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CLAREMONT MCKENNA COLLEGE

The Evolution of the Music Industry in the Post-Internet Era

SUBMITTED TO

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Abstract: The rise in the prevalence of the Internet has had a wide range of implications in nearly every industry. Within the music business, the turn of the millennium came with a unique, and difficult, set of challenges. While the majority of academic literature in the area focuses specifically on the aspect of file sharing within the Internet as it negatively impacts sales within the recording sector, this study aims to assess the Internet's wider impacts on the broader music industry. In the same time that record sales have plummeted, the live music sector has thrived, potentially presenting alternative business models and opportunities. This paper will discuss a variety of recent Internet-related developments including the rise of legal digital distribution, key economic implications, general welfare effects, changes in consumer preference and social phenomena as they relate to both the recording and live entertainment sectors. I employ a time series multiple regression model to evaluate the statistical significance of the relationship between the Internet's rise and the value of record sales. For the concert industry, I will examine recent trends and descriptive data as they relate to the Internet's prevalence.

I. Introduction¹

"I don't even know why I would want to be on a label in a few years, because I don't think it's going to work by labels and by distribution systems in the same way. The absolute transformation of everything that we ever thought about music will take place within 10 years, and nothing is going to be able to stop it"- David Bowie (excerpt from the 2002 New York Times article "David Bowie, 21st Century Entrepreneur" by Jon Pareles)

When the Internet, and peer-to-peer file-sharing services such as Napster, Kazaa and Limewire, began their rise at the turn of the millennium, many predicted that the music industry, among other entertainment sectors, was headed for impending doom and catastrophic losses in sales. To some degree, and for the first few years, these predictions seemed to become a reality as record sales fell drastically at least partially due to piracy. However, as technological change continues at a rate never before seen, the impact of the Internet has been expanded well beyond illegal downloading to include fundamentally different ways of distributing, promoting and marketing music (Aspray 2008, 451-453). Additionally

¹ Referenced books, academic literature and news articles will be cited in an in-text parenthetical in accordance with Kate L. Turabian, *A Manual for Writers of Term Papers, Theses and Dissertations*, (University of Chicago Press). Sources of data are presented in footnotes and detailed within the text of this study.

indirect effects of the Internet may have contributed to rises in the popularity of concerts during a painful transition for recorded music.

The rise of legal digital distribution, beginning with the Apple iTunes Store in 2004, has added a level of complexity to the market potentially offering a way for record companies to recover a portion of their seeming displaced sales. The social media phenomena associated with the rising popularity of the internet has also likely been an important factor as online music communities begin to form. In addition, the Internet has offered new strategies for artist promotion and marketing allowing them to easily distribute music to a greatly expanded audience. One such approach of note reverses the current promotion paradigm of concert tours promoting recorded music as some artists' have started releasing free music as a means to market their live performances (Schultz 2009, 697). Since record companies, which held oligopoly position for over half a century, have traditionally reaped the disproportionate benefit of music sales, musicians actually often generate the majority of their income from concert ticket sales (Aspray 2008, 452). Growth in the live music sector may come as a result of this shifted dichotomy and could have interesting implications with regard to artist welfare and potential alternative business models.

Much of the prior academic literature has largely, and narrowly, focused on the impact of illegal file sharing, specifically on the sale of recorded music. The purpose of this study is to understand and evaluate the broader music business, both live and recorded, and the more encompassing implications of the Internet. In this way, I hope to offer some conclusions regarding the factors and impact of this "absolute transformation" and provide some insight with respect to the music industry's future.

The paper will proceed as follows. In Section II, I will provide an industry overview with specific attention paid developments following 2000. In Section III, I review relevant economic literature before turning to empirical analysis. Section IV, using data from 1973-2011, provides some basic analysis of record sale trends with regard to the Internet and several relevant demand factors. Next, Sections V and VI, present the model for and results of regression analysis to test the significance of the rise in the Internet with regard to record sales. I will then turn to the live music sector, in Section VII, offering some descriptive data on general movements during the new millennium. Finally, Section VIII includes general conclusions as they relate to the future of the music industry.

II. Industry Overview

Today, the music industry in the United States faces its largest challenges to date. Having been fairly static for an extended period of time, the sector seemed long overdue the drastic change it would face entering the 21st century. The Internet, among other technological advances, led to a full-scale restructuring of the landscape. In what follows, I will briefly review the original blueprint of the recording industry and live music business, primary technologies involved in bringing about the transformation and some legal background before delving deeper into the events during the first dozen years of the millennium and the implications of a post-Internet music business.

Original Structure of the Recording Industry

For nearly sixty years, the infrastructure of the industry stood as an oligopoly dominated by six major record labels that essentially controlled all distribution and promotion of recorded music. The system was quite profitable for these companies, but the revenues were distributed

unevenly often leaving artists disproportionately disadvantaged. Among musicians, several were able to reach financial success through recordings, however many others, including some well-known acts, reaped little benefit from the distribution and sale of their work. As a result, many artists made the majority of their income from concert ticket sales rather than actual recorded music.

The distribution system was economically inefficient tied down by the extra complexity created by those looking to benefit from the music. Further, the price of recording a song was high as this required time in professional recording studios. Since it was also pricy to promote and distribute music, musicians were left little choice than to sign on with labels. Additionally, production, promotion and distribution expenses were often incurred, at least in part, by the artists and then debited to the already small percentage of proceeds they received from their recordings. As a result of these various facets, the major record labels were able to use their oligopoly position and exclusive access to means of distribution, production and marketing to control the industry reaping the majority of the benefits. (Aspray 2008, 451-453)²

The Live Music Business

Dating back to ancient times, live performance was the original source of a musician's income. While this segment of the music industry has traditionally been significantly smaller than and lacks the stringent structure of recording, there are several common features worth discussing for a comprehensive understanding of the landscape. Additionally, since the majority

² Many of subsections within the industry overview draw almost exclusively from (Aspray 2008). In these cases in-text citations, with relevant page numbers, will be provided at the end in reference to the entire preceding subsection unless otherwise specified by additional citations.

of artists' revenue stream comes from concerts, trends in this sector may better capture welfare effects for musicians.

There are five major players who are involved in and profit from the live music process-- the performer, personal manager, talent agent, promoter and venue operator. Personal managers work the closest with the performers helping them develop an all-encompassing career strategy. Some managers function as a part of a larger firm, while others work independently for a local band hoping to help them find mainstream success. Early on, they can offer constructive criticism on their music and live performance and help artists obtain publishing agreements or record deals. Managers generally have a vision, and plan, for their band that they work to maintain throughout as they are consulted in most major decisions. If their client finds success, the manager's duties continue expanding to include public relations and any other relevant issues that may arise. Specifically within the realm of concerts, managers help decide on location, venue-size and timing, generally around the release of a new project, of tours. For their efforts, managers usually receive 15 to 20 percent of their artist's gross earnings.

Once the artist and manager have agreed on their approach to a tour, the talent, or booking, agent is in charge of actually contacting concert promoters. With a "tour itinerary" in place and the approval of the manager, these agents can then draft contracts for promoters and venue operators to finalize shows. Essentially, they bridge the gap between managers and venues by developing relationships with the right people. Agents can work on a local, regional or national scale often serving as part of larger organizations. The standard commission for national agencies is 10 percent of the income from shows they help book.

Promoters, often part of larger event promotion organizations, are in charge of marketing and presenting live entertainment events. They serve as yet another middleman in the industry contacting the appropriate venues to find available dates. Their agreements with performers consist of two parts. First, they settle on the date, fee structure and other basic features. Performers generally receive a flat payment for their shows and larger acts also take a specified percentage of profits. Next, the “rider” portion of the contract is drafted, which includes details about the artist’s accommodations and other necessary details. Once the deal has been reached, the promoters can then get to work advertising the event.

In addition to their deal with the artists, promoters also must come to agreements with the venues, which host the concerts. These contracts specify the rental cost for the space, and can extend to include cleanup, event staffing and stage equipment. In certain cases, they will also take a percentage of ancillary merchandise sold at the show. If the venue expects the performance to be especially profitable, they may also take on some of the promotional roles themselves.

Historically, record labels only take part in the live entertainment side of the industry insofar as it helps promote the sales of its recordings. With their less-established artists, labels might have helped financially support tours in order to expand their signee’s audience and fuel the sale of recorded music. With the steep decline in record sales in the early 2000s, though, several record labels began experimenting with vertical integration by helping promote tours and subsequently revising contracts to include a portion of revenues from live music. Recent

developments in this area will be discussed in more detail in the final portion of this section.

(Hull 2004, 97-121)³

Initial Technological Changes

Starting with the introduction of digital, as opposed to analog, formats in the 1980s, technological advances began to break down the previously rigid infrastructure of the recording industry. This burst of change effectively eliminated many of the barriers within production, distribution and promotion that had held the oligopoly strong for over half a century.

The production costs of music began to fall drastically starting in the 1990s when new technologies made robust recording equipment available to individual musicians. Today, there continue to be a growing number of powerful, and affordable, software compatible with personal computers. This removes the necessity of expensive studio time freeing musicians to create through their own means.

In 1981, the compact disc, developed in collaboration between Sony and Philips, was introduced and in less than a decade surpassed sales of records becoming the first widely used digital format. Unlike changes that would come later, the CD served the recording companies well. They could justify raising CD prices, with respect to records, through the higher audio quality and initial expenses related with establishing the facilities necessary for the new format. They were able to maintain these higher prices even though the matured, and streamlined, process for CD manufacturing and shipping proved far cheaper than that for records. Aside from the production system being inherently less costly, CDs were lighter and dimensionally smaller than records allowing them to be more easily transported and take up less room on

³ This subsection draws exclusively from a chapter of Hull's 2004 book *The Recording Industry* and, in this case, is cited in similar fashion as Aspray.

retailers' shelves. Having the reach and control of the business already, it was an easy, and economically effective, transition for the recording companies as they maintained prices while reducing expense.

One particular characteristic of the digital format, however, presented potential issues. Piracy was a relatively harmless issue with analog phonograph records as quality was reduced with every additional copy made. Before this repeated process could have any sizable harmful impact, it would be speedily quelled by the inferior quality of the music. Digital formats could be replicated infinite times without losing fidelity making copies perfect substitutes for the original. Record companies had initially considered watermarking, and other potential techniques, to avoid issues of piracy before electing against this decision. This oversight likely came at a time when few would have pictured a scenario in which the technology required to create, and widely distribute, digital copies would be readily available to individuals. In the end, though, it was not the burning of CDs, but rather a later digital format, that would truly have an impact on sales.

By the mid-90s casual use of the Internet had grown significantly and personal computers were finding their way into more homes. Equally important, a new format called the MP3 was introduced as the product of a European Union project related to MPEG-1 video. The MP3 functions by compressing audio files to a size that is easily transferable, through the Internet among other methods, and can fit on personal computers. In 1995, the first MP3 player, Winplay3, was introduced with the ability to simultaneously, and automatically, decompress and playback digital MP3 files. The WinAmp MP3 Player, a descendant of the

WinPlay, was released in 1997 boasting improved functionality and an intuitive user interface. This platform helped popularize the MP3 format and remains a prominent media player today.

The increase in Internet usage and the development of a new digital format were not the only technological changes that set the stage for the renovation of the music industry. In 1986, Sony and Phillips completed the creation of a digital audio tape recorder (DAT), the first device to be able to both record and play these formats. However, due to legal battles that will be discussed in the next section it never truly broke into the US market. Advances in personal computer processors were sharp and steady making playback for digital files smooth and uninterrupted. Also during the 1990s, storage devices for personal computers, such as hard drives, became increasingly inexpensive, portable and capable of holding large amounts of data. Especially relevant around the same time, was the introduction of USB and FireWire, external products that allowed fast connection to hard drives for transferring of files, which would become the basis for portable MP3 players. By the end of the 20th century, broadband capacity had also entered a period of unbelievable growth contributing to lower prices from Internet providers, and thus more users. This was perhaps the most important factor, as it would allow files to be easily transferrable over the Internet. (Aspray 2008, 453-456)

Relevant Legal Foundations

In understanding the tumult within the music industry that came with the 21st century, it is necessary to get a sense for the legal backdrop that would eventually be at the center of countless lawsuits on the part of record labels. The introduction of video-cassette recorders (VCRs) in the 1970s and digital audio tape (DAT) recorders in the 1980s brought about cases

that would eventually play a pivotal role in shaping the Digital Millennium Copyright Act (DMCA).

Sony's 1975 introduction of the VCR was, within a year, followed by a lawsuit from Universal Studios for indirectly contributing to copyright infringement through their new product. By law, contributory copyright infringement involves knowingly assisting piracy. After an appeal, Sony was defeated with the court recommending damages. In 1984, though, the U.S. Supreme Court overturned this decision ruling in Sony's favor. In the decision, the court decided that selling of copying equipment could not constitute contributing to infringement since the majority of consumers use it for legitimate purposes, within the law, laying the legal groundwork for the decades to come.

The next notable case came with the digital audio tape (DAT) recorders created in collaboration between Sony and Phillips. The DAT recorder was a promising new technology, but its robust and high quality recordings served as the first serious piracy threat to the music industry allowing digital replicates to be easily produced and sold. As a result, the record companies placed legal pressure on the founding companies threatening to sue for both vicarious (having the ability to curb copyright infringement and electing not to for personal gain) and contributory copyright infringement forcing the companies to hold off on releasing the product in the U.S. market. Several legislations regarding the issue had been presented in Congress, but none gained much stronghold. Five years after the technology was first introduced and with no conclusions coming from Congress, Sony finally began selling DAT recorders in the United States.

As promised, this was quickly followed by several lawsuits that prompted the passage of the 1992 Audio Home Recording Act, which required DAT recorders be equipped with copy management systems to reduce piracy and allocated a small percentage of their revenues towards royalties to song writers and publishers. In the case of the DAT recorder, the recording industry successfully stifled the new technology, as it never truly gained any momentum.

The single most applicable and important legal foundation involved in the countless lawsuits related to file sharing was the Digital Millennium Copyright Act (DMCA), passed in 1998. The timing was in part due to the introduction of online media streaming, with out an option for download. Members of the entertainment industry were interested in this technology, but feared that people would easily be able to get around their security to illegally download video and audio files. As a result, they hoped to pass legislation that would prohibit the circumvention of the security technology. Similar laws had been previously passed, such as The Cable Act of 1992, which focused on the unscrambling of cable television signals. In negotiating the terms, the entertainment industry sought broad laws against all circumvention while the computer industry hoped for a more narrow focus on copyright as to allow for reverse engineering and security testing research. Internet service providers were also concerned that they would be liable if their service played any role in circumvention, or dissemination of information on how to do so.

The resulting bill passed easily through the Congress in 1998 and ended up leaning more towards the hopes of the entertainment sector. The legislation prohibited any circumvention of security technologies meant to protect copyright. Maybe more relevant, it made it illegal to produce or distribute any technology that could contribute to this bypassing. It also laid out

criminal penalties for offenses providing the appropriate leverage for entertainment companies to sue those who were not compliant. The DMCA has been highly effective for the entertainment industry to secure their control over copyrighted work. (Aspray 2008, 456-460)

The Story of Napster and Peer-to-Peer File Sharing

Near the end of the millennium, and especially around the start of the dot-com boom, there were numerous attempts, with no clear success, to create Internet-based music companies. Record labels also began minimal, and wary, experimentation into distributing music, and promoting projects, through the Internet. The true impactful development, though, came appropriately at the turn of the millennium with the arrival of peer-to-peer (P2P) file sharing technology, as introduced by Napster.

The sharing of files through file transfer protocol (FTP), one of the Internet's original applications, over the web was hardly a new phenomenon by 2000, having been used in a variety of legal, and illegal, ways for nearly thirty years. For example, scientific researchers utilized the technology in the '80s and '90s to share data sets. Meanwhile, it also found popularity on online forums among teenage hackers who employed it for piracy of mostly software and images. A very small number of early Internet users employed the application in similar fashion for MP3 files. In June of 1999, Shawn Fanning, a soft-spoken undergraduate student at Northeastern University, launched Napster introducing a new, convenient way to share files.

While previous file sharing piracy methods were relatively easy to trace and legally quell, the Napster system hosted files from millions of individuals making it difficult take action. Rather than hold the actual MP3 files on their central server, Napster only kept a list of its

users' file names. Using this compiled directory, individuals would search for a song and subsequently download the MP3 file directly from their fellow file sharers. The fact that files were not actually held on Napster's server also gave it a legal advantage, as it would later argue that, under the DMCA, it could not be held liable for copyright infringement.

The application's powerful technology and handy interface helped it gain instant popularity, particularly among the young adult demographic. In its first sixteen months, Napster boasted an impressive user base of 80 million. College and high school students weren't the only to take notice, though. By December of 1999, The Recording Industry Association of America, representing the major record labels, filed suit in San Francisco federal court for contributory copyright infringement in what would be a drawn out, and highly publicized, legal drama. Legal troubles withstanding, Napster received its first venture capital investment, of 15 million dollars, in May of 2000 from Hummer Windblad, who also assigned the company a professional CEO.

Rather than focus on creating a viable business plan, Napster pushed forward seeking more funding and continuing to expand at a viral rate. The company's youth and inexperience were especially evident through their approach regarding the recording industry. An early business plan, formulated in October of 1999, reflects this lack of understanding of the law and industry, or perhaps a mix of intentional oversight and overconfidence that accompanied their newfound celebrity status. The handwritten document expressed a hope to put together deals with the major record labels, but their plan for doing so truly embodied a hacker mentality. Instead of directly approaching companies, they intended on growing their user base to a point where record labels had no choice but to come to an agreement. This deal, though, carried a

more sinister undertone as it envisioned Napster becoming the main avenue for distribution and promotion of music effectively eliminating the necessity of record labels. By failing to address the legal issues, Napster put itself on a direct collision course with the powerful and well-established recording industry. (Menn 2003, 101-102)

Napster enlisted the lawyer who had been behind Microsoft's anti-trust suit, David Boies. With his help, they put together a three-part defense against the RIAAs claims of contributory copyright infringement. First, he cited the Audio Home Recording Act noting that although it is illegal to profit from copies, consumers were free to share music amongst themselves. As a free service, neither Napster, nor its users, directly profited from copyright infringement. Second, they drew from the Sony v. Universal City Studios case presenting an analogy between their product and video-cassette recorders. The platform, they argued, had legitimate uses and was not merely a space for piracy. For example, they postulated that individual songs downloaded for free could actually help promote record sales by serving as a sample for consumers who could then purchase albums or singles. Finally, Napster portrayed itself as an Internet Service Provider (ISP) that was not liable for simply holding names of files on its central server.

The RIAA was well equipped with a wealth of legal experience and detailed data an otherwise inexplicable drop in sales. The residing Judge Patel dismissed Napster's arguments finding them guilty of contributory copyright infringement with the reigning usage of their platform being piracy. An extended appeals process only came to the same decision and the judge ordered the record companies submit a list of song titles to be removed from Napster's site. Only if there was an essentially impossible 100 percent removal of all copyrighted files

would they be allowed to continue operating. Napster was ordered to shut down and filed for bankruptcy in June of 2002.

Although the RIAA was successfully able to shut down Napster, they now faced countless other sites that utilized this new technology. In addition, peer-to-peer file sharing services began working on decentralized servers, removing the main legal vulnerability that hurt Napster. While the original P2P applications, hosted file names on their own server, more advanced programs, starting with Gnutella, actually create a dispersed network directly connecting computers consequently removing the need for a centralized directory. The diluted nature of the system also made it one difficult to fully shut down. In 2003, the RIAA began filing suit against individuals, who had used the P2P program, Kazaa, to illegally share large numbers of files. Once again, the record companies were able to win large settlements in these cases.

The RIAA's greatest victory, though, came against another decentralized file sharing program called Grokster. In this case, Grokster was found not liable for copyright infringement multiple times before the case reached the U.S. Supreme Court. Just as Napster had, Grokster focused on the Sony vs. Universal City Studios case arguing that their platform was not solely meant for piracy. However, this decision had stated that the equipment must have "substantial" legitimate uses. Grokster attempted to justify their position by presenting possible legal applications of their service. The court ruled that providing an alternate use was not sufficient if the platform's primary function contributed to copyright infringement. The efforts of the RIAA were certainly effective in combating music piracy, but it was simply impossible to eliminate its presence as technology continued to improve. Today, although the RIAA has

remained vigilant about piracy, P2P file sharing, among other methods of illegal piracy, continue to advance in more difficult to trace methods. (Aspray 2008, 468-473)

The iTunes Store and Legal Digital Distribution

In the second half of the 1990s there were a number of failed attempts to create a business model specifically around the distribution of digital music. Some companies related to digital music were deemed illegal under the DMCA. Other services, most notably subscription distributors, were able to survive, but had not found widespread usage. Consumers were accustomed to purchasing, and not renting, their music. Further the record companies, still anxious about the security of the Internet, only provided a limited selection of songs making it difficult to justify subscription fees. A rapidly rising personal computer company, Apple, headed by the late visionary, Steve Jobs, would completely transform the legal digital distribution of music using a purchase, rather than subscription, based approach.

Record executives were naturally skeptical, and unknowledgeable, of new technologies, but Jobs was ruthless in his pursuit of an agreement making countless trips to the major labels in 2002. The record companies were not only hurting from a sales perspective, but their technique of legal action against individuals for illegal file sharing was not by any means a sustainable approach to digital music and began to harm their image among consumers. Jobs pointed out the ineffectiveness of the copy management systems put in place by the Audio Home Recording Act and expressed sympathy regarding the issue of piracy noting that Apple, too, had fallen victim with some of its software being illegally distributed. At the time, Apple's music store would only be available to Mac users. Since the company only held five percent of the U.S. personal computer market, some labels viewed this simply as experimentation with

digital music. Warner and Universal were the first two companies to sign on, and the remaining important players soon followed suit.

The Apple Music, or iTunes, Store was launched in April 2003 allowing Mac users to purchase songs for 99¢ each and albums for \$9.99 without any subscription fee. At its opening, the store featured an extensive library of 200,000 tracks that would only rapidly expand as it continued to thrive. Jobs was able to negotiate relatively loose digital rights management (DRM) in which consumer could sample thirty seconds of each song, play from an iPod and as many as five Apple computers and be burned, without limit, onto CDs. Within its first week alone, the iTunes store sold over a million songs. Perhaps the most important expansion, though, occurred in October 2003 when the Apple Music Store, and iTunes application, was made available to PC users. By December 2003, less than a year from its launch, the iTunes store had sold 20 million songs.

A variety of features allowed Apple to break into this previously impenetrable sector. First of all, it already had an MP3 player, in iTunes, incorporated into its computer package that would be expanded to include the store. Apple's experience, and success, making user-friendly products was consistent with the iTunes store making it easy enough for consumers of all ages, and levels of tech-comfort, to use. The most vital reason, though, was that digital sales of music for Apple were tied to another extremely profitable and widely successful product in their MP3 player, the iPod (and subsequently the iPhone). The engineering quality, and convenient interface, of the iPod allowed it to sell at a higher cost than its competitors while carrying an almost unheard of profit margin. The iTunes Store, on the other hand, was estimated to have minimal, to negative, profits with 65¢ of every 99¢ sale going to the record labels and at least

25¢ to credit card fees, costs of digitizing music, hosting songs and writing and updating related software. The complimentary relationship between digital music and the iPod made it possible for Apple to sell music at a significantly lower price than small, specialized companies whose only revenues came from digital distribution. This integrated, and easy-to-use, interface across Mac computers, iPods and iPhones and digital music positioned Apple perfectly to foster the entrance of a new chapter for the music industry.

Although this scenario was ideal for Apple as a company, and consumers who could purchase music more conveniently at lower prices, record labels were likely not entirely pleased with the agreement. As the store gained popularity, many executives pressured Jobs to use differential pricing to charge more for popular artists. Apple, hoping to keep the store simple, was able to resist this change for several years as its popularity made it too valuable a partner to abandon. A March 2009 article from Daily Finance, though, reported that as CD sales continued their steep decline, Apple finally agreed to introduce a three-tiered pricing model, charging \$1.29 for more popular songs (Massucci 03/27/2009). Also in 2009, as documented by the New York Times, iTunes was able to leave behind the digital rights management standard it first adopted in response to consumer preference and competing services without these restrictions (Stone 01/06/2009).

Today, the iTunes music store has grown to a size likely unimaginable less than a decade ago. In February of 2010, an Apple press release announced that the iTunes store had officially sold its ten billionth song establishing its position atop all music retailers worldwide. With over 12 million songs, Apple also holds the world's largest collection of music (Apple, 02/25/2010). A 2012 article in the online consumer electronics publication, CE Pro, cited a study by the market

research company, NPD Group, which found that Apple owns a 64 percent market share for digital purchases of music, and 29 percent for music retailers as a whole (Archer 10/10/2012).

Apple's success served as motivation for other established companies, such as Amazon and Google, to begin selling music digitally. Further, it forced innovation among small companies seeking to create a viable business model around digital music and a few have been able to thrive. Beatport, started in Denver in 2004, has found success catering specifically to the emerging genre of electronic dance music offering many songs in this niche that may not be found on iTunes (BeatPort.com). The Swedish company, Spotify, has created a subscription model with a desktop application similar to iTunes, and a library that matches their size. Spotify, founded in 2006, has been able to effectively differentiate themselves by incorporating social features into their platform (Spotify.com). With digital sales surpassing physical in value for the first time in 2011⁴, legal digital distribution is clearly a key element looking to the future. (Aspray 2008, 473-475)

*The Post-Internet Music Industry*⁵

There is no doubt that the landscape of the music industry has undergone a significant transformation since the turn of the millennium due to technological change. The record companies have partially lost a hold of the control that once allowed them to keep prices for music, and their profits, high. Ultimately, fundamental changes in production, distribution and promotion brought on by the transformed the economic climate, redistributed profits and created new business opportunities.

⁴ Data from the Recording Industry Association of America's (RIAA) shipment database. More information on this trade publication will be provided in the later sections of this study.

⁵ Much of this subsection is based on my own observations serving as the editor for a music blog. Outside references are cited normally.

With advanced recording, and producing, software now widely available and relatively inexpensive, aspiring artists can create high-quality music from just about anywhere. Musicians no longer need to go into a professional studio nor do they require a record label to initially help supplement these costs. Maybe more importantly, though, all costs associated with distribution and promotion have been largely removed through the free and open communication of the Internet and rise of social media. Control in these two areas was perhaps where the record companies initially drew their power.

Today, an artist can create a song, upload to a third-party host and share it through social media all from the comfort of their bedroom using little more than a personal computer. The popularity and emergence of sites like YouTube, used for videos, and SoundCloud, specifically for music, allow users to easily upload video and audio content for free. Not only will they be public on these highly trafficked sites, but they can then be easily shared around the web through link and embed. Social media giants Facebook and Twitter not only serve as a useful tool for hopeful musicians to connect with fans, but their enormous network also creates the opportunity to develop “buzz” around a new artist or, even more effective, have a song or video spread virally. Other social networks, such as BandCamp and MySpace, cater specifically to artists offering them an outlet through which they can post free projects, sell albums, promote new projects and stream their work. Today, artists can distribute their new music simply by posting a download, or purchase, link directly to their fans through their Twitter or Facebook accounts. Selling music through the iTunes store is more difficult if not affiliated with a major label, but not nearly as much work as it once was to independently distribute an individual or band’s work.

Promotion, although deeply intertwined with social media, has taken possibly the most interesting turn. A variety of artists have begun releasing some, or all, of their music digitally free from charge. These free projects can help get the word out for relatively unknown acts, whose music consumers may not yet be willing to pay for, or serve as a way for established groups or individuals to build momentum around upcoming albums or tours. Since artists traditionally make a large portion of their income from live shows as opposed to actual sales of recordings, releasing free music can serve a powerful promotional tool that can help boost demand for concert ticket sales (Schultz 2009, 697). This relationship, made possible by both the greatly lower production costs and easier channels of distribution through social media, is the polar opposite of the previous model in which tours served as a means to promote the sale of records.

Music blogs and websites dedicated to the digital curation of new music have also begun to emerge, and gain popularity, around the web. These sites, often created by passionate music fans, have become an effective and prevalent means for independent artists to reach a wider audience and promote their work. The most frequented of these sites come to essentially serve as digital music magazines, with a revenue stream and staffed writers. As these websites share, and stamp their approval, of new songs, projects and artists, they can play a large role in helping musicians build a positive reputation, expand their fan base and get out information about releases and shows.

Independent, Pittsburgh-based hip-hop artist, Mac Miller, truly exemplifies the effective use of social media and the latest technology to reach commercial, and financial, success. At only 20 years old, Miller is a multi-millionaire and was featured in Forbes Magazine's "30 under

30” list in 2011. He started developing clout in the Pittsburgh hip-hop scene by releasing free “mixtapes,” as they are referred to within the hip-hop community, online and posting music videos to YouTube. With the approval of several notable music blogs and websites, Miller was able to steadily build his fan base with a combined nearly 400 million views on his YouTube channel. With a more than sufficient “buzz” surrounding him, Miller played over 200 shows in 2011, with an average gross of 40,000 dollars a night. When he finally released his independent album in 2011, his fans showed their support. With 144,000 units sold in the first week, his album became the first independent album to top the charts since 1995. (Greenburg 12/19/2011)

While artists benefit from more convenient and affordable ways of producing music, promoting themselves, reaching fans and distributing their content and consumers gain from wider selection and easier access to music, record labels are forced to innovate as some of their roles have been minimized. Regardless, many artists who may initially gain popularity through the Internet still elect to sign on with a major record label. Their wealth of experience, connections with major media organizations and radio stations, public relations expertise, access to mainstream forms of distribution and general knowledge of career strategizing allow the record labels to retain at least some of their relevance and importance.

In light of the recent technological developments, record companies have started to adapt by forming relationships with popular music blogs, utilizing the latest social media outlets to discover potential stars and promote their current signees and finding ways to alter their business plans to capitalize on new prospects. In a 2011 article by the Guardian News, Tony Wadsworth, Former CEO of EMI music, describes the evolution of their role, “record labels are

unrecognizable compared to the 90s. They are smaller, more efficient and they have diversified and taken on many more functions.” One such difference is an increased role in all aspects of their artists’ careers including merchandise, touring and sponsorships. (Topping 05/13/2011) Adjustments withstanding, today only three, as opposed to six, companies remain dominant in the recording industry today.

By expanding to these realms, record labels can also share in the profits as many have adopted “360 Deals.” Interestingly, one of the first major such deals was actually with the live event promotions company, Live Nation, who came to a 120 million dollar agreement with Madonna making themselves the “exclusive partner for merchandise, recorded music, touring and other music related businesses for 10 years” (Schultz 2009, 697). Perhaps this highlights the unprecedented growth in live music revenues during the early 2000s (Hull 2004, 98) that allowed Live Nation to make such an investment. Nevertheless, several record companies followed suit including Warner Music Group, who worked to reinvent themselves as a “music based content company” rather than a traditional label. Some personal managers, though, are skeptical of the value of record companies, who seem to have a shrinking resource base, in the live music process (Schultz 2009, 432-433).

The live entertainment industry has also gone through several interesting changes in the last dozen years. In the early 2000s, an ABC News article notes that while music sales fell from \$13 billion to \$11.5 billion, concert revenues simultaneously soared from \$1.3 billion to \$2.1 billion (Kafka 07/11/2003). The relative small size of the live music industry, though, may be an indicator that the music business cannot yet be fully sustained by concert revenues. Updated descriptive data on trends in the concert industry will be presented in Section VIII.

The latest introduction in digital distribution comes with cloud computing, which allows consumers to remotely store their music libraries and access it from virtually any device with an Internet connection. Apple introduced their iTunes Match service in 2011, generating a revenue stream for themselves, and record labels, from the new technology. According to Apple's website, the service scans a users' music library and matches their collection with songs available through the iTunes store. It then sends the information to the cloud, making their music remotely available on up to 10 devices. This means that even if a consumer has illegally downloaded a portion of their library, they will have access to a likely higher quality version of these pirated songs from essentially anywhere. For further expanding consumers' listening opportunities, Apple charges \$25 a year, a portion of which goes to the artists and record labels or publishers. Although this might not completely heal the damage from piracy, one former EMI Music executive described it as "one way to make someone pay for music they've already bought" in a 2011 article by Rolling Stone magazine (Knopper 06/06/2011). The fact that the service offers a way to charge for music that has been illegally downloaded may be even more important.

The last dozen years have clearly seen a massive transformation of the music business, in both recordings and live entertainment. Artists and consumers both seem to benefit from the opened environment offered by the Internet. Record labels, though, in addition to piracy, have been hurt by massive changes in distribution, promotion and distribution and will likely have to take new form as they get a feel for the evolved environment. Digital distributors, as discussed in the previous subsection, are growing to play the primary role in selling music. Contrary to record sales, live entertainment has seen some expansion and moved towards

music festivals as an important feature of its structure. The impact of the Internet on the music business as a whole is yet to be fully realized, but the events thus far provide the foundation for a fundamentally restructured industry.

III. Literature Review

In the last decade, a number of academic articles have attempted to understand the impact of the Internet and peer-to-peer file sharing on the music industry. The rapid progression of the Internet, and its relative young age, has led to widely inconclusive results. However, these works provide interesting commentary into the landscape of this portion of the industry at specific points in time and remain valuable points of reference when building a model. A few academic papers have explored the concert industry, as it relates to file sharing and the Internet, and will also be discussed in this section.

While many scholars predicted a complete collapse for the record companies, several argued that these assumptions might have been somewhat premature. Alexander correctly forecasts that, “the established business model in the industry may indeed have a relatively short life span” (2002, 152). However, he notes that the entertainment sector has generally preferred “technological stability,” but ultimately benefitted from advancements. This resistance to adaptation is embodied by the extensive legal action taken against peer-to-peer networks such as Napster, but victories in court were expected to be short-lived. Citing a survey by Jupiter Communications that found that Napster users are 45% more likely to increase music purchases, Alexander concludes that, at the time, it was not clear that music file sharing had a negative impact on sales, while envisioning a scenario in which “the Internet supplements radio

and television as a means to inform consumers and generate publicity for the firms in the industry” (2002, 160).

Liebowitz (2003) evaluates the “annihilation hypothesis” looking at a number of demand factors, aside from piracy, which could contribute to the decline in sales. Before turning to time series aggregate data from 1973-2002, he observes some of the underlying trends in the industry that may provide alternate explanations for the downward movement. Noting that the market for singles had, at the time, been steadily declining since the 1970s, he diverts focus to album sales as the main indicator of the market. Unlike singles, album sales had shown mostly positive growth with revenues, adjusted for inflation, jumping from \$4 billion (400 million units) in 1973 reaching well over \$8 billion (1 billion units) before the downturn at the turn of the century (Liebowitz 2003, 9-11). However, this growth was non-linear with four notable dips in sales during the thirty-year period suggesting that the decline from 2000-2002 is not, by itself, “cause for alarm” (11). Shifts in recorded media formats may also relate to the trends in album sales as well. For example, the largest increase in album sales occurred between 1986 and 1994, coinciding with the rise of CDs as the main form of recorded music (Liebowitz 2003, 12).

Liebowitz (2003) then turns to other factors that may help explain changes in sales over the observed time period. These include price and income, copying using cassettes, portability, impact of substitutes, general interest in music and changes in audience. After finding price and income largely insignificant, he turns to copying using cassettes, the most historically analogous scenario to file sharing. Finding that sales thrived at the height of the cassette tape, Liebowitz points to the expanded locations for listening to music as a contributing factor to the rise in sales, which brings to light the possible demand impacts of changes in portability (2003, 17-19).

As people are able to listen to music on the move, “new consumption opportunities” (Liebowitz 2003, 17) are created and consumers are willing to spend more time and money listening to music. This contention is supported by the all-time high in album sales reached during the rise of sales in portable players. Yet, there appears to be little relationship between changes in format and the 2000-2002 dip, leaving the decline still unexplained. Another common theory relates to the effect of substitute entertainment products such as movies, DVDs and videogames. The concurrent rise of these two products from 1972-1999 provides evidence against this hypothesis. Considering the amount of time it takes to consume these products also suggests different demand schedules (Liebowitz 2003, 20-21). Interest in music at a certain time may also contribute to changes in sales. Interestingly, in attempting to use the concert industry as a proxy for interest in music, he finds “the years 2000 and 2001 had the largest real increase in concert revenues—the same time the record industry was experiencing unusually large decreases in revenue” (2003, 22). Finally, Liebowitz analyzes possible changes in audience that could contribute to a drop in sales finding that people ages 15-24 lowered their purchases by a disproportionate amount starting in 1995, but that the post-Napster era showed a smaller decline than did the previous period (2003, 22-23). Completing his process of elimination, Liebowitz comes to the conclusion that harm has likely been done by MP3 downloads but that there was not enough data at the time to confirm this possibility (2003, 30).

Peitz and Waelbroeck (2004) create a regression model of physical music sales from 1998-2002 using a cross-section of the 16 countries with the largest markets for prerecorded music. They define their independent variables as GDP, Downloads, Broadband, Digital Media Players, DVD Players (to measure for substitutes) and CD-R Players. Peitz and Waelbroeck find

that GDP has a strong positive effect on music purchases, although they admit this may likely “capture other factors related to the domestic economic environment” (2004, 75). Both the downloads and broadband variables are found to be negative and significant at the ten percent level. The -.2 coefficient on music downloads suggests that, between the years of 1998-2002, “music downloading could have caused a 20% reduction in music sales worldwide” and provides strong evidence of MP3s substitutive value for CDs (Peitz and Waelbroeck 2004, 75). One important shortcoming is their measurement of downloads, represented as the percentage of adults who have downloaded an MP3 illegally at least once (2004, 73). The lack of data on intensity of downloads and the omitted variables implied by the significance of GDP, though, leave the findings mostly inconclusive. Data until 2002 is also unable to include legal digital sales, now an important part of the industry, as no successful digital distributors had been fully established at the time.

Stevens and Sessions (2005) utilized time series regression analysis to try to explain the decline in record sales from 2000-2004. While previous studies had found price and substitutes insignificant, they note that CD prices rose 19.4% from 1998 to 2002 and that sales of videogames and DVDs have increased post-2000 (2005, 313). Another plausible explanation would be that the introduction of MP3s has altered the price elasticity of demand for recorded music (2005, 315). If music downloading serves as a substitute for these purchases, then the increasing price of music may have amplified the decline (Stevens and Sessions 2005, 316).

Stevens and Sessions’s (2005) time series model uses consumer spending on physical music purchases as the dependent variable and explanatory variables including personal income, price index of physical sales, price index of software, per unit price of DVDs and a time

trend dummy variable holding the value of 1 beginning in the first quarter of 2000. Stevans and Sessions find evidence to support their claim of “structural change in the demand for recorded music” (2004, 316). Their time trend shows a notable decrease from 2.25 to 0.77 percent in the growth rate of consumption of recorded music likely capturing the increase in the prevalence and quality of broadband and other omitted explanatory variables (2004, 320). Interestingly, they find that price and DVD prices are both significant, with coefficients, which are clearly larger after 2000. As a result, they conclude that music downloads, although not the only factor, have altered the slope of demand leading to a disproportionate decline in spending on music after 2000. Despite the lack of data on legal music downloading at the time, Stevans and Sessions finish their analysis with some accurate predictions on their potential effect. They postulate that, even if more aggressive copyright laws reduce the price elasticity of demand, digital distributors’ lower prices would balance out these increases. As a result, “consumers would benefit, since they would not only face price stability, but also an enhanced market for all music formats” (Stevans and Sessions 2004, 322).

Oberholzer-Gee and Strumpf (2007) continued the update of the literature with their look at the effect of file sharing on legal music sales. However, unlike many previous studies that use proxies, such as broadband or a time trend, to capture the effect of file sharing they employ data on actual downloads to U.S. sales data for a large sample of albums. In their literature review, they note that many previous studies had failed to isolate P2P users pointing out that file sharers are generally “time-rich but cash poor” deeming this segment already less likely to purchase music (2007, 5). As a result, their model focuses on micro-data on downloads to compensate for this perceived oversight.

Oberholzer-Gee and Strumpf's (2007) data set consists of 1% of the world's downloads (1.75 million downloads) extracted from P2P download logs from the last third of 2002, a time of rapid growth in the sector. They then used an algorithm to match these downloads with weekly sales of corresponding albums, using a database of over 10,000 "album-weeks" in an attempt to find the true nature of this controversial relationship with respect to weekly sales (2007, 3). From this model, they find that the coefficient on downloads is neither statistically significant nor economically important. If file sharing is not the cause of the decline in sales, Oberholzer-Gee and Strumpf consider other facets that may have played a role including record sales shifting largely to discount retailers, the end of a boom in the industry caused by the introduction of the CD and growing popularity in other forms of entertainment (2007, 39). Although their brief analysis argues that the results would stand in an updated study, it would be practically impossible to separate file-sharers from non-file-sharers with the prevalence in broadband access and improvements in file sharing technology that exist today. Regardless, Oberholzer-Gee and Strumpf come to the conclusion that file sharing had not caused sales displacement, but rather improved general aggregate welfare (2007, 40).

Zentner (2009) utilizes a panel of twelve years of data from 1996-2008 for 49 countries to see if music sales have been hurt more in countries with greater broadband access, which serves as a proxy for increased file sharing. He finds that broadband presence specifically, and not general Internet penetration, to be the statistically significant and economically important factor in sales (2009, 7). This correlation suggests that speed of Internet could be an important determinant of losses representing file sharing. Zentner also separates total and physical sales, in order to take into account substitution of physical music purchases for legal digital ones,

finding that file sharing maintains its negative relationship (2009, 16). However, the international nature of the data may deem this part of study premature as digital distribution was still at an “infant level” of development outside of the United States (Zentner 2009, 10).

Waldfoegel’s 2010 paper is one of the first to attempt to try to reevaluate the effect of music file sharing in the “iTunes era.” With the emergence of legal digital distribution, consumers now have the ability to buy, rather than steal, individual songs, with added benefits such as cover art and guaranteed high quality files. By 2008, digital music sales amassed nearly a third of music sales in the U.S., three quarters of that coming from iTunes. Waldfoegel purports that in order to decide whether or not file sharing actually causes sales displacement we must first establish if songs illegally downloaded would otherwise be purchased by legal means (2010, 307). In order to attempt to quantify this question, he utilizes two surveys, from 2009 and 2010, of University of Pennsylvania undergraduate students. These questionnaires provided a sample of fifty songs, chosen from top iTunes sales, and had students answer questions about whether or not they have the song, if they had a physical copy or digitally downloaded it legally or illegally, their willingness to pay for these songs, general interest in music and size of their music collection (Waldfoegel 2010, 309). Controlling for other demand factors, Waldfoegel finds a relationship suggesting that one additional illegally downloaded song decreases purchases by a third to a sixth of a song implying a significant impact (2010, 310). However, he uses a welfare analysis to estimate that file sharing has increased consumer surplus by a sizable amount, only a small part (less than 10%) of which is attributed to loss in producer surplus with the remaining portion resulting from a declined deadweight loss (2010, 312-313). Waldfoegel concludes that although the emergence of digital distribution has

drastically changed music retailing, it has had little impact on the effects of piracy (2010, 313). Although these results are certainly valuable, it may suffer from sampling bias, as the group of Ivy League students may not necessarily represent the full population.

Clearly there is extensive literature examining the effects of file sharing, and more broadly increased and improved Internet access, on record sales. This only covers half of the story, though. As Liebowitz (2003) briefly mentions, the drastic decrease in record sales of the early 2000s was met by a previously unmatched boom in revenue from live music. Perhaps because of the larger size of the recording industry and media attention and legal action involved with their sales displacement, the trend within live music has been largely overlooked. There are several articles that discuss the viability and potential of this growing portion of the industry. This limited academic literature may help introduce the discussion of live entertainment in the Internet era.

A 2005 paper by Curien and Moreau considers a new business model for the music industry based on live performance, which would structurally adjust to the effects of piracy rather than engaging in futile legal battles against it. They argue that the record companies' lawsuits have failed to effectively slow down file sharing, citing that they continued to increase by 10% in the second half of 2004. Curien and Moreau establish that sales for live performances and "ancillary products" will increase with the "diffusion" of an artist's music (2005, 3). In this sense, file sharing has undeniably made this diffusion easier and more widespread than it has ever been. They bring up a crucial point regarding the welfare effect of piracy by pointing out that contractual agreements in the recording industry disproportionately benefit the labels over the artists. Just as they realize most of the profits from prerecorded music sales, record

companies take the biggest hit as a result of file sharing. Artists, on the other hand, actually benefit for the most part as they share in a larger portion of profits from live entertainment and additional “ancillary” products, which are boosted by further distribution and availability of their music, whether legal or illegal (Curien and Moreau 2004,11-13). Using this logic, it follows that the music industry could benefit, and compensate for losses in sales, by finding a way to incorporate these sectors as part of their business plan. Curien and Moreau recommend that record labels either restructure contracts to include live entertainment or attempt a “downstream vertical integration, especially towards the concert industry” (2004, 21). This analysis captures the shift in profits from the labels to artists, maybe one that was long overdue in a structure that has historically underpaid musicians.

Schultz revisits the idea and viability of a concert-based music industry in detail in his 2009 paper. He first outlines the four “challenges” that face the industry, several of which on their own would merit a re-structuring. The first, and most widely discussed, is the emergence of P2P file sharing deeming payment for consumption essentially voluntary. The cost of recording studio-quality music has also steeply declined with the introduction of advanced, and affordable, software. Third, expenses related to producing and distributing music have drastically fallen with the ability to release through the digital infrastructure. Finally, social media and “online communities” make it easier for consumers to connect with and learn about artists (Schultz 2009, 689-690). In this way, the digital age has revolutionized the methods, and lowered the cost, of nearly every aspect of the music industry.

After touching on several other suggested alternative business models, including subscription music services, Schultz turns to one based on live performance. He makes the vital

observation that, in this model, prerecorded music will serve as a necessary promotion expense for live entertainment and merchandising (2009, 697). This infrastructure may indeed make sense as music nears the non-excludable and non-rivalrous status of a public good. The ineffectiveness of copyright law for music deems live entertainment the only “non-copyable, eminently excludable” good that remains (Schultz 2009, 699). Schultz also comes to a similar conclusion as Curien and Moreau about general welfare, suggesting both artists and consumers actually benefit (2009, 692,761).

Moving to a deeper analysis, Schultz examines the actual viability of live performance supporting the recording industry using commonplace parameters for considering new business structures. He first considers the relationship between the availability of free recordings and the demand for live concerts finding there to be a relatively weak link between the two (Schultz 2009, 713-714). He attempts to draw parallels to other industries that have benefitted from a “strong tie between a freely available work and a revenue-producing work” (2009, 722). These sectors were able to benefit from a shift to revenue sharing based, complementary and bundling models (Schultz 2009, 705). In the television industry, studios benefit from revenue sharing in advertisements by charging the broadcast networks. The live entertainment model would not fit the sharing-based structure as consumers do not need to go to concerts to get prerecorded music like they have to “watch television broadcasts, with accompanying commercials, to view television shows” (Schultz 2009, 723). Offering the example of a software company that offers its application for free only charging for its expert customer support, Schultz notes that consumers do not need to attend concerts to “enjoy recorded music,” making the link relatively low (2009, 723). The third model, bundling, may be slightly more

applicable to the music industry. In 2007, musician Prince gave away free copies of his album at his concert effectively including the price of the CD with the purchase of a ticket. Although this might work for established artists with a loyal fanbase, people will likely not purchase tickets for a more obscure musician whose work may be unknown (Schultz 2009, 724). In order for the free album to be of value, the industry would have to find a way to protect these works, which brings back the original issue facing record companies.

Although the above models were effective in other industries, they do not prove applicable for a live entertainment-driven recording industry. Instead, Schultz (2009) suggests that the most relevant structure may be one rooted in sampling. Before the emergence of the Internet, the radio served as a sampling mechanism for the music business offering consumers a free preview for a more informed purchase decision. Free downloading vastly expands the variety and amount of such previews allowing, “more niche tastes” to be “served and cultivated” (Schultz 2009, 724). At the same time, this wider availability can hurt the industry if it begins to displace the demand. This is where concerts may fit as a revenue driving force with the actual prerecorded music as a sample increasing willingness to purchase concert tickets. This setup could help the industry as a whole grow if customers are more satisfied with their “music choices” (Schultz 2009, 726). Sampling may facilitate this process. In a theoretical situation where prerecorded music becomes a free advertisement for concerts “a separate and large business” would be eliminated and instead become “an additional expense for a [concert] business only a fraction of the size of today’s recording industry” (Schultz 2009, 726). Once again, we see the shortcomings of a scenario in which the music business relies solely on concerts.

According to Schultz, there are several characteristics of the concert business, which may also counteract its positive effects. First of all the supply of shows is inherently limited as there is only a certain amount of time and space for these events (Schultz 2009, 723). Second, demand is hindered by “practical” constraints including the necessity of consumers to be in the right place at the right time to be able to engage making for a greater opportunity cost than other experience products (2009, 727). Also, the nature of shows, often crowded and plagued by illicit activity, may hurt their demand among a large portion of the population. In these ways, among others, it is far easier to casually enjoy recorded music than to dedicate resources to attend a concert. In addition, the scarce nature of concerts in contrast with the rising availability of free music magnifies this conflict. (Schultz 2009, 728). The ability to reach audience from a wide range of locations achieved by the Internet may be countered by the time and place constraints of live entertainment (2009, 730). Schultz concludes that concerts by themselves do not provide an adequate way to fully fuel the recording industry. The shift, though, does not have to be this drastic. Instead, live entertainment serves as one of several ways that the music business can help capitalize on the new opportunities created by improvements in technology.

Dewenter, Haucap and Wenzel ‘s 2012 paper provides the most recent discussion of the “indirect network effects” between file sharing, concert ticket sales and music recordings. They attempt to understand how demand for recorded music affects demand for concert ticket sales and vice a versa. The authors describe the relationship as analogous to that of books and movies based on those works to that between recordings and live concerts. Reading of a book may enhance the experience of viewing the movie, while the movie will likely bring in more

revenue with the sale of more copies of the book (Dewenter et al 2012, 3). Through their analysis, they compare the current scenario, in which recording and concert industries are separate, to a business structure that incorporates both. They find an integrated model to be a more profitable one, in agreement with the contentions of Curien and Moreau (2005) and Schultz (2009).

IV. Descriptive Data: General Trends in Record Sales⁶

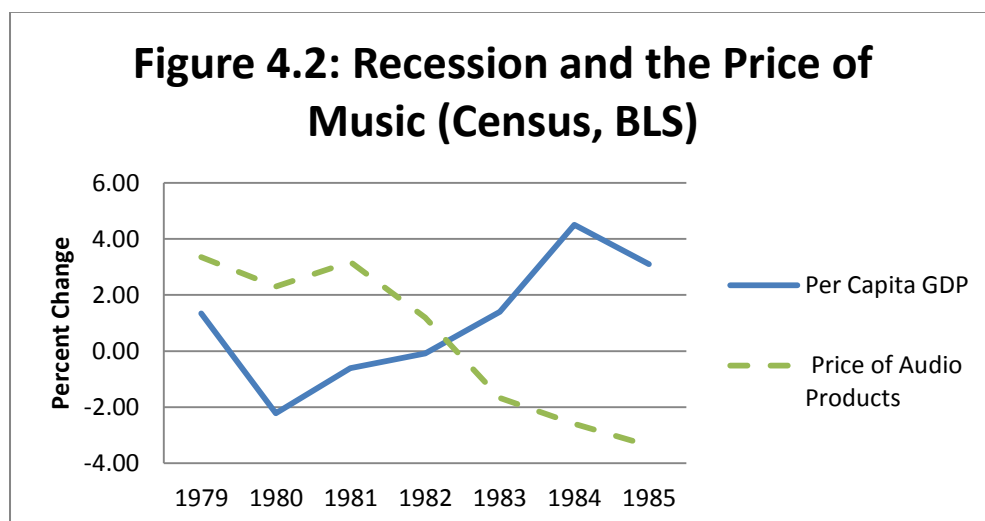
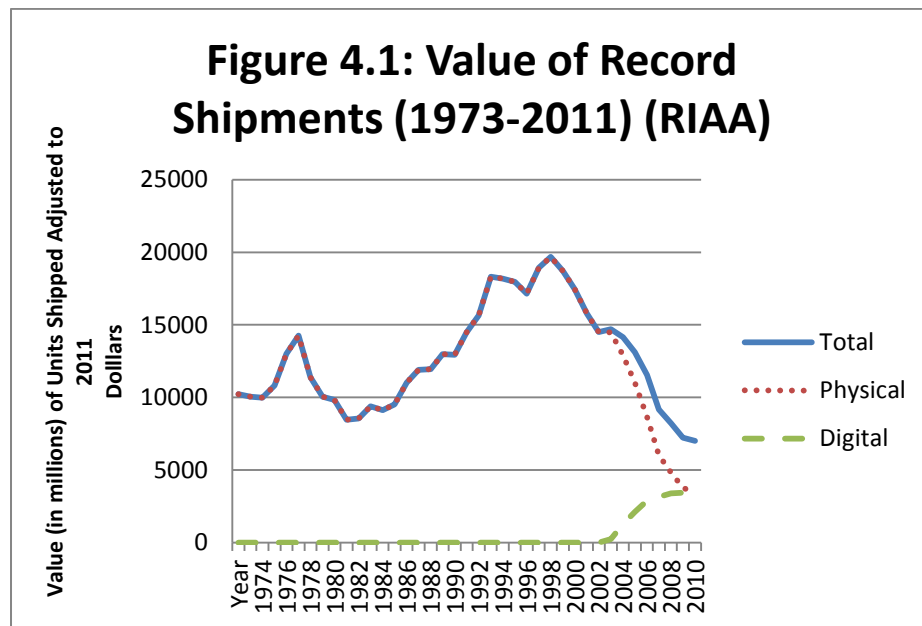
Before delving into a deeper empirical approach, an updated look at the basic trends within record sales can help us formulate some initial hypotheses about its relationship to the rise in the prevalence of the Internet. In this section, I will first examine both the largest drop and greatest expansion in sales prior to 2000 and speculate regarding the reasons for these more extreme movements. Next, I turn focus to record sales in the 21st century as they relate to increases in Internet availability, and speed, utilizing data and the historical background provided in Section II for analysis. Finally, I will explore additional demand factors that may have contributed to the decline in sales during the 2000s.

General Historical Movements in Record Sales Prior to 2000

Looking at Figure 4.1 on the next page, from 1973 until the turn of the millennium, value of record sales saw a nonlinear average growth rate slightly below 3% with the most notable dip coming from 1979 to 1985 followed by its largest upsurge between the years of 1986 and 1994. Since only physical music was available until the early 2000s, the line that represents this

⁶ All data regarding record sales was obtained from the Recording Industry of America's "U.S. Shipment Database," cited in figures as (RIAA), which is available for purchase at <http://www.riaa.com>. All chained consumer price indices are from the U.S. Bureau of Labor Statistics' (BLS) website: <http://www.bls.gov/>. Data on Internet and broadband penetration are publicly available through the International Telecommunication Union (ITU) here: <http://www.itu.int/en>. Data on GDP is also publicly available through the U.S. Census Bureau here: <http://www.census.gov/>. More description regarding these databases will be provided in Section V.

data naturally follows Total Sales in the 20th century. The decline from 1979 to 1985 came at a time of economic recession in the United States when per capita GDP income saw slow to negative growth until 1983 (see Figure 4.2). Although there were likely other contributing factors, consumers are less likely to spend excessively during recession. Possibly in response to the lowered demand, the price of audio products also saw a rare decline from 1982 to 1985 as shown in Figure 4.2. Despite their lower prices, value of record sales fell by nearly 20% from 1979-1985.



During the 8-year span from 1986-1994, real value of record sales showed unprecedented growth at an average of over 9% a year (see Figure 4.1). A recovering economy surely helped boost sales, but this increase may likely be largely attributed to the change in format to the compact disc (Liebowitz 2003, 12). As discussed in Section II, record labels were able to increase profits from CDs by charging the same, and in some cases even higher, price for a product that was less expensive to manufacture and distribute, all the while offering higher sound quality. In Figures 4.3 and 4.4, this practice is clear as the price index for audio-related products remained relatively constant, actually rising slightly during the same time period in which CDs gained popularity.

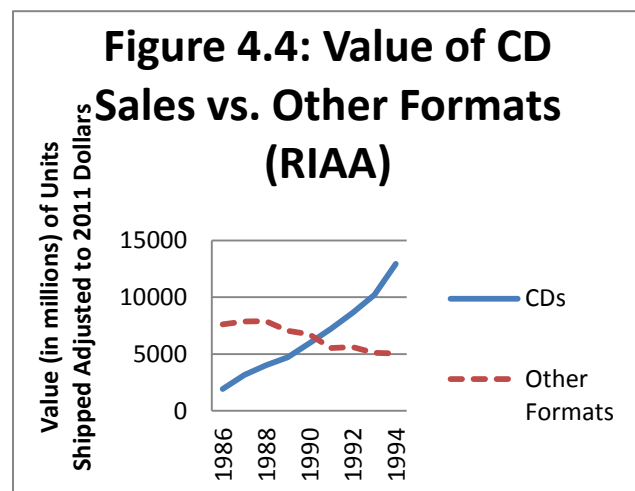
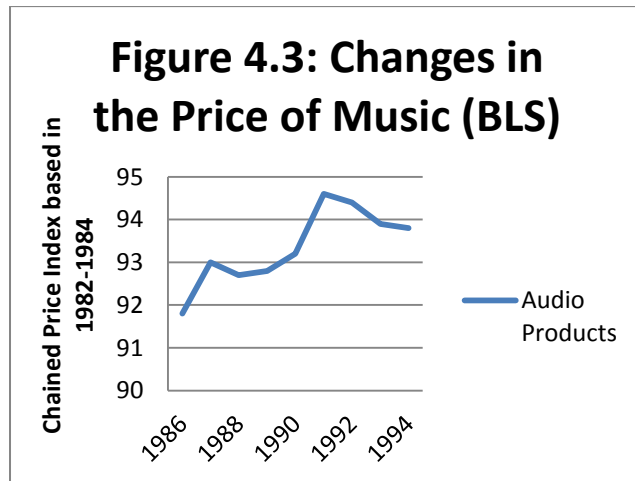
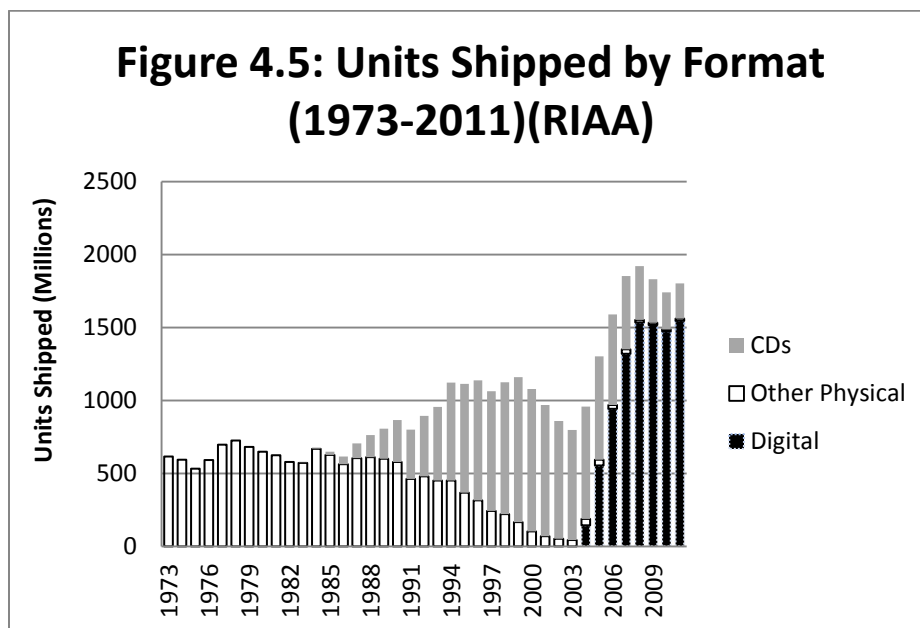
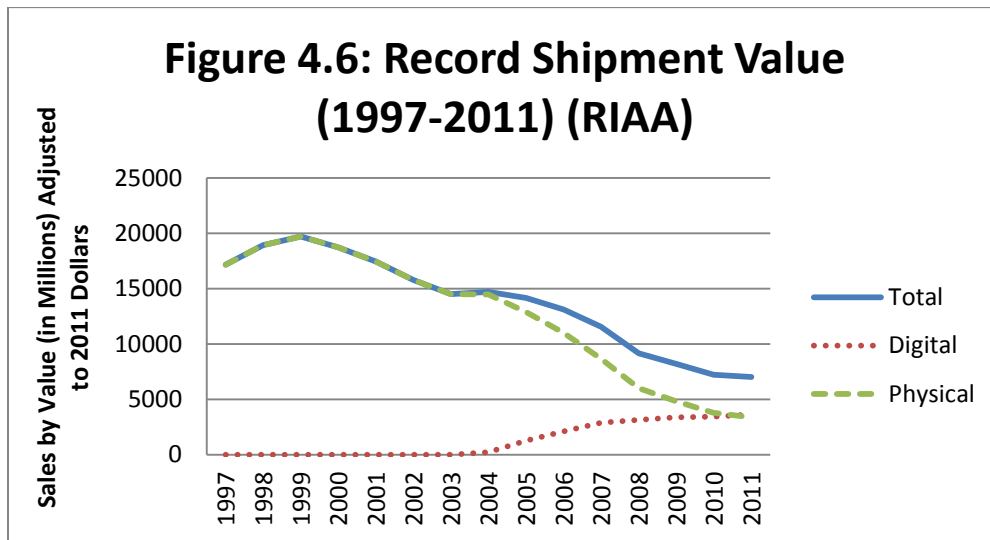


Figure 4.3 utilizes the chained price index for consumer audio products with the average of the base years, 1982-1984, holding the value of 100. Although the prices are slightly lower than this based time period, ranging from 91.8 in 1986 to 94.6 in 1991, these years experienced an overall increase, slightly over 2%, in the price of audio products as more confident consumers, in a recovering economy, may have been increasingly willing to spend money on entertainment. Higher prices in the base years of 1982-1984 likely reflect initial additional costs associated with manufacturing equipment and other related transition costs (Aspray 2008, 453-454). Despite the fact that the manufacturing process had likely been standardized by 1986, the market may not have adjusted fully to the lower expenses incurred by suppliers, whose producer surplus elevation is evident by the increase in the value of their record sales. Figure 4.4 illustrates the rise of the CD format, which surpassed all other formats by value in 1991, ten years after its introduction. Interestingly, an alternate perspective looking at units shipped (see Figure 4.5 below) shows CDs actually do not surpass other formats in terms of units sold until 1993. This once again points to the relative high price of compact discs during this time.

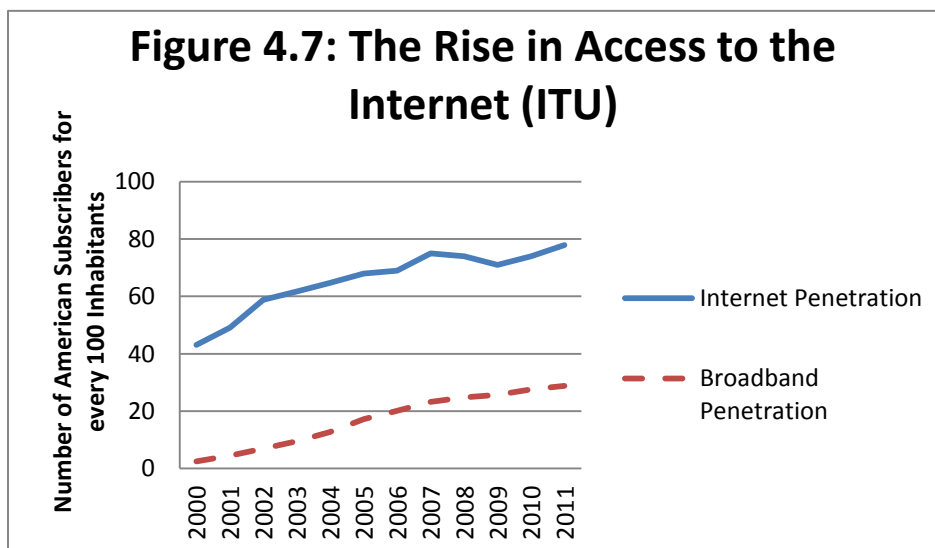




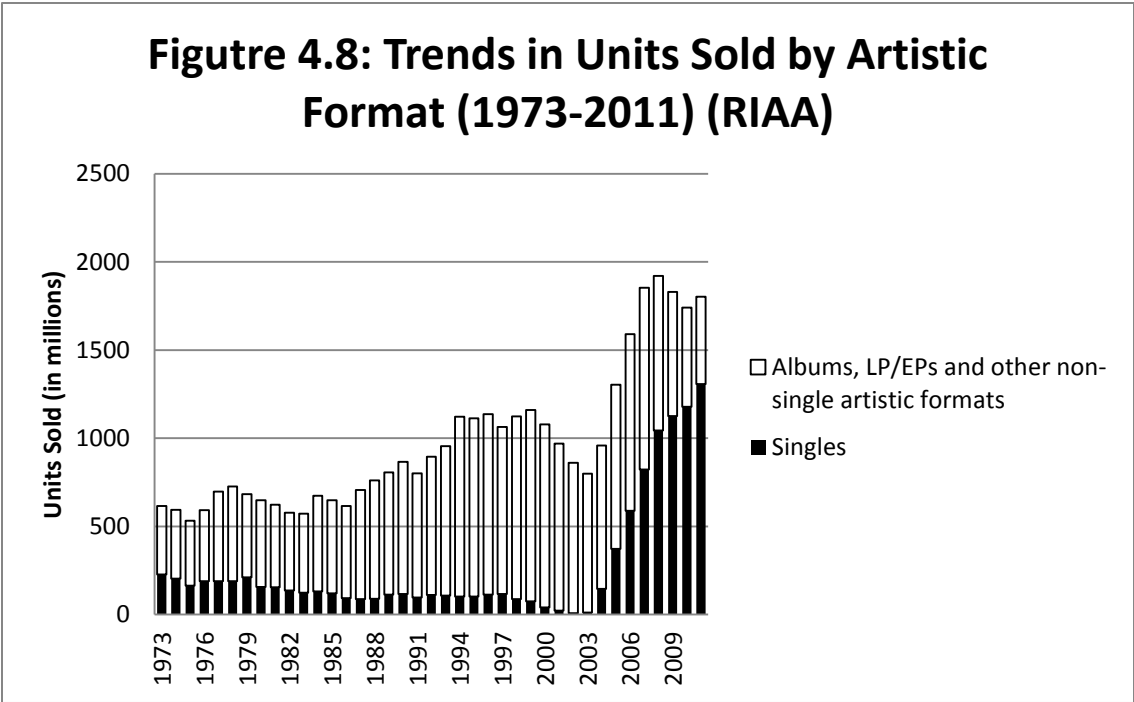
Taking a look at Figure 4.6 above, the value of record sales commenced a steep fall at the turn of the century that they are yet to recover from. Early on, the RIAA took legal action seeing Napster and illegal piracy as the culprit, and they certainly had a valid case. A viable legal digital distribution model was introduced to the industry in 2003, and to the data in 2004, with the unveiling of Apple's iTunes music store. Digital sales surpassed physical in terms of units sold by 2006 (Figure 4.5) and in value by 2011 (Figure 4.6) gaining dominance at a rate even more rapid than that of CDs. However, the rise in the prevalence of the Internet (Figure 4.7) appears, at first glance, to have had the opposite impact. Between 2000 and 2011 record sales fell by over 60 percent in value. From 2000 to 2003 units sold dropped by over 25 percent, but have since rapidly increased to their highest level since 1973. As will later be discussed, this is misleading as the growth in units sold actually reflects the re-emergence of the single song purchase. While the decline in units sold was reversed after 2003, the value of record shipments continued on a steady decline with the exception of a slight boost in 2004 (see Figure 4.6). In this subsection, I will explore the relationship between the rise in high-speed

Internet availability and movements in record sales, in terms of both value and units separated by technological (i.e. digital vs. physical) and artistic format (i.e. single vs. album).

The first dozen years of the 21st century have seen an enormous amount of technological change. Figure 4.7 below shows the rise of the Internet, a movement counter to that of record sales presented (Figure 4.6). Both access to the Internet and high-speed connections, represented by broadband penetration, have seen a steady increase since the start of the millennium. Several studies (see Section III) have utilized broadband, and Internet, penetration as proxies for illegal file-sharing. In the years from 2000-2003, this assumption may hold valid. Since legal digital distribution had not yet been widely successful, consumers, with relation to music, could really only access, and download, songs illegally online. Thus, the trends in the rise of the prevalence of Internet, and broadband, connections could be considered representative of Napster’s inception, and the growth of music piracy, from 2000-2003. It is important to note, though, that the widespread use of the Internet also birthed other phenomena such as social media and online communities, which would play a large role in the music industry as the 21st century continued.



With widespread legal digital distribution becoming available in 2004, consumers now at least had the option of purchasing music online, which was reflected by the first growth, a modest 1.4 percent increase, in record sales by value since 1999. As a result, the role of the rise in Internet and broadband penetration take on a new set of implications with regard to record sales expanding to include, not just piracy, but also digital music purchases and the beginnings of new channels of marketing and promotion. The recovery of sales in 2004 may also reflect the RIAA’s key legal victories in the previous year that helped shut down Napster and other similar P2P file sharing services.



One of the most fascinating developments directly resulting from online music retailers, though, is the resurgence in the sale of single songs (see Figure 4.8), a practice that had become practically extinct by 2000. As CDs, which were mostly presented as albums, emerged as a dominant format for the sale of music, singles, which had some popularity during the 1970s in vinyl format, were considered by many an irrelevant format. In fact, they were so insignificant

that Liebowitz, correctly, went as far as omitting them from his early analysis (2003, 9). Peer-to-peer file sharing services, may have actually helped assist in establishing a market for digital singles even before legal means of selling them existed. Applications such as Napster had user-friendly interfaces that allowed illegal downloaders to search the names of virtually any individual song and download it practically instantaneously. The advent of the iTunes store enabled consumers to purchase single songs from their extensive library legally, conveniently and with guaranteed high quality, for a relatively low price of 99 cents. In this way, they were able to take advantage of this newfound demand for individual songs while helping record labels recover at least a portion of sales displacement due to piracy.

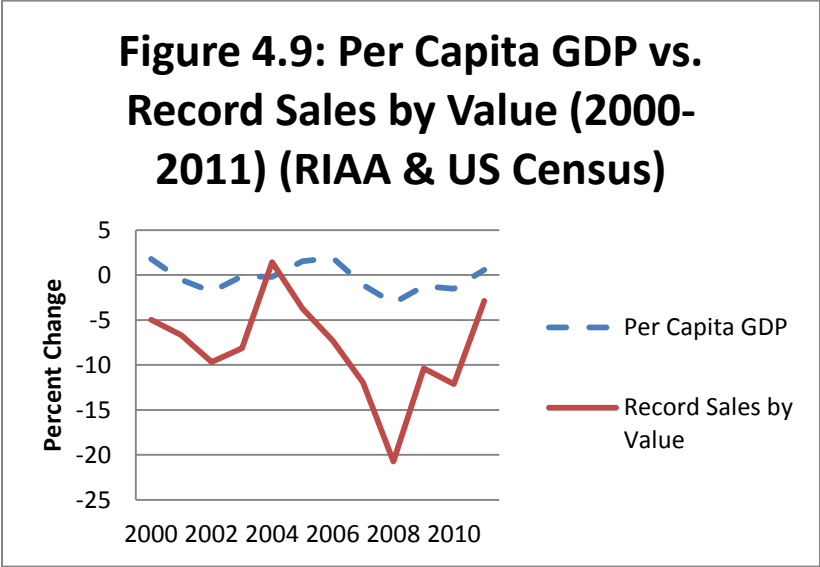
Even though legal digital singles helped reverse the negative trend in unit sales (see Figures 4.5 and 4.8), the value of record sales returned to its negative trajectory after 2004 (see Figure 4.6) and was cut in half between the years of 2005 and 2011. Although the number of albums, and other non-single formats, sold slightly recovered from 2004-2006, they saw a staggering reduction of 52 percent between 2007 and 2012, coinciding with a nearly 60 percent boost in the number of singles sold. From a value standpoint, sales of albums, and other non-single formats, steadily declined every year from 2000-2011, netting a decimation of 77 percent. It stands to reason that a rise in popularity of a lower priced product, and steep decline in a more expensive one, in this case albums, could net overall losses. The rise in the Internet as it pertains to illegal piracy and legal digital distribution undeniably played a major role in the massive shift in consumer preference by providing them the means to easily access individual songs without even stepping out of their front door.

Between the years of 2004 and 2011, though, the effects of the Internet on the recording industry cannot be limited to piracy and the introduction of legal distribution. Several aspects in the rise of social media make it another key element represented by the rise of the Internet. Using social media outlets, artists have begun to release free music directly to their fans, a practice that, although helps promote acts and expand their fan base, probably has mixed results in terms of record sales. Music released free of charge can be seen as sampling for upcoming works for sale, potentially uplifting record purchases. On the other hand, this surely can serve to hurt sales simply by notion of providing free entertainment that could be charged for. More generally, the role of social media marketing has been essential in the success of many of the Internet generation's stars and can be seen as a valuable way to promote record sales. In addition, online communities developed by new media outlets can help enhance an artist's popularity, and subsequently sales. The multi-faceted rise of the Internet as it has developed in the last decade has likely contributed to the decline in record sales, but piracy can only explain so much of this change. Rather, the Internet as a whole seems to have altered consumer preference, and the overall demand schedule, within the record sale market. In the following section, I will briefly examine other factors that may have impacted the demand for recorded music.

Potentially Relevant Alternative Demand Factors

Personal income is nearly always a demand factor worth discussing, especially in the case of goods that fall outside the realm of necessity. Historically, in the case of music, the recession of the early 80s serves as an example of its possible tie to sales. Looking at Figure 4.9, we find that real GDP actually experienced a slight decrease from 2001 to 2004. A decline that

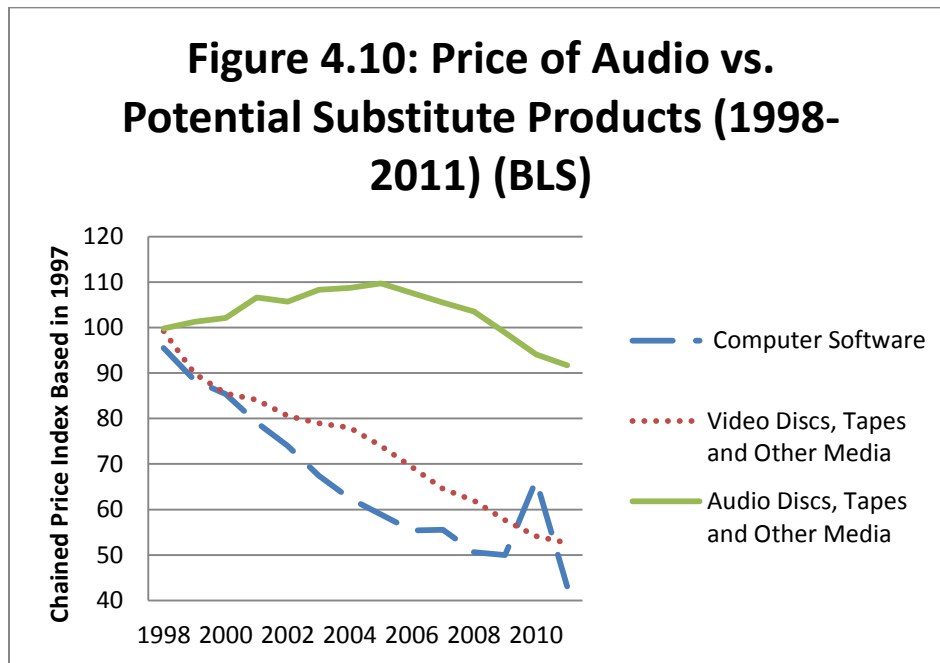
averaged less than a percentage point, though, might not be strong enough to suggest a pivotal role in the severe downward trend that occurred in record sales leaving piracy as the most likely contributor of the early 2000s. Similarly, an average rise in GDP slightly less than 2 percent in 2005 and 2006 could certainly have aided in flattening the steep decline of record sales, but might still take a back seat to technology-related factors



From 2007 to 2011, per capita GDP fell by an undeniably significant 6 percent coinciding with a drop in record sales by value of 47 percent. In this case, it seems that GDP could have played a relatively significant role in changes. Consumers, who had already started moving towards singles, were likely even less likely to purchase the more expensive formats when their income was significantly reduced. In this way, the Great Recession of the late 2000s could have accelerated this aspect of the Internet’s impact.

Within the discussed literature of Section II, we saw several studies that discussed both the prices of music and other forms of entertainment as possibly relevant variables to record sales. In Figure 4.10, we generally see a downward trend in the prices of selected substitute

products, video discs and computer software. Meanwhile, the chained price index of audio products shows a subtle parabola shape, increasing, with the exception of a less than 1 percent decrease in 2002, until 2005 before it declines back to a level well below that of 1998.



The oppositional movement of the price of audio products and potential substitute entertainment goods in the late '90s and early 2000s could have led to consumers choosing cheaper, alternate forms of entertainment over audio. Additionally, it may have increased people's willingness to download songs illegally when the practice became convenient and commonplace. One might expect that an industry struggling with a transformed demand schedule might lower prices to adjust to the market. It was not until 2006, though, that prices for audio discs and other media began to fall. It is possible that the nearly 15 percent drop in prices came as a result of illegal piracy's toll, the rise of digital sales, which are generally cheaper than physical ones, and the Great Recession. Although descriptive data cannot fully

capture these complicated inter-relationships, it offers a base off which we can begin further analysis.

V. The Model

In order to update the empirical literature on the impact of the Internet on the music industry, I have created a time series multiple regression model with 39 observations from 1973-2011 using the log of record sales by real value as the dependent variable and seven independent variables including Internet-related factors and other relevant facets relating to demand. This model may be broadly represented by the following:

$$LRS_t = \beta_0 + \beta_1 LGDP_t + \beta_2 Int_Pen_t + \beta_3 Broad_Pen_t + \beta_4 Price_Audio_t + \beta_5 Price_Video_t + \beta_6 Price_Soft_t + \beta_7 Millen$$

N=39 observations (1973-2011)

where...

- **LRS_t** is the natural log of the value total record sales (in millions of dollars) adjusted for inflation to 2011 dollars during time *t* starting in the year 1973
- **LGDP_t** is the natural log of per capita GDP adjusted for inflation during time *t*
- **Int_Pen_t** is the level of Internet penetration expressed as subscriptions per 100 U.S. inhabitants in time *t* starting in the year 2000
- **Broad_Pen_t** is the level of broadband penetration as subscriptions per 100 U.S. inhabitants time *t* starting in the year 2000
- **Price_Audio_t** is the natural log of the chained price index for audio products in time *t* starting in the year 1977
- **Price_Video_t** is the natural log of the chained price index for video products other than televisions in time *t* starting in the year 1988
- **Price_Soft_t** is the natural log of the chained price index for software in time *t* starting in the year 1998
- **Millen** is a time trend variable, which is 0 before 2000 and carries the values of 1-12 from 2000-2011

Data Sources, Variable Selection and Potential Shortcomings

All data regarding record sales was obtained from the Recording Industry Association of America (RIAA)⁷, the trade publication for major record labels and a reputable source of industry data. The RIAA's U.S. shipment database dates back to 1973 and presents record sales using three different measures—units sold, value sales and real value adjusted for inflation to 2011 dollars. As illustrated in the previous section, rises in units sold do not necessarily represent growth in record sales. For my model, I chose the third option as it seems to be the most representative of real movements. I then apply the natural log function to this nonlinear (see Figure 4.1) data in order to capture the marginal changes throughout the years.

Data on Gross Domestic Product (GDP) is publicly available online through the U.S. Census Bureau⁸. I chose per capita real GDP, in terms of 2011 dollars, to provide consistency and best demonstrate the impact of personal income. I took the natural log of this as well once again to keep the focus on year-to-year changes.

The International Telecommunication Union (ITU), is a United Nations agency who, according to their website, aim to “identify, define and produce international official statistics covering the telecommunication/ICT sector.”⁹ For my model, I utilize their free data on both Internet and broadband penetration, which date back to 2000 and are presented as the number of people, for every 100 individuals, with subscriptions. Internet penetration captures anyone with a connection, while broadband should better represent changes in access to higher-speed networks. Although the lack of data is a potential shortcoming, it seems

⁷ Available for purchase at the RIAA's website: <http://www.riaa.com>

⁸ Publicly available on the US Census Bureau's website: <http://www.census.gov>

⁹ Publicly available on the ITU's website: <http://www.itu.int>

appropriate to introduce this variable in 2000 when the Internet was truly starting to take hold. For this segment of the data, I kept the values in their original form as they are fairly linear (see Figure 4.7).

The chained consumer price indices were obtained from the historical data of the U.S. Bureau of Labor Statistics (BLS).¹⁰ These numbers are based in a certain year, which holds the value of 100, as a way of expressing values in a way that is comparable across products. For both audio and video, two separate indices have been developed over time. The initial price index for audio, titled “Audio Products,” spans from 1977 to 1997 and is based in the years 1982-1984. For video products, data on price indices commenced in 1988, which is used as the base year, and was titled “Video Products Other Than Televisions” also spanning until 1997. Starting in 1998, new indices, both based in 1997, were used for both audio, titled “Audio Discs, Tapes and Other Media,” and video products, titled “Video Discs and other Media.” According to the BLS, both of these include digital formats as well. A price index for software was also introduced, and based, in 1997. I utilize the natural log of the chained price index to emphasize marginal changes.

The most straight-forward approach to the differing price indices is to separate them as individual variables in the model that correspond with their appropriate years. In this case, the portion of the model expressed by $(\beta_4 Price_Audio_t + \beta_5 Price_Video_t)$ can be alternatively written as $(\beta_4 Price_Audio_{1977-1997} + \beta_5 Price_Audio_{1998-2011} + \beta_6 Price_Video_{1988-1997} + \beta_7 Price_Video_{1998-2011})$. This could also make for more valuable results by isolating significance of price in these

¹⁰ All chained price indices are either publicly accessible, or free upon request, from the BLS website: <http://www.bls.gov/>

fundamentally different time periods. Since software was not introduced to the consumer price index until 1997, there is no need for this type of split.

Presenting additional variables to a model already restricted by only 39 variables, though, may present an issue in terms of explanatory power. In order to avoid losing valuable degrees of freedom, I also attempted to essentially re-base the second portion of the data on audio and video price indices to the base year of the first portion. This requires representing the second section of data in terms of the base year of the first. For example, the second set of audio price indices are based in December of 1997, the last value provided by the first half of the data. Since price indices are represented with respect to 100, we can use the following formula to adjust the latter portion of the audio data: $(\text{Index}_{\text{base1982-1984}}) = (\text{Index}_{\text{base1997}/100}) * (\text{Index}_{\text{Dec2009base1982-1984}})$. Using this strategy, the originally denoted two variables, would be written as $(\beta_4 \text{Price_Audio}_{1977-2011} + \beta_5 \text{Price_Video}_{1988-2011})$. Once this has been consolidated, I can once again calculate the natural log of both. This data manipulation also has potential downfalls mainly by comparing indices that include differing bundles of products.

The actual substitutive power of these products can also be called into question for several reasons. First, music, in its consumption, is a truly different product than video. It requires far less time to listen to a song than watch a movie, or show. At the same time, the consumption opportunities related to audio products are much greater as people can listen to music on the go in a variety of ways. Further, music can often accompany other activities, while movies are generally the exclusive center of one's attention. Still, looking at the descriptive data in the previous section, the concurrent falling price of video and record sales warrants further testing. Software is probably an even less likely substitute, but does include video games,

another entertainment-related good. With the same, and even more extreme, consumption differences as movies, video games are still worth looking into as their prices, too, fell steadily. Another interesting facet that the price of software could capture is the lowered costs of producing music thanks to more affordable applications for doing so.

Figure 5.1

| | Millen | Int_Pen | Broad_Pen |
|-----------|---------------|---------------|-----------|
| Millen | 1.000 | | |
| Int_Pen | 0.9203 | 1.0000 | |
| Broad_Pen | 0.9965 | 0.9218 | 1.0000 |

The millennium variable is a simple time trend, from 1-12, beginning in the year 2000. This has been included to explain any other Internet and technology factors that might not be represented in the dependent variables. This could potentially cause issues with multicollinearity in relation to the Internet penetration variables. Looking at the correlation matrix in Figure 5.1 above, we see that Millen is in fact correlated nearly perfectly with broadband penetration and very closely to the Internet as well. In addition, the Internet variable, as would be expected, is highly correlated with that of broadband. Since these correlations do not equal exactly one, though, I will experiment including all three, together and separately, in the testing.

The main shortcomings of this model come with the relatively small number of observations, possibly omitted explanatory variables and potential complex interconnections within the dependent variables. With only 12 values for the Internet and time trend variables, it

may still be difficult to come to fully conclusive results about the impact of the millennium. In addition the existence of general trends in response to the emergence of the internet could cause multicollinearity.

VI: Regression Results

Figure 6.1: Results with Consolidated Price Indices

| VARIABLES | (1) | (2) | (3) | (4) | (5) |
|--|----------|-------------|------------|------------|-----------|
| | TRS | TRS | TRS | TRS | TRS |
| LGDP₁₉₇₃₋₂₀₁₁ | 0.0552 | 1.402 | 1.162* | 1.074* | 0.737 |
| | (1.045) | (0.838) | (0.615) | (0.585) | (0.615) |
| Int_Pen₂₀₀₀₋₂₀₁₁ | | -0.00886*** | | | 0.00295 |
| | | (0.00173) | | | (0.00247) |
| Broad_Pen₂₀₀₀₋₂₀₁₁ | | | -0.0288*** | | 0.0287 |
| | | | (0.00344) | | (0.0292) |
| Millen | | | | -0.0766*** | -0.168** |
| | | | | (0.00854) | (0.0758) |
| Price_Audio₁₉₇₇₋₂₀₁₁ | -0.002 | -0.0361 | -0.0297 | -0.0275 | -0.0191 |
| | (0.043) | (0.0333) | (0.0249) | (0.0237) | (0.0241) |
| Price_Video₁₉₈₈₋₂₀₁₁ | 0.084* | 0.0333 | 0.0402 | 0.0430* | 0.0545** |
| | (0.044) | (0.0348) | (0.0258) | (0.0245) | (0.0253) |
| Price_Soft₁₉₉₇₋₂₀₁₁ | -0.120 | 0.0380 | 0.0294 | 0.0347 | 0.0326 |
| | (0.0481) | (0.0378) | (0.0281) | (0.0269) | (0.0275) |
| Constant | 9.177 | -4.552 | -2.185 | -1.325 | 1.990 |
| | (10.273) | (8.238) | (6.047) | (5.746) | (6.045) |
| Observations | 39 | 39 | 39 | 39 | 39 |
| R-squared | 0.214 | 0.608 | 0.775 | 0.795 | 0.812 |

Standard errors in parentheses

*denotes statistical significance at the 10% level, ** 5%, ***1%

In the above table, the first set of regression results are presented using the consolidated chained price indices calculated employing the method discussed in Section V. Introducing the internet and time trend variables each individually in (2) through (4) of Figure 6.1, we see that all have a negative coefficient at the 1 percent level with varying levels of economic importance. The second column of results would suggest that every additional one in one hundred, or one percent increase in, people with any internet subscriptions is associated

with less than a one percent decline in total record sales by value. Moving across the table, though, we see that the broadband and time trend variables individually have a stronger, and more practically meaningful, negative relationship with total record sales. Broadband penetration's larger negative coefficient in column (3) may result from the necessity of a high-speed connection for many media-related online activities, from illegal downloads to legal purchases and streaming. When all three variables are included in the model in (5), both internet and broadband become statistically insignificant with the time trend seemingly absorbing their explanatory power. This shift is to be expected considering the high correlation between these three variables as presented in Figure 5.1 of this study. The fact that the millennium time trend retains its significance, albeit at the 5 percent level, may suggest that there has been a unifying, linear change during the 2000s that likely encompasses not only the general rise of the Internet and other technological developments but also the intangible social, cultural and economic changes that come with it. Its coefficient may be interpreted as each additional year into the millennium being associated with an undeniably economically important drop of nearly 17 percent in the value of record sales.

When tested on their own in column (1) of Figure 6.1, the included demand factors show relatively low explanatory power for the value of record sales, with an adjusted R-squared of only 21 percent. Surprisingly, personal income only shows statistical significance at the 10 percent level in two of the regressions (3 and 4). In the cases where it is significant, a one percent rise in per capita GDP is related to a nearly proportionate percentage rise in value of record sales. The positive sign of its coefficient, though, is in the direction one would expect as higher per capita GDP is generally associated with more consumption and spending. Although,

in the case of recession for example, there may be several periods of time in the data set where more extreme personal income changes played a role in the value of record sales, the results in column (5) suggest that they are not closely related from a longer-term, more stable, perspective.

The prices of audio and potential substitute goods prove largely statistically insignificant throughout the tables. As mentioned previously, record companies, with their oligopoly position, were mostly able to maintain, and even increase, the price of audio prior the 2000s without necessarily having to adjust to the true nature of the demand schedule. This may serve as an explanation as to why the model shows a statistically weak correlation between the price of music, which took a negative turn in 2000, and the value of record sales. The insignificance of the price of software confirms that, as a whole, this product bundle lacks substantial substitutive qualities with respect to record sales. Interestingly, the price of video proves statistically significant at the five percent level when including all independent variables. The all-inclusive model (5) would suggest that a one percent increase in the price of video products yields a minimal .05 percent rise in the value of record sales. Although this is relatively economically unimportant, its positive sign suggests at least a weak substitutive quality between the two entertainment products and could help capture the diversion between prices for audio versus other forms of entertainment, most of which have steadily fallen in real terms since their introduction. Before coming to further conclusions about the impact of prices, I will present the regression results isolating the differing price indices for audio and music. In addition to removing potential accuracy issues, this may allow more precise insight into differences between the two time periods.

Figure 6.2: Regression Results with Separated Price Indices

| | (1) | (2) | (3) | (4) | (5) |
|--|-----------|-----------|----------|-----------|-----------|
| VARIABLES | TRS | TRS | TRS | TRS | TRS |
| LGDP₁₉₇₃₋₂₀₁₁ | 1.173* | 1.041 | 0.993 | 0.755 | 0.686 |
| | (0.683) | (0.670) | (0.667) | (0.637) | (0.649) |
| Int_Pen₂₀₀₀₋₂₀₁₁ | | 0.00632 | | | 0.00308 |
| | | (0.00382) | | | (0.00423) |
| Broad_Pen₂₀₀₀₋₂₀₁₁ | | | -0.0326* | | 0.0330 |
| | | | (0.0179) | | (0.0334) |
| Millen | | | | -0.115*** | -0.166** |
| | | | | (0.0410) | (0.0790) |
| Price_Audio₁₉₇₇₋₁₉₉₇ | -0.0299 | -0.0267 | -0.0254 | -0.0194 | -0.0178 |
| | (0.0269) | (0.0263) | (0.0261) | (0.0247) | (0.0250) |
| Price_Audio₁₉₉₈₋₂₀₁₁ | -1.759*** | -2.599*** | 0.144 | 0.811 | -0.372 |
| | (0.231) | (0.556) | (1.068) | (0.940) | (1.563) |
| Price_Video₁₉₈₈₋₁₉₉₇ | 0.0398 | 0.0442 | 0.0460 | 0.0540** | 0.0562** |
| | (0.0282) | (0.0276) | (0.0274) | (0.0260) | (0.0265) |
| Price_Video₁₉₉₈₋₂₀₁₁ | 1.834*** | 2.668*** | -0.102 | -0.769 | 0.430 |
| | (0.247) | (0.559) | (1.089) | (0.954) | (1.580) |
| Price_Soft₂₀₀₀₋₂₀₁₁ | 0.00675 | 0.0115 | 0.0111 | 0.0180 | 0.0211 |
| | (0.0383) | (0.0374) | (0.0370) | (0.0350) | (0.0355) |
| Constant | -2.300 | -0.997 | -0.521 | 1.814 | 2.493 |
| | (6.712) | (6.585) | (6.555) | (6.264) | (6.379) |
| Observations | 39 | 39 | 39 | 39 | 39 |
| R-squared | 0.757 | 0.776 | 0.780 | 0.806 | 0.814 |

Standard errors in parentheses

*denotes statistical significance at the 10% level, ** 5%, ***1%

Figure 6.2, although generally confirming the importance of the broadband and time trend variables, presents some interesting results with regard to the relationship between record sales and the audio price indices. In regressions (1) and (2), the price of audio is statistically significant at the one percent level and economically important in the time period following 1997. As expected, price of audio, appears less meaningful from 1977-1997, years when prices could be kept high and static. The first column of Figure 4.2 suggests that, from 1998-2011, a one percent rise in the price of audio products could be associated with a near 2

percent drop in the value of record sales. In regression (2), the coefficient becomes an even larger negative value while the added internet penetration variable proves statistically insignificant at the one percent level. This suggests that the price of audio may actually be capturing some of the explanatory power of internet penetration as it follows a similarly linear path from 1998-2011. Continuing across the table, though, the price of audio loses its statistical significance with the introduction of the broadband and time trend variables. If the time trend does indeed capture the general trajectory of the internet age, the price of audio, which has certainly transformed due to technological changes, could potentially be included in its explanatory realm. The statistical insignificance of the price of audio from 1977-1997 once again points to the unique market structure that limited changes during this time period.

Regarding the price of video, the above table also gives a slightly more detailed understanding of its possible relationship with record sales. In the first 2 regressions, only the price of video from 1998-2011 proves statistically significant showing the expected sign for a coefficient on the price of a substitute product. Once the broadband and time trend variables are included, the video price indices of the first period become significant with the latter becoming insignificant. The steady downward trend in price of video during the 2000s may cause multicollinearity with the Internet variables, which display oppositional linear growth. Testing for correlation between the log of the chained price index of video, restricted to 2000-2011, and the time trend we find a nearly perfectly negative relationship between the two variables. This helps explain why the price indices from 1998-2011 prove insignificant in these results, and additionally may point to the internet's all-encompassing impact. On the other hand, the fact that the price of video during the first portion of the data proves more

statistically significant than that of audio in a similar timeframe emphasizes the weak relationship between music's price and its demand schedule before 2000.

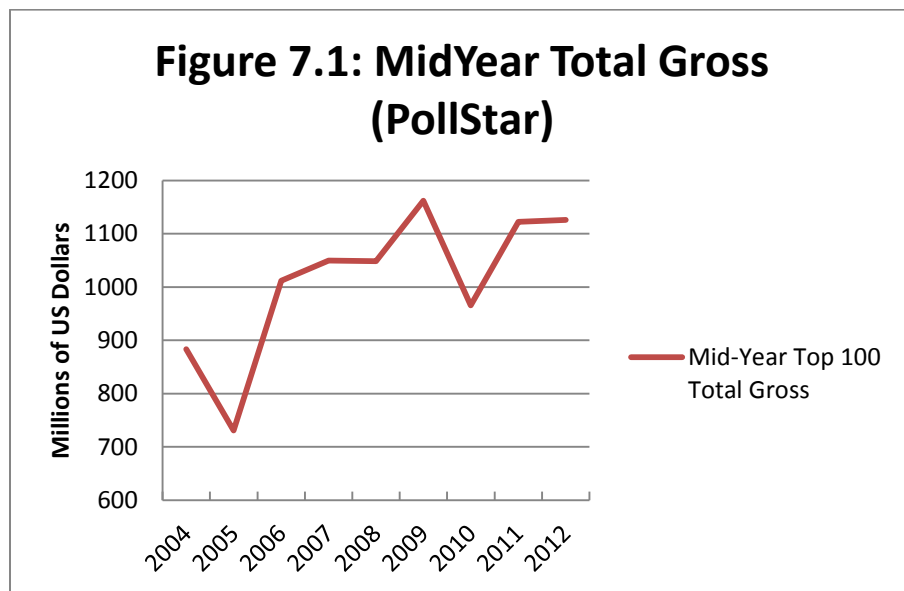
The regression results presented in this section confirm the difficulties facing record sales, and companies, over the last dozen years. The negative, statistically significant, coefficients of the internet variables certainly suggest an adverse impact on the real value of music sales. Including a time trend from 2000-2012 allows us to capture not only the internet's rise, but also its broader implications including shifts in consumer preference, social changes and new channels for distribution and promotion among other aspects. The fact that the price of audio was mostly, and always when including the years from 1977-1997, insignificant points to the market control held by a few firms whose resources allowed them to set a price likely above equilibrium.

New developments of the 21st century, though, have expanded consumer selection, and means of obtaining, music forcing the price of music towards one that is more reflective of its demand schedule in a free market. The shift is expressed in the first two columns of Figure 6.2 as the price of audio is significant in the absence of the broadband and time trend variables, whose further reaching implications may in fact reflect these changes. Although the coefficient on the price of video variable is economically minimal, its statistical significance could highlight downward adjustments in price by different entertainment-related industries that were not similarly made by the recording industry until more recently. While it may have been appropriate to use the rise in the prevalence of the Internet as a proxy file sharing in the early 2000s, the true implications of the Internet today are far more expansive. Still, when looking at record sales, the time trend is alarmingly negative reflecting the abrupt change to an

established, and thriving, industry that now faces the challenge of adjusting to the digital landscape.

VII. Trends in the Concert Industry: 2004-2012

The drastic fall of record sales in the early 2000s coincided with consecutive record-breaking years in terms of revenue for the concert industry (see Section II). The more accessible means of distribution and greater opportunities for consumption, while hurting the sale of prerecorded music, may have served as a powerful sampling mechanism for the promotion of live shows. Since most artists generate more income from their live performances than music sales, this would imply the general welfare shift suggested by the literature presented in Section III. Although it remains relatively unlikely that concerts could serve as the sole revenue stream for a viable music industry model, its rapid growth offers new, valuable opportunities in the music industry. Using data from PollStar’s “2012 MidYear Report,”¹¹ I will briefly illustrate and discuss the updated trends in the live music sector.



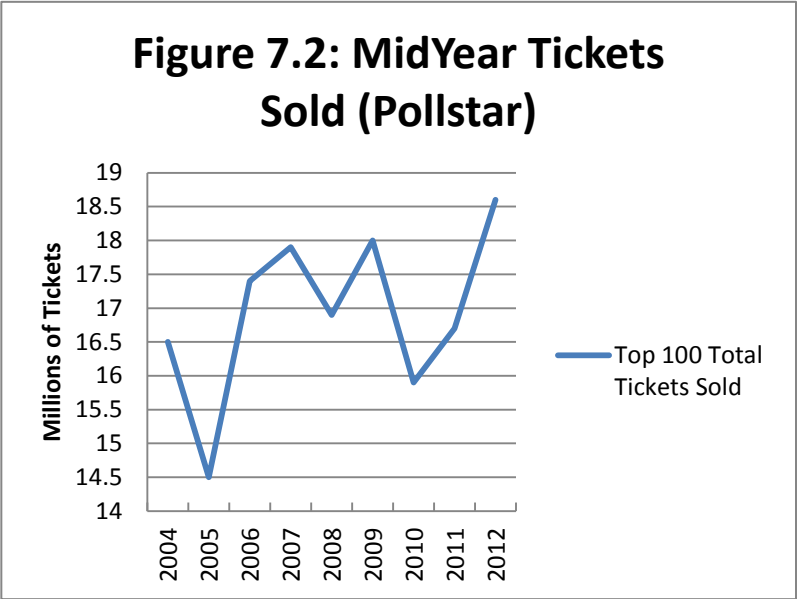
¹¹ The “PollStar 2012 MidYear Report” is a physical publication, which can be ordered through their website: <http://www.pollstar.com/>. As before, the citation (PollStar) suggests use of data from this report.

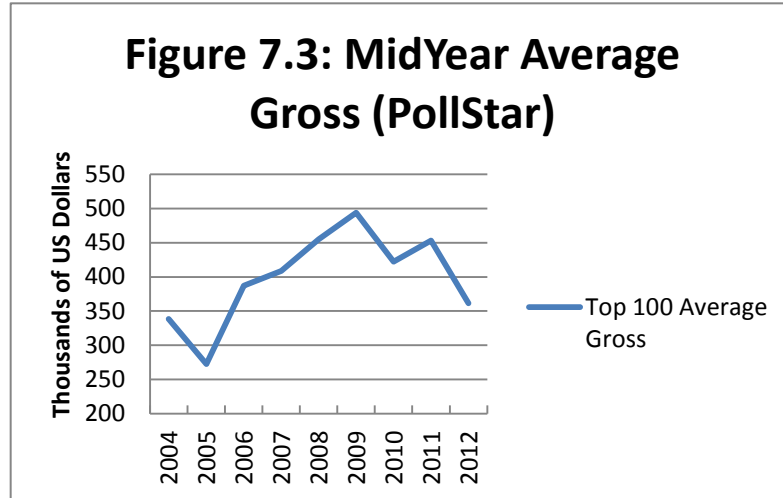
In their report, Pollstar, the leading trade publication for the concert industry, provides historical midyear data regarding the top 100 grossing tours and events of North America, from 2004 to 2012. Figure 7.1 illustrates the growth in the total gross of these tours. Even with a few slight dips, this aggregate rose by almost 28 percent in the seven year period in which the value of record sales were cut in half. While recording is still, from a revenue standpoint, a larger industry, the current trajectory, accelerated enormously by new technology, is quite striking. It is also important to remember that these numbers are only representative of the highest margin and do not capture a growing base of smaller acts that has perhaps begun to emerge.

A 2008 article in Forbes Magazine documented a record-breaking year for concert revenue of \$3.9 billion in 2007. At the same time, the revenues from the top 20 grossing concert tours fell by 15 percent suggesting growing success among smaller touring acts and “strength from the bottom up” (Hau 01/04/2008). The rise in the prevalence of the Internet may be one possible explanation for this shift as smaller artists may more easily distribute music to build a fan base whom which they may then charge for their shows. For established acts, releasing free music, along with effective use of social media marketing, can also serve as promotion for tours.

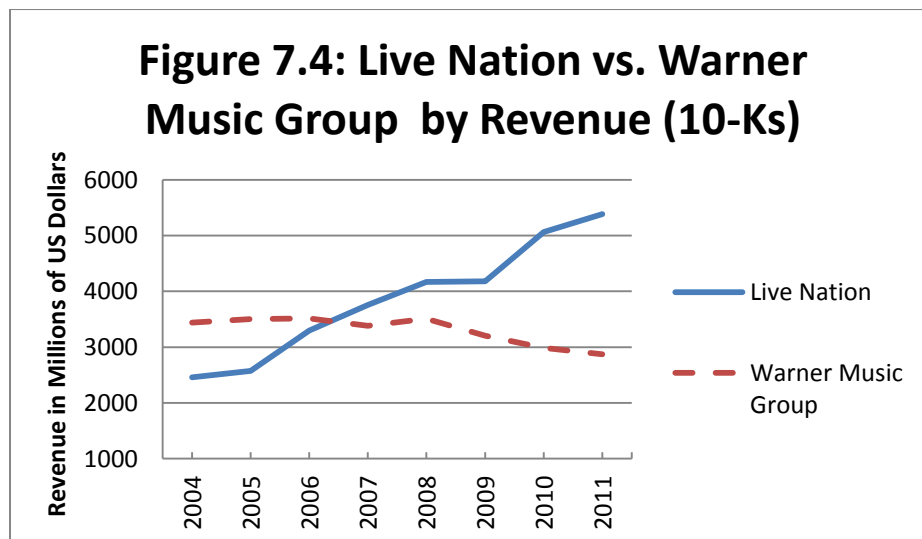
Another notable shift in the concert sector has occurred with music festivals gaining widespread popularity. A 2011 article in the Wall Street Journal highlights the Coachella Valley Music and Arts Festival, calling it the “Woodstock of the Internet generation” (Ring 08/26/2011). While the gross revenue from the top 100 tours actually declined in 2009 and 2010, Coachella, and other similar festivals, continued to break attendance records every year. One possible explanation may be Americans’ watching their spending. The article speculates

that rather than pay \$90 to see one band, consumers can spend \$300 and see over 100 bands (Ring 08/26/2011). In addition festivals have taken on a role beyond concerts as they often serve as a full weekend experience with a culture of their own. These events often feature up-and-coming bands along with several top-tier headliners and, with over 100,000 people in attendance, can help an artist at any level expand their fan base. This also creates an incentive for consumers who are looking to discover new artists. The extended length of festivals brings several additional revenue streams from related necessities such as campsites, parking, food and merchandise (Ring 08/26/2011). In 2012, three of the top five concert grosses came from music festivals with Coachella, which expanded to two identical weekends, standing at number one with a record-shattering 47 million dollar gross (PollStar). As more artists gain exposure through the Internet, festivals can host a wide-range of performers, from different genres and levels of mainstream consciousness.





The recent spike in total ticket sales, shown in Figure 7.2, has likely been greatly aided by festivals, whose larger scale venues and multiple artists allow them to both expand their audience and charge a higher price. Meanwhile, average gross per event within the top 100 has fallen in recent years (see Figure 7.3) suggesting less even distribution within the collection. This could also potentially be attributed to the rise of large, sold-out festivals, which bring in enormous amounts of revenue that few, if any, individual acts could earn in one show. The rising, often independent, bands who perform at festivals, though, gain valuable exposure that might serve to boost recent bottom-up development, not expressed in the top 100 data.



An alternative way to explore the differing trends within concerts and recorded music would be to compare revenues¹² of industry leaders. Live Nation Entertainment is the largest ticketing and events promotion company in the world with over 10 million tickets sold in the first half of 2012 alone (Pollstar). Warner Music Group, discussed in Section II, is the largest U.S.-owned music retailer, and third largest in the world, and has worked to reinvent its business strategy in light of record sale woes. The simple representation in Figure 7.4 can, of course, not conclusively represent these two industries, or even companies, but does offer interesting anecdotal juxtaposition in terms of the growth in popularity of concerts and coinciding struggles of record labels. In addition, Live Nation, whose revenues surpassed 5 billion dollars in 2011, may better represent those acts not included in the top 100 data since they work with events of all sizes.

The illustrations included in this section suggest that impacts of the Internet, although not as directly, likely played a role in the resurgence of the concert industry. Not only have revenues from live music risen significantly, but the general composition of the live music business seems to have shifted slightly away from the top 100 with a larger number of small performances possibly contributing to the general upward trend during this century. The re-emergence of music festivals as a popular, and profitable, strategy for live entertainment companies also may both reflect impacts of the Internet and contribute to the shift in composition. Due to the limiting nature of the data I was able to obtain, though, the

¹² All revenue data used for Figure 7.4 were taken from the 10-K filings of the two companies. For Live Nation Entertainment those can be found online at their investor relations page: <http://phx.corporate-ir.net/phoenix.zhtml?c=194146&p=irol-irhome>. Similarly Warner Music Group's 10-k filings can be found on their website: <http://investors.wmg.com>.

information provided in this section can only be considered preliminary at best.¹³ Further empirical study is certainly warranted regarding live performance, a potentially essential expanding market.

VII. Conclusions

While David Bowie's 2002 predictions that opened this study may have seemed extreme at the time, the results and analysis of this study suggest that they may in fact be coming to fruition. The landscape of the music industry continues to transform, from both an economic and social perspective, largely due to the rise of the Internet and related technological advances. Although sales displacement due to illegal file sharing was likely a key contributor to the drastic drop in record sales of the early 2000s, the impact of the Internet now represents a much broader change presenting the music industry with a set of unique challenges, and opportunities.

Record labels, which enjoyed an extended oligopoly, no longer have the market dominance to keep their prices at a level above equilibrium with major shifts in areas they once almost exclusively controlled--production, distribution and promotion of music. The resurgence of the single song sale format, one that was nearing extinction prior to 2000, was catalyzed by illegal file sharing and subsequently capitalized on with the advent of legal digital distribution. This shift in consumer preference and expansion of their selection, likely creates a more accurate representation of the free market demand schedule for music as fans are more inclined to pay 99 cents for a song of their choice than \$10 or more for a full album. While

¹³ Due to budget constraints, I was unable to obtain aggregate, more historical, data from PollStar. Aggregate numbers, as opposed to top 100 exclusively, may likely better represent the actual movements of the concert industry.

music listeners enjoy greater selection and lower prices, the value of record sales continue to deteriorate. The negative, statistically significant and economically important coefficient of the time trend variable with regard to the value of record sales supports the notion of a downward trajectory commencing at the turn of the millennium. High correlation between the time trend and broadband penetration, also negative and significant when included individually, variables further implies the importance of the Internet and its broader influences.

Interestingly, the general welfare of artists, who often saw little profit from the sale of their recorded works, does not seem to follow the decline in record sales. The advances of the Internet have made wide distribution of music easy and affordable allowing some to forego the former necessity of signing a record deal. Further, the social media phenomenon and growth of online music communities have allowed rising artists to connect and establish with the appropriate fan base and provided new marketing techniques for already established acts. Some musicians have begun utilizing these new outlets to release portions or, in some cases, all of their music for free as a unique type of sampling promotion for live performance, the main source of income for most artists.

This reversed strategy, among other developments fueled by direct and indirect influences of the Internet, may help describe the expansion of the concert business during the contraction of the recording industry. Beginning in the 2000s, the live music business has seen unprecedented growth particularly from the bottom up. This developing base may be attributed to the ability of smaller acts to easily promote themselves and establish and expand their following. Another notable change comes with the re-emergence, and reinvention, of the music festival business model, featuring over 100 artists over the course of several days. The

large number and variety of artists at these events is likely made possible by the industry's growing base of small to mid-level acts. Within the top ranks of the live music sector, music festivals have proven a driving force of both ticket sales and revenue. Concerts may not hold the full solution to losses in record sales but will likely continue to play an increasingly important role in the broader music industry.

As many of the key functions of the record label become irrelevant, they will be forced to trim down to remove inefficiencies and work to develop innovative business strategies. One way in which these companies can stay pertinent is by shifting focus to broader artist career cultivation and expanding the realm of their contracts to include concert-related revenues. This strategy has begun to take hold with the development of "360 Deals." Regardless of the correct approach, it is evident that the classic structure of the recording side of the industry cannot be sustained in the 21st century.

There is little doubt that the wide-ranging social and economic implications of the Internet have had an adverse impact on the value of record sales. However, these struggles have been wrongly attributed to the broader music industry. The impacts of the Internet have removed inefficiencies within the original system allowing artists to easily reach an essentially unlimited audience and providing consumers lower prices and a constantly growing selection of music. New business opportunities, particularly in the areas of digital distribution and live entertainment, will likely take center stage as the progression of the Internet continues. Moving forward, the success of the music industry will be largely dependent on innovation, a cornerstone of the post-Internet era.

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