribution agreements with Big Box stores like Wal-Mart are shorter, and music is pulled from shelves sooner if it does not reach sales goals.

Contracts with artists have also been changed. They include more potential revenue for the producer or record company from the sale of tickets to concerts, merchandise, etc. The changes are called "360 deals" (all-encompassing) and are thought to be necessary to make up for the loss incurred by the reduced revenue from sales of recordings. Contracts with artists have changed also in that the terms are less likely to be measured in "albums," owing to the shift toward promoting and selling singles.

Contracts with artists are also becoming shorter. The general length of time recording companies give artists to succeed has been dramatically shortened. One executive said that companies used to spend more time than they do now developing artists, and speculated that Bruce Springsteen would not make it today because his first few albums did not do particularly well. Another industry professional explained that in the past, if the first single from a new artist's album wasn't a hit, the artist was given on average between four to five additional singles before the label gave up on them. Now, they are lucky to be given one before the label "changes direction," which often means dropping all promotional resources entirely. Contracts with artists are also becoming shorter because it is harder now to determine the future value of an artist's catalog. Artists themselves often want shorter terms. Many established artists want them so they can move to get a better deal once they are successful.

Networks. All the interviewees agreed that having a network of contacts is crucial to success in the music business. It is important to have a larger *quantity* of contacts and a *diversity* of contacts that can provide different services. One executive explained that this is because of the uncertainty. "Companies diversify their investments in artists because they know genres of music come and go without a lot of warning."

The contacts in a network are developed and maintained by actually working together and collaborating without being unnecessarily competitive. Because the business moves so quickly, it can be impossible to get something done if you don't have somebody to call who can deliver what you need right away. One industry executive told us that maintaining their network is "almost a full-time job."

Successful people build networks at every level they can, although artists don't often have contacts at higher levels of the industry. At the industry level, it is very important, because executives tend to rotate among the companies and often their contacts increase their value. The operation of these networks has changed since 1995 with the advent of e-mail, social networks, and cell phones. A lot more of the contact takes place with the use technology. Justin Shukat said, "The tools like the social networks are greater than they were in 1995, but you develop your network by meeting and delivering what you promise. At the end of the day it's about dealing with people you have worked well within the past."

Is the Industry Adaptable? When asked to rate the adaptability of the music industry on a scale from A to F, most of the interviewees rated it at "about a C." Many said that in 1995 and until recently, there was no perceived need to adapt. Some attributed the slow adaptation to the "egos" in the business. Others said that people in the music business are just like all people—they are afraid of change and wait until they are sure of how things are going to turn out. It can be dangerous to point out change: Rick Dobbis noted that "You adapt quickly when you see the house is on fire. People who pointed out the fire sometimes got rewarded but sometimes they got fired."

But the pace of adaptation has picked up in the last few years. Some executives attributed this increase to the industry's being "genuinely scared" now and therefore ready to look for new business models and licensing opportunities. For example, there are now deals between independent producers and record companies that permit the company to pick up an artist who is starting to take off. This approach gives the producer access to more marketing assets when they are needed and takes away some of the risks associated with new artists from the record companies. One thing that keeps the companies from adapting faster is fear that any new distribution schemes will just cannibalize current systems. Something that slows adaptation is the size of some of the companies, and their tendency to have bureaucracies and rules.

Are Producers Adaptable? Generally, the interviewees gave producers higher marks for adaptability, which, they said, has grown a lot since 1995. They attribute this change to the producers' being able to move faster, since producers generally are not saddled with large bureaucracies. New technology (like a high-end Macintosh) allows them to record at far lower costs, making it possible for them to keep their margins low and record more artists. But in an industry where it's hard to predict success, some producers stick with genres they know best, which prevents them from trying new things. And some are struggling to adjust to the fact that sales are moving from albums to singles.

Are Artists Adaptable? Most of the interviewees felt that artists adapt much more quickly than record companies or producers. Some believe that artists are more likely now to take their ideas and run with them—without being held back by record companies or producers who are looking for hits. Artists have many more tools at their command to communicate with fans than they did in 1995. Many use Facebook and Twitter. Since they can operate with very low costs for production, distribution, and marketing, some artists are willing to give their music away in the hope that it will catch on. Genre artists, though, tend to have less ability to adapt if their genre goes out of style. One executive thinks that there are two kinds of people recording music today: capitalists (who will adapt to whatever it takes to win) and artists (who don't adapt if they think doing so would hurt their art—they don't care about commercial success).

Is Radio Still Critical? Radio plays a lesser role in the music business than it did in 1995, but it is still the biggest predictor of sales success according to all of the interviewees. Most of them acknowledged that fewer people (particularly young people) listen to radio today, but one executive thought it remains "the best way to have your music heard for free." Justin Shukat said, "Today what drives sales is Internet viral distribution. We need somebody we trust to tell us what to listen to. We used to trust local DJs. It's all about trust in my opinion."

Some interviewees cited the role that huge radio chains with centralized song selection and consolidated play lists have in reducing the number of songs that get air time today. Others thought that services such as Amazon and Pandora are picking up radio's role of suggesting the music that individuals might like. One executive sees services like Pandora as a significant change—people are renting a music library, not buying their own.

One industry professional explained that the biggest change over the last decade has been the "additional avenues to expose a song that might not immediately get radio airplay." According to him, YouTube, TV, movies, and Internet advertising have a strong impact on creating buzz outside radio.

Is Retail Still Important? In 1995, most music was sold in a physical form in a physical place. But that has changed. One interviewee was blunt: "Music retail is dying." Record stores are rapidly becoming extinct, and distributors deal only with Big Box stores such as Wal-Mart. This change affects the power dynamics between a record company and the people who sell its products. Small record stores had much less power to negotiate than Big Boxes do. Big Box stores generally carry only 100 to 500 titles, and often only 1 to 2 copies of each title. Some big retailers still see music as a "loss-leader" that gets people into the store. But some interviewees think that floor space in the stores is getting smaller, which is important because browsing is an important function in sales. One executive noted that iTunes is now the largest music store in the United States. Several interviewees expressed the belief that independent and small record stores will thrive in the near future, since they are able to adapt to changes in customers' demand and can serve niche audiences more quickly than larger retailers can. There might be a symbiotic relationship between these independent and small stores and the recording companies in that they work together to succeed.

Are Cable Channels Like MTV Still Important? All the interviewees agreed that cable channels like VH1 and MTV play a much smaller role in driving sales than they did in 1995, when they were enormously influential and were seen by many as the arbiters of "cool." MTV, in fact, has taken its business in a new direction and no longer shows music videos in prime time. Video games and the various talent shows, such as Glee, American Idol, and Guitar Hero, are more influential today. Although channels like MTV may be less relevant to music sales now, the role of TV in general may actually be more significant today than it was in the past.

Chapter Three

The Record Industry As a Complex, Unpredictable System

In **Chapter Two** we found significant evidence that the recording industry does, indeed, follow a gamma, or fat-tail, distribution pattern, and several other attributes of the industry suggest significant complexity and uncertainty. This pattern is important, because it indicates that management strategies that work in more stable environments may not work as well in the music industry. In this chapter we give a brief overview of complex systems, list their important attributes, and discuss how the music industry exhibits them.

Systems are said to become "complex" when there are intricate interdependencies among their various parts and many variables operate at the same time. Examples of complex systems include the weather and the spread of disease in a population. Complex systems are generally nonlinear; the effect of adding something to the system (such as an infected person or air disturbed by a butterfly's flapping its wings) may diffuse unevenly throughout it, because the other components of the system are not evenly distributed or because the force doing the distributing is not equally strong throughout the system.

It is important to distinguish nonlinear systems, sometimes referred to as chaotic, from random systems. The outcome of rolling a pair of dice, for example, is random, because on the basis of their initial conditions there is no way to predict how the dice will land. These systems are called *nondeterministic*. A system that is chaotic is *deterministic*. If all the initial conditions and their effects on the outcome were known, there would be predictive power. In a complex system the number of initial conditions is massive, but the outcome is highly sensitive to very small changes (i.e., the movement of a butterfly's wings) that make prediction nearly impossible.[16]

Think of throwing a handful of buttons on the floor and then connecting them in various ways: some are connected by heavy string, some by magnets, some only by dotted lines on the floor. All the red buttons are connected to one another and some of them are connected to blue buttons. Most (but not all) the blue buttons are connected to one yellow button, while all the red buttons are connected to one black button. The red buttons move quickly, the blue ones move very slowly, but each yellow button moves at a different pace from that of all the other yellow buttons. The group of buttons is sitting on top of an active earthquake area. Could you predict the location of any one of the blue buttons a week from now? Could you predict the number of buttons that would move if someone pulled the string attached to one of the yellow buttons?[17]

---

[16] For further reading see, James Glieck. *Chaos: Making a New Science.* Penguin Group USA (1987). See also S. H. Strogatz. *Sync: The Emerging Science of Spontaneous Order*. Hyperion (2003).

[17] This is an adaptation of the "buttons and strings" metaphor used by Stuart Kaufman to explain complex systems in *At Home in the Universe: The Search for the Laws of Self Organization and Complexity*, New York: Oxford University Press (1995), pp. 55-58.

Some complex systems are *adaptive;* they *evolve* when individual things (such as organisms or persons) called "agents" (not be confused with agents in the music business) operate independently in response to forces in their environment. In some systems, agents can "learn" from one another when some agents obtain more resources and their actions are copied by others. In systems in which there is a change that cannot be learned by agents in the current generation (for example, if the change is a mutation in an organism's genetic structure), the change can eventually become part of the system if organism with the change (mutation) leaves more offspring. This is evolution by natural selection. For example, a mouse with better hearing is more likely than others to survive the presence of foxes in her environment and will leave more offspring than other mice do. Over many generations these offspring with better hearing also will leave more offspring, and gradually the number of mice without acute hearing will decline. Organizations and whole industries sometimes adapt in this way. Firms adapt when they look at what is working for others and change what they themselves are doing. Or, over time, more organizations survive that have developed a new strategy or capability that is appropriate to a new environment.

Management theorists have been using these ideas about complexity, adaptability, and unpredictability for at least fifty years.[18] In what would become one of the more influential business books of the late twentieth century, Peter Senge suggested that businesses must learn to adapt to change by creating "learning organizations."[19] But he knew it wouldn't be easy.

Businesses and other human endeavors are systems. They are bound by invisible fabrics of interrelated actions, the effects of which often take years to fully play out on one another. Since observers are themselves part of that lacework, seeing the whole pattern of change is doubly hard.[20]

Senge set out to destroy "the illusion" that the world is created by separate, unrelated forces and to develop understanding of *dynamic complexity* where cause and effect "are not close in time and space and obvious interventions do not produce the expected outcome."[21] Subsequent writers, such as Robert Louis Flood, have expanded on this idea, expanded the evidence against predictability in complex business situations and warned of the consequences of assuming that these processes are capable of being controlled.

"An 'A caused B' rationality is a source of much frustration and torment in people's lives. If a difficult situation arises at work, then an 'A causes B' mentality sets up a witch hunt for the person or

---

[18] Theorists like Alfred Chandler have been thinking about firms in turbulent times since the 1960s; see, *Strategies and Structure: Chapters in the History of American Industrial Enterprise*, Cambridge MA: MIT Press, 1962. For recent ideas, see, e.g., Robert Axelrod and Michael D. Cohen, *Harnessing Complexity: Organizational Implications of a Scientific Frontier*, New York: The Free Press (1999); Ralph D. Stacey, Douglas Griffin and Patricia Shaw, *Complexity and Management: Fad or Radical Challenge to Systems Thinking?* London and New York: Routledge (2000); Peter Schwartz, *Inevitable Surprises: Thinking Ahead in a Time of Turbulence,* New York: Gotham Books (2003).

[19] Peter Senge, *The Fifth Discipline: The Art and Practice of Learning Organizations*. Doubleday: New York (1990), p. 7. For earlier work in the same vein, see, Chris Argyris, *Integrating the Individual and the Organization.* Wiley: New York (1964).

[20] Ibid., p. 364.

[21] Ibid.

people who caused the problem."[22] A "witch hunt" causes otherwise successful executives to be fired when they fail to predict the future—at untold cost to an industry. In an industry like the music business, where the turbulence in the early twenty-first century made everything even less certain than usual, constant changes at the top can be more than usually destabilizing. Of course, the music industry is not alone in this. Many industries are becoming more complex as they grow more interconnected and as the forces working on them become more global than local. But the recording industry, more than most other industries, exhibits the classic characteristics of complex systems— intricate interdependencies, many variables, nonlinear inputs, and adaptation.[23]

Intricate Interdependencies. Like the button system described above, some of the connections in the music business have been strong and generally ongoing (artists' connections to their agents, producers' to distributors). Most other connections have been weak, because individual recordings are made as individual projects, with people and firms attaching themselves to a project for a limited period. During a project's life, all the players depend on one another, and the failure of one player to contribute appropriately will affect the entire project. Some projects are connected to other projects where the participants are working simultaneously, or have worked, or will work soon.

Wide Variety of Variables. In recent years, the music business has been buffeted by the digitization of the technologies they depend on for both production and distribution. Globalization and changes in world demographics have diversified their audience. For the release of a particular recording, other uncontrollable variables include the other music released at the same time; the "mood" of the public (if people are nervous about the economy they might not want to hear music that is not uplifting); the weather when a critical open-air concert is scheduled; and what music radio stations choose to play. Some variables can be controlled (stars, marketing budget, genre, release date, etc.), but all the industry executives interviewed agreed that manipulation of the variables that they can control does not give consistently predictable results, let alone the variables they can't control.

Nonlinear Effects and Cascades. When forces affecting a system do not change it in a simple, system-wide manner or do change it by more than the amount added, we say the effect is *nonlinear*. For example, adding one posting on a popular web site may have a nonlinear effect (good or bad) on the sales of recorded music. This is important because the sales of a particular song or album depend heavily on "word of mouth" communication among listeners. A growing body of research studies systems that *cascade* at unpredictable points. Epidemics and fashion fads are examples of cascades. In some systems, a cascade is the *tipping point* of the system—something that moves the system from one state into another.[24] In fact, there may be two tipping points in many networked systems. The first tipping point

---

[22] Robert Louis, *Flood, Rethinking The Fifth Discipline: Learning Within the Unknowable*, Routledge: London and New York (1999), p. 84. See, also, Scott Snook, *Friendly Fire: The Accidental Shootdown of U.S. Black Hawks Over Northern Iraq*, Princeton, NJ: Princeton University Press (2000).

[23] For a discussion of the communications sector as a complex system, see, P. H. Longstaff, *The Puzzle of Competition in the Communications Sector: Can Complex Systems be Regulated or Managed?"* Program for Information Resources Policy, Harvard University, July, 2003.

[24] For a discussion of how this works in marketing, see, Malcolm Gladwell, *The Tipping Point: How Little Things Can Make a Big Difference*, Boston: Little, Brown and Company (2000).

appears when a system develops enough connections so that local islands of connection merge into a larger network where large cascades are possible. As the network grows, the cascades grow larger and more likely, until the *second* tipping point, at which the cascades become smaller and rarer, because there is *too much connectivity*. The second tipping point is said to be a dilution effect that occurs when individuals in the network are connected to so many people that any one of the connections does not have a great enough influence. Each individual is said to "tip" (e.g., decide to buy a song or album) when a certain *fraction* of its neighbors makes this choice, not a certain *number* of them. If I have more people to whom I look for clues to music or fads, it will take even more people to get me to join the bandwagon.[25] But, as noted in **Chapter Two**, immediate access to Internet traffic data makes it possible as well as easier to spot cascades.

This understanding of tipping points and cascading networked systems seems to indicate that there should be some way to figure out the best places at which to nudge a networked system to make it tip your way—to make your song the one that beats the odds to become a hit. But it is important to remember that if the system is adaptive and has many variables working on it, the likelihood of predicting a cascade that will tip the system is not high. This is true particularly when other people also have this information and are trying to nudge the system their way—which is, of course, exactly what is happening in the music business.

Adaptation. Music products exist in a highly competitive environment, with most individual songs and albums living and dying in a relatively short period. Since the people working on these products are highly interconnected, ideas about why certain projects die early (or are never born) travel quickly through the system, and other people adapt their strategies on the basis of their own view of what works and what doesn't. That there is often disagreement about what makes a project fail means that adaptation is not uniform and not predictable. At the level of the industry, adaptation is much slower owing to longer-term commitments and tight coupling, discussed in **Chapter Four**.

The music industry continues to adapt at both the micro and macro levels. It does so in a highly complex and unpredictable environment. This is good evidence that the industry has resilience strategies—even if it doesn't know it. Next, we look for specific resilience characteristics in the this industry.

---

[25] There are a number of accessible books on this idea. See, e.g., Duncan J. Watts, *Six Degrees: The Science of a Connected Age*, New York and London: W.W. Norton & Co., 2003; S. H. Strogatz, *Sync: The Emerging Science of Spontaneous Order*, New York: Hyperion (2003) esp, Chapter 10; Mark Buchanan, *Nexus: Small Worlds and the Groundbreaking Science of Networks*, New York and London: W. W. Norton & Co. (2002); Mark Buchanan, *Ubiquity: The Science of History…Or Why the World Is Simpler Than We Think*, New York: Crown Publishers (2001).

Chapter Four

Dealing With Unpredictability in the Music Industry: Resilience Strategies

When confronted with danger, the best strategy may be to develop a defensive system that will keep the danger away or one that will act as a buffer to keep you from being affected by the danger. This is called a *resistance* strategy, and it is a good plan if you know the nature of the danger(s) you are likely to face. If you are likely to be threatened by an army equipped with spears and swords, building a wall around your city will create a buffer and prevent harm to those within. While there will be some temporary defensive measures put in place in case of attack, sooner or later the city will return to normal. But building a wall around your assets (literally or figuratively) may keep out other things (like water and food for the besieged city or potential customers) and keep those being protected from taking advantage of opportunities outside the protected area.

When an individual or group (species, business organization) must operate in an environment where resources and dangers are too unpredictable for a resistance strategy, it is often good to develop *resilience*.[26] Resilience seems to come in two forms. *Engineering* resilience means the system will bounce back to do exactly what it did before being "surprised" by some sort of disaster or crisis. *Biological* resilience means that the system will bounce back but to an operating mode that has been adapted to the changes in the environment brought on by the disaster or crisis.[27] If the environment has changed, bouncing back to doing what was done before is not desirable, even if that is what most of us would *like* to do.

In the music business, uncertainty at the level of the individual album does not *necessarily* mean that there is instability at the level of the industry. Even though there are many failures, the industry has survived because of a few big successes that any person or company could enjoy if they had the right product at the right time and were lucky. In the past, there were more record companies of medium size, so the industry had less of the fat-tail look than it has today, with a few big players and many small ones. This new fat-tail distribution indicates more uncertainty at the industry level than was seen in the past and a greater need to add a resilience strategy as a defense against possible dangers (known and unknown).

Resilience and Diversity. Individuals or groups in systems existing in unpredictable environments often try many strategies and hope that some of the individuals or groups will be able to take advantage of unforeseen opportunities or survive whatever challenges or dangers they encounter. Birds lay several eggs because they live in a dangerous environment, and some eggs are lost to predators. Businesses often

---

[26] There is a growing body of work that looks at resilience. See, e.g., Lance H. Gunderson, "Adaptive Dancing: Interactions Between Social Resilience and Ecological Crises," *Navigating Social-Ecological Systems: Building Resilience for Complexity and Change*, Cambridge UK and New York: Cambridge University Press, 2003; C. Folke, F. Berkes, and J. Colding, "Ecological Practices and Social Mechanisms for Building Resilience and Sustainability," *Linking Social and Ecological Systems: Management Practices and Social Mechanisms for Building Resilience*, ed. Berkes and Folke, Cambridge: Cambridge University Press, 1998.

[27] These concepts and others here were developed by the Resilience Alliance. See, http://www.resalliance.org/564.php.

develop many products in prototype form but abandon them if they do not meet specific targets. Thus, both *a limited investment in large numbers of the same thing* and *diversity in the things tried* can be tools for resilience. But survival using these strategies does not necessarily involve anything even close to *stability* in the short-term fortunes of the individuals of that species or firms in that industrial sector.[28] The strategy of resilience and diversity requires a willingness to accept many failures or to deal with the same challenge in different ways, or both. A few eggs and a few products survive because they are lucky enough to find themselves in exactly the right environment to thrive. No one could have predicted which eggs or which products would be so lucky.

The music business would seem to be a perfect example of this type of resilience in action. As already noted, it is a business that operates in an environment with many unpredictable variables. The total number of albums released each year is large (and getting larger). Some things may give an album a better chance to become a hit (many executives interviewed mentioned "quality," for example), but no one can predict all the winners or losers. The industry is constantly experimenting with new ideas and looking in new places for the next hit. For every song released, many more are not recorded or released.

A strategy of trying many things is made possible in part by adaptive contracts and by the practice of *contingent compensation*. For example, artists make some money for writing a song or performing one, or both, but they become entitled to more money (sometimes much more) if the song becomes a hit. If the song or album does not turn a profit, only the investors who gambled on net profits walk away with nothing. But, like those who bet on other unpredictable events, such as horse races, the investors take their losses as just one try in a bigger game and wait for a big hit. Adaptivity is also enhanced by the shorter-term contacts, as the executives interviewed noted, which allow any party to the contract to cut their losses sooner.

In recent years, many businesses have been told that they can build resilience by developing "a broad portfolio of breakout experiments with the necessary capital and talent"[29] out of which will come winners and losers. "Most experiments *will* fail. The issue is not how many times you fail, but the value of your successes when compared with your failures."[30] The music industry seems to be a good example of this advice in action. But a view of resiliency on this larger time scale is often difficult for investors from more traditional businesses, where profits and losses are calculated on a quarterly basis. For the rest of us, it is not easy to just concentrate on profits from the winners and ignore all the losers. But "looking on the bright side" may be necessary if the system is to work. In a system with a lot of uncertainty, a business would not risk funding a lot of losers unless the upside was very attractive. When the odds are

---

[28] There remains a serious debate in biological science about the relationship between diversity and stability. Some argue that diversity enables stability because it acts as insurance: if there is a danger it is more likely that a system will recover if it contains species with various strategies or tolerances. On the other hand, some experiments have indicated that low diversity systems recover more biomass faster. See, Shahid Naeem, "Biodiversity: Biodiversity Equals Instability?" *Nature*, Vol. 416, (2002), pp. 23-24.

[29] Gary Hamel and Lisa Valikangas, "The Quest for Resilience," *Harvard Business Review*, Sept. 2003, pp. 52-63, at p.54.

[30] Id., at p.60.

low but the prize is big, and when the cost of failure is low as compared with the reward of success, the optimal strategy is be as spread out as possible.

Resilience at Fast and Slow Scales. Many authors have noted that slower parts of a system act as resilience mechanisms for the faster parts, because they can "remember" how to handle certain surprises. In return, the faster parts of a system give the slower parts information about changes taking place and allow it to adapt at its own pace. In some cases, the slower parts fail to adapt because they do not get the information, they are not able to use it fast enough, or they simply don't believe it. In these cases, the parts of the organization or industry operating at the slow scale are liable to undergo drastic, cascading change when the changes forced on them reach a critical level, particularly if the system has become tightly coupled over time. There was a strong indication in our discussions with industry executives that such a drastic, cascading change occurred when the the preceding changes reached a critical level for the music business at the industry level. When industry leaders finally "saw" the accumulating changes that were making permanent changes in the environment, they were unable to adapt quickly enough because of long-term commitments, legacy bureaucracies, and fear of cannibalizing their current income streams.

Resilience in Loose and Tight Coupling. The very connectedness or sameness that makes an organization or industry strong and efficient can amplify internal weaknesses or external shocks. This situation has been seen in many systems.

> When the system is reaching the limits to its conservative growth, it becomes increasingly brittle and its accumulated capital is ready to fuel rapid structural changes. The system is very stable, but that stability derives from a web of interacting connections. When this tightly connected system is disrupted, the disruption can spread quickly, destabilizing the entire system. The specific nature and timing of the collapse-initiating disturbance determines, within some bounds, the future trajectory of the system. Therefore, this brittle state presents the opportunity for a change at a small scale to cascade rapidly through a system and bring about its rapid transformation. This is the "revolt of the slave variable.[31]

In the music business, such cascading change at the slow level (the level of the industry) was seen in the consolidation of the large music firms as they struggled to survive in an environment with many fewer dollars in the system that they could control.

The importance of the relative *strength* of the connections in a system is increasingly seen as critical to the analysis of the system's behavior. In fact, relative strength is a fairly good predictor of the stability and resilience of any group. Strong (or tight) coupling within or between organizations would be

---

[31] Lance H. Gunderson, "Adaptive Dancing: Interactions Between Social Resilience and Ecological Crises," *Navigating Social-Ecological Systems: Building Resilience for Complexity and Change*, Cambridge UK and New York: Cambridge University Press, 2003, pp. 12-13.

predicted when critical resources are reliably available, the system changes rapidly *as a whole*, and influence spreads quickly in the system.[32]

In tightly coupled systems*,* any disturbance in the system will affect all of its parts, and if any part fails, the likelihood is greater that others will fail with them. This aspect of tight coupling has very interesting implications for organizations seeking efficiency through developing economies of scale. One of the seldom acknowledged trade-offs for seeking efficiency in this way, many times in a highly connected way, is that tight coupling will inevitably create an unstable situation if redundancy is taken out of the system to lower costs. For example, we all know that individual widgets can be produced more cheaply if a lot of them are built in the same way, using processes very closely tied to the processes of suppliers and customers. This kind of efficiency remains the Holy Grail for many firms that must compete with firms that have cheaper factors of production (e.g., lower distribution costs). As attractive as this goal is, it comes with a dark side. If a critical supplier, customer, or piece of technology were removed, with no redundant (or alternative) source in place, the entire system would become vulnerable to collapse. Loosely connected systems with built-in redundancy seem to be the most secure from this type of danger.

Loosely coupled systems are those in which the components have weak enough links that the links can ignore small perturbations in the system. If one link fails, it will not take all the others with it. The components of a loosely coupled system are said to have more independence from the system than tightly coupled components do, since they can maintain their equilibrium or stability even when other parts of the system are affected by a change in the environment. The components of loosely coupled systems are also better at responding to local changes in the environment, since any change they make does not require the whole system to respond. Thus, if innovation or localized response to particular problems or opportunities in an unpredictable environment were the goal, then loosely coupled systems would have the best chance to find new answers and develop resilience.

We see both tight and loose coupling in the recording industry. Companies and artists are often very tightly coupled within their group. Individuals often have loose ties when they are not working on a project (song or album or tour) but very strong ties once they begin a project. Then they must coordinate schedules and work together closely to meet their budget and schedule. At the level of the project, anything that affects the contributions of one will affect everyone. But outside a particular project, the failure of one has almost no effect on the others. If one company finds a good solution to a problem, several others may try it, but the solution will not be adopted by the entire industry unless it has been shown to work in many situations *or* unless there is a need for uniformity, as is the case of the format of recorded music. Record labels do not risk pinning their success on a single album (or artist), even when the album (or artist) may be a "sure thing," such as a new release by a seasoned superstar, but instead knowingly release many more albums per quarter than could realistically become hits.

When tight coupling is needed at the industry level, firms look to the higher level of organization provided by professional organizations such as the Recording Industry Association of America. This type

---

[32] See, Karl E. Weick and Kathleen M. Sutcliffe, *Managing the Unexpected: Assuring High Performance in an Age of Complexity*, Jossey-Bass: San Francisco CA (2001); Longstaff, note 20.

of strong coupling works very efficiently and effectively as long as the firms (individually or collectively) don't face unique challenges or encounter new opportunities that would give one or more of them a competitive advantage in obtaining scarce resources (like album sales).

Networks, Power Laws, and Resilience. A new (and growing) body of research looks at the connections between things that function as a network. Network science gained popularity as the "small world" problem or, recently, as the "Kevin Bacon game." The small-world problem is the puzzle of why most people on the Earth seem to be separated from one another by only six other people, or six degrees of separation. The "Kevin Bacon game" uses the movie actor and his connection to people in the film industry to test the degrees of separation between them and him.

Work being done on networks, as that on other complex systems, indicates that the strength of the ties between things is critical for understanding (if not always for predicting) the operation of networked systems. There is good evidence that weak ties (or loose couplings) are often more important than strong ones when dealing with a new opportunity or problem. For example, if two firms are tightly coupled to each other, they are probably also strongly linked with each other's links, so what happens to one link will affect all the other links. If something unexpected happens, the weaker links of each firm will be bridges to other systems that have other resources or ideas that can be used when the firms face a new problem.[33] Thus, the long-term stability of a system (or firm) may actually increase if it has many weak ties—even if this means the system (or firm) is less efficient in the short term. This observation has led to speculation that a balance between the need for stability and diversity is called for, and that whether the strength is appropriate will depend on the number of connections available: "the super-connected few should be linked to others mostly by weak links, while those with few links to others should be connected by strong links."[34] Accordingly, a record company with weak ties to many service providers, producers, and artists would thus be able to adapt quickly to new opportunities or dangers.

A system with a *variety* of weak links (not just a lot of links of the same kind) that are connected to the super-connected hubs requires some diversity, because if the links are all the same, it will be difficult for the system to connect to alternative resources that would be useful in case something unpredicted happens. In the music business there are many different types of people who are connected to one another through weak links to highly connected individuals. If these "super-connected hub individuals" were connected only to certain types of people, they would not be able to pull together all the resources needed for a project, and they would themselves require connections to other hubs. The diversity of their links also makes these super-connected people more likely to be able to take advantage of unexpected opportunities or deal with potential disasters.

Resilience is also improved in a network if the super-connected hubs have some functional redundancy. If they are unexpectedly removed from the system, someone or some function will perform their role in the system. In the music business functional redundancy is accomplished by allowing many

---

[33] See, e.g., Mark Buchanan, *Nexus: Small Worlds and the Groundbreaking Science of Networks*, New York and London: W.W. Norton & Co. (2002), Chapter Two, "The Strength of Weak Ties."

[34] Id., p. 149.

different professionals to serve as connectors: producers, agents, managers, and lawyers all often perform the task of putting people and deals together.

When Resilience Fails. Resilience fails when a system loses its capacity to absorb disturbance or undergo change. When it is surprised by a danger or a crisis, it cannot retain essentially its same functions, structures, identity, and feedbacks (e.g., the company goes bankrupt or reorganizes into something that looks nothing like what it was before). Resilience fails when the danger is too different from those already known, or it manifests too suddenly for adaptation, or there are too many problems for the system to handle at one time. That is, the system does not have response capabilities that are diverse enough, it cannot marshal its responses quickly enough, or the danger is so forceful that all its responses are overwhelmed. In an industry where all the competitors use a resilience strategy, the last competitor to bounce back is the winner. The winning company will have planned (and made some critical trade-offs) for resilience. One trade-off is often efficiency. Becoming more efficient (using less input to get more output) is often very desirable, since efficiency usually means lowers costs, but since it frequently also reduces the diversity of resources or redundancy, or both, it will reduce resilience capabilities.[35]

The resilience of a large system such as a multiunit business organization can also fail if those managing it impose a strategy that is not consistent with the possible surprises facing each local unit. In systems made up of many units that have different histories and different local resources, there is unlikely to be a resilience strategy that works everywhere. If a global strategy is imposed, the resilience of some local units will fail, because it will not meet their unique needs. Each part of a company or institution should thus adopt resilience measures that are justified by the level of surprise each faces and the price it will pay for any surprise.

The recent reorganization of the music industry at the macro level to a more fat-tail distribution means that the resilience strategies will be different in the different parts of the industry. Each part has resilience strength and weakness. While the larger organizations will likely have more resources to use than the parts have, the organizations will not be able to adapt as fast as the small parts can. So, if an organization is competing against those that are adapting quickly, it too can play that game, or it can aggregate a lot of resources. The danger of aggregating resources is that the organization might aggregate resources that will no longer be valuable. The danger of the strategy of adapting quickly is that the organization will adapt to something that is no longer relevant. There is not much certainty for anybody. But it is the historic ability of the music industry to deal with uncertainty that may mean it will be around long after its detractors and competitors are gone.

---

[35] See, P. H. Longstaff, "The Resilient Company: Bouncing Back When Things Become Unpredictable," posted on *Navigating New Media 2/12/2010*. Available at http://www.navigatenewmedia.com/Home/Article.aspx?100013; also P. H. Longstaff, *Security, Resilience, and Communication in Unpredictable Environments Such As Terrorism, Natural Disasters, and Complex Technology,* Program on Information Resources Policy, Harvard University, November 2005. Available at http://pirp.harvard.edu/pubs_pdf/longsta/longsta-p05-3.pdf.

Chapter Five

Conclusions

The ideas presented in the previous chapters are here used to develop steps that all industries and businesses can take if they find themselves in situations of uncertainty similar to that which besets the music industry. These steps will also be helpful to industries now swimming in the same waters as industries that operate under uncertainty—and particularly helpful to those that have lived a long time in a very predictable environment. Their environments are not worlds where the risk-averse will find happiness. Risk is the price of admission to systems with high uncertainty. The music industry has always been good at living with risk, and there is every reason to believe that its fundamental resilience will pull it through the current challenges. Since all the people and firms in the music industry live in different environments, there is no one-size-fits-all plan for coping with uncertainty using resilience strategies. But time spent looking at the ideas presented here may be rewarded by the discovery of ideas might work in other particular situations.

The steps below are applicable to both established firms and start-ups. Start-ups have the advantage of being able to build hubs, establish links of various strengths, and create "ramp up" and "get out" trigger points from the outset, thereby avoiding any legacy networks or locked-in systems that are difficult to adapt quickly enough to meet important surprises. Established firms have the advantage of having deeper understanding of the slow scales of their systems and the resources for building in redundancy. But all firms, established or start-up, must get better at surviving surprises in an ever more connected and complex world.

> **Step One: Do You Live with High Uncertainty?** Decide if your business (your industry or firm, or both) is unpredictable by its nature or if it is just in an unpredictable phase of development so that stability can be expected to return. If the unpredictability is temporary, for example, if it is due to changes in resource availability or customer demand, you would want a resilience strategy that allows you to bounce back when things return to normal and you would not want to burden the enterprise with some complex coping mechanism that at a further point would no longer be needed. If there has been a fundamental (or structural) change in the business environment so that this unpredictability will be with you for the foreseeable future, you will want to examine fundamental processes of your industry or firm, particularly those that are tightly coupled to unpredictable resources.

> **Step Two: How Do You Define a Success?** Expand the time scale for measuring success and acknowledge the goal of resilience. This step may be the most difficult one to take. It involves changing the expectations of all stakeholders, particularly those of investors and employees. It means acknowledging risk in specific terms and not punishing failure due to unpredictable complexity.

Step Three: Learn to Accept and Value "Failure." Either throw many seeds (products) of the same kind into many environments and see where they grow, or throw many different kinds of seeds and see which ones thrive in a particular environment. Once again, this means acknowledging risk and making failure part of the cost of doing business, and not a personal or professional death knell for those involved with seeds that do not grow. Set up feedback mechanisms that allow you to distinguish success and failure as early as possible. If the system is likely to have tipping points, decide how you will identify them and how you will rush resources to (or from) the tipping system. This is especially important if the system is tightly coupled and subject to either cascading failure or runaway success. For many companies (and government organizations), this step is very difficult, because their cultures punish anything that looks like failure. It's not surprising that nobody signals that things are failing (or not growing) if to do so would be to risk professional suicide or jeopardize a bonus.

Step Four: Resist Setting Things in Stone. Set up mechanisms that allow the maximum possible adaptability and allow you to invest in success and cut losses for flops. The mechanisms might include adaptive contracts and contingency compensation, which may result in fewer long-term contracts (for both employment and other resources) in "seedling" enterprises or products. It may also mean having resources ready to throw at any seedling that looks like it's about to take off. It may mean keeping a resource reserve for this purpose (which, however, will not yield a maximum return while in reserve) or having resources that can be quickly redeployed from other projects (those without long-term commitments).

Step Five: Choose Your Strong Links Carefully. Make sure there are weak links to resources outside your business that can be used when the unpredictable happens. These links should be weak enough that they are not affected by problems in either your business or the businesses to which it is linked. You might consider using a variety of suppliers or paying a supplier to be on "standby." Strong coupling should be used where efficiency is critical, but acknowledge the trade-off in resilience for the critical function—strong coupling to resources prone to surprise would be limited to functions that have redundancy (such as backup that will take over that function). If you need electric power to perform critical functions (cooling, running computers, etc.), you might have a strong link to an electric power supplier that gives you quantity discounts, but only if you have auxiliary generators or standby power suppliers that can step in to perform this critical function if power is cut off by a natural disaster or terrorist attack.

Make sure that the people who have to deal with the unexpected have links to many resources. The links should be on multiple scales and should not require going through a hierarchy in times of opportunity or danger. If the person running an operation (like a music concert) needs to get alternative electric power quickly, this person should not have to go up the chain of command for permission and should have direct access to those who can deliver what is needed, regardless of whether this person and they are at similar levels of the organizational chart.

Step Six. Consider Trading Some Efficiency for Some Resilience. Make sure that important functions have redundancy, preferably at different scales, so that if a function is damaged at one scale it can be picked up at another. This is especially necessary for any function that acts as a hub. For example, if communication services are centralized at the national (or international) level, there should be redundant communication services at the local level. Hubs (people or places) should have diverse connections that allow the people who use them to access many different types of resources—even resources those people don't use very often. People and functions where things come together (such as manufacturing) need to have access to many things that they *might need* and even to things that nobody thinks they will ever need. This access allows them to fix a problem without having to fix the supply chain first.

Step Seven: Stay in Touch with Both the Slow and Fast Parts of the Business. The parts of the business that change slowly are just as important as the parts that respond quickly to every change in the environment. "The Fast proposes but the Slow disposes." There is great value in the people who have been performing a function for many years. They should never be treated as failures. Likewise, new ideas should not be dismissed without real consideration—particularly in light of feedback mechanisms set up to alert the organization about changes in the environment. Many of us do not notice changes in the environment until it is too late to respond except with considerable effort, thereby slowing down resilience.

And, finally, give up the idea that you can find The Answer. As the complexities of the world increase and uncertainty becomes The New Normal, not even The Questions will stay the same for long. The people with things to teach us may come from places no one has yet thought to look—such as the music industry.

Appendix A

Industry Professionals Interviewed

Industry analyst (prefers to be anonymous).

Radio and recording industry professional (prefers to be anonymous).

Rich Appel, Director of Consumer Research, Sony Records.

Scott Cameron, Senior Consultant – Music and Movies, Brimstone Consulting.

Rick Dobbis, Chairman, Rick Dobbis organization, Global (R-DOG), former president, Sony Music
International.

Michael Lehman, Attorney/Artist Manager.

Steve Meyer, President/CEO, Smart Marketing Consulting Services, former executive for Capital and
MCA Records.

Sean Ross, Executive editor of music and programming, Radio-Info.

Justin Shukat, General Manager/Founding Partner, Primary Wave Music Publishing.

Mike Toppe, General Manager, Revolver Distribution.

Appendix B

Methodology: Additional Graphs

The data used to measure album sales was obtained from Nielsen's SoundScan database under an agreement that we would not publish any specific sales data which they consider proprietary. As a result, we cannot publish the data used to create the below figures, but would be happy to answer any questions that may arise regarding methodology. In each year examined, a random sample of approximately 400 albums was used (in some cases it was slightly higher to reflect a larger amount of albums released in that year).
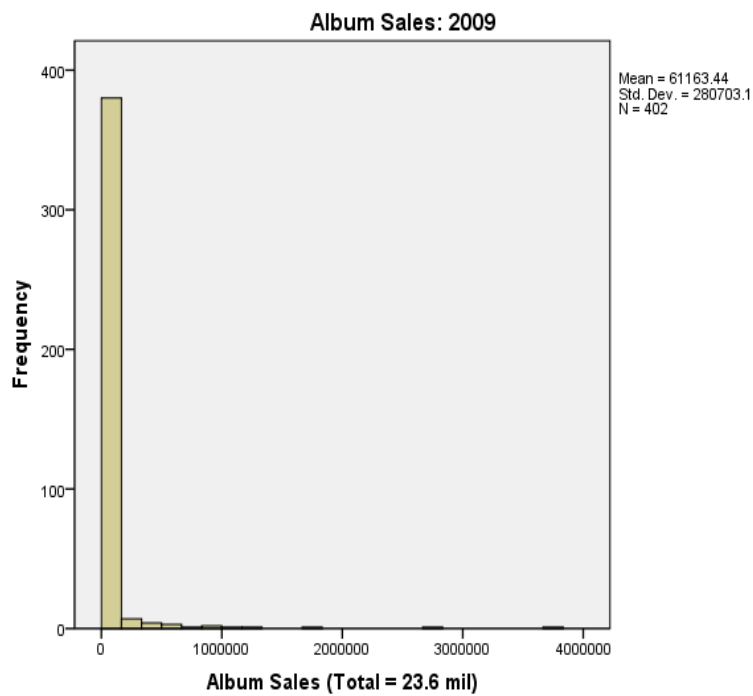
Figure B-1

Figure B-2

Figure B-3

Album Sales: 2006

Mean = 65671.59
Std. Dev. = 187007.264
N = 435

Album Sales (Total = 28.6 mil)

Figure B-4

Album Sales: 2004

Mean = 142075.14
Std. Dev. = 517392.561
N = 404

Album Sales (Total = 57.4 mil)
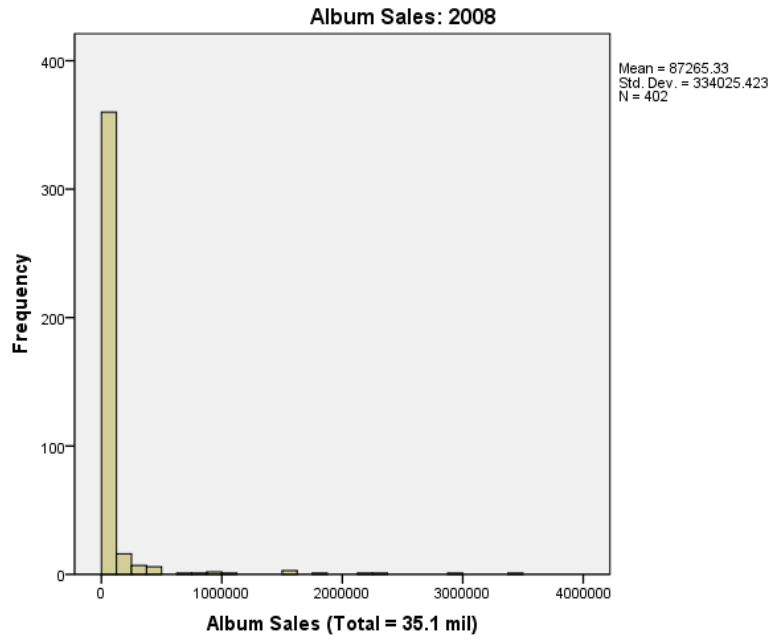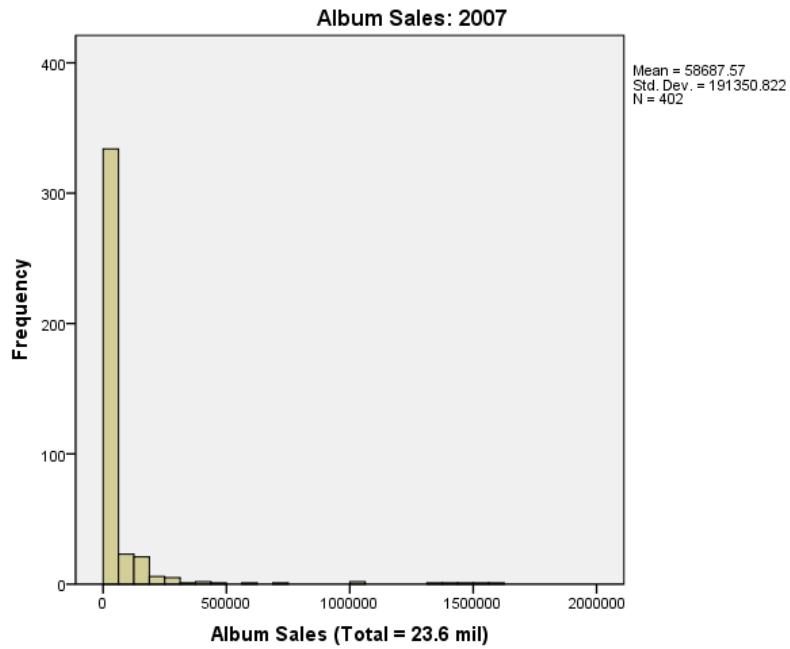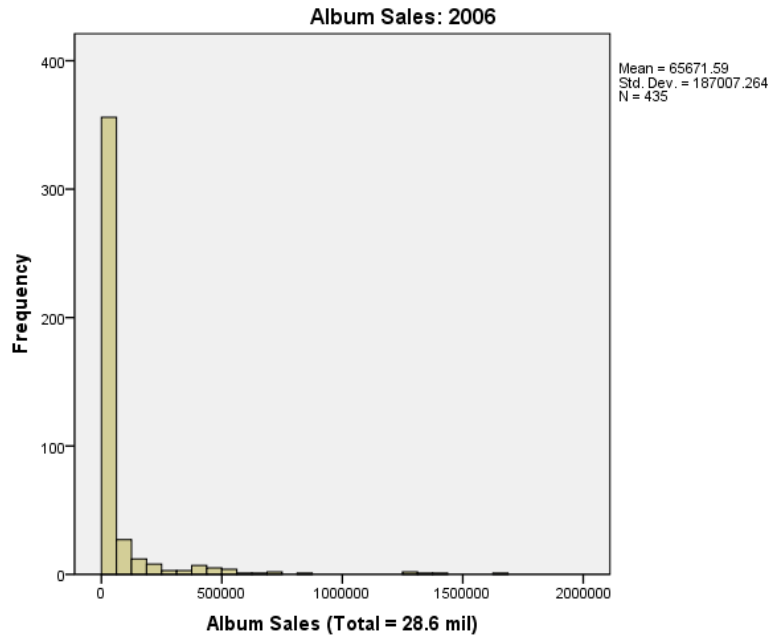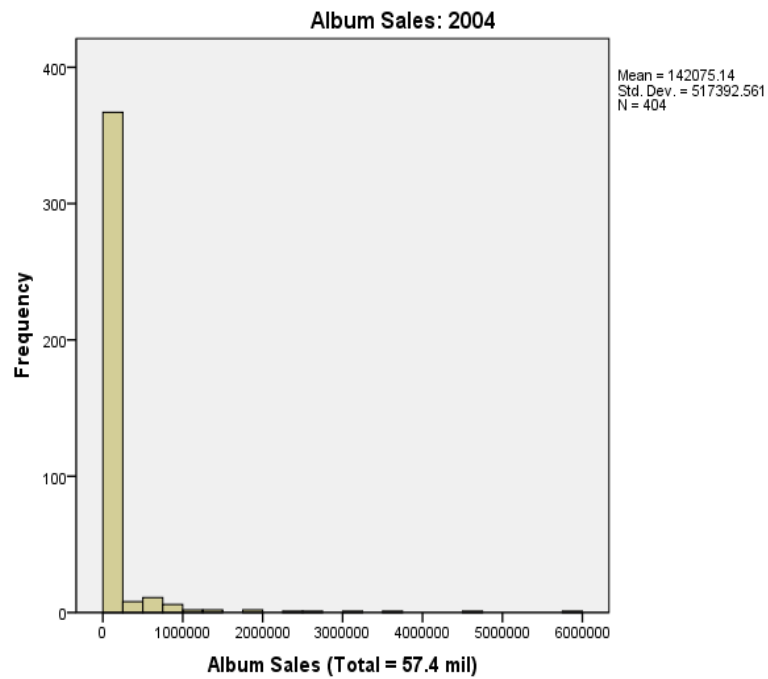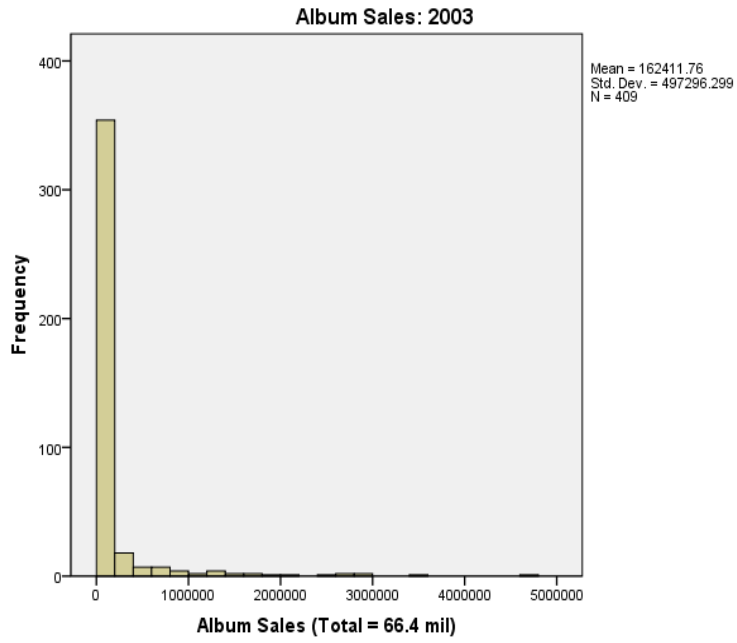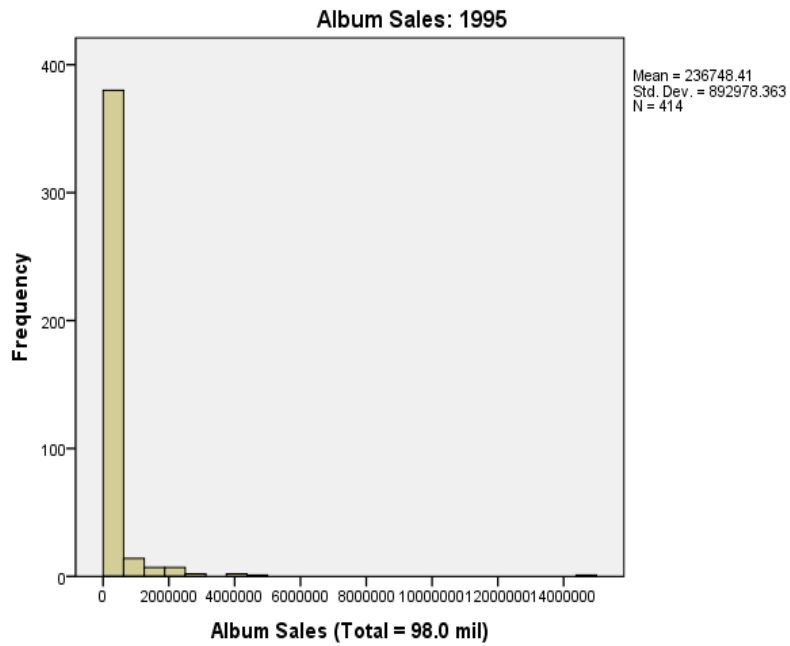
Figure B-5

Figure B-6

Figure B-7

Appendix C

Further Reading

Music Industry

Burnett, R. (1993). "The popular music industry in transition." *Popular Music and Society* **17**(1): 87-114.

Herrada, O. (2008). Music Recommendation and Discovery in the Long Tail. Unpublished Doctoral Dissertation. Available at: http://www.iua.upf.es/~ocelma/PhD/index.html.

Denisoff, R. and W. Schurk (1986). *Tarnished Gold: The Record Industry Revisited*, Transaction Publishers.

Giles, D. (2006). "Superstardom in the US popular music industry revisited." *Economics Letters* **92**(1): 68-74.

Hutchison, T., A. Macy, et al. (2006). *Record Label Marketing,* Focal Pr.

Lam, C. and B. Tan (2001). "The internet is changing the music industry." *Communications of the ACM* **44**(8): 62-68.

Lee, S. (1995). "Independent record companies and conflicting models of industrial practice." *Journal of Media Economics* **8**(4): 47-61.

Lee, Z. and S. Gosain (2002). "A longitudinal price comparison for music CDs in electronic and brick-and-mortar markets: Pricing strategies in emergent electronic commerce." *Journal of Business* **19**: 55-71.

Lopes, P. (1992). "Innovation and diversity in the popular music industry, 1969 to 1990." *American Sociological Review* **57**(1): 56-71.

Lopes, P. (1992). "Innovation and diversity in the popular music industry, 1969 to 1990." *Sociological Review* **57**(1): 56-71.

Neer, R. (2001). *FM: The Rise and Fall of Rock Radio.* Villard Books.

Steinfield, C., T. Adelaar, et al. (2002). *Integrating Brick and Mortar Locations With E-Commerce: Understanding Synergy Opportunities,* Published by the IEEE Computer Society.

Stratton, J. (2008). "Capitalism and Romantic ideology in the record business." **3**: 143-156.

Strobl, E. and C. Tucker (2000). "The dynamics of chart success in the UK pre-recorded popular music industry." *Journal of Cultural Economics* **24**(2): 113-134.

Sweeting, A. (2006). "Too much rock and roll? Station ownership, programming and listenership in the music radio industry." *Northwestern University,* January **15**.

Vaccaro, V. and D. Cohn (2004). "The evolution of business models and marketing strategies in the music industry." *International Journal on Media Management* **6**(1): 46-58.

Business and Economics: Complexity and Resilience

Ahlquist, G., Irwin, G., Knott, D., and Allen, K. (2003). Enterprise Resilience. *Best's Review*, 88.

Anderson, C. (2008). Hyperion Books.

Arthur, W. (1995). "Complexity in economic and financial markets." **1**(1): 20-25.

Robert Axelrod and Michael D. Cohen, *Harnessing Complexity: Organizational Implications of a Scientific Frontier*, New York: The Free Press (1999).

Beinhocker, E. (2006). *The Origin of Wealth: Evolution, Complexity, and the Radical Remaking of Economics*. Boston: Harvard Business School Press.

Brynjolfsson, E., Y. Hu, et al. (2006). "From niches to riches: Anatomy of the long tail." **47**(4): 67.

Dollinger, M.J. (1990). The Evolution of Collective Strategies in Fragmented Industries. *Academy of Management Review, 15*(2), 266–285.

Dietrich Dorner, *The Logic of Failure: Recognizing and Avoiding Error in Complex Situations*, New York: Metropolitan Books (1996).

Granovetter, M. (1973). The Strength of Weak Ties. *American Journal of Sociology, 78*(6), 1360.

Granovetter, M. (1983). The strength of weak ties: A networked theory revisited. *Sociological Theory, 1*, 201-233.

Hannan, M.T. (1986). Uncertainty, Diversity, and Organizational Change. In N.J. Smelser and D.R. Gerstein, (Eds.), *Behavioral and Social Sciences: Fifty Years of Discovery*. Washington D.C.: National Academy Press.

Kahneman, D. andLovallo, D. (1993). Timid Choices and Bold Forecasts: A Cognitive Perspective on Risk Taking. *Management Science, 39*(1), 17-31.

Longstaff, P. H., Velu, R., and Obar, J. (2004). *Resilience for Industries in Unpredictable Environments: You Ought To Be Like Movies*. Cambridge, MA: Program for Information Resources Policy, Harvard University.

McCarthy, I. and Gillies, J. (2003). Organizational Diversity, Configurations and Evolution. In E. Mitleton-Kelly (Ed.), *Complex Systems and Evolutionary Perspectives on Organizations: The Application of Complexity Theory to Organizations.* (pp. 71-97). Oxford, UK: Elsevier Science.

Ormerod, P. (1998). *Butterfly Economics: A New General Theory of Social and Economic Behavior*. New York: Basic Books.

Oettinger, A. (1964). Knowledge Innovations: The Endless Adventure. *Bulletin of the American Society for Information Science and Technology*, 27(2), 10-15.

Oettinger, A. (2001). A Bull's Eye View of Management and Engineering Information Systems. *Proceedings of the Association for Computing Machinery*.

Stacey, R. (2003). *Strategic Management and Organizational Dynamics: The Challenge of Complexity* (4th ed.). London: Pearson Education.

Stark, D. (1999). Heterarchy: Distributing Authority and Organizational Diversity. In J.H. Clippinger III (Ed.) *The Biology of Business: Decoding the Natural Laws of Enterprise,* (pp. 153-179). San Francisco: Jossey-Bass.

Trim, P., and Lee, Y. (2008). A strategic marketing intelligence and multi-organisational resilience framework. European Journal of Marketing, 42(7/8), 731-745.

Wood, Robin, *Managing Complexity: How Business Can Adapt and Prosper in the Connected Economy,* London: The Economist Association with Profile Books (2000).

Youssef, C., and Luthans, F. (2007). Positive organizational behavior in the workplace: The impact of hope, optimism, and resilience. *Journal of Management, 33*(5), 774-800.

Resilience (General)

Adger, W. N. (2000). Social and ecological resilience: Are they related? *Progress in Human Geography, 24*(3), 347-364.

Ball, P. (2004). *Critical Mass: How One Thing Leads to Another*. New York: Farrar, Straus and Giroux.

Batten, D., Casti, J., and Thord, R. (Eds.), (1995). *Networks in Action: Communication, Economics and Human Knowledge*. Springer-Verlag, Berlin, New York, London

Berkes, F., Colding, J., and Folke, C. (Eds.), (2003). *Navigating Social-Ecological Systems: Building Resilience for Complexity and Change*. London and New York: Cambridge University Press.

Dorner, D. (1996). *The Logic of Failure: Recognizing and Avoiding Error in Complex Situations*. New York: Metropolitan Books.

Gunderson, L. H., and Holling, C.S. (Eds.). (2002). *Panarchy: Understanding Transformations in Systems of Humans and Nature*. Washington D.C: Island Press.

Holling, C. S. (2001). Understanding the Complexity of Economic, Ecological, and Social Systems. *Ecosystems*, *4*, 390-405.

Longstaff, P. (November, 2005). *Security, Resilience, and Communication in Unpredictable Environments Such As Terrorism, Natural Disasters, and Complex Technology*. Cambridge, MA: Program for Information Resources Policy, Harvard University.

Morgan G. and Henrion, M. (1992, reprinted 1998). *Uncertainty: A Guide to Dealing With Uncertainty in Quantitative Risk and Policy Analysis*. Cambridge MA: Cambridge University Press.

Peat, F.D. (2002). *From Certainty to Uncertainty: The Story of Science and the Ideas of the Twentieth Century.* Washington, D.C.: John Henry Press.

Surowiecki, J. (2004). *The Wisdom of Crowds: Why the Many Are Smarter Than the Few and How Collective Wisdom Shapes Business, Economies, Societies, and Nations*. New York: Doubleday.

Complexity Theories (General)

Mark Buchanan, *Ubiquity: The Science of History…Or Why the World is Simpler Than We Think*, New York: Crown Publishers (2000).

Murray Gell-Mann, *The Quark and the Jaguar: Adventures in the Simple and the Complex*, New York: W.H. Freeman (1994).

James Gleick, *Chaos: The Making of a New Science*, New York: Penguin Books (1988).

John H. Holland, *Hidden Order: How Adaptation Builds Complexity*, Reading MA: Addison-Wesley (1995).

Steven Johnson, *Emergence: The Connected Lives of Ants, Brains, Cities, and Software*, New York: Scribner (2001).

Networks (General)

Albert-Laszlo Barabasi, *Linked: The New Science of Networks*, Cambridge MA: Perseus Press (2002).

Mark Buchanan, *Nexus: Small Worlds and the Groundbreaking Science of Networks*, New York: W.W. Norton ((2002).

Duncan Watts, *Six Degrees of Separation: The Science of the Connected Age,* New York: W.W. Norton (2003). And *Small Worlds: The Dynamics of Networks Between Order and Randomness*, Princeton, NJ: Princeton University Press (1999).

Appendix D

Interview Questions

1. I have sent you two charts. One is a normal or curve distribution, and the other is a gamma or "fat-tail" distribution. Think of the numbers on left side as representing the revenue from a recording and the numbers along the bottom as representing all the recordings released in a given year.
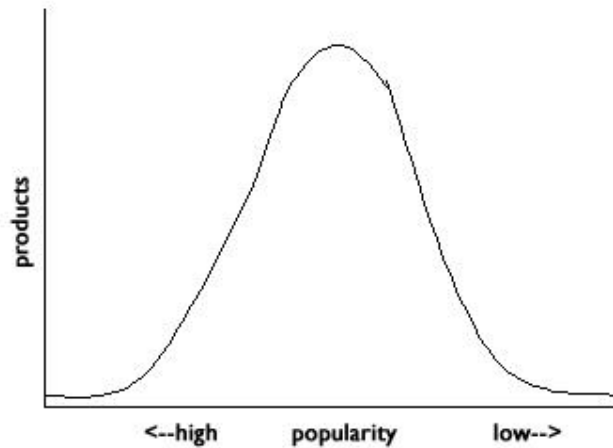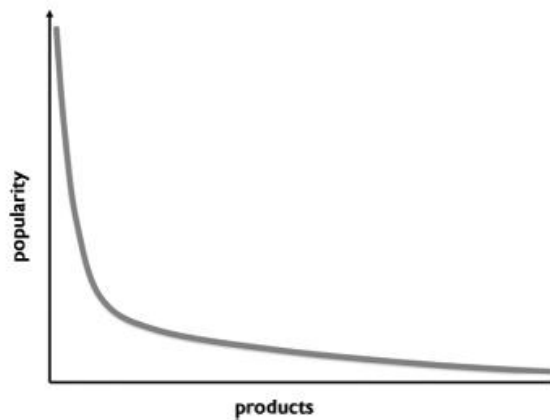

Figure D-1

Figure D-2

A. Which one of these do you think best represents the recording industry for the last year?

B. Which one represents the industry in 1995 at the height of the CD era?

2. Do you think anyone could predict with reasonable accuracy which recordings would become hits:

A. In 1995?

B. Today?

C. What information would you need to make a prediction in 1995?

D. What information would you need to make a prediction today?

3. Have you ever witnessed the industry, a company, or an artist "cascade" or "tip" into positive or negative territory?

A. If YES, were these cascades more common in 1995 or today? Why?

4. Do some companies or artists" or recordings grow (or decline) more quickly than others? Can this be predicted?

A. If YES, What information would you need to make this prediction?

a. In 1995?

b. Today?

B. If NO, why not?

5. Do you think most record producers usually use(d) long term contracts

A. For suppliers

a. In 1995?

b. Today?

B. For marketing and distribution services?

a. In 1995?

b. Today?

C. For artists?

a. In 1995?

b. Today?

6. Is it important in the recording industry to have a network of contacts?

A. If NO, why not?

B. If YES, how are these networks developed and maintained?

a. How are they used?

b. Are they built at various scales? (the industry, the producer, the artist?)

c. Has this changed at all since 1995?

7. Is it important to have a **diverse** network of contacts for possible needs?

A. If NO, why not?

B. If YES, how is this diversity developed and maintained?

a. Has it changed since 1995?

8. How would you rate the industry's ability to adapt to the forces that affect it?

A. What makes it adapt more quickly?

B. What prevents it from adapting?

C. Has this changed since 1995?

9. How would you rate the typical producer's ability to adapt to the forces that affect it?

A. What makes it adapt more quickly?

B. What prevents it from adapting?

C. Has this changed since 1995?

10. How would you rate the typical artist's ability to adapt to the forces that affect it?

A. What makes it adapt more quickly?

B. What prevents it from adapting?

C. Has this changed since 1995?

11. What role(s) does radio play in driving sales of recorded music today?

A. Has this changed since 1995?

12. What role(s) does retail play in driving sales of recorded music today?

A. Has this changed since 1995?

13. What role(s) do cable channels like MTV play in driving the sales of recorded music?

A. Has this changed since 1995?